Keys to the Flora of the Chicago Region

A Companion Distillation Extracted From:

Flora of the Chicago Region: A Floristic and Ecological Synthesis

Published by the Indiana Academy of Sciences, Indianapolis, 2017

With:
CONSERVATION RESEARCH INSTITUTE
Cedarburg, Wisconsin

THE CHICAGO BOTANIC GARDEN
With the support of Robin Tennant Colburn of the Negaunee Foundation
Glencoe, Illinois

THE FOREST PRESERVE DISTRICT OF COOK COUNTY
River Forest, Illinois

Gerould Wilhelm & Laura Rericha

September 15, 2023

CONSERVATION RESEARCH INSTITUTE
Sandpoint, Idaho

THE FOREST PRESERVE DISTRICT OF COOK COUNTY
River Forest, Illinois

[For Field Use Only, NOT to be cited]

Keys to the Flora of the Chicago Region

Gerould Wilhelm & Laura Rericha

Conservation Research Institute
and
Forest Preserve District of Cook County

The book Flora of the Chicago Region, a notoriously heavy volume, is quite a burden to carry into the field—although we have seen it done by some stout and devout students of the flora, which volumes are quite weather worn. The distillation here is in response to those experienced field botanists who wish they had an easily negotiated field reference with just the keys so that they might be reminded of the differences between or among some species in a genus, look up a specific epithet, or perhaps look up the family of a seldomly encountered plant. We hope that this extraction will meet that need and allow the desk reference to remain less abused in the herbarium, in the car, or at home!

The Conservation Research Institute provides several companion references and addenda that pertain to the flora of the Chicago Region. The website provides an Illustrated Glossary and illustrated keys to Ferns & Lycophytes as well as illustrated keys to the genera: *Crataegus, Galium,* and *Salix*. More are on the way as time and resources permit. One may also wish to download Gerould Wilhelm's the latest draft of the Lichens of the Southern Lake Michigan Region as well as many keys to the bees of the same region, the ongoing research of Laura Rericha-Anchor. In addition, there are numerous essays on local ecology and conservation philosophy.

The Keys to the Flora of the Chicago Region and all of the other educational tools are available without charge, downloadable from the website. The institute, however, continues to appeal to the fair nature of dedicated biologists, ecologists, conservationists, and educators to support our research and educational efforts with a donation. Your thoughtfulness can be sent to:

Conservation Research Institute
P. O. Box 243
Sandpoint, ID 83864

KEY TO THE FAMILIES

A. Plants woody with leaves linear-acicular, awl-like, scale-like, or needle-like, with resin ducts; flowers in clusters; fruit a dry woody cone or drupe-like and blue-waxy with fleshy fused scales.
  B. Leaves scale-like, appressed-imbricate or acicular-subulate, or both, mostly opposite or in whorls of 3 . . . . . CUPRESSACEAE
  B. Leaves linear to needle-like, arranged spirally and appearing alternate on the twigs or grouped into fascicles or clusters of 2-several.
    C. Leaves deciduous.
      Leaves several to many in fasciculate clusters . . . . . **Larix** in PINACEAE
      Leaves not in clusters . . . . . TAXODIACEAE
    C. Leaves evergreen.
      Seed imbedded in a red, fleshy, drupe-like cone . . . . . TAXACEAE
      Seeds imbedded in dry, scaly or imbricated cones . . . . . PINACEAE

A. Plants without the above combination of characters.
  D. Plants prostrate, thick and fleshy, consisting of 1-several flattened, spiny or prickly, ovate, oblong-ovate, or suborbicular segments . . . . . CACTACEAE
  D. Plants without the above combination of characters.
    E. Plants without stamens, pistils, or true seeds (the LEMNACEAE will key out here as well as under the next lead) . . . . . **Section 1**
    E. Plants with stamens, pistils, and true seeds (dioecious plants will have only stamens or pistils).
      F. Plants usually with at least two of the following characters: leaves parallel-veined, cotyledon one, floral parts in threes, stem vascular bundles scattered, cambium usually absent. § MONOCOTYLEDONEAE . . . . . **Section 2**
      F. Plants usually with at least two of the following characters: leaves with netted venation, cotyledons two, floral parts not in threes, stem vascular bundles in a ring, cambium present. § DICOTYLEDONEAE.
        G. Plants woody at least at the base, including trees, shrubs, subshrubs, and woody vines (facultative or questionable plants will key out elsewhere as well).
          H. Woody vines, usually sprawling or climbing by twining, tendrils, or adhesive discs; plants never prickly . . . . . **Section 3**
          H. Plants erect to suberect shrubs or trees, or occasionally low, prostrate, creeping, trailing, or arching, sometimes prickly.
            I. Plants prostrate, creeping, or trailing, never with prickles or compound leaves . . . . . **Section 4**
            I. Plants erect, suberect, or arching trees or shrubs, or if trailing, then usually with prickles or compound leaves or both.
              J. Leaves flabelliform and 2-lobed, two or more from alternate spurs . . . . . GINKGOACEAE
              J. Leaves not as above.
                Leaves appearing opposite or whorled (some shoots alternate in CERCIDIPHYLLACEAE) . . . . . **Section 5**
                Leaves alternate (rarely subopposite in Rhamnaceae and Salicaceae) . . . . . **Section 6**
        G. Plants herbaceous, annuals, biennials, or perennials, the stems usually dying back to the ground each year.
          K. Principal stem leaves alternate or stem leaves absent (inflorescence leaves may be opposite or whorled, or the proximal or distal leaves may appear somewhat opposite) . . . . . **Section 7**
          K. Principal stem leaves opposite or whorled, sometimes confined to a single pair or whorl (inflorescence leaves may be alternate).
            Plants wholly aquatic, the stems and leaves floating or suspended, but stems may be anchored to the substrate . . . . . **Section 8**
            Plants paludal or terrestrial (if growing in water, then plant ascending to erect with the upper stem and inflorescence emersed) . . . . . **Section 9**

Section 1
Plants without stamens, pistils, and true seeds

1. Stems and branches rush-like, jointed, and appearing leafless . . . . . EQUISETACEAE
1. Stems and branches neither rush-like nor appearing jointed and leafless.
  2. Plants with stems manifestly short and bulb-like, with elongate leaves . . . . . ISOËTACEAE
  2. Plants not as above.
    3. Leaves small, numerous, persistent, often imbricate, 4-16 ranked; sporangia axillary or nearly so.
      Plants small, moss-like; leaves with ligules, 4-16 ranked; some of the sporangia with 3 or 4 large spores . . . . SELAGINELLACEAE
      Plants not usually small and moss-like; leaves without ligules, 4-6 ranked; all sporangia with numerous tiny spores . . . . . LYCOPODIACEAE
    3. Leaves (fronds) not closely imbricate or if slightly so, then never more than 2-ranked; sporangia not axillary (absent in LEMNACEAE).
      4. Plants floating or suspended in water.
        5. Plants with fronds deeply 4-lobed . . . . . MARSILEACEAE
        5. Plants without 4-lobed fronds.
          Plants moss-like, the fronds loosely 2-ranked in small, usually much branched colonies . . . . . SALVINIACEAE
          Plants not moss-like, the fronds single or if colonial, then not 2-ranked . . . . . LEMNACEAE
      4. Plants neither floating nor suspended.
        6. Sporangia borne in a paniculate or spicate inflorescence from near the base of the blade or petiole base of a sterile frond . . . . . OPHIOGLOSSACEAE
        6. Plants without the above combination of characters.
          7. Fertile fronds or fertile portions of fronds unlike the sterile ones, brownish or blackish, without green tissue.
            Fertile segments with the margins rolled up over the sporangia, appearing like a string of beads or close segments . . . . . ONOCLEACEAE
            Fertile segments covered with numerous, exposed, bivalved sporangia . . . . . OSMUNDACEAE
          7. Fertile fronds similar to the sterile fronds, the sporangia borne on the segments of green or greenish blades.
            8. Sori marginal, the indusium more or less formed by the revolute margin of the frond or its segments.

Plants coarse, becoming 0.3 m or more high . . . . . DENNSTAEDTIACEAE
Plants delicate, less than 0.3 m high . . . . . ADIANTACEAE

8. Sori not marginal, the indusium not formed by the frond margins.
9. Indusium absent, the sori exposed; frond not deltate . . . . . POLYPODIACEAE
9. Sori protected by an indusium or indusium-like structure, or if indusium absent then the frond deltate with a winged rachis.
10. Indusium opening parallel to the midrib . . . . . BLECHNACEAE
10. Indusium opening obliquely to the midrib or toward the margin or tip of the pinna, or the indusium obscured by spores.
11. Fronds leathery, evergreen, the blades linear-oblong to long-attenuate, less than 8 cm wide; rachis wiry, glossy, dark reddish, purplish, or blackish throughout . . . . . ASPLENIACEAE
11. Fronds membranaceous and deciduous, not leathery, or if somewhat so, then without the above combination of characters.
12. Segments of frond ciliate, the distal portions of the rachis beset with acicular hairs; petiolar vascular bundles 2 and crescent-shaped proximally, united distally into a U-shaped bundle . . . . . THELYPTERIDACEAE
12. Segments of frond eciliate, the rachis without acicular hairs; petiolar vascular bundles 2 and lunate or more than 2.

Cross section of petiole with 2 vascular bundles; fronds membranaceous, not evergreen . . . . . WOODSIACEAE
Cross section of petiole with more than 2 vascular bundles; fronds coriaceous, often more or less evergreen . . . . . DRYOPTERIDACEAE

Section 2
Monocotyledonous families

1. Plants wholly aquatic, floating or submersed.
2. Plants lacking stems and true leaves, minute, rarely flowering . . . . . LEMNACEAE
2. Plants with true stems and leaves, not minute, commonly flowering.
3. Leaves linear, entire, distinctly several-nerved, but without a distinct midnerve . . . . . **Heteranthera** in PONTEDERIACEAE
3. Leaves various, but if linear and entire, then nerveless or with a distinct midnerve.
4. Plants with either small, numerous, linear to oblong leaves in whorls or with extremely long (up to 2 m) ribbon-like leaves emanating from a basal tuft; flowers imperfect, the fruits indehiscent and ripening under water . . . . . HYDROCHARITACEAE
4. Plants not as above.
5. Leaves in floating rosettes, rotund or cuneate-spatulate.

Petioles strongly inflated, the leaf blades rotund . . . . . **Eichhornia** in PONTEDERIACEAE
Petioles absent, the leaf blades cuneate-spatulate . . . . . **Pistia** in ARACEAE

5. Leaves not in floating rosettes, neither broadly spatulate nor rotund.
6. Flowers and fruits solitary, axillary; leaves whorled or paired, conspicuously sheathing at the base, the margins minutely spinulose to coarsely toothed; flowers imperfect . . . . . NAJADACEAE
6. Flowers and fruits clustered or in terminal spikes; leaves all, except rarely the distalmost ones, alternate, sheathed or sheathless, the margins entire or merely wavy or serrulate; flowers usually perfect.

Individual fruits pedicellate on long slender stalks; leaves capillary-filiform with conspicuous sheaths up to 5 cm long; stamens 2 . . . . . RUPPIACEAE
Individual fruits sessile or nearly so; leaves and sheaths various; stamens 1 or 4 . . . . . ZOSTERACEAE

1. Plants paludal to terrestrial, emergent.
7. Plants tall, 1-2 meters or more in height; either the flowers numerous and inconspicuous in a dense, brown, cylindrical, terminal spike more than 0.6 cm wide and to 20 cm long or plant a reed with hollow internodes.

Plant a branched shrubby reed or bamboo . . . . . POACEAE
Plant unbranched, with basally disposed leaves . . . . . TYPHACEAE

7. Plants not as above.
8. Inflorescence a dense, thick spadix in which the flowers are at least partially imbedded in the fleshy axis . . . . . ARACEAE
8. Inflorescence not a spadix.
9. Inflorescence a whitish, solitary, button-like head, subtended by involucral bracts atop a smooth, slender, ridged scape arising from a dense basal rosette, the perianth chaffy, the flowers imperfect . . . . . ERIOCAULACEAE
9. Plants not as above.
10. Flowers subtended by regularly imbricate or distichous scales.
11. Fruit more than one-seeded; perianth present, yellow; leaves all basal . . . . . XYRIDACEAE
11. Fruit always one-seeded; perianth absent; leaves commonly cauline.

Cauline leaves 2-ranked, the sheaths usually open; culms usually hollow, terete; anther versatile, attached at the middle to its filament; fruit either a grain or utricle . . . . . POACEAE
Cauline leaves 3-ranked, the sheaths usually closed; culms solid, often triangular; anther basifixed, attached at one end to the tip of its filament; fruit a nutlet or achene (achene enclosed in a perigynium in Carex) . . . . . CYPERACEAE

10. Flowers not subtended by regularly imbricate or distichous scales.
12. Corollas absent or small, actinomorphic, greenish-herbaceous to brown-chartaceous; plants without broad green leaves.
13. Leaves reduced to inconspicuous scales which subtend clusters of filiform, more or less needle-like branchlets; stamens 6, the stigmas 3 . . . . . ASPARAGACEAE
13. Plants not as above.
14. Perianth lacking or if present, then slightly greenish, herbaceous, and the flowers imperfect; fruits bur-like . . . . . SPARGANIACEAE
14. Perianth consisting of small, greenish-herbaceous to brown-chartaceous segments, the flowers perfect; fruits not bur-like.

Inflorescence loose to dense, in a spike-like raceme (raceme few-flowered in Scheuchzeria); perianth segments greenish-herbaceous, blunt; with 3 or 6, 1-2 seeded mericarps . . . . . JUNCAGINACEAE
Inflorescence a loose to dense cyme; perianth segments firm, green to brownish, sharp to subulate, chartaceous; fruit a many-seeded capsule or 3-seeded in Luzula . . . . . JUNCACEAE

12. Corollas present and not as above; plants commonly with broad green leaves.
    15. Plants vines; flowers small, imperfect, in loose paniculate clusters; leaves broad, strongly ribbed, alternate, ovate, palmately net-veined, heart-shaped; fruit a 3-winged capsule . . . . . DIOSCOREACEAE
    15. Plants without the above combination of characters.
        16. Stamens 6 or 9 or more; carpels separate, numerous; fruit a nutlet; plants with broad plantain-like leaves and scapes with numerous whorled and panicled branches; flowers perfect or imperfect. ALISMATACEAE
        16. Stamens up to 6 (9 to many in the rare Butomaceae); carpels neither separate nor numerous; fruit not a nutlet; leaves and inflorescences various; flowers usually perfect.
            17. Stamens more than 6; flowers umbellate, the perianth of six segments, pink, the outer three segments smaller and more deeply colored than the inner ones; leaves all basal; fruit a cluster of follicles . . . . . BUTOMACEAE
            17 Stamens 1-6; plants otherwise without the above combination of characters.
                18. Ovary inferior.
                    19. Stamens 1 or 2; flowers very irregular . . . . . ORCHIDACEAE
                    19. Stamens 3 or more; flowers more or less regular.
                        20. Stamens 6; plants pubescent or if glabrous, then the perianth tube elongate, with a cup-like crown at the junction of the tube and the spreading lobes; stems terete.
                            Plant pubescent; leaves mostly less than 0.5 cm wide . . . . . HYPOXIDACEAE
                            Plant glabrous; leaves mostly more than 0.5 cm wide . . . . . AMARYLLIDACEAE
                        20. Stamens 3, except in the Thismiaceae; plants glabrous and the perianth never with a cup-like crown; stems terete to strongly compressed-winged.
                            Plants more than 2 cm high, with 2-ranked, flat, equitant leaves . . . . . IRIDACEAE
                            Plants less than 2 cm high and otherwise not as above . . . . . THISMIACEAE
                18. Ovary superior (partly inferior in Aletris, with the sepals and petals united into a cylindrical, scurfy, roughened perianth).
                    21. Perianth yellow, salverform with a slender tube; leaves linear; stamens 3 . . . . . **Heteranthera** in PONTEDERIACEAE
                    21. Plants without the above combination of characters.
                        22. Stamens 6, with 3 long-exserted and 3 short (often sterile) and included within the blue-violet, 6-parted perianth; leaves lance-ovate, cordate, long-petiolate . . . . . PONTEDERIACEAE
                        22. Plants without the above combination of characters.
                            23. Sepals green, not colored like the petals, the petals, or at least 2 of them, blue; stamens 3, 5, or 6 . . . . . COMMELINACEAE
                            23. Sepals colored like the petals or if green, then the petals white, yellowish, red, or blue; stamens 4 or 6.
                                24. Flowers in spathiform umbels . . . . . ALLIACEAE
                                24. Flowers not in spathiform umbels.
                                    25. Cauline leaves in 1 or 2 whorls of 3 or more . . . . . TRILLIACEAE
                                    25. Cauline leaves not in whorls or if so, then the whorls more than 2.
                                        26. Flowers in axillary umbels; tendrils often present . . . . . SMILACACEAE
                                        26. Flowers not umbellate or if so, then the umbels terminal; tendrils absent.
                                            27. Leaves broad, elliptic to ovate or rotund, cauline or basal.
                                                28. Flowers less than 2 cm long or if longer, then the styles 3 or deeply 3-cleft; plants with elongate rootstocks . . . . . CONVALLARIACEAE
                                                28. Flowers more than 2 cm long, the styles 1, generally from bulbs or fibrous-rooted in the HOSTACEAE.
                                                    29. Inflorescence spicate; tepals united, at least below the middle . . . . . HOSTACEAE
                                                    29. Flowers solitary or from the distal axils, not in spikes; tepals separate.
                                                        Leaves perfoliate or at least partly sheathing at the base; flowers axillary and yellow . . . . . COLCHICACEAE
                                                        Leaves sessile to petiolate, not sheathing or perfoliate; flowers not both axillary and yellow . . . . . LILIACEAE
                                            27. Leaves filiform to linear, prevailingly basal or proximally disposed.
                                                30. Flowers more than 5 cm long.
                                                    Plants in flower more than 1 m high, coarse; leaves numerous, stiff, mostly basal, the larger ones more than 0.5 m long and over 3 cm wide; flowers white, large . . . . . AGAVACEAE
                                                    Plants without the above combination of characters . . . . . HEMEROCALLIDACEAE
                                                30. Flowers less than 5 cm long.
                                                    31. Style 1; fruit a berry; mat-forming herb from short rhizomes . . . . . CONVALLARIACEAE
                                                    31. Styles 1-3; fruit a capsule; often bulbous, not mat-forming.
                                                        32. Style 1; leaves all basal, from concentrically coated, tunicated, onion-like bulbs. . . . . HYACINTHACEAE
                                                        32. Styles 3; leaves basal or proximally disposed, from rhizomes, corms, or non-tunicated bulbs.
                                                            33. Plants with 2 or more well developed cauline leaves . . . . . MELANTHIACEAE

33. Plants scapose or with fewer than 2 well developed cauline leaves.
    Leaves lanceolate, many 1 cm or more wide, forming a conspicuous basal rosette; inflorescences more than 0.8 dm long; perianth roughened . . . . NARTHECIACEAE
    Leaves linear, usually less than 1 cm wide, not forming a conspicuous basal rosette; inflorescences less than 0.8 dm long; perianth not roughened . . . . . TOFIELDIACEAE

Section 3
Woody vines

1. Leaves opposite.
   2. Leaves simple, entire to rarely sinuate; fruit fleshy . . . . . **Lonicera** in CAPRIFOLIACEAE
   2. Leaves compound, pinnate with 3 or more leaflets; fruit dry.
      Leaves with 9-11 ovate and short-petiolulate leaflets; flowers orange and red, trumpet-shaped, usually over 5 cm long; fruit a capsule . . . . . **Campsis** in BIGNONIACEAE
      Leaves with up to 9 leaflets, many of them often with long petiolules; flowers neither red and orange nor trumpet-shaped, always much less than 5 cm long; fruit an aggregate of achenes . . . . . **Clematis** in RANUNCULACEAE
1. Leaves alternate.
   3. Leaves compound.
      4. Leaves trifoliolate.
         Petiolule of terminal leaflet long-stipitate, densely hispid with tawny hairs; stipules present . . . . . **Pueraria** in FABACEAE
         Petiolule of terminal leaflet absent to elongate, glabrous or with white pubescence, not stipitate; stipules absent . . . . . ANACARDIACEAE
      4. Leaves not trifoliolate.
         5. Leaves pinnately divided; leaflets more than 7 . . . . . **Wisteria** in FABACEAE
         5. Leaves palmately divided; leaflets 3-7.
            Leaflets entire, retuse . . . . . LARDIZABALACEAE
            Leaflets coarsely toothed, acute or acuminate . . . . . **Parthenocissus** in VITACEAE
   3. Leaves simple, auriculate, or subdivided into 2 basal lobes, but never compound.
      6. Plants climbing by tendrils; bark exfoliating . . . . . **Vitis** in VITACEAE
      6. Plants without tendrils; bark tight.
         7. Leaves serrulate to serrulate-crenate; ripe fruits orange or yellowish-orange . . . . . **Celastrus** in CELASTRACEAE
         7. Leaves entire to lobed, never serrulate or crenate; ripe fruits not orange or orangish.
            8. Leaves prevailingly 3-lobed, coriaceous, evergreen . . . . . **Hedera** in ARALIACEAE
            8. Leaves neither prevailingly 3-lobed, coriaceous, nor evergreen.
               Leaves peltate, the petiole attached to the under surface of the leaf near the truncate to cordate base; blades broadly ovate to orbicular-reniform, 0-7 angled or lobed; flowers imperfect, greenish-white; fruit a one-seeded bluish-black drupe . . . . . MENISPERMACEAE
               Leaves not peltate; blades lanceolate to ovate, acute to acuminate, sometimes lobed proximally; flowers perfect, violet; fruit a many-seeded berry, not bluish-black . . . . . SOLANACEAE

Section 4
Prostrate or trailing shrubs

1. Leaves alternate.
   Petals absent; stamens 4; leaves conspicuously clustered near the ends of shoots, coarsely dentate . . . . . **Pachysandra** in BUXACEAE
   Petals present, usually 5; stamens 8-10; leaves not notably predisposed at the ends of shoots, serrate or entire . . . . . ERICACEAE
1. Leaves opposite.
   2. Leaves serrate or serrulate; petals separate, green or greenish-purple; fruit a 3-parted capsule . . . . . **Euonymus** in CELASTRACEAE
   2. Leaves entire (few-toothed in the rare Linnaea); petals united, not green; fruit not as above.
      3. Flowers in whorls in dense terminal clusters; leaves broadly cuneate, 5-12 mm long; plant fragrant when crushed . . . . . **Thymus** in LAMIACEAE
      3. Flowers solitary or paired in terminal or axillary inflorescences; leaves various; plants inodorous.
         4. Leaves lanceolate, more than 1.5 cm long; ovary superior; flowers more than 1.5 cm across, blue or lavender-blue (white); fruit a pair of cylindrical follicles 1 cm or more long . . . . . **Vinca** in APOCYNACEAE
         4. Leaves ovate or orbicular, truncate to cuneate at the base, less than 1.5 cm long; ovary inferior; flowers less than 1.5 cm across, white to light-pink or purplish; fruit a capsule or berry (drupe).
            Leaf blades ovate to orbicular, rounded to subtruncate at the base; flowers paired, the ovaries united at the base, at the summit of peduncles shorter than the leaves; corolla lobes densely bearded inside; fruit a fleshy red berry or drupe . . . . . **Mitchella** in RUBIACEAE
            Leaf blades orbicular, abruptly cuneate at the base; flowers 2, the ovaries separate on paired pedicels at the ends of peduncles which greatly exceed the leaves in length; corolla lobes often sparsely pilose, but never densely bearded within; fruit a dry 3-locular, 1-seeded capsule . . . . . **Linnaea** in LINNAEACEAE

Section 5
Shrubs or trees with opposite or whorled leaves

1. Leaves digitately 5(7)-foliolate; fruit an echinate capsule 2 cm or more long, the seeds large, shiny, nut-like . . . . . HIPPOCASTANACEAE

1. Leaves simple, trifoliolate, or pinnately compound; fruit and seeds not as above.
   2. Leaves compound.
      3. Leaves mostly with 3 leaflets, though some often with 5(7) in Sapindaceae.
         Leaflets minutely and evenly serrulate; flowers white; fruit an inflated capsule . . . . . STAPHYLEACEAE
         Leaflets coarsely few-toothed to subentire; flowers not white; fruit a samara . . . . . SAPINDACEAE
      3. Leaves always with at least 5 leaflets, many often with more.
         4. Leaflets crenulate, strongly pellucid-punctate; flowers in terminal panicles or corymbs; fruit a 5-seeded drupe . . . . . **Phellodendron** in RUTACEAE
         4. Leaflets entire, serrate, or dentate, not pellucid-punctate; flowers in axillary inflorescences or terminal compound cymes; fruit a samara or a 3-5 seeded drupe.
            Shrubs with numerous, small, whitish flowers in large, terminal, compound cymes; stems scarcely woody, with soft pith; fruit a berry-like drupe . . . . . **Sambucus** in ADOXACEAE
            Trees with axillary inflorescences that emerge with or before the leaves; stems and twigs definitely woody, with hard pith; flowers not white; fruit a samara . . . . . **Fraxinus** in OLEACEAE
   2. Leaves simple.
      5. Leaf margins essentially entire and unlobed to rarely (in Symphoricarpos) more or less sinuate-pinnatifid.
         6. Leaves evergreen.
            Leaves less than 2.5 cm long . . . . . **Buxus** in BUXACEAE
            Leaves more than 2.5 cm long . . . . . **Kalmia** in ERICACEAE
         6. Leaves not evergreen.
            7. Plants scurfy, the twigs, leaves, and buds covered by brownish to silvery stellate scales . . . . . ELAEAGNACEAE
            7. Plants glabrous to variously pubescent, but never as above.
               8. Principal leaves ternately arranged to apparently whorled, appearing 3 or more per node.
                  9. Leaves large, ovate, cordate at the base; plant a tree; fruits long, cigar-shaped . . . . . **Catalpa** in BIGNONIACEAE
                  9. Leaves not cordate; plants shrubs; fruits not cigar-shaped.
                     10. Flowers and fruits sessile in spherical, long-pedunculate heads; petioles usually more than 1 cm long; leaves broadly lanceolate to ovate; plant glabrous . . . . . **Cephalanthus** in RUBIACEAE
                     10. Flowers and fruits pedicellate, 2 to several in loose, axillary clusters or fascicles; petioles usually less than 1 cm long; leaves various; plants glabrous or pubescent.
                        Flowers and fruits paired (ovaries inferior and united at the base) at the summit of slender peduncles; leaves ovate, broadly rounded to subcordate at the base; petals united; stamens 5; fruit a berry . . . . . **Lonicera** in CAPRIFOLIACEAE
                        Flowers and fruits mostly 3 to several, separate, each stoutly pedicellate; leaves lanceolate, tapering at the base; petals separate; stamens (8)10; fruit a capsule . . . . . **Decodon** in LYTHRACEAE
               8. Principal leaves merely opposite or subopposite.
                  11. Leaves lanceolate to oblanceolate, mostly sessile, often with fascicles of smaller leaves in their axils, the blades pellucid-punctate, appearing clear-dotted in transmitted light; flowers yellow; stamens more than 10; fruit a capsule . . . . . HYPERICACEAE
                  11. Plants not as above; stamens never more than 10.
                     12. Flowers and fruits either in pairs in the leaf axils or in tight, short, usually axillary spikes or clusters; petals united; stamens 4 to 5; ovary inferior; shrubs . . . . . **Symphoricarpos** in CAPRIFOLIACEAE
                     12. Flowers in paniculate or loosely to densely cymose or thyrsiform inflorescences, either axillary or terminating branches of shrubs or trees; petals, stamens, and ovaries various.
                        13. Inflorescences axillary; petals separate; stamens (8)10; fruit a 3-5 locular capsule.
                           Leaves obovate, the petioles longer than the pedicels . . . . . **Frangula** in RHAMNACEAE
                           Leaves lanceolate, the petioles absent or much shorter than the pedicels . . . . **Decodon** in LYTHRACEAE
                        13. Inflorescences terminal; petals separate or united; stamens 2 to 4; fruit fleshy, or if dry, then either consisting of indehiscent nutlets or comprising a 2-locular capsule.
                           14. Flowers and fruits in simple to more or less thyrsiform panicles; petals united; stamens 2; ovary superior . . . . . OLEACEAE
                           14. Flowers and fruits in open, naked, flattish to convex cymes, or in tight heads or head-like cymes; petals separate or united; stamens 4; ovary inferior.
                              Flowers in tightly packed globose heads; petals united; fruit an indehiscent nutlet; usually at least some of the leaves whorled . . . . . **Cephalanthus** in RUBIACEAE
                              Flowers in loose to compact cymes; petals separate; fruit a fleshy 1-seeded drupe; leaves all opposite . . . . . CORNACEAE
      5. Leaf margins crenate, serrulate, serrate, dentate, or lobed.
         15. Leaves palmately 3-several lobed.
            16. Petioles at least 5 cm long . . . . . BIGNONIACEAE
            16. Petioles all less than 5 cm long.
               Flowers not white; fruits with a pair of thin wings; trees . . . . . SAPINDACEAE
               Flowers white; fruits pulpy drupes with stony centers; shrubs . . . . . **Viburnum** in ADOXACEAE
         15. Leaves not lobed.
            17. Flowers all in axillary or supra-axillary cymes or solitary in the axils.
               18. Leaves cordate, suborbicular . . . . . CERCIDIPHYLLACEAE
               18. Leaves neither cordate nor orbicular.
                  19. Flowers large, bright-yellow and showy; fruit a 2-celled capsule . . . . . **Forsythia** in OLEACEAE
                  19. Flowers small, neither bright-yellow nor showy; fruit either a 3-5 lobed capsule or a fleshy drupe.
                     Fruit berry-like; cymes not pedunculate; branches and shoots often spine-tipped; stamens opposite the petals . . . . . **Rhamnus** in RHAMNACEAE
                     Fruit a 3-5 lobed capsule; cymes long-pedunculate; branches and shoots not spine-tipped; stamens alternate with the petals . . . . . **Euonymus** in CELASTRACEAE
            17. All or most of the flowers in inflorescences terminating branches.

20. Petals united, at least at the base; stamens fewer than 6; fruit a drupe or drupe-like, or a slenderly cylindrical, ultimately beaked capsule.
    Inflorescence usually 3-flowered; low shrub to 1 m high . . . . . DIERVILLACEAE
    Inflorescence several-flowered; erect shrub more than 1 m high . . . . . **Viburnum** in ADOXACEAE
20. Petals quite separate; stamens more than 6; fruit a hemispherical capsule or a cluster of one-seeded drupelets.
    21. Leaves downy-pubescent abaxially, sharply doubly serrate; fruit a cluster of one-seeded drupelets . . . . . **Rhodotypos** in ROSACEAE
    21. Leaves glabrous or pubescent along the veins abaxially, subentire to dentate or merely serrate; fruit a hemispherical capsule.
        Leaves shallowly serrate, less than 4 cm wide, rounded at the base; flowers more than 1 cm across, usually few in simple cymes, racemes, or panicles . . . . . PHILADELPHACEAE
        Leaves dentate, more than 4 cm wide, mostly cordate at the base; fertile flowers less than 1 cm across, numerous in compound cymes . . . . . HYDRANGEACEAE

Section 6
Shrubs or trees with alternate leaves

1. Leaves compound with distinct leaflets.
   2. Leaflets with a few teeth along the margin near the base (otherwise entire), each tooth bearing a gland . . . . . SIMAROUBACEAE
   2. Leaflets not as above.
      3. Leaflets entire or nearly so, or leaflets more than 20 and less than 4 cm long, or both.
         4. Leaflets 5(7), more or less silky, lanceolate, often with revolute margins; bark conspicuously shredding . . . . . **Dasiphora** in ROSACEAE
         4. Leaflets or leaf divisions more than 5; bark usually tight.
            5. Leaf rachis either strongly winged or leaflets acuminate, or both; leaflets mostly more than 5 cm long; stamens 5; petals inconspicuous, all similar; fruit a drupe . . . . . **Rhus** in ANACARDIACEAE
            5. Leaf rachis never winged; leaflets mostly obtuse or merely acute, up to 5 cm long; stamens more than 5; petals various; fruit a pod or follicle.
               6. Leaves 2-3 times pinnately compound, the ultimate leaf divisions distinct . . . . . CAESALPINIACEAE
               6. Leaves 1-pinnately compound, or if further divided, then the ultimate leaf divisions pinnatifid.
                  Petals separate, the corolla actinomorphic; inflorescence terminal . . . . . RUTACEAE
                  Petals partly united, the corolla not actinomorphic; inflorescence axillary . . . . . FABACEAE
      3. Leaflets serrulate-crenulate to crenate, serrate, or dentate (occasionally finely so), 3 to 17 (if rarely more, then more than 4 cm long).
         7. Flowers and fruits in umbels, the umbels 2 or more in panicles; leaves decompound to twice or partly thrice compound . . . . . **Aralia** in ARALIACEAE
         7. Flowers and fruits not in paniculate umbels; leaves various.
            8. Plants trees; leaflets 5 to 17, the larger usually exceeding 6 cm long; plants never with spines or prickles; staminate flowers in elongate catkins; fruit a large nut . . . . . JUGLANDACEAE
            8. Plants shrubs, brambles, or small trees; leaflets various; plants with or without spines or prickles; none of the flowers in catkins; fruit not a large nut.
               9. Leaflets finely crenulate; plants upright shrubs or small trees; leaves either 3-foliolate, the leaflets sessile at the end of a long petiole or the leaves with (5)7-13 leaflets and the petioles flanked by two broad-based stipular spines . . . . . RUTACEAE
               9. Leaflets strongly serrate, crenate, denticulate, or dentate, otherwise various; habit various; plants with or without spines or prickles.
                  10. Stamens 5; leaflets 11 to 31 and fruits densely pubescent or leaflets 3 and the margins broadly crenate to crenate-serrate; plants never with spines or prickles . . . . . ANACARDIACEAE
                  10. Stamens more than 5; leaflets 3 to 17, always sharply serrate to serrate-dentate; plants often with spines or prickles; if leaflets 11 to 17, then fruits glabrous.
                     11. Plants either with the branchlets forming long spines or with the leaflets pungently spinulose-serrate.
                        Leaflets 3, usually less than 7 mm wide; branchlets forming long spines . . . . . **Ononis** in FABACEAE
                        Leaflets 3 to 17, usually more than 7 mm wide; branchlets not forming long spines . . . . . **Mahonia** in BERBERIDACEAE
                     11. Plants without spinose branchlets or leaves.
                        Leaves pinnatifid to bipinnate, the terminal leaflets of the lateral leaflets much larger than the proximal leaflets. . . . . **Koelreuteria** in SAPINDACEAE
                        Leaves 1-compound or trifoliolate, the terminal leaflets not notably larger that the proximal leaflets . . . . . ROSACEAE
1. Leaves simple, entire or serrate to deeply dissected, but not compound.
   12. Leaves either inconspicuous, subulate, scale-like, closely imbricate, or evergreen with coarse spinose teeth.
      13. Leaves well developed, coarsely spinose-dentate . . . . . AQUIFOLIACEAE
      13. Leaves scale-like or subulate, not spinose-dentate.
         Flowers yellow, in the axils of foliaceous bracts . . . . . **Hudsonia** in CISTACEAE
         Flowers pink, densely disposed in linear-cylindric spikes . . . . . TAMARICACEAE
   12. Leaves manifest, never subulate and scale-like nor evergreen with coarse spinose teeth.
      14. Plants scarcely woody; leaves numerous, dissected into revolute, linear-filiform segments less than 1.5 mm wide; flowers in small involucrate heads; ovaries inferior . . . . . ASTERACEAE
      14. Plants not as above.
         15. Plants low shrubs with simple spatulate leaves borne in fascicles on short spurs, the spurs subtended by 1 to 3 stipular spines; flowers yellow; fruits red . . . . . **Berberis** in BERBERIDACEAE
         15. Plants without the above combination of characters.
            16. Leaves with sheathing stipules, the blades cuneate-subtruncate to subcordate at their base; plants scarcely woody . . . . . **Reynoutria** in POLYGONACEAE

16. Leaves without sheathing stipules, otherwise various; plants definitely woody.
    17. Petals or petal-like sepals absent or rudimentary.
        18. Flowers and fruits one to several in open inflorescences, not in catkins or densely-flowered racemes, spikes, or heads; fruit a samara or drupe.
            19. Leaves coarsely serrate to doubly serrate, at least beyond the middle . . . . . ULMACEAE
            19. Leaves entire to minutely serrulate or weakly lobed.
                Leaves entire to shallowly and irregularly dentate, obovate and abruptly acuminate; stamens more than 5; fruit 1-seeded . . . . . NYSSACEAE
                Leaves entire to crenate or serrate, variously shaped; stamens 4 or 5; fruit with more than 1 seed . . . . . **Rhamnus** in RHAMNACEAE
        18. Flowers and fruits in catkins or densely flowered racemes, spikes, or heads (or solitary in pistillate flowers of the Fagaceae); fruits various.
            20. Leaves pinnately lobulate-incised (rarely finely and weakly serrulate in Myrica), with numerous small yellow, resinous glands on both surfaces; low shrubs . . . . . MYRICACEAE
            20. Leaves never pinnately lobulate-incised, without glands, or if glandular in Betula, then the leaves coarsely serrate-dentate; plants shrubs or trees.
                21. Leaves strictly entire, ovate, long-acuminate; axillary spines often present . . . . . **Maclura** in MORACEAE
                21. Leaves not as above; spines absent.
                    22. Leaves ovate or star-shaped, at least some of them 1-5 lobed, broadly rounded to cordate or cordate-truncate at the base.
                        Leaves palmately 5-lobed and distinctly star-shaped, truncate-cordate at the base; petioles without milky juice; fruit a capsule . . . . . **Liquidambar** in HAMAMELIDACEAE
                        Leaves ovate, variously 1-5 lobed, with rounded sinuses; petioles usually with milky juice; fruit a drupe . . . . . **Morus** in MORACEAE
                    22. Leaves variously shaped, but never both broadly rounded-cordate or cordate-truncate and lobed.
                        23. Fruit a dehiscent capsule containing numerous silky-haired seeds; styles or stigmas 2; leaves linear to ovate, entire to serrate, never lobed . . . . . SALICACEAE
                        23. Fruit an acorn or nutlet; styles 2 or 3; leaves mostly ovate, entire to lobed or with doubly serrate margins.
                            Leaves lobed or entire or with each lateral vein exiting the margin in a sharp tooth, the number of lateral veins subequaling the number of teeth; styles 3 . . . . . FAGACEAE
                            Leaves serrate-dentate to doubly serrate, the teeth always more than the number of lateral veins; styles 2 . . . . . BETULACEAE
    17. Petals present (sepals petal-like in Dirca and Elaeagnus).
        24. Leaves entire, cordate, ovate, short-acuminate; fruit a legume; petals purple to pink, often emerging before the leaves; calyx purplish, pinkish, or reddish; tree . . . . . **Cercis** in CAESALPINIACEAE
        24. Plants not as above.
            25. Leaves lobed, 5-20 cm long and wide, broadly emarginate to truncate at the apex, cordate to subcordate at the base; petals 6, about 5 cm long; trees . . . . . MAGNOLIACEAE
            25. Leaves not as above; petals usually not 6, less than 5 cm long; trees or shrubs.
                26. Leaf bases both subcordate and asymmetrical; leaves never lobed.
                    Leaf margins sharply serrate; tree . . . . . TILIACEAE
                    Leaf margins wavy-toothed; shrub or small tree . . . . . HAMAMELIDACEAE
                26. Leaf bases symmetrical, subcordate-truncate, broadly rounded to cuneate; leaves unlobed or sometimes 3-several lobed.
                    27. Leaves up to 25 cm wide, wider than long, 3-5 lobed, often with coarse teeth; bark exfoliating in patches; tree . . . . . PLATANACEAE
                    27. Plants not as above.
                        28. Leaves distinctly not entire, though sometimes weakly toothed to minutely serrulate.
                            29. Stamens more than 10, or if occasionally fewer than 10 (in Crataegus), then plant a tree with coarse thorns; petals 5, separate.
                                Calyx with an involucre of 7-10 linear bracts . . . . . **Hibiscus** in MALVACEAE
                                Calyx without an involucre . . . . . ROSACEAE
                            29. Stamens 4 to 10; plants not thorny trees, or if so in Rhamnus, then stamens 4 or 5.
                                30. Leaves with 3 to several coarsely toothed lobes; stamens 4 to 5 . . . . . GROSSULARIACEAE
                                30. Leaves not lobed; stamens 4 to 10.
                                    31. Stamens 8 to 10; petals united, at least at the base; flowers in simple racemes or fruits crowned by the calyx teeth.
                                        Fruits both pubescent and in axillary inflorescences; leaves remotely serrate . . . . . STYRACACEAE
                                        Fruits glabrous or if pubescent, then the inflorescences terminal; leaves various . . . . . ERICACEAE
                                    31. Stamens 4-7(9); petals separate or absent; flowers neither in simple racemes nor fruits crowned by the calyx teeth.
                                        Stamens 4 to 5, opposite the petals or petals absent; fruit a capsule or if a drupe, then dark-blue or blackish when mature . . . . . RHAMNACEAE
                                        Stamens 5 to 9, alternate with the petals; fruit a bright-red, berry-like drupe . . . . . AQUIFOLIACEAE
                        28. Leaves entire (or as in Sassafras and rarely in Nyssa, some often with one to few blunt lobes or coarse teeth).
                            32. Leaves entire or not, typically acuminate at the apex with glabrous or glabrate branchlets or leaves 10 cm or more long; stamens mostly more than 8 or if only 4, then ovary inferior.
                                33. Twigs and leaves aromatic (unpleasantly so in Annonaceae when bruised); leaves obtuse to abruptly short-acuminate.

Flowers clustered, yellowish, less than 1 cm across; leaves usually with fewer than 10 pairs of veins; stamens 9 in fully staminate flowers . . . . . LAURACEAE
Flowers solitary, madder-purple, usually more than 1 cm across; leaves usually with more than 10 pairs of veins; stamens more than 9 . . . . . ANNONACEAE

33. Twigs and leaves not aromatic when bruised, the leaves subacute to acuminate.
34. Petals white to pink, showy; stamens more than 15; calyx lobes 5, persistent; fruit a pome . . . . . ROSACEAE
34. Petals white or yellowish, small; stamens more or less than 15; calyx lobes mostly four or absent; fruit a drupe.
35. Leaves acuminate, ovate to rhombic-ovate; young twigs yellowish-green; stamens 4; inflorescences terminal . . . . . CORNACEAE
35. Leaves elliptic-oblanceolate to obovate, acute to short-acuminate; young twigs brown; stamens more than 4; inflorescences axillary.
Twigs pubescent . . . . . EBENACEAE
Twigs glabrous . . . . . NYSSACEAE

32. Leaves obtuse, acute, to mucronulate, or if abruptly acute or short-acuminate, then the branchlets pubescent or silvery-scaly; leaves never longer than 10(12) cm; stamens 4 to 8 (sometimes 10 in Ericaceae); ovary usually superior.
36. Mature leaves, at least many of them, abruptly short-acuminate at the apex; branchlets pubescent. . . . . **Rhamnus** in RHAMNACEAE
36. Leaves never abruptly short-acuminate; branchlets glabrous, pubescent, or silvery-scaly.
37. Branchlets and herbage silvery-scaly . . . . . **Elaeagnus** in ELAEAGNACEAE
37. Branchlets and herbage without silvery scales.
38. Mature leaves ovate to rhombic-ovate, usually 1.5 cm or more wide and less than twice as long as wide.
39. Petioles 1-2 mm long; branches jointed, supple and leathery, the branchlets glabrous; flowers yellow; stamens more than 5 . . **Dircа** in THYMELAEACEAE
39. Petioles 5 mm or more long; branches not jointed nor leathery, the branchlets glabrous or pubescent; flowers greenish; stamens 5.
Flowers pedicellate in axillary clusters; fruit a fleshy or leathery drupe . . . . . RHAMNACEAE
Flowers in terminal panicles, the branches with numerous sterile pedicels beset with long, spreading purplish or greenish hairs, a few pedicels bearing kidney-shaped fruits . . . . . **Cotinus** in ANACARDIACEAE
38. Mature leaves linear, oblong, to lanceolate or lance-ovate, almost always twice as long as wide or longer, but if less than twice as long as wide, then the leaves less than 1.5 cm wide.
40. Plant weakly erect to more often sprawling; leaves lanceolate (usually 2 cm long or longer), tapering at both ends, acute; stems sarmentose-arching, sometimes with several stipular spines . . . . . **Lycium** in SOLANACEAE
40. Plants not as above.
Petioles less than 5 mm long; stamens 5 to 10 (if rarely only 5, in Ledum, then the leaves with revolute margins and densely brown-tomentose abaxially) . . . . . ERICACEAE
Petioles 5 mm or more long; stamens 4 to 5 . . . . . **Nemopanthus** in AQUIFOLIACEAE

Section 7
Herbaceous dicots with alternate or basal leaves

1. Plants essentially without chlorophyll.
2. Plants orange, leafless vines, deriving nutrients and water from the host plants by means of haustoria . . . . . CUSCUTACEAE
2. Plants variously colored, not vines, the leaves often present and scale-like; haustoria absent.
Stamens fewer than 5; capsule 1-locular; plants not succulent . . . . . OROBANCHACEAE
Stamens more than 5; capsule 4-5 locular; plants succulent . . . . . MONOTROPACEAE

1. Plants with chlorophyll.
3. Leaves peltate, the petiole attached on the abaxial surface of the blade.
4. Plants terrestrial; leaves lobed or divided.
5. Leaves 1 or 2, umbrella-like, deeply cleft, the petiole inserted at the center of the blade; fruits solitary; perennial . . . . . **Podophyllum** in BERBERIDACEAE
5. Leaves more than 2, shallowly to deeply lobed, with petioles inserted near the margin; fruits several to numerous, clustered; annual.
Leaves deeply divided with serrulate lobes; plant coarse, erect . . . . . **Ricinus** in EUPHORBIACEAE
Leaves with shallow, subentire lobes; plant a slender vine . . . . . MENISPERMACEAE
4. Plants aquatic or of sandy shores; leaves entire to merely shallowly and widely crenate.
6. Leaves widely and shallowly crenate; flowers small, 2 to several, on widely radiating pedicels in terminal or axillary umbels . . . . . **Hydrocotyle** in APIACEAE
6. Leaves strictly entire; flowers solitary, small to very large.
Leaves elliptic, less than 15 cm long, floating; flowers purple, less than 5 cm across . . . . . CABOMBACEAE
Leaves orbicular, more than 15 cm in diameter, usually held above the surface of the water by long petioles; flowers pale-yellow, more than 5 cm across. . . . . NELUMBONACEAE
3. Leaves not peltate.
7. Plants aquatic; leaves suborbicular and usually with a deep basal cleft or sinus.
8. Flowers less than 1 cm long, in distinct umbels; leaves deeply 5-6 lobed . . . . . **Hydrocotyle** in APIACEAE

8. Flowers more than 1 cm long, solitary or several from terminal axillary clusters; leaves orbicular, cordate, entire or obscurely toothed.
    Leaves all on elongate petioles that originate from the rhizome; bracteal leaves absent . . . . . NYMPHAEACEAE
    Many of the leaves arising from the stem, the bracteal leaves similar . . . . . **Nymphoides** in MENYANTHACEAE
7. Plants not aquatic, or if so, then the leaves not as above.
9. Style short, much flattened distally into a very broad, umbrella-like summit; flowers purplish; leaves hollow, pitcher-like; carnivorous, scapose plant of bogs and fens . . . . . SARRACENIACEAE
9. Plants not as above.
10. Stems and inflorescences with ocreae (sheathing stipules) subtending the flower clusters and typically subtending the leaf bases or petioles as well . . . . . POLYGONACEAE
10. Ocreae absent.
    Plants in flower . . . . . **Section 7A**
    Plants in fruit . . . . . **Section 7B**

Section 7A

Herbaceous dicots with alternate or basal leaves: in flower

1. Petals or petaloid sepals united, at least at the base.
2. Stamens more than 5.
3. Leaves lobed, divided, or compound.
4. Stipules absent; flowers 2-merous; stamens 6 . . . . . FUMARIACEAE
4. Stipules present or absent; flowers not 2-merous; stamens more than 6.
5. Posterior sepal petaloid, developed either into a long spur or helmet-shaped hood . . . . . RANUNCULACEAE
5. None of the sepals petaloid or developed into a spur or hood.
6. Leaves trifoliolate, the leaflets deeply emarginate, entire; styles 5 . . . . . OXALIDACEAE
6. Leaves various; style one or styles numerous and united below.
    Corollas zygomorphic; leaves compound . . . . . FABACEAE
    Corollas actinomorphic; leaves without distinct leaflets . . . . . MALVACEAE
3. Leaves simple and unlobed.
7. Leaves all basal, elliptic to orbicular; inflorescence a raceme; stigma one, 5-lobed or 5-rayed . . . . . **Pyrola** in PYROLACEAE
7. Plants not as above.
8. Leaves all or nearly all distinctly cordate (reniform in Asarum); flowers solitary to several in the leaf axils or borne near the base of the plant.
    Petals yellow or orange, united only at the base; leaves acuminate, deltate-orbicular, downy-pubescent . . . . . **Abutilon** in MALVACEAE
    Petals or petal-like sepals neither yellow nor orange, united for much of their length; leaves glabrous or pubescent but not as above . . . . . ARISTOLOCHIACEAE
8. Leaves not or only weakly cordate; inflorescence various.
9. Perianth zygomorphic.
    Stamens 10; petals yellow. . . . . **Crotalaria** in FABACEAE
    Stamens fewer than 10; petals or petal-like sepals not yellow . . . . . POLYGALACEAE
9. Perianth actinomorphic.
10. Flowers 1-several in tubular involucres; calyx 6-parted; stamens 9 . . . . . **Eriogonum** in POLYGONACEAE
10. Flowers not in tubular involucres; calyx 5-parted; stamens not 9.
    Corolla tube well developed . . . . . ERICACEAE
    Corolla tube absent, the petals united only at the base . . . . . MALVACEAE
2. Stamens 0 to 5.
11. Fertile stamens 2 or 4, the anthers separate.
12. Plants not scapose, the leaves of the stem well developed.
13. Upper lip or lobes of the corolla covering the lower lip in bud . . . . . SCROPHULARIACEAE
13. Lower lip or lateral lobes not covered by the upper lip or lobes.
    Corollas without nigrescent tinctures in drying, white or blue, or if with purplish tinctures, then more than 3.5 cm long . . . . . SCROPHULARIACEAE
    Corollas commonly with nigrescent tinctures in drying, not blue or white, less than 3.5 cm long . . . OROBANCHACEAE
12. Plants scapose, the leaves all basal.
14. Leaves absent or when present, the blades or ultimate divisions very slender or filiform, often trap-bearing . . . . . LENTIBULARIACEAE
14. Leaves present, foliaceous.
    Leaves ternately or pinnately compound . . . . . **Epimedium** in BERBERIDACEAE
    Leaves simple . . . . . PLANTAGINACEAE
11. Fertile stamens absent, 5, or anthers united.
15. Ovary inferior.
16. Flowers capitate, sharing a receptacle subtended by phyllaries . . . . . ASTERACEAE
16. Flowers not as above.
17. Leaves dissected or lobed or plants trailing, climbing, or twining vines . . . . . CUCURBITACEAE
17. Leaves unlobed, the plants never trailing, climbing, or twining.
18. Corollas zygomorphic; anthers united . . . . . LOBELIACEAE
18. Corollas actinomorphic; anthers separate.
    Ovary partly superior, the calyx adnate to the ovary only below; anthers cordate . . . . . SAMOLACEAE
    Ovary wholly inferior, the ovary completely adnate to the calyx; anthers not cordate . . . . . CAMPANULACEAE
15. Ovary superior.
19. Stamens strongly modified, the anthers adnate to the stigma, the filaments developed as hoods, forming a corona which is usually quite showy and often more conspicuous than the reflexed corolla lobes; plants with or without milky juice . . . . . ASCLEPIADACEAE

19. Stamens not as above; plants with milky juice only in certain members of the Convolvulaceae.
    20. Calyx 5-parted; corolla rotate, yellow or white, 2 of the lobes usually somewhat dissimilar from the other 3; stamens unequal, at least 3 of the filaments copiously pilose; style dilated and flattened at the summit . . . . . **Verbascum** in SCROPHULARIACEAE
    20. Plants without the above combination of characters.
        21. Corollas zygomorphic.
            22. Leaves entire or subentire; stipules absent; stamens separate, adnate to the corolla tube . . . . . BORAGINACEAE
            22. Leaves entire, crenate, serrate, or lobed; stipules present or absent; stamens separate, or the filaments united, but not adnate to the corolla tube.
                Green sepals 2, the third petaloid, saccate, with a hooked spur; corolla yellow, orange, purple, or rose, often spotted, the petals neither gibbous nor spurred; leaves all cauline, crenate or serrate, oblanceolate to ovate; stems succulent, usually more than 1 m high . . . . . BALSAMINACEAE
                Green sepals 5, never spurred; corolla variously colored, but never orange nor spotted, the lower petal gibbous or spurred; leaves various; stems not succulent, less than 0.5 (1) m high . . . . . VIOLACEAE
        21. Corollas actinomorphic or nearly so.
            23. Leaves distinctly trifoliolate, the leaflets entire; petioles sheathing at the base, closely alternate along the creeping rootstock, the inflorescence appearing scapose . . . . . **Menyanthes** in MENYANTHACEAE
            23. Leaves cauline or basal, simple or compound, but not as above.
                24. Plants scapose; leaves basal, entire; inflorescence distinctly umbellate, or stamens opposite the corolla lobes, or both . . . . . PRIMULACEAE
                24. Plants not scapose; leaves various; inflorescence not distinctly umbellate; stamens positioned alternate to the corolla lobes.
                    25. Leaves cordate, sagittate, or hastate at the base; plants usually sprawling, climbing, or twining vines.
                        Calyx lobes more than 3 mm long . . . . . CONVOLVULACEAE
                        Calyx lobes less than 3 mm long . . . . . **Brunnera** in BORAGINACEAE
                    25. Leaves neither cordate, sagittate, nor hastate; plants not vines.
                        26. Leaves lobed or compound.
                            27. Style deeply bilobed . . . . . HYDROPHYLLACEAE
                            27. Style not deeply bilobed.
                                Stigmas 3; leaves developed, divided or compound; corollas scarlet to pale-lavender or white . . . . . POLEMONIACEAE
                                Stigma one (sometimes 2-lobed); leaves various; corollas usually white or yellow, but never scarlet . . . . . SOLANACEAE
                        26. Leaves unlobed, simple.
                            28. Styles appearing to be 2 or very deeply 2-lobed . . . . . CONVOLVULACEAE
                            28. Style one.
                                29. Stigmas 3; flowers in a dense terminal cyme or glomerule . . . . . POLEMONIACEAE
                                29. Stigmas 1 or 2, entire or bilobed; inflorescence various.
                                    30. Ovary deeply 4-lobed or inflorescence a scorpioid raceme or both . . . BORAGINACEAE
                                    30. Ovary not deeply 4-lobed; inflorescence not a scorpioid raceme.
                                        Inflorescence an elongate, narrow, terminal thyrse; calyces less than 5 mm long . . . . . **Lysimachia** in MYRSINACEAE
                                        Inflorescence not a thyrse; calyces more than 5 mm long . . . . . SOLANACEAE

1. Petals or petal-like sepals separate or absent.
    31. Styles 2 to numerous (sometimes one and deeply divided, thus appearing more than one). Caution: plants sometimes staminate.
        32. Principal leaves deeply lobed, divided, or compound (emersed leaves merely serrate or absent in Haloragidaceae).
            33. Leaves trifoliolate, the leaflets entire, deeply emarginate or obcordate at the tip . . . . . OXALIDACEAE
            33. Leaves not as above.
                34. Inflorescence umbellate; ovary inferior.
                    Styles 2 . . . . . APIACEAE
                    Styles 5 . . . . . **Aralia** in ARALIACEAE
                34. Inflorescence not umbellate; ovary superior or inferior.
                    35. Stamens usually 3; petals absent; ovary inferior; leaves dimorphic, the submersed ones deeply divided, the emersed mostly simple, or leaves much reduced; plants aquatic or paludal . . . . . HALORAGIDACEAE
                    35. Stamens more than 3; petals often present; ovary superior; leaves not particularly dimorphic; habitats various.
                        36. Leaves palmately 3-7 foliolate, the leaflets serrate; petals absent; stamens 5 . . . . . **Cannabis** in CANNABINACEAE
                        36. Leaves various, but if palmately 3-7 foliolate, then the petals or petal-like sepals present; stamens often more than 5.
                            37. Stipules present (absent or minute in Aruncus with 3 pistils, numerous stamens, and leaves 2 to 3 times pinnately compound with serrate leaflets); flowers usually with both sepals and petals . . . . . ROSACEAE
                            37. Stipules usually absent; petals present or absent; sepals present, absent, or petaloid.
                                Leaves coarsely pinnately dissected; plants sometimes foul-smelling; petals absent . . . . CHENOPODIACEAE
                                Plants not as above . . . . . RANUNCULACEAE
        32. Leaves not deeply lobed or divided.
            38. Flowers in dense, capitate clusters, the stem leaves either coarsely setose-serrulate along the margins or coarsely spinose-dentate . . . . . **Eryngium** in APIACEAE
            38. Plants not as above.
                39. Plants scapose or subscapose, the leaves all basal or essentially so.
                    40. Leaves more than 1 cm wide, entire to coarsely serrate or shallowly lobed . . . . . SAXIFRAGACEAE
                    40. Leaves less than 1 cm wide, entire.
                        Leaves spatulate, copiously clothed with viscid sticky hairs . . . . . DROSERACEAE
                        Leaves linear, glabrous . . . . . **Myosurus** in RANUNCULACEAE
                39. Plants caulescent, the stems with well developed cauline leaves.
                    41. Leaves cordate or reniform.
                        Perianth absent; flowers white, numerous in dense spikes; leaves more than 1.5 times as long as wide . . . . .

. . . . . SAURURACEAE
Perianth present, the petal-like sepals yellow; flowers one to few, axillary or terminal; leaves no longer than wide . . . . . **Caltha** in RANUNCULACEAE

41. Leaves neither cordate nor reniform.
    42. Petals present, colored, or if white, then more than 8 mm long.
        43. Leaves linear to narrowly lanceolate; stems firm and wiry; stamens 5; plants not at all succulent . . . . . LINACEAE
        43. Leaves wider; stems thick and fleshy; stamens more than 5; plants succulent.
            Plants annual, prostrate; flowers sessile . . . . . **Portulaca** in PORTULACACEAE
            Plants perennial, erect or creeping and mat-forming; flowers pedicellate . . . . . CRASSULACEAE
    42. Petals absent, greenish, or if white, then less than 8 mm long.
        44. Plants stellate-pubescent . . . . . **Croton** in EUPHORBIACEAE
        44. Plants glabrous or pubescent but never with stellate hairs.
            45. Stamens 0 to 5.
                Plants with milky juice; styles 3, each bifid . . . . . **Euphorbia** in EUPHORBIACEAE
                Plants without milky juice; styles usually 2 to 3, but if 3 then not bifid . . . . . CHENOPODIACEAE
            45. Stamens more than 5 (flowers imperfect in Acalypha).
                46. Leaves entire; plants glabrous.
                    Leaves small, succulent, usually often terete; flowers in cymes or corymbs; carpels free; plants less than 0.5 m high . . . . . CRASSULACEAE
                    Leaves broad, flat, and membranaceous; flowers in racemes; carpels united; plants more than 0.5 m high . . . . . PHYTOLACCACEAE
                46. Leaves serrate or serrulate; plants glabrous to pubescent.
                    47. Plants scapose or subscapose, the leaves basally disposed . . . . . SAXIFRAGACEAE
                    47. Plants caulescent.
                        Pistils 5 or 8 . . . . . PENTHORACEAE
                        Pistil one . . . . . **Acalypha** in EUPHORBIACEAE

31. Styles one or absent (3 to several and united, at least below, in the Malvaceae and Loasaceae; in Amaranthaceae, 3 separate stigmas with no style may appear to be 3 styles). Caution: plants sometimes staminate.
    48. Hypanthium well developed; the ovary superior or inferior.
        49. Leaves compound. . . . . ROSACEAE
        49. Leaves simple.
            50. Stamens more than 20; plants coarsely pubescent with often uncinate hairs . . . . . LOASACEAE
            50. Stamens fewer than 20; pubescence not as above.
                51. Petals absent; flowers 2 to several in terminal, more or less corymbiform cymes . . . . . SANTALACEAE
                51. Petals present or absent; inflorescence not as above.
                    52. Leaves small, scale-like to linear; perianth 4-parted, greenish or yellowish; stamens 8, in 2 ranks, one ring over the other, inserted on the hypanthium; ovary superior, 1-locular; styles very short, the stigma capitate; annual . . . . . **Thymelaea** in THYMELAEACEAE
                    52. Plants not as above.
                        Ovary inferior; petals usually neither 6 nor purplish . . . . . ONAGRACEAE
                        Ovary superior; petals usually both 6 and purplish . . . . . LYTHRACEAE
    48. Hypanthium absent or very short; ovary superior.
        53. Petals 4, usually present; sepals 4, separate; stamens 6, 4 long and 2 short or reduced to 2 or 4 of similar lengths; leaves never palmately compound with entire to minutely serrulate leaflets . . . . . BRASSICACEAE
        53. Plants without the above combination of characters.
            54. Sepals 2(3-4), deciduous; petals 4 to 6 (8 to 12 in Sanguinaria, none in Macleaya), imbricate, deciduous; stamens more than 10, distinct; anthers longitudinally dehiscent; style very short, the stigma usually 2 to several lobed or rayed . . . . PAPAVERACEAE
            54. Plants not as above.
                55. Leaves simple, entire or merely serrate or dentate.
                    56. Stamens 0 to 6.
                        57. Petals conspicuous, showy.
                            Green sepals 2, the third petaloid, saccate, with a hooked spur; corolla yellow, orange, purple, or rose, often spotted, the petals neither gibbous nor spurred; leaves all cauline, crenate or serrate, oblanceolate to ovate; stems succulent, usually more than 1 m high . . . . . BALSAMINACEAE
                            Green sepals 5, never spurred; corolla variously colored, but never orange nor spotted, the lower petal gibbous or spurred; leaves various; stems not succulent, less than 0.5 (1) m high . . . . . VIOLACEAE
                        57. Petals absent or inconspicuous, or flowers with petaloid sepals.
                            58. Leaves distinctly serrate.
                                Flowers in loose paniculiform clusters; plant with stinging hairs . . . . . **Laportea** in URTICACEAE
                                Flowers in tight, pedunculate, capitate cymes; plant without stinging hairs . . . . . **Fatoua** in MORACEAE
                            58. Leaves entire or merely sinuate.
                                59. Sepals 4, those of the pistillate flowers united at the base; flowers usually imperfect . . . . . **Parietaria** in URTICACEAE
                                59. Plants without the above combination of characters.
                                    Flowers subtended by scarious bracts . . . . . AMARANTHACEAE
                                    Flowers not subtended by scarious bracts . . . . . CHENOPODIACEAE
                    56. All or nearly all of the flowers with more than 6 stamens, including infertile ones (rarely fewer in the CISTACEAE).
                        60. Plants scapose or subscapose; leaves sometimes succulent.
                            61. Leaves narrowly linear, succulent . . . . . **Phemeranthus** in PORTULACACEAE
                            61. Leaves ovate, cordate, or reniform, not succulent.
                                Flowers solitary . . . . . PARNASSIACEAE
                                Flowers 2 to several in racemes . . . . . **Pyrola** in PYROLACEAE
                        60. Plants caulescent; stem leaves several to numerous, never succulent.
                            62. Stamens separate.

Section 7A continued . . .

Leaves glabrous, more than 3 cm wide . . . . . PHYTOLACCACEAE
Leaves pubescent, less than 3 cm wide . . . . . CISTACEAE
62. Stamens at least partly united into a tube.
63. Styles numerous, united below, distinct above . . . . . MALVACEAE
63. Style one, simple.
Stamens fewer than 9 . . . . . POLYGALACEAE
Stamens more than 9 . . . . . **Crotalaria** in FABACEAE
55. Leaves lobed, divided, or compound.
64. Flowers zygomorphic (sometimes weakly so in Viola).
65. Stamens 12 to 15; petals either 6 or much reduced and the flowers consisting principally of petaloid sepals; leaves either palmately lobed or compound or merely pinnatifid.
Posterior sepal petaloid, developed either into a long spur or helmet-shaped hood; leaves palmately lobed or compound. . . . . RANUNCULACEAE
None of the sepals petaloid or developed into a spur or hood; leaves merely pinnatifid . . . . . RESEDACEAE
65. Stamens fewer than 12; petals fewer than 6; leaves various.
66. Stamens 6; leaves decompound. . . . . FUMARIACEAE
66. Stamens not 6; leaves not decompound.
Leaves compound with distinct leaflets; stamens usually 10; plants caulescent . . . . . FABACEAE
Leaves merely deeply divided; stamens 5; plants usually scapose . . . . . **Viola** in VIOLACEAE
64. Flowers actinomorphic or nearly so.
67. Stamens united into a tube . . . . . MALVACEAE
67. Stamens separate or united only at the base.
68. Flowers 5-merous; stamens rarely more than 10.
69. Leaves deeply lobed, divided, or much dissected, or if compound, then the ultimate divisions not distinct; ovary 5-locular; petals pink . . . . . GERANIACEAE
69. Leaves pinnate to bipinnate, the ultimate divisions with distinct leaflets, or if indistinct, then the petals yellow.
70. Leaves bipinnately compound . . . . . MIMOSACEAE
70. Leaves 1-pinnately compound.
Flowers more than 2 cm long . . . . . **Dictamnus** in RUTACEAE
Flowers less than 2 cm long . . . . . CAESALPINIACEAE
68. Flowers not 5-merous; stamens various.
71. Leaves trifoliolate or palmately compound with 3 to 7 lanceolate to oblanceolate, entire to minutely serrulate leaflets; stamens 6, or 10 to 16; petals 4, showy . . . . . CLEOMACEAE
71. Plants not as above.
72. Stamens more than 10 . . . . . RANUNCULACEAE
72. Stamens fewer than 10.
Ultimate leaf divisions 1 cm or more wide, 2-5 lobed; flowers more than 6 mm wide; petals more than 3 . . . . . BERBERIDACEAE
Ultimate leaf divisions less than 1 cm wide, entire; flowers less than 6 mm wide; petals 2 or 3 . . . . . LIMNANTHACEAE

Section 7B

Herbaceous dicots with alternate or basal leaves: in fruit

1. Plants high-climbing or sprawling vines, with tendrils, prickly fruits, and palmately lobed leaves or fruit a gourd or melon more than 5 cm long . . . . . CUCURBITACEAE
1. Plants not as above.
2. Fruit a schizocarp, or an aggregate or cluster of achenes, nutlets, follicles, drupelets, or berries.
3. Ovary wholly inferior.
4. Hypanthium well developed; leaves pinnately compound . . . . . ROSACEAE
4. Hypanthium absent; leaves various.
5. Leaves stiff, linear-lanceolate, Yucca-like, with coarsely setose-serrulate margins . . . . . **Eryngium** in APIACEAE
5. Leaves not as above.
6. Fruit a cluster of achenes, these sessile, sharing a common receptacle subtended by phyllaries; infructescence not usually umbellate; leaves various. . . . . ASTERACEAE
6. Plants not as above.
Fruit indehiscent, 3(4)-angled, solitary (2-3) and sessile in the leaf axils; emersed leaves simple or much reduced . . . . . HALORAGIDACEAE
Fruit a schizocarp or pair of mericarps, the infructescence umbellate; at least the distal leaves compound . . APIACEAE
3. Ovary superior (hypanthium sometimes adnate to the base of the ovary in the Saxifragaceae).
7. Fruit usually of 3 or 4 separating nutlets; leaves entire . . . . . BORAGINACEAE
7. Fruit not of 3 or 4 separating nutlets; leaves various.
8. Leaves all basal and simple.
Leaves narrowly linear, less than 5 mm wide. . . . . RANUNCULACEAE
Leaves not linear, more than 5 mm wide. . . . . SAXIFRAGACEAE
8. Stem leaves present or if absent, then the basal leaves compound.
9. Fruit a ring of separating carpels.
Plants glabrous; leaves linear to narrowly lanceolate, entire . . . . . LINACEAE
Plants pubescent or if glabrous, then the leaves not as above . . . . . MALVACEAE
9. Fruit not a ring of separating carpels.
10. Leaves deeply lobed, divided, or compound.
11. Stipules present; sepals usually persistent in fruit . . . . . ROSACEAE

11. Stipules absent; sepals sometimes absent in fruit.
    12. Sepals 3; petals 3; leaves pinnately compound with entire divisions; delicate woodland ephemeral . . . . . LIMNANTHACEAE
    12. Plants without the above combination of characters.
        13. Leaves palmately 3-7 foliolate with lanceolate, serrate leaflets . . . . . **Cannabis** in CANNABINACEAE
        13. Leaves not as above.
            14. Sepals persistent, investing the fruit; leaves merely coarsely dissected, usually heavily laden with fetid glands. . . . . CHENOPODIACEAE
            14. Plants not as above.
                Fruits well beset with thick, black-tipped hairs . . . . . **Dictamnus** in RUTACEAE
                Fruits without black-tipped hairs . . . . . RANUNCULACEAE
10. Leaves all simple.
    15. Fruit an aggregate of achenes.
        16. Fruits or fruiting head long-stalked.
            Achenes surrounded by an enlarged and persistent calyx . . . . . **Fatoua** in MORACEAE
            Achenes not surrounded by an enlarged calyx . . . . . RANUNCULACEAE
        16. Fruits or fruiting cluster sessile, mostly tightly glomerulate in numerous axillary and terminal spikes or clusters.
            Fruits subtended by scarious bracts; leaves entire . . . . . AMARANTHACEAE
            Fruits without scarious bracts; leaves sometimes not entire . . . . . CHENOPODIACEAE
    15. Fruit a cluster of follicles or capsules.
        17. Principal leaves broadly cordate to reniform . . . . . RANUNCULACEAE
        17. Leaves not broadly cordate to reniform.
            Plants not succulent; infructescence glandular-puberulent . . . . . PENTHORACEAE
            Plants succulent, glabrous throughout . . . . . CRASSULACEAE

2. Fruit various, but not as above (flowers sometimes minute and inconspicuous in clusters, the fruits then sometimes appearing clustered).
    18. Fruit indehiscent, usually a drupe, berry, nutlet, or achene.
        19. At least the proximal leaves deeply lobed, divided, or compound.
            20. Fruit a more or less fleshy drupe or berry (drupe-like in Caulophyllum).
                21. Infructescence of one to many umbels; ovary inferior . . . . . **Aralia** in ARALIACEAE
                21. Infructescence various, but not umbellate; ovary superior.
                    22. Ultimate leaf divisions indistinct, or stems pubescent or spiny, or both . . . . . SOLANACEAE
                    22. Ultimate leaf divisions distinct and petiolulate; stems always smooth.
                        Fruits red or white; leaflets serrate . . . . . **Actaea** in RANUNCULACEAE
                        Fruits blue; leaflets merely with 2 to 5 blunt teeth or lobes above the middle . . . . . **Caulophyllum** in BERBERIDACEAE
            20. Fruit dry, usually a nutlet or achene.
                23. Fruit ringed at the summit by numerous hooked bristles . . . . . **Agrimonia** in ROSACEAE
                23. Fruit without a ring of hooked bristles at the summit.
                    24. Fruits 2 to several-seeded.
                        25. Leaves ternately compound, the leaflets once or twice pinnately compound with serrate divisions; fruits in elongate terminal racemes . . . . . **Cimicifuga** in RANUNCULACEAE
                        25. Leaves not as above; infructescence various.
                            26. Fruit 3-angled . . . . . **Proserpinaca** in HALORAGIDACEAE
                            26. Fruit not 3-angled.
                                Infructescence bracteate; stipules often present; fruits without a partition down the middle . FABACEAE
                                Infructescence ebracteate (except below in Erucastrum); stipules absent; fruits usually with a partition down the middle . . . . . BRASSICACEAE
                    24. Fruits one-seeded.
                        27. Leaves distinctly compound, the leaflets entire to serrulate; stipules present; style one or nearly absent . . . . . FABACEAE
                        27. Plants without the above combination of characters.
                            28. Leaves palmately compound, with 3 to 7 lanceolate, serrate leaflets . . . . . **Cannabis** in CANNABINACEAE
                            28. Leaves various, but not as above.
                                29. Leaves lobed, not dissected all the way to the midrib . . . . . CHENOPODIACEAE
                                29. Leaves compound or at least divided all the way to the midrib.
                                    30. Leaves twice to thrice pinnatisect; sepals 2; fruits in axillary racemes . . . **Fumaria** in FUMARIACEAE
                                    30. Leaves merely pinnately divided or compound; sepals not 2; fruits solitary in the leaf axils or in terminal spikes or heads.
                                        Leaflets entire, sessile; fruits solitary in the leaf axils . . . . . LIMNANTHACEAE
                                        Leaflets serrate, petiolulate; fruits in terminal spikes, heads, or panicles . . . . . ROSACEAE
        19. Leaves simple, undivided (sometimes coarsely toothed or sinuate).
            31. Leaves deeply cordate, entire . . . . . SAURURACEAE
            31. Leaves not cordate.
                32. Fruit a more or less fleshy drupe or berry.
                    Fruits dark-purple to black, in elongate racemes; plant more than 1 m high, glabrous throughout . . . . . PHYTOLACCACEAE
                    Fruits variously colored, not in elongate racemes; plants less than 1 m high, often more or less pubescent . . . . . SOLANACEAE
                32. Fruit dry.
                    33. Ovary inferior.
                        Fruit globose . . . . . SANTALACEAE
                        Fruit more or less fusiform, 4-ribbed or angled, at least above the middle . . . . . **Gaura** in ONAGRACEAE
                    33. Ovary superior.
                        34. Fruit separating into 3 or 4 nutlets . . . . . BORAGINACEAE

34. Fruit not separating into 3 or 4 nutlets.
    35. Fruit 2-several seeded; calyx deciduous . . . . . BRASSICACEAE
    35. Fruit one-seeded; calyx persistent.
        36. Leaves either coarsely serrate, ovate, copiously beset with stinging trichomes, or plant minutely pubescent with leaves delicate, lanceolate, acuminate, entire, and scaberulous above . . . . . URTICACEAE
        36. Plants not as above.
            37. Fruit clusters nestled in deep tomentose cups (ocreae) . . . . . **Eriogonum** in POLYGONACEAE
            37. Fruit clusters not in deep cups.
                Flowers subtended by scarious bracts; leaves entire . . . . . AMARANTHACEAE
                Flowers without scarious bracts; leaves sometimes not entire . . . . . CHENOPODIACEAE

18. Fruit at least partially dehiscent, usually a capsule, follicle, or utricle.
    38. Leaves all basal or essentially so, the plant appearing scapose or subscapose, with one to few much reduced stem leaves (infructescence umbellate and sometimes leafy-bracted in Androsace).
        39. Stems with several much reduced, sessile, ovate, entire leaves . . . . . **Besseya** in SCROPHULARIACEAE
        39. Stems leafless or with only 1 or 2 such leaves.
            40. Plants aquatic or paludal; leaves absent or linear-filiform, often trap-bearing; fruit of circumscissile or irregular dehiscence . . . . . LENTIBULARIACEAE
            40. Plants not as above.
                41. Leaves deeply lobed, divided, or compound.
                    42. Leaves trifoliolate.
                        Leaflets obcordate at the tip, not much longer than wide . . . . . OXALIDACEAE
                        Leaflets obtuse at the tip, definitely longer than wide . . . . . MENYANTHACEAE
                    42. Leaves variously lobed or even ternately divided, but never simply trifoliolate.
                        43. Ovary and fruit more than 3 times as long as wide.
                            Leaves reniform, irregularly palmately lobed, the margins entire to coarsely toothed or crenate . . . . . **Sanguinaria** in PAPAVERACEAE
                            Leaves pinnately or ternately compound, the leaflets pinnatifid . . . . . **Dicentra** in FUMARIACEAE
                        43. Ovary and fruit less than 3 times as long as wide.
                            44. Leaves either deeply bilobed, the segments half-ovate, or the leaves long-petiolate and ternately or pinnately compound . . . . . BERBERIDACEAE
                            44. Leaves neither deeply bilobed with half-ovate segments nor long-petiolate and ternately or pinnately compound.
                                Fruits 2-locular, strongly flattened, rotund, and retuse, in elongate racemes . . . . . **Teesdalia** in BRASSICACEAE
                                Fruits 3-locular, round in cross section, ovoid to ellipsoid, acute or obtuse, solitary in the leaf axils . . . . . **Viola** in VIOLACEAE
                41. Leaves simple, entire to merely crenate, or lobed only near the base.
                    45. Fruits in dense, elongate, terminal spikes, with circumscissile dehiscence . . . . . PLANTAGINACEAE
                    45. Fruits not in dense spikes, dehiscing by longitudinal valves or by terminal pores.
                        46. Leaves copiously beset with viscid glandular trichomes . . . . . DROSERACEAE
                        46. Leaves without viscid glandular trichomes.
                            47. Fruits 2 to several in umbellate infructescences . . . . . PRIMULACEAE
                            47. Fruits not in umbels.
                                48. Leaves succulent and narrowly linear; infructescence cymose **Phemeranthus** in PORTULACACEAE
                                48. Leaves not succulent, narrowly lanceolate to orbicular or reniform; infructescence various.
                                    49. Plants annuals or winter annuals, up to 12(15) cm high with both simple and branched hairs; sepals deciduous; stems and infructescences delicate; fruit 2-locular . . . . . BRASSICACEAE
                                    49. Plants not as above.
                                        50. Calyx tubular, pubescent, with 3 acuminate, widely spreading lobes; leaves widely reniform-cordate . . . . . **Asarum** in ARISTOLOCHIACEAE
                                        50. Plants not as above.
                                            51. Hypanthium present . . . . . SAXIFRAGACEAE
                                            51. Hypanthium absent.
                                                52. Capsule 5-locular; fruits in racemes . . . . . **Pyrola** in PYROLACEAE
                                                52. Capsule fewer than 5-locular; fruits solitary at the ends of each scape.
                                                    Capsule 4-valved; leaves entire . . . . . PARNASSIACEAE
                                                    Capsule 3-valved; leaves subentire to crenate or serrate . . **Viola** in VIOLACEAE
    38. Plants with well developed cauline leaves.
        53. Fruit with circumscissile dehiscence, or one-seeded, or both.
            54. Fruits 2 to several-seeded.
                55. Fruits long-pedicellate.
                    Leaves petiolate, some of them hastiform to subtruncate at the base . . . . . **Kickxia** in SCROPHULARIACEAE
                    Leaves sessile, ovate . . . . . **Anagallis** in MYRSINACEAE
                55. Fruits sessile or embedded in a white floc.
                    At least the distal leaves conspicuously clasping, mostly sinuate or lobed . . . . . **Hyoscyamus** in SOLANACEAE
                    None of the leaves clasping, strictly entire . . . . . **Portulaca** in PORTULACACEAE
            54. Fruits one-seeded.
                56. Flowers subtended by scarious bracts; leaves entire . . . . . AMARANTHACEAE
                56. Flowers not subtended by scarious bracts; leaves sometimes not entire.
                    Hypanthium well developed; plant yellow-green, up to 4(5) dm high, glabrous; stem rigid, erect, slender, terete; leaves sessile or subsessile, narrowly lanceolate to linear, acute, scarcely narrowed basally, somewhat coriaceous, slightly glandular-punctate, gradually decreasing in size along the terminal shoots; flowers small, solitary, or more typically 2 to 3 in a leaf axil . . . . . **Thymelaea** in THYMELAEACEAE
                    Hypanthium absent; plants otherwise without the above combination of characters . . . . . CHENOPODIACEAE

53. Fruit 2 to many-seeded, longitudinally dehiscent, or opening by terminal pores or by the rupturing of the capsule.
    57. Leaves deeply lobed, divided, or compound.
        58. Stipules foliaceous, deeply divided; fruit a 3-valved capsule; sepals 5 . . . . . **Viola** in VIOLACEAE
        58. Stipules absent or present and not as above; fruit and sepals various.
            59. Leaves pinnately or ternately compound, each division once or twice compound or decompound, never sensitive to touch; fruit a capsule or follicle; stipules absent.
                60. Plants delicate vines or herbs less than 7.5 dm high; fruit a capsule . . . . . FUMARIACEAE
                60. Plants coarse, more than 7.5 dm high; fruit a follicle.
                    Follicles more than 4 mm long; petioles and petiolules with dilated bases . . . . . **Cimicifuga** in RANUNCULACEAE
                    Follicles less than 4 mm long; petioles and petiolules without dilated bases . . . . . **Aruncus** in ROSACEAE
            59. Leaves merely dissected, lobed, once-compound, or bipinnate, the leaflets sensitive to touch or not; plants otherwise various.
                61. Fruit a ring of more than 5 carpels . . . . . MALVACEAE
                61. Fruit not a ring of more than 5 carpels.
                    62. Fruit 1-locular.
                        63. Petioles much inflated and sheath-like at the base; stems glabrous, prostrate, or weakly ascending, the infructescence appearing scapose . . . . . MENYANTHACEAE
                        63. Plants not as above.
                            64. Hypanthium well developed; leaves lanceolate, shallowly sinuate, copiously beset with stiff, often uncinate, hairs; stamens persistent, more than 20 . . . . . LOASACEAE
                            64. Plants not as above.
                                65. Capsule dehiscing by a terminal pore; stems erect; fruits in dense terminal racemes . . . . . RESEDACEAE
                                65. Plants without the above combination of characters.
                                    66. Stigmas conspicuous, 2 or more, or numerous and modified into a flat radiate disc . . . . . PAPAVERACEAE
                                    66. Stigma one or inconspicuous (Caution: styles deeply bifid in Hydrophyllaceae).
                                        67. Leaves digitately 3(5-7) foliolate, the leaflets entire or minutely serrulate; sepals deciduous; fruit strongly reticulate-veiny; stem usually viscid-pubescent . . . . . CLEOMACEAE
                                        67. Plants not as above.
                                            68. Leaves not distinctly compound or if so, then the leaflets not as below; stipules absent; fruit a capsule . . . . . HYDROPHYLLACEAE
                                            68. Leaves distinctly compound, the leaflets entire to minutely serrulate; stipules usually present; fruit a legume.
                                                69. Leaves bipinnately compound, the leaflets responsive in unison to touch . . . . . MIMOSACEAE
                                                69. Leaves variously compound, the leaflets unresponsive to touch or if so, then the leaves merely 1-pinnate.
                                                    Leaves evenly 1-pinnate, without tendrils; legume 4-several seeded . . . . . CAESALPINIACEAE
                                                    Leaves without the above combination of characters . . . . . FABACEAE
                    62. Fruit more than 1-locular.
                        70. Leaves palmately 3-foliolate, the leaflets distinct, entire, deeply emarginate to obcordate . . . . . OXALIDACEAE
                        70. Leaves not as above.
                            71. Fruit 4-locular; sepals 4; leaves laciniate; hypanthium well developed, the ovary inferior . . . . . **Oenothera** in ONAGRACEAE
                            71. Plants not as above; ovary superior.
                                72. Fruit 2-locular.
                                    73. Leaves broadly cordate . . . . . **Macleaya** in PAPAVERACEAE
                                    73. Leaves not cordate.
                                        Sepals deciduous . . . . . BRASSICACEAE
                                        Sepals persistent . . . . . SCROPHULARIACEAE
                                72. Fruit more than 2-locular.
                                    74. Fruit 3-locular . . . . . POLEMONIACEAE
                                    74. Fruit more than 3-locular (sometimes 3-locular in Gossypium).
                                        75. Calyx subtended by an involucre of 6 or more slender bristles . . . . . MALVACEAE
                                        75. Involucre absent.
                                            76. Fruit separating into 5 carpels, each carpel one-seeded and united at the tip by a long tail . . . . . GERANIACEAE
                                            76. Fruit not as above.
                                                Plant strongly punctate-aromatic . . . . . **Ruta** in RUTACEAE
                                                Plant not punctate-aromatic . . . . . PAPAVERACEAE
    57. Leaves simple and unlobed (rarely slightly lobed).
        77. Fruit more than 6-locular (falsely so in Linaceae) or foliage spiny-toothed.
            78. Leaves linear to narrowly lanceolate, less than 5 mm wide, entire; plants glabrous . . . . . LINACEAE
            78. Plants not as above, often pubescent.
                Fruit a ring of separating carpels . . . . . MALVACEAE
                Fruit opening by apical valves or pores at the summit . . . . . PAPAVERACEAE
        77. Fruit 1-6 locular and foliage never spiny-toothed.
            79. Fruit a follicle, opening along one line of dehiscence; seeds numerous, with tufts of long hairs . . . . . **Asclepias** in ASCLEPIADACEAE

79. Fruit not a follicle; seeds generally without tufts of long hairs, except in Epilobium.
  80. Ovary inferior or capsule 6-locular (ovary occasionally only half-inferior in Lobelia).
    81. Leaves petiolate, strongly cordate at the base . . . . . ARISTOLOCHIACEAE
    81. Leaves not cordate, or if so, then sessile and clasping.
      82. Calyx 4 (3,5,8)-parted (rarely all 5-parted in the aquatic Jussiaea).
        Capsules linear, sessile; calyces 3, 4, and 5-parted; leaves linear to narrowly lanceolate . . . . . **Specularia** in CAMPANULACEAE
        Plants without the above combination of characters . . . . . ONAGRACEAE
      82. Calyx 5-parted; plants never aquatic.
        83. Capsules 5-locular, opening at the summit . . . . . SAMOLACEAE
        83. Capsules 2-3 locular, opening variously.
          Capsules 3-locular . . . . . CAMPANULACEAE
          Capsules 2-locular . . . . . LOBELIACEAE
  80. Ovary superior; capsule never 6-locular.
    84. Capsules 5-locular; leaves serrate-dentate.
      Green sepals 5, conspicuous, persistent; plants not succulent . . . . . MALVACEAE
      Green sepals 2, inconspicuous or absent; plants succulent . . . . . BALSAMINACEAE
    84. Capsules 1-4 locular or evidently so.
      85. Capsules 1-locular.
        86. Stipules absent or inconspicuous.
          Pubescence simple or stellate; sepals strongly dimorphic, the 2 outer ones much narrower than the 3 inner ones. . . . . CISTACEAE
          Pubescence simple or absent; sepals equal . . . . . **Lysimachia** in MYRSINACEAE
        86. Stipules conspicuous.
          Stipules wedge-shaped, decurrent; fruit clearly longer than broad, dehiscent along 2 sutures; leaves entire . . . . . **Crotalaria** in FABACEAE
          Stipules not decurrent; fruit often about as long as broad, dehiscent by 3 valves; leaves usually not entire . . . . . VIOLACEAE
      85. Capsules 2-4 locular.
        87. Capsules 3-locular.
          88. Plants twining, sprawling, or climbing vines (rarely suberect); leaves mostly cordate, subcordate, or hastate at the base. . . . . CONVOLVULACEAE
          88. Plants not vines; leaves various.
            89. Stipules present; flowers on long pedicels or peduncles; leaves usually petiolate, often cordate; plants without milky juice . . . . . VIOLACEAE
            89. Stipules absent; flowers sessile, or plants with milky juice, or both; leaves sessile or petiolate, but never cordate (rarely more or less sessile and clasping in Euphorbia).
              Flowers sessile, clustered in a dense terminal cyme; leaves entire, sessile, lanceolate; calyx lobes lanceolate, united for part of their length; plant without milky juice . . . . . **Collomia** in POLEMONIACEAE
              Plants without the above combination of characters . . . . . EUPHORBIACEAE
        87. Capsules 2(4) locular.
          90. Fruit a large prickly bur. . . . . **Datura** in SOLANACEAE
          90. Fruit not bur-like.
            91. Hypanthium well developed . . . . . LYTHRACEAE
            91. Hypanthium absent.
              92. Sepals 4, deciduous; fruits as long as broad to narrowly linear . . . . . BRASSICACEAE
              92. Sepals persistent, usually not 4; fruits never narrowly linear.
                93. Sepals 5, dimorphic, the outer 3 small and sepal-like, the inner 2 large and petal-like; fruits in dense, elongate to compact racemes . . . . . POLYGALACEAE
                93. Plants not as above.
                  94. Plants either sprawling, climbing, or twining vines, with cordate, subcordate, or hastate, petiolate, entire leaves or plants canescent with silky-villous hairs, the leaves sessile, and lance-elliptic, the fruits solitary and axillary . . . . . CONVOLVULACEAE
                  94. Plants without the above combination of characters.
                    Capsules longitudinally dehiscent for all or most of their length . . . . . SOLANACEAE
                    Capsules not dehiscent for their whole length . SCROPHULARIACEAE

Section 8
Wholly aquatic plants with opposite or whorled floating leaves

1. None of the submersed leaves whorled.
  2. Style 1 or nearly absent; petals present or absent.
    Petals absent; style very short, less than 0.5 mm long; leaves linear to narrowly oblong . . . . . **Peplis** in LYTHRACEAE
    Petals present; style elongate, more than 0.5 mm long; leaves lanceolate to ovate or suborbicular . . . . . SCROPHULARIACEAE
  2. Styles 2; petals absent.
    Sepals absent; flowers imperfect; stamen one; fruit a schizocarp, breaking at maturity into 2 to 4 one-seeded portions . . . . . CALLITRICHACEAE
    Sepals present; flowers perfect; stamens more than one; fruit a capsule . . . . . **Chrysosplenium** in SAXIFRAGACEAE

1. At least the submersed leaves whorled (or appearing so in Megalodonta).
   3. Leaves simple . . . . . HIPPURIDACEAE
   3. Leaves dissected or compound.
      4. Leaves or their principal divisions dichotomously forked.
         Emersed leaves simple, opposite; florets yellow, clustered in involucrate heads at the summits of definite peduncles . . . . . **Megalodonta** in ASTERACEAE
         Leaves all similar, none of them emersed, all whorled; flowers not yellow, usually solitary, sessile or subsessile in the leaf axils . . . . . CERATOPHYLLACEAE
      4. Leaves not dichotomously forked.
         Stem leaves numerous, the flowers and fruits sessile or subsessile in the axils; ovary inferior; petals separate and minute or absent; fruit an indehiscent nutlet. . . . . **Myriophyllum** in HALORAGIDACEAE
         Leaves and branches appearing basal, the inflorescence scapose; ovary superior; petals present (in chasmogamous flowers) and showy, united; fruit a capsule . . . . . LENTIBULARIACEAE

Section 9
Herbaceous dicots with opposite or whorled leaves

1. Plants vines, or if not, then with 4 petal-like sepals more than 2 cm long.
   2. Leaves compound or simple with 4-petal-like sepals more than 2 cm long . . . . . **Clematis** in RANUNCULACEAE
   2. Leaves not compound, the blades simple or deeply lobed or divided.
      3. Leaves deeply lobed or divided; stems usually retrorsely spinulose . . . . . **Humulus** in CANNABINACEAE
      3. Leaves entire; stems not spinulose.
         4. Petioles less than 1 cm long, the leaves tapered at the base; flowers solitary in the leaf axils, the corollas 1 cm or more long . . . . . **Vinca** in APOCYNACEAE
         4. Petioles of principal leaves more than 1 cm long, the leaves rounded to cordate at the base; flowers or flower clusters 2 to several on axillary peduncles, the corollas less than 1 cm long.
            Ovary inferior, the flowers 2 to several in heads subtended by phyllaries; fruit an achene . . . . . **Mikania** in ASTERACEAE
            Ovary superior, the flowers not in heads; fruit a many-seeded follicle . . . . . ASCLEPIADACEAE
1. Plants not vines, although sometimes trailing or prostrate; never with 4 petal-like sepals more than 2 cm long.
   5. Stems very coarse, copiously beset with broad-based spines; principal leaves connate-perfoliate, coarsely prickly along the midrib abaxially . . . . . DIPSACACEAE
   5. Stems and leaves not as above.
      6. At least some of the leaves deeply lobed, divided, or compound.
         7. Cauline or involucral leaves whorled.
            8. Ultimate leaf divisions filiform, less than 0.5 mm wide . . . . . LENTIBULARIACEAE
            8. Ultimate leaf divisions wider.
               9. Distinct leaflets numbering 3 or more per leaf, serrate or serrulate for all or nearly all of their lengths; flowers and fruits pedicellate in umbellate inflorescences . . . . . **Panax** in ARALIACEAE
               9. Plants without the above combination of characters.
                  Inflorescence loosely racemose; flowers 4-merous; fruits narrowly linear . . . . . **Dentaria** in BRASSICACEAE
                  Plants not as above. . . . . RANUNCULACEAE
         7. Cauline and involucral leaves not whorled.
            10. Plants prostrate; one leaf of each pair noticeably smaller than its opposite one; flowers solitary, pedicellate; fruits usually pungently spiny . . . . . ZYGOPHYLLACEAE
            10. Fruits never spiny; plants otherwise not as above.
               11. Leaves deeply palmately lobed or compound.
                  12. Calyx lobes subulate, prolonged into stiff slender spines; corollas bilabiate; flowers axillary, verticillate . . . . . **Leonurus** in LAMIACEAE
                  12. Plants not as above.
                     13. Leaves compound; leaflets distinct and serrate for their entire lengths . . . . . **Cannabis** in CANNABINACEAE
                     13. Leaves merely deeply lobed or divided, without distinct leaflets.
                        Plants glabrous; leaves peltate; fruit a large, fleshy, subglobose berry . . . **Podophyllum** in BERBERIDACEAE
                        Plants pubescent; leaves not peltate; fruit elongating into a capsuliform beak, the carpels dehiscing elastically along the central axis . . . . . **Geranium** in GERANIACEAE
               11. Leaves pinnately divided or compound, or occasionally merely trilobed.
                  14. Ovary inferior, the calyx absent or reduced to a minute crown of teeth or slender capillary or setiform bristles, awns, or scales.
                     15. Calyx absent or consisting of a short crown of scales or awns . . . . . ASTERACEAE
                     15. Calyx present in the form of a pappus or capillary or setiform bristles.
                        Flowers in involucrate heads, the phyllaries conspicuously glandular-dotted; annual, with pinnatifid or bipinnatifid leaves, the ultimate divisions linear or filiform . . . . . **Dyssodia** in ASTERACEAE
                        Plants not as above. . . . . **Valeriana** in VALERIANACEAE
                  14. Ovary superior, the calyx conspicuous (sometimes deciduous), typified by the manifest sepals or calyx lobes.
                     16. Flowers in long-pedunculate, umbellate inflorescences . . . . . **Erodium** in GERANIACEAE
                     16. Flowers not in umbels.
                        17. Cauline leaves 2; petals 4, separate, yellow; sepals 2, deciduous; stamens numerous; fruit an elliptic or fusiform, longitudinally dehiscent, pubescent capsule . . . . . **Stylophorum** in PAPAVERACEAE
                        17. Plants not as above.
                           18. Flowers and fruits solitary in the axils of leaves or leaf-like bracts; fruit a capsule; calyx lobes obtuse, acute, or acuminate, but never subulate or spine-tipped.
                              Stamens 5; styles bifid; ovary and fruit 1-locular. . . . . **Ellisia** in HYDROPHYLLACEAE
                              Fertile stamens fewer than 5; styles not bifid (sometimes with 2 stigmas); ovary and capsule 2-locular . . . . . SCROPHULARIACEAE

18. Flowers either in terminal, bracteate spikes, or glomerulate or clustered in the leaf axils; fruit of usually 4 separating nutlets; calyx lobes various.
    Flowers glomerulate or clustered in the leaf axils; calyx lobes subulate or spine-tipped . LAMIACEAE
    Flowers in spicate inflorescences; calyx lobes blunt to acute, but never subulate or spine-tipped . . . . . **Verbena** in VERBENACEAE

6. Leaves all entire to coarsely serrate to dentate to shallowly lobed or hastate, but never deeply lobed or divided, or leaves absent.
19. Flowers imperfect; stamens 3 to 5; styles 2; the pistillate flowers mostly enclosed by 2 broad, deltate bracteoles, the perianth absent . . . . . **Atriplex** in CHENOPODIACEAE
19. Plants not as above.
20. Inflorescences loosely to densely cymose; styles 3, each bifid; fruit a 3-lobed capsule; plants usually with milky juice . . . . . EUPHORBIACEAE
20. Plants not as above.
21. Leaves absent, the stems thick-cylindric and very succulent and fleshy . . . . . **Salicornia** in CHENOPODIACEAE
21. Plants not as above.
22. Leaves minute and scale-like, not at all foliaceous.
    Calyx 4-parted . . . . . **Bartonia** in GENTIANACEAE
    Calyx 5-parted . . . . . HYPERICACEAE
22. Leaves indurated to foliaceous, not scale-like.
23. Petioles beset with narrowly oblong to linear nigrescent glands . . . . . BALSAMINACEAE
23. Petioles absent, eglandular, or the glands not nigrescent and linear.
    Plants in flower . . . . . **Section 9A**
    Plants in fruit . . . . . **Section 9B**

Section 9A
Herbaceous dicots with opposite or whorled leaves: in flower

1. Petals or petal-like sepals absent or greenish and inconspicuous.
2. Leaves distinctly and evenly serrate or dentate; ovary superior . . . . . URTICACEAE
2. Leaves entire, subentire, or rarely bluntly and remotely dentate (or if serrate in the Asteraceae, then the ovary inferior); ovary superior or inferior.
3. Sepals 5, dimorphic, the outer 2 narrowly linear, the inner 3 ovate; style absent; stigmas 3, plumose; stamens usually more than 5 . . . . . **Lechea** in CISTACEAE
3. Plants not as above.
4. Flowers in dense, short or elongate terminal spikes, or plants densely tomentulose or stellate-pubescent, or both.
5. Ovary inferior; styles deeply 2-cleft; leaves serrate or entire . . . . . ASTERACEAE
5. Ovary superior; styles not 2-cleft; leaves entire.
    Leaves less than 3 mm wide; plants pubescent, but never tomentulose or stellate . . . . . PLANTAGINACEAE
    Leaves more than 3 mm wide; plants either densely tomentulose or stellate-pubescent . . . . . AMARANTHACEAE
4. Flowers one to several in the leaf axils; plants glabrous to pubescent, but never tomentulose or stellate.
6. Style 1.
    Calyx free from the ovary . . . . . LYTHRACEAE
    Calyx adnate to the ovary . . . . . **Ludwigia** in ONAGRACEAE
6. Styles 2 to 5.
7. Leaves whorled.
    Perianth parts 3 or 4, united at the base; ovary inferior . . . . . **Galium** in RUBIACEAE
    Perianth parts 5, distinct; ovary superior . . . . . MOLLUGINACEAE
7. Leaves opposite or the distal sometimes alternate.
8. Flowers unisexual, the staminate ones with one stamen; styles 2; ovary 2-locular . . . . . CALLITRICHACEAE
8. Flowers perfect; stamens more than one; styles and ovary various.
    Leaves linear to lanceolate; flowers 5-merous . . . . . CARYOPHYLLACEAE
    Leaves broadly ovate to suborbicular, sometimes bluntly and remotely dentate; flowers 4-merous . . . . . SAXIFRAGACEAE

1. Petals or petal-like sepals present, usually conspicuous, but if small then neither green nor greenish.
9. Styles well developed, 2 to 5 (absent in staminate flowers); leaves entire.
10. Petals 5, united; stamens 5, much modified into hoods, the pollen in pollinia; plants with milky juice . . . . . ASCLEPIADACEAE
10. Petals 4, 5, or more, separate (united at the base in Galium); stamens more than 5, or 5 and not as above (as few as 3 in Stellaria); plants without milky juice.
11. Leaves coarsely serrate to shallowly palmately lobed.
    Cauline leaves numerous, succulent . . . . . CRASSULACEAE
    Cauline leaves 2, membranaceous . . . . . **Mitella** in SAXIFRAGACEAE
11. Leaves entire.
12. Sepals 2; leaves usually only 2, linear to linear-lanceolate; inflorescence racemose; petals whitish to pink or roseate . . . . . **Claytonia** in PORTULACACEAE
12. Sepals more than 2 or absent; leaves more than 2, variously shaped; inflorescence various; petals variously colored.
13. Sepals either absent or united into a calyx tube.
    Ovary inferior; calyx absent; petals 3 or 4; styles 2 . . . . . **Galium** in RUBIACEAE
    Ovary superior; calyx present; petals mostly 5; styles seldom less than 3 . . . . . CARYOPHYLLACEAE
13. Sepals separate or connate only at the base.
14. Leaves whorled.
    Leaves succulent, in whorls of 3 . . . . . CRASSULACEAE
    Leaves linear-filiform to subulate, appearing to be in whorls of 6 or more . . . **Spergula** in CARYOPHYLLACEAE
14. Leaves not whorled.
15. Petals white, or if pink, then stipules scarious and conspicuous . . . . . CARYOPHYLLACEAE

15. Petals yellow or pinkish-purple; stipules absent.
    16. Stamens 5 . . . . . LINACEAE
    16. Stamens more than 5.
        Plants succulent, prostrate. . . . . **Portulaca** in PORTULACACEAE
        Plants not succulent, erect. . . . . HYPERICACEAE

9. Style one or obsolete; leaves entire or not.
    17. Petals or petal-like sepals separate (Caution: the ray flowers in the Asteraceae may seem separate).
        18. Flowers capitate, the head solitary, subtended by a showy whorl of 4 white bracts; well developed leaves confined to a single false whorl at the base the inflorescence . . . . . CORNACEAE
        18. Plants not as above.
            19. Sepals 5, the outer two narrower than the inner 3; petals 3, shorter than the sepals . . . . . **Lechea** in CISTACEAE
            19. Sepals and petals without the above combination of characters.
                20. Sepals and petals 5, or petals absent and petal-like sepals 5.
                    21. Leaves serrate . . . . . PYROLACEAE
                    21. Leaves essentially entire.
                        22. Leaves principally basal, broadly ovate to suborbicular; hypanthium absent . . . . . **Pyrola** in PYROLACEAE
                        22. Stems with numerous verticils of whorled leaves; hypanthium absent or present.
                            Hypanthium well developed; plant a tall, erect, suffruticose herb of remnant wetlands . . . . . **Decodon** in LYTHRACEAE
                            Hypanthium absent; plant a prostrate herb of dry soil . . . . . MOLLUGINACEAE
                20. Sepals and petals not 5 (except occasionally in Lythraceae).
                    23. Principal leaves deltate-cordate at the base, coarsely dentate, sessile or short-petiolate; flowers purple, more than 1.5 cm across, with 4 petals . . . . . **Lunaria** in BRASSICACEAE
                    23. Leaves and flowers not as above.
                        24. Hypanthium absent.
                            Sepals 2; leaves usually only 2 . . . . . **Claytonia** in PORTULACACEAE
                            Sepals 5, the outer 3 small, the inner 2 much larger and petaloid; leaves more than 2 . . . . . POLYGALACEAE
                        24. Hypanthium well developed.
                            25. Ovary superior, free from the hypanthium; leaves opposite or whorled, entire; sepals and petals mostly 4 to 6 . . . . . LYTHRACEAE
                            25. Ovary inferior, adnate to the hypanthium (or if free in the Melastomataceae, then the leaves serrate); leaves opposite or some of them alternate, serrate or entire; sepals and petals 2 or 4.
                                Stamens 2, 4, or 8; anthers less than 4 mm long; leaves serrate or entire, not strongly 3-nerved . . . . . ONAGRACEAE
                                Stamens 8; anthers more than 4 mm long; leaves serrate, strongly 3-nerved . . . . . MELASTOMATACEAE
    17. Petals or petal-like sepals united, at least at the base.
        26. Ovary inferior.
            27. Flowers capitate, sessile on a receptacle subtended by few to several phyllaries; anthers united into a tube around the style; leaves serrate, dentate, or entire . . . . . ASTERACEAE
            27. Flowers sessile to pedicellate, solitary to glomerulate, but not in involucrate heads; anthers not united; leaves entire.
                28. Calyx 5-parted, green, the lobes sepaloid; stamens 5 (4 in the rare, prostrate, suffruticose Linnaea); corollas 5-parted . . . . . CAPRIFOLIACEAE
                28. Calyx 2-4 parted, reduced to bristles or obsolete or petaloid and showy; stamens 3 to 5; corolla lobes 3 to 5 or corollas absent and the calyx corolla-like.
                    29. Leaves whorled. . . . . RUBIACEAE
                    29. Leaves opposite.
                        30. Flowers paired at the ends of slender peduncles, united at the base by their hypanthia . **Mitchella** in RUBIACEAE
                        30. Flowers not as above.
                            31. Calyx lobes sepaloid, 2-4 parted . . . . . RUBIACEAE
                            31. Calyx essentially absent, or of pappus bristles, or the lobes at least partially united, showy and petaloid.
                                Flowers white, less than 5 mm long; calyx absent or obsolete . . . . . VALERIANACEAE
                                Flowers usually not white, more than 5 mm long; calyx lobes petaloid and showy . . . NYCTAGINACEAE
        26. Ovary superior.
            32. Leaves long-petiolate, entire or subentire, cordate, the larger ones more than 10 cm long (except in depauperate specimens) and about as wide; corollas more than 3 cm long; plants densely glandular-pubescent; calyx 5-parted, zygomorphic; fertile stamens 4 . . . . . MARTYNIACEAE
            32. Plants without the above combination of characters.
                33. Fertile stamens more than (3)4; leaves entire.
                    34. Corollas 3-parted, strongly zygomorphic, the lower lobe very dissimilar to the upper 2; sepals 5, the outer 3 small, the inner 2 much larger and petaloid. . . . . POLYGALACEAE
                    34. Plants not as above.
                        35. Calyx corolla-like, the tube conspicuously constricted at the summit of the ovary, making the ovary appear inferior; involucre calyx-like; stamens 3 to 5; style one, the stigma capitate; ovary 1-locular . . . . . NYCTAGINACEAE
                        35. Plants not as above.
                            36. Calyx 5-parted; corolla 5-parted; stamens 5, originating from the corolla tube; style one or absent; stigma one, conspicuous; plants with milky juice . . . . . APOCYNACEAE
                            36. Plants without the above combination of characters and never with milky juice.
                                37. Stigma 1; ovary 1-locular; stamens opposite the corolla lobes; flowers sometimes yellow . . . . . MYRSINACEAE
                                37. Stigmas 2 or 3; ovary 2-3 locular; stamens alternate with the corolla lobes; flowers never yellow.
                                    Stigmas 3; ovary 3-locular. . . . . **Phlox** in POLEMONIACEAE
                                    Stigma 1 or 2; ovary 2-locular . . . . . GENTIANACEAE
                33. Fertile stamens 2 or 4; leaves serrate or entire.
                    38. Plants with both actinomorphic corollas and entire leaves.

39. Ovary deeply 4-lobed or parted around the style . . . . . LAMIACEAE
39. Ovary 0-2 lobed, the style apical.
40. Calyx lobes 5, similar; stigma one (or if 2 then one of them much smaller than the other); ovary 2-locular . . . . . **Ruellia** in ACANTHACEAE
40. Calyx lobes 4 or 5, similar or dissimilar; stigmas 2 and subequal, or if 1, then the calyx lobes 4; ovary various.
Stigmas 2 or 2-lobed (rarely sometimes capitate in Centaurium); calyx lobes all similar; fertile stamens 4 . . . . . GENTIANACEAE
Flowers without the above combination of characters . . . . . SCROPHULARIACEAE
38. Plants with zygomorphic corollas, or leaves not entire, or both.
41. Leaves entire.
42. Stamens 2; calyx 5-parted, the lobes similar; plants glabrous throughout . . . . . **Justicia** in ACANTHACEAE
42. Plants without the above combination of characters.
43. Stems often quadrangular; flowers in false whorls or verticils, 2 or more per leaf axil; ovules one in each locule . . . . . LAMIACEAE
43. Stems terete; flowers not verticillate, one per leaf axil; ovules 2 to numerous in each locule.
44. Calyx lobes fewer than 5 . . . . . **Melampyrum** in OROBANCHACEAE
44. Calyx lobes five.
Leaves scabrous, often less than 5 mm wide, commonly with nigrescent tinctures in drying; sepals united . . . . . OROBANCHACEAE
Leaves not scabrous, commonly more than 5 mm wide, without nigrescent tinctures in drying; sepals separate to the base or united . . . . . SCROPHULARIACEAE
41. Leaves not entire.
45. Ovary 1-locular; 3 of the calyx teeth becoming conspicuously hooked at the tip . . . . . PHRYMACEAE
45. Ovary 2-4 locular; calyx teeth not hooked, or if rarely so in the Lamiaceae, then all 5 of the teeth hooked.
46. Ovules 1 in each locule.
47. Ovary deeply 4-lobed around the style; plants often aromatic . . . . . LAMIACEAE
47. Ovary lobeless, the style apical; plants not aromatic.
Stamens originating on the corolla tube well up from the base; ovary 4-locular . . . . . VERBENACEAE
Stamens originating from at or near the base of the corolla tube; ovary 2-locular . . . . . SCROPHULARIACEAE
46. Ovules 2 to numerous in each locule.
48. Flowers in the axils of well developed leaves.
Leaf divisions mostly less than 2 mm wide . . . . . **Leucospora** in SCROPHULARIACEAE
Leaf divisions all more than 2 mm wide . . . . . OROBANCHACEAE
48. Flowers in interrupted spikes, racemes, or panicles.
Pedicels mostly less than 1 mm long . . . . . OROBANCHACEAE
Pedicels more than 1 mm long . . . . . SCROPHULARIACEAE

Section 9B
Herbaceous dicots with opposite or whorled leaves: in fruit

1. Fruit a follicle or pair of follicles; seeds typically with a dense silky coma (coma absent in the rarely fruiting Vinca and in the rare Asclepias perennis); plants typically with milky juice.
Seeds flat, mostly more than 2 mm long; follicles usually in pairs, stout, usually more than 5 mm broad . . . . . **Asclepias** in ASCLEPIADACEAE
Seeds subterete, more or less fusiform or cylindric, about 2 mm long; follicles in pairs, slender, less than 5 mm broad . . .APOCYNACEAE
1. Fruit usually not a follicle, or if so, then the follicles in clusters of 3 to 5; seeds rarely with a coma; plants without milky juice.
2. Fruit consisting of 2 to 4 separating nutlets.
3. Fruits solitary in the axils of well developed, entire leaves; carpels 2; nodes swollen . . . . . .**Diodia** in RUBIACEAE
3. Fruits either in terminal bracteate spikes or one to several in glomerulate or verticillate axillary clusters; leaves usually not entire; carpels 2 to 4; nodes usually not swollen.
4. Calyx absent; leaves entire; fruits 1 to 3 in the leaf axils . . . . . CALLITRICHACEAE
4. Calyx present; leaves not often entire; infructescence various.
Flowers sessile to pedicellate in glomerulate or verticillate clusters in the axils of leaves or bracts . . . . . LAMIACEAE
Flowers sessile or subsessile, axillary in usually dense spikes or racemes . . . . . VERBENACEAE
2. Fruit not of 2 to 4 separating nutlets.
5. Fruit an indehiscent nutlet, achene, drupe, berry, or utricle.
6. Flowers capitate; fruit an achene, seated on a receptacle subtended by numerous phyllaries; leaves serrate, dentate, or entire . . . . . ASTERACEAE
6. Plants without the above combination of characters.
7. Principal leaves whorled.
Fruits fleshy, in capitate clusters; principal leaves in a single false whorl at the summit of the stem . . . . . CORNACEAE
Fruits dry, usually paired at the ends of slender peduncles; whorls of leaves numerous . . . . . **Galium** in RUBIACEAE
7. Leaves not whorled.
8. Fruits bristly, with uncinate hairs, in loose, terminal and axillary, ebracteate racemes . . . . . **Circaea** in ONAGRACEAE
8. Fruits without uncinate hairs; inflorescence various.
9. Leaves serrate or dentate; ovary superior.
Calyx 5-parted, zygomorphic, the sepals united; pedicels strongly reflexed, the fruit in terminal or axillary racemes . . . . . PHRYMACEAE
Calyx 2, 3, or 4-parted, actinomorphic, the sepals separate or united; pedicels not reflexed, the inflorescence usually of axillary or terminal spikes, cymes, or subcapitate clusters . . . . . URTICACEAE
9. Leaves entire or subentire (weakly serrulate in the rare Linnaea); ovary superior or inferior.

10. Ovary superior; fruit a utricle enclosed by an indurated, usually denticulate, calyx tube; flowers in dense spikes; plants variously pilose, tomentulose, lanate, or stellate-pubescent . . . . . AMARANTHACEAE
10. Ovary inferior or superior; fruit various; calyx not as above; flowers not in dense spikes; pubescence various, but never stellate or lanate.
    11. Ovary superior; fruit a utricle; stipules scarious and conspicuous or stipules absent and leaves linear-subulate . . . . . CARYOPHYLLACEAE
    11. Ovary inferior (superior in Nyctaginaceae); fruit not a utricle; stipules absent or inconspicuous; leaves never linear-subulate.
        12. Fruit an achene, 2 to several in mostly terminal clusters; plants never prostrate.
            Leaves either narrowly linear or distinctly petiolate; inflorescence bracts (involucres) pubescent, glandular, or densely ciliate; stems glabrous, pubescent, or glandular . . . . . NYCTAGINACEAE
            Leaves sessile, broadly oblong; inflorescence bracts glabrous or remotely ciliate; stems glabrous or glabrate . . . . . VALERIANACEAE
        12. Fruit a drupe or berry, or plant prostrate with the fruits in pairs, or both; infructescence never in terminal clusters.
            Fruits fleshy, more than 4-seeded; leaves more or less deltate-ovate, green and typically variegated with white lines; plant glabrous . . . . . **Mitchella** in RUBIACEAE
            Fruits dry, 1-3 seeded; leaves various, but not as above; plants usually at least sparsely pilose . . . . . CAPRIFOLIACEAE

5. Fruit dehiscent, usually a capsule or follicle.
    13. Stem with one pair of cauline leaves; inflorescence a terminal spike or raceme.
        Leaves serrate or dentate, with basal leaves present . . . . . **Mitella** in SAXIFRAGACEAE
        Leaves entire, with basal leaves usually absent . . . . . **Claytonia** in PORTULACACEAE
    13. Stem with more than one pair of cauline leaves, or if rarely with only one pair, then the inflorescence neither a raceme nor a spike.
        14. Hypanthium present, the stamens originating well above the base of the ovary.
            15. Seeds with a tuft of hairs at one end; capsules linear; leaves serrate or entire . . . . . **Epilobium** in ONAGRACEAE
            15. Seeds without a tuft of hairs; capsules not linear, except in the rare Jussiaea; leaves entire, or in the Melastomataceae, the leaves ciliate-serrate.
                16. Leaves ciliate-serrate; calyx lobes 4, persistent on the urceolate hypanthium . . . . . MELASTOMATACEAE
                16. Leaves entire; calyx lobes and hypanthium various.
                    17. Ovary superior, the hypanthium not adherent to the ovary . . . . . LYTHRACEAE
                    17. Ovary inferior, the hypanthium adherent to the ovary.
                        18. Fruits on slender pedicels or peduncles, one to few in terminal cymes . . . . . **Houstonia** in RUBIACEAE
                        18. Fruits sessile or pedicellate on stout stalks, mostly solitary in the leaf axils.
                            Plants succulent; capsule with circumscissile dehiscence . . . . . **Portulaca** in PORTULACACEAE
                            Plants not succulent; capsule dehiscence not circumscissile . . . . . ONAGRACEAE
        14. Hypanthium absent, the stamens originating at the base of the ovary.
            19. Leaves serrate, dentate, or divided.
                20. Stems with only one pair of cauline leaves . . . . . **Mitella** in SAXIFRAGACEAE
                20. Stems with more than one pair of cauline leaves.
                    21. Leaves distinctly lobed or divided.
                        Leaf divisions mostly less than 2 mm wide . . . . . **Leucospora** in SCROPHULARIACEAE
                        Leaf divisions all more than 2 mm wide . . . . . OROBANCHACEAE
                    21. Leaves not distinctly lobed or divided.
                        22. Leaves truncate or cordate; fruits flat, wafer-like, reticulate-veiny, broadly elliptic, more than 3 cm long; annual . . . . . **Lunaria** in BRASSICACEAE
                        22. Plants not as above.
                            23. Capsule 1-locular; styles 2; plant prostrate, delicate species of swamp forests . . . . . **Chrysosplenium** in SAXIFRAGACEAE
                            23. Capsule 2 or 5-locular; style one or absent; habits and habitats various, but not as above.
                                Capsule 5-locular; style obsolete, the stigma very large and peltate; stem leaves mostly crowded into a whorl or cluster at the summit of the stem . . . . . **Chimaphila** in PYROLACEAE
                                Capsule 2-locular; style manifest, slender; leaves mostly evenly distributed along the stem . . . . . SCROPHULARIACEAE
            19. Leaves entire.
                24. Capsule with a woody endocarp, much longer than broad, strongly curved toward, and ultimately recurved at the tip, splitting into two hooked beaks . . . . . MARTYNIACEAE
                24. Fruits not as above.
                    25. Pistils 4 or 5; fruit a cluster of follicles, each dehiscing along one suture; plants succulent . . . . . CRASSULACEAE
                    25. Pistil one (rarely more); fruit a capsule, the dehiscence circumscissile or along more than one suture; plants often not succulent.
                        26. Styles 2 to 6, or absent and with 3 sessile stigmas in the Aizoaceae.
                            27. Sepals distinctly united for at least part of their lengths . . . . . CARYOPHYLLACEAE
                            27. Sepals separate.
                                28. Leaves whorled.
                                    Leaves linear-filiform to subulate; infructescences terminal . **Spergula** in CARYOPHYLLACEAE
                                    Leaves linear-oblong to spatulate; fruits axillary . . . . . AIZOACEAE
                                28. Leaves not whorled.
                                    29. Stipules conspicuous . . . . . **Spergularia** in CARYOPHYLLACEAE
                                    29. Stipules absent.
                                        30. Plants prostrate, succulent; style branches 4 to 6, the capsule with circumscissile dehiscence . . . . . **Portulaca** in PORTULACACEAE
                                        30. Plants not as above.
                                            31. Capsule appearing 10-locular, many of the stem leaves often alternate . . . . . LINACEAE

31. Capsule 1-5 locular; leaves all opposite.
    32. Fruits solitary in the leaf axils; sepals 4; plants prostrate, delicate species of swamp forests. . . . . **Chrysosplenium** in SAXIFRAGACEAE
    32. Fruits not solitary in the leaf axils; sepals 5; plants almost never prostrate; habitats various.
        Leaves not punctate; capsule dehiscing by 4 to 10 short apical teeth or longitudinally by 3 to 5 valves; stamens 5 to 10 . . . . . CARYOPHYLLACEAE
        Leaves usually punctate; capsule dehiscence mostly septicidal; stamens usually more than 10. . . . . HYPERICACEAE

26. Style one or absent; stigma sessile.
    33. Flowers in dense, subcapitate spikes; capsule with circumscissile dehiscence; calyx actinomorphic, 4-parted; corolla persistent, the 4 lobes scarious and reflexed . . . . . PLANTAGINACEAE
    33. Inflorescence not as above.
        34. Capsule 1-locular.
            35. Sepals dimorphic, the outer two narrowly linear, the inner 3 ovate; capsule dehiscing by 3 valves . . . . . **Lechea** in CISTACEAE
            35. Plants not as above.
                36. Sepals separate; stamens more than 5, persistent; leaves never whorled . . . HYPERICACEAE
                36. Sepals united or separate; stamens (4)5 (sometimes up to 6 or 7 in Lysimachia), persistent or deciduous; leaves sometimes whorled.
                    Corollas usually persistent, the stamens alternate with the lobes; calyx 4 or 5-parted; stigmas 2 (rarely unlobed) . . . . . GENTIANACEAE
                    Corollas deciduous, or if present, then the stamens opposite the lobes; calyx 5-parted; stigma one, capitate . . . . . MYRSINACEAE
        34. Capsule 2-5 locular.
            37. Capsule 3 or 5-locular.
                38. Leaves all or nearly all basal, broadly ovoid to suborbicular; style very short, the stigma large and peltate, or 5-lobed or 5-rayed . . . . . **Pyrola** in PYROLACEAE
                38. Leaves principally cauline, narrower; stigmas not as above.
                    Calyx lobes distinctly united for at least part of their lengths . . . . . **Phlox** in POLEMONIACEAE
                    Calyx lobes separate . . . . . HYPERICACEAE
            37. Capsule 2-locular or appearing so.
                39. Leaves whorled.
                    Leaves linear, less than 1 cm wide; plants less than 0.5 m high; inflorescence spicate . . . . . POLYGALACEAE
                    Leaves oblanceolate, more than 1 cm wide; plants more than 0.5 m high; inflorescence a paniculate cyme . . . . . **Frasera** in GENTIANACEAE
                39. Leaves not whorled.
                    40. Fruits in terminal racemes, cymes, or panicles.
                        Stigmas 2; corollas persistent and fruits in subcapitate, spiciform, or umbelliform cymes, or corollas deciduous and fruits in loose, corymbiform cymes GENTIANACEAE
                        Stigma one, simple or capitate; corollas deciduous; fruits in leafy-bracted racemes, panicles, or paniculate racemes. . . . . MYRSINACEAE
                    40. Fruits in axillary inflorescences.
                        41. Capsule elastically dehiscent, up to 12(16)-seeded . . . . . ACANTHACEAE
                        41. Capsule not elastically dehiscent, usually more than 16-seeded .
                            42. Calyx lobes fewer than 5 . . . . . **Melampyrum** in OROBANCHACEAE
                            42. Calyx lobes five.
                                Leaves scabrous, often less than 5 mm wide, commonly with nigrescent tinctures when dry; sepals united . . . . . OROBANCHACEAE
                                Leaves not scabrous, commonly more than 5 mm wide, without nigrescent tinctures when dry; sepals separate to the base or united . . . . . SCROPHULARIACEAE

KEYS TO THE GENERA AND SPECIES

All text sections from the text reference have been removed. The typography is sustained to make coordination to the reference volume a little easier, although the font is changed to Geramond to save space. Genus names are sustained in ALL CAPS, and specific epithets for non-native taxa are sustained in italics. Genera with only one local species are sustained in the alphabetical listing along with the single local species. For the family keys, the Genera are sustained in ALL CAP.

ABELMOSCHUS*esculentus*

ABIES*balsamea*

ABUTILON *theophrasti*

ACALYPHA

1. Lobes of pistillate bracts broadly deltate, most of them about as wide as long; leaves oblong-lanceolate, nearly or quite entire, the petioles no more than ¼ as long as the blades . . . . . **Acalypha gracilens**
1. Lobes of pistillate bracts mostly much longer than wide; leaves lance-ovate to rhombic, prevailingly crenate, the larger petioles more than ¼ as long as the blades.

   Pistillate bracts fewer than 9-lobed, glabrescent or sparsely pilose, usually thinly beset with long-stipitate whitish glands; leaves glabrous or with hairs mostly along the veins . . . . . **Acalypha rhomboidea**

   Pistillate bracts mostly with 9 or more lobes, densely white-ciliate along the lobe margins, eglandular; leaves fairly densely pubescent with close, appressed-curved hairs . . . . . **Acalypha virginica**

ACANTHACEAE

A. Plant glabrous throughout; stamens 2 . . . . . JUSTICIA
A. Plant pubescent, at least in lines; stamens 4 . . . . . RUELLIA

ACER

1. Leaves compound; petals absent; anthers linear, minutely apiculate . . . . . **Acer negundo**
1. Leaves simple; petals present or absent; anthers oval or oblong, blunt.
   2. Leaves unlobed or more commonly the terminal lobe about twice as long and twice as wide as the weak, basal, lateral lobes . . *Acer ginnala*
   2. Leaves all lobed, the major lobes about equal in size and shape.
      3. Margins of leaves merely remotely toothed or entire, the sinuses broadly rounded in the angles; leaves not silvery abaxially.
         4. Teeth of lobes narrowly tapering to acute or acuminate, attenuate tips; petioles with milky juice . . . . . *Acer platanoides*
         4. Teeth obtuse to acute; petioles with or without milky juice.
            5. Lobes broadly rounded, obtuse, about as wide as long; petioles with milky juice . . . . . *Acer campestre*
            5. Lobes acute, variously proportioned; petioles without milky juice.

               Lower leaf surfaces, and typically the petioles, permanently pubescent; leaf margins usually more or less drooping; blades with the main lobes normally round-shouldered, subentire . . . . . **Acer nigrum**

               Lower leaf surfaces and petioles smooth or the blades sometimes pubescent below; leaf margins flat; blades with the main lobes each normally with coarse, acute, lateral lobes or teeth . . . . . **Acer saccharum**
      3. Margins of leaves serrate throughout, the sinuses mostly sharp-angled; leaves silvery abaxially or not.
         6. Leaves notably 5-lobed, the main lobes tending to be ovate, curving inward below the middle; flowers in narrow, paniculate inflorescences; winter buds green . . . . . *Acer pseudoplatanus*
         6. Leaves 3-5 lobed, the main lobes tending to be rhombic or with parallel sides; flowers in subcapitate or umbelliform fascicles; winter buds reddish.
            7. Leaves cleft less than halfway to the base of the blade, the terminal lobe usually widest at the base, coarsely double-serrate, the major lobes often with a pair of shallow lateral lobes . . . . . **Acer rubrum**
            7. Leaves very deeply lobed, the terminal lobe generally widest well above the base, coarsely and irregularly serrate, the proximal pair of teeth on each primary lobe enlarged to form a pair of secondary lobes.

               Principal sinuses tending to be narrowly U-shaped, the lateral lobes with a pair of widely spreading teeth or lobes . . . . . **Acer saccharinum**

               Principal sinuses tending to be V-shaped, the lateral lobes generally without a strong pair of lateral teeth . . *Acer ×freemanii*

ACHILLEA

1. Ligules yellow; leaves pinnatifid with toothed segments . . . . . *Achillea filipendulina*
1. Ligules white or pink; leaves either simple or finely dissected.
   2. Leaves simple, entire to crenulate-serrulate . . . . . *Achillea ptarmica*
   2. Leaves compound, once to several times pinnately dissected.

      Ligules white; ultimate leaf divisions curled or twisted, not lying in one plane . . . . . **Achillea millefolium**

      Ligules pink to rose; ultimate leaf divisions flat, lying in one plane . . . . . *Achillea millefolium 'Roseum'*

ACINOS *arvensis*

ACMISPON *americanus*

ACONITUM *uncinatum*

ACORUS

1. Leaves with 2-6 equally raised veins forming a broad, striated mid-section along the blade; pollen grains fertile, becoming stained in aniline blue; the spadix developing fruits . . . . . **Acorus americanus**

1. Leaves with a strong, often cartilaginous, notably raised midvein that is prevailingly offset from the middle of the blade, with any additional veins much reduced and concentrated near the prominent midvein; pollen grains sterile, not stained in aniline blue; the spadix persistently long and narrowly tapered, without forming fruits . . . . . *Acorus calamus*

ACROPTILON *repens*

ACTAEA
1. Pedicels stout, becoming more than 0.7 mm in diameter; fruits usually white; leaves glabrous or glabrate abaxially . . . . . **Actaea pachypoda**
1. Pedicels filiform, up to 0.7 mm in diameter; fruits usually red; leaves often pubescent along the veins abaxially . . . . . **Actaea rubra**

ADIANTACEAE
A. Fronds reniform in general outline, dichotomously branched at the base into two recurving branches, each bearing 5-9 pinnately divided pinnae on one side. . . . . ADIANTUM
A. Fronds neither reniform nor dichotomously branched at the base.
  B. Petioles greenish except toward the base . . . . . CRYPTOGRAMMA
  B. Petioles brown or blackish throughout.
    Many of the ultimate leaf divisions more than 4 mm wide and notably longer than wide . . . . . PELLAEA
    Ultimate leaf divisions orbicular, less than 4 mm wide . . . . . CHEILANTHES

ADIANTUM pedatum

ADLUMIA fungosa

ADOXACEAE
A. Leaves pinnately compound . . . . . SAMBUCUS
A. Leaves simple. . . . . VIBURNUM

AEGILOPS*cylindrica*

AEGOPODIUM *podagraria*

AESCULUS
1. Leaflets crenulate, the distal length of each tooth less than 0.5 mm long and much shorter than the proximal length; flowers white; stamens twice or more as long as the petals . . . . . *Aesculus parviflora*
1. Leaflets serrulate or serrate, the distal length of each tooth more than 0.5 mm long and often subequaling the proximal length; flowers yellow, pink, or white with red spots; the stamens less than twice as long as the petals.
  2. Flowers pale to deep-pink; fruits smooth or weakly prickly . . . . . *Aesculus ×carnea*
  2. Flowers white and red-spotted to yellow; fruits decidedly and wholly echinate.
    Winter buds notably glutinous; leaves coarsely doubly serrate; flowers white with red spots; larger fruits more than 5 cm in diameter . . . . . *Aesculus hippocastanum*
    Winter buds not glutinous; leaves finely serrulate or crenulate; flowers yellow throughout; fruits less than 5 cm in diameter . . . . . **Aesculus glabra**

AETHUSA *cynapium*

AGALINIS
1. Leaves lanceolate, the larger more than 5 mm wide, auriculate at the base . . . . . **Agalinis auriculata**
1. Leaves linear, less than 5 mm wide, not auriculate at the base.
  2. Pedicels less than 6 mm long, shorter than to a little longer than the calyx.
    Corollas prevailingly more than 2 cm long; calyx lobes never more than 2 mm long . . . . . **Agalinis purpurea**
    Corollas less than 2 cm long; calyx lobes more or less than 2 mm long . . . . . **Agalinis paupercula**
  2. Longer pedicels more than 6 mm long, as long as or longer than the calyx.
    3. Plants deep-green, tending to blacken in drying; seeds dark-colored; leaves to 6 mm wide; calyx tube not particularly reticulate-veined.
      Sinus of calyx V-shaped to sharply U-shaped, the inner faces of the calyx lobes densely puberulent, the capsule distinctly longer than wide, the larger more than 7 mm long; pedicels stout, strongly ascending, usually a little roughened; stigmas more than 1.5 mm long . . . . . **Agalinis aspera**
      Sinus of calyx shallowly U-shaped to truncate, the inner faces of the calyx lobes not or only weakly puberulent, the capsule scarcely as long as wide, no more than 7 mm long; pedicels slender, widely spreading, smooth; stigmas to 1.5 mm long . **Agalinis tenuifolia**
    3. Plants yellow-green and tending to remain so in drying; seeds yellow to yellowish-brown; leaves to 1.2 mm wide; calyx tube conspicuously reticulate-veined.
      Stems strongly angled, scaberulous, simple or with short, ascending branches . . . . . **Agalinis skinneriana**
      Stems terete or essentially so, at least below the middle, smooth, usually with spreading branches . . . . . **Agalinis gattingeri**

AGASTACHE
1. Abaxial leaf surfaces finely white-pannose. . . . . *Agastache foeniculum*
1. Abaxial leaf surfaces green, not pannose.
  Flowers yellowish or cream-hued; calyx lobes obtuse to subacute, ovate to ovate-oblong, to 2 mm long, two usually a little shorter than the other three; mature spikes less than 1.4 cm in diameter . . . . . **Agastache nepetoides**
  Flowers purplish or white; calyx lobes acute to acuminate, deltate-lanceolate, mostly more than 2 mm long, subequal; mature spikes prevailingly more than 1.4 cm in diameter . . . . . **Agastache scrophulariifolia**

AGAVACEAE*:* One genus in our area . . . . . YUCCA

AGERATINA altissima

AGRIMONIA
1. Leaves with 5 or more pairs of lance-acuminate lateral leaflets (not including the much shorter interstitial leaflets); stems both villous and puberulent throughout . . . . . **Agrimonia parviflora**
1. Major pairs of lateral leaflets up to 4; stem pubescence various.
   2. Stipules essentially entire or rarely with 1-few shallow teeth . . . . . **Agrimonia striata**
   2. Stipules notably dentate or with several deep cuts.
      3. Rachis of inflorescence eglandular or nearly so, with copious appressed to spreading pubescence; leaflets downy-pubescent abaxially on the laminae and veins . . . . . **Agrimonia pubescens**
      3. Rachis of inflorescence copiously but minutely glandular, the pubescence sparse or absent; leaflets glabrous to sparsely hirsute along the veins abaxially, rarely on the laminae.
         Rachis of inflorescence with long, sparsely disposed spreading hairs; sepals 2 mm or more long; mature fruits (including beaks) more than 5 mm long. . . . . **Agrimonia gryposepala**
         Rachis of inflorescence with glands only or with a few short hispid hairs intermixed; sepals less than 2 mm long; mature fruits less than 5 mm long. . . . . **Agrimonia rostellata**

AGROPYRON
1. Glumes tapering into awns, the awns more than 3 mm long . . . . . *Agropyron cristatum*
1. Glumes abruptly ending in awns, the awns less than 3 mm long . . . . . *Agropyron desertorum*

AGROSTEMMA *githago*

AGROSTIS
1. Palea present, about ½ as long as the lemma.
   2. Ligule to 1.5 mm long, broad, truncate at the summit; leaves to 4 mm wide . . . . . *Agrostis capillaris*
   2. Ligule more than 1.5 mm long, narrow, obtuse; leaves often wider than 4 mm.
      Panicle branches contracted; leaves to 5 mm wide, sometimes involute . . . . . **Agrostis stolonifera**
      Panicle branches open; leaves to 8 mm wide, flat . . . . . *Agrostis gigantea*
1. Palea absent or virtually so.
   3. Larger leaves more than 2.5 mm wide; panicle branches forking at or below the middle; flowering after late July.
      Pedicels mostly ascending, mostly shorter than to subequaling the spikelets . . . . . **Agrostis perennans**
      Pedicels widely divergent, mostly longer than the spikelets . . . . . **Agrostis perennans aestivalis**
   3. Larger leaves less than 2.5 mm wide; panicle branches forking only toward the tips; usually setting fruit by late July.
      Pedicels rarely more than 2 mm; 1st glume to 2 mm long . . . . . **Agrostis hyemalis**
      Pedicels commonly more than 2 mm long; 1st glume mostly more than 2 mm long . . . . . **Agrostis scabra**

AILANTHUS *altissima*

AIRA *caryophyllea*

AJUGA
1. Stems glabrous or glabrate, or the distal portions pubescent only in lines; plant stoloniferous . . . . . *Ajuga reptans*
1. Stems villous-pubescent on all sides; plant not stoloniferous . . . . . *Ajuga genevensis*

AKEBIA *quinata*

ALETRIS farinosa

ALISMA
1. Fresh flowers 3-4 mm broad; fruiting head less than 4 mm in diameter; fresh petals to 3 mm long; sepals to 2.5 mm long; achenes no more than 2.2 mm long. . . . . **Alisma subcordatum**
1. Larger fresh flowers more than 4 mm broad; fruiting head more than 4 mm in diameter; fresh petals more than 3 mm long, notably exceeding the 3-6 mm long sepals; larger achenes more than 2.2 mm long . . . . . **Alisma triviale**

ALISMATACEAE
A. Inflorescence paniculate; flowers all perfect, numerous, mostly more than 50; stamens 6 or 9; carpels forming a single-ringed series on a flattened receptacle; leaf blades ovate, round to subcordate but never linear or sagittate . . . . . ALISMA
A. Inflorescence verticillate; flowers usually imperfect, fewer than 50, the pistillate usually below; stamens usually more than 9; carpels forming several series around a nearly globose receptacle; leaf blades linear, lanceolate, lance-ovate to sagittate, but rarely as above.
   B. Flowers perfect.
      Leaves linear-oblong, the blades less than 3.5 cm long; heads few, sepals less than 3 mm long . . . . . HELANTHIUM
      Leaves ovate, truncate to subcordate, the blades more than 3.5 cm long; heads several, sepals more than 3 mm long . . . . . ECHINODORUS
   B. Flowers imperfect.
      Fruiting pedicels spreading-ascending or absent, the pistillate sepals spreading or recurved . . . . . SAGITTARIA
      Fruiting pedicels recurved, the pistillate sepals enclosing the flower or fruiting head . . . . . LOPHOTOCARPUS

ALLIACEAE

A. Perianth not reflexed in fruit; herbage inodorous; flowers on slender pedicels longer than the flowers, the petals about 1 cm long . . . . . NOTHOSCORDUM
A. Perianth reflexed in fruit; herbage distinctly onion-scented; flowers various . . . . . ALLIUM

ALLIARIA *petiolata*

ALLIUM

1. Stems strongly fistulose, at least some of the proximal portions over 1.5 cm in diameter.
   Sheaths about ¼ to ½ as long the stem; bulbs elongate and scarcely differentiated from the stem . . . . . *Allium fistulosum*
   Sheaths basal to about a fifth as long as the stem; bulbs ovoid, rather well differentiated from the stem . . . . . *Allium cepa*
1. Stems fistulose or solid, less than l.5 cm in diameter.
   2. Leaves contracted to a distinct petiole, usually more than 2 cm wide, often absent at flowering time; flowers white.
      Petioles, leaf sheaths, and proximal portions of the stems red or reddish; bulbs shallowly buried; blades mostly more than 2.5 cm wide; anthesis beginning in July . . . . . **Allium tricoccum**
      Petioles, leaf sheaths, and stems pale or greenish; bulbs deeply buried; blades usually less than 2.5 cm wide; anthesis beginning in June, with fruits maturing in July . . . . . **Allium burdickii**
   2. Leaves tapered at the base, without a distinct petiole, usually less than 2 cm wide, present at flowering time; flowers white, pink, or purple.
      3. Inflorescence globose or nearly so; flowers deep-pink to purple.
         4. Leaves all basal or nearly so, the sheaths covering much less than ⅓ of the stem.
            Ovary abruptly contracted to a short stalk; anthers not united at the base . . . . . *Allium aflatunense*
            Ovary broadly tapered to a sessile base; anthers united at the base . . . . . *Allium giganteum*
         4. Leaves cauline, the sheaths covering ⅓ or more of the stem.
            5. Leaves solid, flat or channeled . . . . . *Allium rotundum*
            5. Leaves fistulose, terete, at least below the middle.
               Flowers as long as to much longer than the short pedicels . . . . . *Allium schoenoprasum*
               Flowers mostly shorter than the pedicels . . . . . *Allium vineale*
      3. Inflorescence hemispheric, or if subglobose, then the flowers white or pink, or flowers replaced by bulblets.
         6. Ovaries with 2-horned processes; rarely blooming prior to July 1.
            Leaves soft; bulb elongate; perianth campanulate . . . . . **Allium cernuum**
            Leaves stiff; bulb ovoid; perianth stellate, the tepals widely divergent . . . . . *Allium stellatum*
         6. Ovaries not horned; blooming dates various (see text).
            7. Umbel bearing bulblets.
               8. Leaves terete or channeled, hollow; sheaths covering the proximal ⅓ to ½ of stem . . . . . *Allium vineale*
               8. Leaves flattish, solid; sheaths essentially basal, covering only the proximal ¼ of stem or less.
                  Larger leaves over 5 mm wide . . . . . *Allium sativum*
                  Leaves to 5(7) mm wide, usually much less . . . . . **Allium canadense**
            7. Umbel not bearing bulblets.
               9. Flowers blooming after July 31; bulbs elongate, on a stout rhizome.
                  Flowers white without tinctures of pink or lavender . . . . . *Allium tuberosum*
                  Flowers with tinctures of pink or lavender . . . . . *Allium senescens*
               9. Flowers finished blooming bloom by July 31; bulbs not elongate, rhizomes absent.
                  Flowers mostly pale-pink to whitish, rarely maturing capsules; stems soft, notably fistulose; pedicels mostly more than 2 cm long . . . . . **Allium canadense**
                  Flowers deep-pink, mostly maturing capsules; stems firm, narrowly fistulose; pedicels mostly less than 2 cm long . . . . . **Allium canadense lavendulare**

ALNUS

1. Leaves broadly obtuse to emarginate at the summit . . . . . *Alnus glutinosa*
1. Leaves acute or short-acuminate.
   Leaves obovate to elliptic, up to twice as long as broad, mostly widest beyond the middle, serrulate . . . . . **Alnus serrulata**
   Leaves much less than twice as long as broad, widest at or about the middle, serrulate to irregularly crenate-dentate . . . . . **Alnus rugosa**

ALOPECURUS

1. Spikelets 4 mm or more long; many awns exserted 4 mm or more beyond the tip of the lemma . . . . . *Alopecurus pratensis*
1. Spikelets less than 4 mm long; none of the awns exserted 4 mm, usually no more than 2.5 mm.
   2. Awns straight or nearly so, included or exserted mostly less than 1 mm, originating from near the middle of the lemma . . . . . **Alopecurus aequalis**
   2. Awns twisted near the base, exserted more than 2 mm, originating from near the base of the lemma.
      Spikelets 2-2.5 mm long; anthers less than 1 mm long; plant annual . . . . . **Alopecurus carolinianus**
      Spikelets 2.5 mm or more long; anthers 1 mm or more long; plant perennial . . . . . *Alopecurus geniculatus*

ALTHAEA

1. Distal stem surfaces concealed by a pannose pubescence of stellate hairs of similar size; petals less than 3.5 cm long . . . . . *Althaea officinalis*
1. Distal stem surfaces exposed in many areas, the hairs simple to stellate, spreading and setose or with short-appressed hairs intermixed; petals more than 3.5 cm long . . . . . *Althaea rosea*

ALYSSUM *alyssoides*

AMARANTHACEAE

A. Leaves opposite.
   Plant prostrate; pubescence densely stellate . . . . . TIDESTROMIA
   Plants erect; tomentulose to pilose, but not with stellate hairs . . . . . FROELICHIA

A. Leaves alternate.
  Floral bracts flat, silvery-scarious throughout or with a tincture of pink toward the tip of the spike; style elongate, with a capitate stigma; flowers perfect . . . . . CELOSIA
  Floral bracts flat or more often keeled, green or with scarious margins, sometimes red-tinged; style nearly obsolete, the stigma elongate; flowers imperfect . . . . . AMARANTHUS

AMARANTHUS

1. Plant with a pair of firm spines in the leaf axils . . . . . *Amaranthus spinosus*
1. Plants without axillary spines.
  2. Plants prostrate to decumbent or ascending, less than 0.5(1) m high; flowers all in axillary clusters.
    3. Leaves deeply and broadly emarginate . . . . . *Amaranthus blitum*
    3. Leaves not emarginate.
      Plant decumbent to more often ascending or erect; distal leaves of branches normally much reduced; stems white or whitish-yellow; bracts much longer than the perianth; sepals 3; seeds less than 1.1 mm long . . . . . *Amaranthus albus*
      Plant prostrate to decumbent; leaves of stems and branches all of similar size and shape; stems pale-green to often purplish-tinged; bracts shorter than to scarcely longer than the perianth; sepals 4 or 5; seeds more than 1.1 mm long . . . . . *Amaranthus blitoides*
  2. Plants usually erect and often more than 0.5 m high; flowers in terminal and axillary spikes or panicles.
    4. Plants monoecious.
      5. Inflorescence strongly infused with red or yellow; distal leaf blades mostly 8 cm or more long.
        6. Longer bracts more than 2.3 mm long . . . . . *Amaranthus hypochondriacus*
        6. Bracts no more than 2.3 mm long.
          Sepal margins of pistillate flowers overlapping well beyond the middle . . . . . *Amaranthus caudatus*
          Sepal margins of pistillate flowers overlapping only near the base . . . . . *Amaranthus cruentus*
      5. Inflorescence essentially dull-green or the plant weakly suffused with purplish tints; distal leaf blades prevailingly less than 8 cm long.
        7. Subulate floral bracts less than 3.5 mm long . . . . . **Amaranthus hybridus**
        7. Subulate floral bracts mostly more than 3.5 mm long.
          Stems lanate; terminal panicle lobulate with numerous, short lateral lobes, the terminal spike not much prolonged; stamens 5. . . . . *Amaranthus retroflexus*
          Stems glabrous, or nearly so, or merely sparsely pilose distally, but never lanate; terminal panicle with a prolonged central spike (lateral spikes, if present, often also prolonged); stamens usually 3 . . . . . *Amaranthus powellii*
    4. Plants dioecious.
      8. Bracts more than 3 mm long, strongly subulate . . . . . *Amaranthus palmeri*
      8. Bracts less than 3 mm long, acute.
        9. Flowers pistillate.
          10. Tepals 5, spatulate, all the same length . . . . . *Amaranthus arenicola*
          10. Tepals absent, rudimentary, or 1-2 and bract-like.
            Sepals absent or rudimentary; utricle without a clear line of dehiscence . . . . . **Amaranthus tuberculatus**
            Sepals 1-2, bract-like, lanceolate to linear; utricle with circumscissile dehiscence . . . . . *Amaranthus rudis*
        9. Flowers staminate.
          11. Bracts with thick green midribs that end at the acute tip . . . . . *Amaranthus arenicola*
          11. Bracts with slender green midribs that are excurrent well beyond the scarious tissue . . . . .
            Outer sepals of calyx subulate, notably longer than the inner, the midvein excurrent and stout or even carinate-thickened . . . . . *Amaranthus rudis*
            Outer sepals merely apiculate or aristate, not much longer than the inner, the midvein very slender . . . . . **Amaranthus tuberculatus**

AMARYLLIDACEAE

A. Flowers with a corona, on stout pedicels 2 mm or more thick . . . . . NARCISSUS
A. Flowers without a corona, the pedicels wiry or flexuous, less than 2 mm thick.
  Flowers 2 or more per scape, the perianth equally 6-parted . . . . . LEUCOJUM
  Flowers 1 per scape, the outer three tepals notably longer than the inner 3 . . . . . GALANTHUS

AMBERBOA*moschata*

AMBROSIA

1. Leaves simple, unlobed or 3(5)-lobed, opposite . . . . . **Ambrosia trifida**
1. Leaves compound, pinnatifid or dissected, alternate or opposite.
  2. Leaves alternate, the blades dark-green adaxially, densely white-tomentose abaxially . . . . . *Ambrosia tomentosa*
  2. At least the proximal leaves opposite, the blades not densely white-tomentose abaxially.
    3. Plant a taprooted annual; leaves 1-2 deep-pinnatifid, smoothish, the pubescence not particularly harsh to the touch, many of them distinctly petiolate . . . . . **Ambrosia artemisiifolia**
    3. Plant perennial from a horizontal rootstock; leaves pinnatifid to 1-pinnate, with the ultimate lobes entire to few-toothed, scabrous, usually harsh to the touch, sessile or obscurely petiolate.
      Stems strigose with coarse, closely appressed hairs; staminate involucres appressed-hispid with coarse tapered hairs . . . . . **Ambrosia psilostachya**
      Stems usually with some spreading hairs; staminate involucres with slender spreading hairs or cilia . . . . . **Ambrosia ×intergradiens**

AMELANCHIER

1. Top of ovary glabrous or with a few short hairs.
  2. Racemes glabrous or glabrate, the lowest pedicels soon exceeding 2.2 cm long; leaves strongly reddish-tinged and half-grown at flowering time, becoming completely glabrous . . . . . **Amelanchier laevis**

2. Racemes tomentose and remaining at least thinly so in age, the lowest pedicels rarely more than 2.2 cm long, even in fruit; leaves nearly absent or merely white-tomentose and still folded at flowering time, retaining some of the tangled hairs into maturity.
   3. Petals less than 10 mm long, broadly oblong-spatulate, the racemes erect or ascending, the proximal pedicels to 10 mm long in fruit; multi-stemmed shrub . . . . . *Amelanchier canadensis*
   3. Petals mostly more than 10 mm long, linear-oblong, the racemes drooping, the proximal pedicels more than 10 mm long in fruit; few-stemmed shrub or small tree.
      Leaves with tinctures of red beneath the tomentum; lowest pedicel often more than 2.5 cm long in fruit; fruit often more than 10 mm in diameter, juicy and sweet . . . . . *Amelanchier ×grandiflora*
      Leaves without tinctures of red; lowest pedicel to 2.5 cm long in fruit; fruit to 10 mm in diameter, pithy and rather tasteless . . . . . **Amelanchier arborea**

1. Top of ovary permanently and densely tomentose.
   4. Teeth prevailingly fewer than twice as many as the veins; lateral veins prominent abaxially, even through tomentum, the distal veins particularly appearing to end in a tooth, not much anastomosing or forking before reaching the teeth.
      Larger petals more than 10 mm long; racemes soon glabrous or glabrescent; longer pedicels more than 13 mm long . . . . . **Amelanchier sanguinea**
      Petals less than 10 mm long; racemes persistently floccose; pedicels to 13 mm long . . . . . **Amelanchier humilis**
   4. Teeth prevailingly twice or more as many as the veins; lateral veins evident, but not prominent abaxially, the distal ones generally branching and anastomosing before reaching the teeth, such that no patterned relationship with the teeth is evident.
      5. Larger pedicels more than 16 mm long; abaxial leaf surfaces glabrate at flowering time . . . . . **Amelanchier interior**
      5. Pedicels to 16 mm long; abaxial leaf surfaces with a tomentum at flowering time.
         Calyx lobes narrowly deltate, clearly longer than wide . . . . . **Amelanchier spicata**
         Calyx lobes broadly deltate, about as long as wide . . . . . *Amelanchier alnifolia*

AMMANNIA robusta

AMMOPHILA breviligulata

AMORPHA
1. Plant less than 1 m high; leaves gray-hoary, nearly sessile; leaflets to 1.5 cm long . . . . . **Amorpha canescens**
1. Plant more than 1 m high; leaves glabrate to sparsely pubescent, distinctly petiolate; leaflets 2 cm or more long . . . . . **Amorpha fruticosa**

AMPELAMUS *laevis*

AMPELOPSIS *brevipedunculata*

AMPHIACHYRIS *dracunculoides*

AMPHICARPAEA
1. Stems and petioles with thinly disposed, retrorsely appressed, pale or whitish hairs; leaflets weakly pubescent with short-appressed hairs; aerial fruits glabrous or glabrate . . . . . **Amphicarpaea bracteata**
1. Stems and petioles densely pubescent with divergent to reflexed castaneous or sordid hairs; leaflets coarsely pubescent with sordid-long hairs; aerial fruits villous-hirsute . . . . . **Amphicarpaea bracteata comosa**

AMSINCKIA *menziesii*

ANACARDIACEAE
A. Leaves simple. . . . . COTINUS
A. Leaves compound.
   Inflorescences axillary; drupe pale or sordid, without red hairs . . . . . TOXICODENDRON
   Inflorescences terminal; drupe abundantly invested by red, multicellular hairs . . . . . RHUS

ANAGALLIS *arvensis*

ANAPHALIS margaritacea

ANCHUSA *officinalis*

ANDROMEDA glaucophylla

ANDROPOGON
1. Individual racemes less than 5 cm long, digitate or paniculate, beset with numerous silky-villous hairs, typically with fewer than 5 per peduncle. . . . . **Andropogon virginicus**
1. Individual racemes 5-10(13) cm long, digitate, not silky-villous, 2 to 10 per peduncle.
   Awns absent or less than 5 mm long; hairs of joints and rachides tawny to golden . . . . . *Andropogon hallii*
   Awns of fertile spikelets more than 5 mm long; hairs of joints and rachides white to merely sordid . . . . . **Andropogon gerardii**

ANDROSACE occidentalis

ANEMONE
1. Plants delicate, less than 23 cm high; flowers solitary; largest leaflet less than 4.5 cm long; blooming period over by the end of May.

2. Involucral leaves sessile, the ultimate leaf segments linear-oblong . . . . . **Anemone caroliniana**
2. Involucral leaves petiolate, the leaflets oblanceolate to obovate.
Petal-like sepals 5, oblong to oval, white or pinkish; leaves strigose adaxially . . . . . **Anemone quinquefolia**
Petal-like sepals 9-14, narrowly oblong, blue; leaves villous adaxially . . . . . *Anemone blanda*

1. Plants coarse, more than 23 cm high; flowers often more than one; largest leaflet more than 4.5 cm long; blooming period usually beginning after mid May, continuing into summer.
3. Involucral leaves sessile or subsessile; achenes strigose . . . . . **Anemone canadensis**
3. Involucral leaves manifestly petiolate; achenes concealed by a dense cottony indument.
4. Involucral leaves more than 3; main leaflets oblanceolate to obovate in general outline, cuneate, usually deeply incised or cleft, irregularly dentate toward the tips, subcoriaceous. . . . . **Anemone cylindrica**
4. Involucral leaves 2 or 3; main leaflets rhombic-ovate, broadly cuneate or rounded at the base, usually shallowly cleft, serrate to below the middle, membranaceous.
Anthers 1.2 mm or more long; mature heads more than 11.5 mm thick, the styles horizontally divergent . . . . **Anemone virginiana**
Anthers less than 1.2 mm long; mature heads less than 11.5 mm thick, with spreading-ascending styles . . **Anemone virginiana alba**

ANEMONELLA thalictroides

ANETHUM *graveolens*

ANGELICAatropurpurea

ANNONACEAE: One genus in our area . . . . . ASIMINA

ANODA*cristata*

ANTENNARIA

1. Larger leaves more than 1.5 cm wide; midrib flanked by one to several pairs of distinct, well developed lateral veins.
2. Pistillate involucres less than 7 mm high; staminate corollas to 3.5 mm long . . . . . **Antennaria plantaginifolia**
2. Larger pistillate involucres 7 mm or more high; larger staminate corollas more than 3.5 mm long.
Adaxial leaf surfaces of young proximal leaves glabrous. . . . . **Antennaria parlinii**
Adaxial leaf surfaces of proximal leaves permanently at least thinly floccose . . . . . **Antennaria parlinii fallax**

1. Larger leaves less than 1.5 cm wide; midrib not flanked by well developed lateral veins or flanked by a poorly developed pair of lateral veins.
3. Adaxial leaf surfaces at least thinly and persistently pubescent . . . . . **Antennaria neglecta**
3. Adaxial leaf surfaces soon glabrous or glabrate.
Leaf blades distinctly apiculate distally, tapered proximally to a rather distinct petiole . . . . . **Antennaria howellii neodioica**
Leaf blades obtuse or weakly apiculate, attenuate proximally with nearly straight margins, the petiole indistinct . . . . . **Antennaria howellii petaloidea**

ANTENORON virginianum

ANTHEMIS

1. Plant odorless; pales lanceolate, long-acuminate to cuspidate; ray flowers pistillate; achenes mostly 4-angled, not glandular-tuberculate . . . . . *Anthemis arvensis agrestis*
1. Plant malodorous; pales linear, stiff, and acute; ray flowers sterile; achenes subterete, glandular-tuberculate . . . . . *Anthemis cotula*

ANTHOXANTHUM *odoratum*

ANTHRISCUS

1. Ovaries and bodies of fruits copiously beset with hooked tubercles . . . . . *Anthriscus caucalis*
1. Ovaries and fruits smooth.
Bractlets broadly ovate; fruit lanceolate, the beak less than one-fifth as long as the body . . . . . *Anthriscus sylvestris*
Bractlets linear to narrowly lanceolate; fruit linear, the beak more than one-fifth as long as the body . . . . . *Anthriscus cerefolium*

ANTHYLLIS *vulneraria*

ANTICLEA elegans

ANTIRRHINUM

1. Plant perennial, many of the leaves more than 5 mm wide . . . . . *Antirrhinum majus*
1. Plant annual, the leaves to 5 mm wide . . . . . *Antirrhinum orontium*

APERA *interrupta*

APIACEAE

A. Leaves all simple.
Leaves orbicular, as long as wide . . . . . HYDROCOTYLE
Leaves linear to ovate, clearly longer than wide . . . . . ERYNGIUM

A. Leaves, or many of them, deeply pinnately, palmately, or ternately divided to compound.
B. Plants either with the ovaries and fruits densely pubescent, bristly, spiny, hispid, or tuberculate, or with the stems lanate, or both; flowers never yellow (occasionally yellowish-green in Sanicula).
C. Ovaries and fruits with the hairs or bristles hooked or strongly curved at the tip.

D. Leaves palmately divided or compound; plants glabrous; perennials . . . . . SANICULA
D. Leaves pinnate to bipinnately compound; plants strigose or hispid; annuals or biennials.
E. Stems and peduncles sparsely to densely hispid with spreading or divergent hairs; primary involucres of long pinnate bracts . . . . . DAUCUS
E. Stems and peduncles glabrous to copiously strigose with closely appressed hairs; primary involucres absent or of one to few elongate simple bracts.
Stems and peduncles thinly to abundantly retrorse-strigose; principal leaf divisions lanceolate, at least twice as long as wide, coarsely dentate or incised; bristles of fruit papillose-scabrid . . . . . TORILIS
Stems and peduncles nearly or quite glabrous; principal leaf divisions ovate, much less than twice as long as wide, finely divided; bristles of fruit smooth . . . . . ANTHRISCUS
C. Ovaries and fruits without hooked or curved bristles.
F. Ovaries and fruits merely pubescent to glabrescent; stems lanate . . . . . HERACLEUM
F. Ovaries and fruits tuberculate, strigose, bristly, hispid, or spiny; stems not lanate.
G. Plants glabrous; ovaries and fruits merely tuberculate . . . . . SPERMOLEPIS
G. Plants usually at least sparsely pubescent; ovaries and fruits hispid, strigose-bristly, or spiny.
Ovaries and fruits more than twice as long as broad, with appressed-ascending bristles; ultimate leaf divisions ovate . . . . . OSMORHIZA
Ovaries and fruits less than twice as long as broad, copiously beset with stiff spreading hairs or spine-like bristles; ultimate leaf divisions linear to narrowly oblong . . . . . DAUCUS
B. Ovaries and fruits smooth, variously winged, ridged, grooved, or margined, but never as above; stems not lanate; flower color various.
H. Principal leaves 3(5)-foliolate; umbels irregular, the rays typically of notably uneven lengths; petals white; fruits much longer than broad . . . . . CRYPTOTAENIA
H. Principal leaves more than 3-foliolate, or if not, then the flowers and fruits not as above; umbels usually with the rays more or less of even lengths.
I. All leaves with the ultimate divisions filiform, less than 0.5 mm wide; petals yellow.
Rays of umbel subequal; petiolar sheaths to 3 cm long . . . . . ANETHUM
Rays of umbel of notably different lengths; longer petiolar sheaths more than 3 cm long . . . . . FOENICULUM
I. At least the proximal leaves with the ultimate divisions dilated, usually more than 0.5 mm wide; petal color various.
J. Ultimate leaf divisions distinct, entire, ovate or obovate, usually mucronate; flowers yellow . . . . . TAENIDIA
J. Ultimate leaf divisions not as above; flower color various.
K. Leaflets with lateral veins terminating in the sinuses, or if this feature is obscure, then the leaves with bulblets in the distal axils. . . . . CICUTA
K. Leaflets with netted, reticulate venation, the lateral veins ending in the teeth; plants never with bulblets.
L. Flowers and fruits short-pedicellate to subsessile; fruits as broad as or broader than long; inflorescence scapiform, leafless (excluding the solitary foliaceous bract), from a bulbous-based rosette; ultimate leaf divisions dissected, elliptic-spatulate to obovate or oblanceolate, entire; petals white; stamens dark; plant delicate, to 1.5 dm high . . . . ERIGENIA
L. Plants without the above combination of features.
M. Leaves dimorphic, the distal ones with the ultimate divisions linear-filiform, less than 1 mm wide, the proximal with the divisions dilated, more than 1 mm wide.
N. Rays of primary umbel stout, fewer than 8; petals of different sizes; fruits globose; terrestrial . . . . . CORIANDRUM
N. Rays of primary umbel slender, usually more than 8; petals more or less equal in size; fruits subglobose to elliptic-oblong; aquatic or terrestrial.
O. Sepals present and persistent on the fruit; plant more than 5 dm high . . . . . PERIDERIDIA
O. Sepals absent; plant usually less than 5 dm high.
Terrestrial biennial; involucre absent . . . . . CARUM
Aquatic perennial; involucre well developed . . . . . BERULA
M. Middle and distal leaves with the ultimate divisions more than 1 mm wide, the proximal and distal leaves similar or dissimilar.
P. Leaves all finely divided, the ultimate divisions pinnatifid; petals white; fruits longer than broad (except in Perideridia).
Q. Rays of umbel 1-3 or rarely some umbels with 4 in *Chaerophyllum tainturieri* . . . . . CHAEROPHYLLUM
Q. Rays of umbel always 3 or more.
R. Plants pubescent, at least along the sheaths, the leaflet margins at least sparsely ciliolate; fruits wingless, with a distinct beak ¼ or more as long as the body . . . . . ANTHRISCUS
R. Plants completely glabrous (rarely puberulent in the inflorescence); fruits thinly winged or wingless, with a tiny beak much less than ¼ as long as the body.
S. Fruit nearly as wide as long, to 4 mm long, with inconspicuous ribs; sepals deltate . . . . . PERIDERIDIA
S. Fruit clearly longer than wide, mostly more than 4 mm long, notably winged or coarsely ribbed; sepals absent.
Bractlets green; fruits broadly ovoid, strongly ribbed; leaf divisions acute . . . . . AETHUSA
Bractlets scarious; fruits elongate-elliptic, narrowly winged; leaf divisions obtuse . . . . . CONIOSELINUM
P. Leaves not as above, the ultimate divisions serrate, dentate, or coarsely toothed; petals white or yellow; fruits various.
T. Leaves simple to ternately compound, forked at the summit of the petiole into 3 principal leaflets, sometimes further divided.
U. Petals white; stylopodium present; leaves sometimes variegated; loosely stoloniferous and colony-forming . . . . . AEGOPODIUM
U. Petals yellow (rarely purple); stylopodium absent; leaves never variegated; plants neither stoloniferous nor colony-forming.
Central pistillate flower and fruit of each umbellet sessile; fruits with low ribs . . . . . ZIZIA
All flowers pedicellate; fruits with distinct wings . . . . . THASPIUM

T. Leaves 1-3 times pinnately compound.
V. Principal leaf divisions of main stem leaves linear to linear-lanceolate, more than 4 times as long as wide; petals white.
Leaf divisions finely and closely serrate; involucre always present, of 2-several reflexed bracts . . . . . SIUM
Leaf divisions entire or with a few coarse, irregularly spaced teeth; involucre absent or of 1-2 slender bracts. . . . . OXYPOLIS
V. Principal leaf divisions lance-ovate to ovate, less than 4 times as long as wide; petals white or yellow.
W. Sheaths large, strongly inflated, the distal bladeless or nearly so; rays of umbel numerous, radiating in all directions, the umbel usually appearing spherical in general outline; stems very stout, strongly fistulose, typically with a purplish cast . . . . . ANGELICA
W. Plants not as above.
X. Umbels and umbellets bractless or with minute, filiform or setaceous bracts; petals yellow.
Stems terete or subterete; principal leaf divisions scarcely or not at all distinct, less than 1 cm wide, coarsely few-toothed . . . . . POLYTAENIA
Stems very coarse and strongly angular or grooved; principal leaf divisions distinct, usually more than 1 cm wide . . . . . PASTINACA
X. Both the umbels and the umbellets subtended by bracts; petals white.
Stems maculate, copiously beset with purplish spots; leaves finely divided . . . . . CONIUM
Stems not abundantly purple-maculate; leaves variously divided, the proximal ones ovate and serrate or lobed, the distal similar or lanceolate and deeply incised . . . . OENANTHE

APIOS americana Medik.

APLECTRUM hyemale

APOCYNACEAE
A. Plant a spreading, creeping vine; flowers solitary, blue-violet; fruit to 2.5 cm long . . . . . VINCA
A. Plants erect (rarely ascending) herbs; flowers cymose, white or pink; fruit longer than 3 cm . . . . . APOCYNUM

APOCYNUM
1. Primary cauline leaves sessile or subsessile or on petioles to 3 mm long, with the bases broadly rounded to cordate-clasping.
Leaves glabrous on both sides . . . . . **Apocynum sibiricum**
Leaves pubescent abaxially. . . . . **Apocynum sibiricum farwellii**
1. Primary cauline leaves on petioles more than 3 mm long, the bases broadly cuneate to rounded.
2. Corollas pale to pink or pink-striped, twice as long as or longer than the calyx lobes; primary cauline leaves mostly spreading or drooping; inflorescence often surpassing the foliage; coma of seed to 2 cm long.
Corollas less than 2.5 times as long as the calyx lobes, less than 4.5 mm long, pale to faintly pink-tinged; stem leaves spreading or ascending . . . . . **Apocynum ×floribundum**
Corollas more than 2.5 times as long as the calyx lobes, many of them more than 4.5 mm long, pink or pink-striped; many of the stem leaves drooping . . . . . **Apocynum androsaemifolium**
2. Corollas white to greenish-white, less than twice the length of the calyx lobes; primary cauline leaves mostly ascending; inflorescence surpassed by the usually sterile lateral branches; coma of seed 2 cm or more long.
3. Plant glabrous or pulverulent throughout.
Leaves below the inflorescence all similar in size, to 4 cm long and at least as long as the adjacent internode . . . . . **Apocynum isophyllum**
Leaves below the inflorescence with the proximal ones larger than the distal, the larger more than 4 cm long, the longer internodes usually more than 4 cm long . . . . . **Apocynum cannabinum glaberrimum**
3. Plant pubescent, at least on the abaxial leaf surfaces.
4. Plant pubescent only on the abaxial leaf surfaces . . . . . **Apocynum cannabinum**
4. Plant pubescent in the inflorescence, abaxial midnerve persistently pubescent.
Cymes with the cortices of the pedicels and branchlets hidden by tomentum . . . . . **Apocynum tomentellum**
Cymes pubescent, but with the cortices quite evident . . . . . **Apocynum cannabinum pubescens**

AQUIFOLIACEAE
A. Leaves elliptic-oblong to elliptic-ovate, mostly more than twice as long as wide, obtuse to acute, entire or remotely serrulate, mucronate; petals linear; calyx obsolete . . . . . NEMOPANTHUS
A. Leaves broadly obovate, to twice as long as wide, most of them abruptly acuminate, serrate, never mucronate; petals oblong or oval; calyx manifest, persistent in fruit . . . . . ILEX

AQUILEGIA
1. Flowers red, orange, or yellow; spurs straight or essentially so . . . . . **Aquilegia canadensis**
1. Flowers not red, usually some shade of blue, purple, white, or pink; spurs strongly hooked . . . . . *Aquilegia vulgaris*

ARABIDOPSIS
1. Petals less than 4.5 mm long; seeds less than 0.6 mm long; basal leaves entire or shallowly dentate . . . . . *Arabidopsis thaliana*
1. Petals more than 4.5 mm long; seeds more than 0.6 mm long; basal leaves often lyrate-lobed . . . . . **Arabidopsis lyrata**

ARABIS
1. Longer petals 6 mm or more long; cauline leaves fewer than 12, remote . . . . . *Arabis eschscholtziana*
1. Petals all less than 5 mm long; cauline leaves generally 12 or more, at least the proximal ones overlapping.
Stems with spreading, prevailingly simple hairs . . . . . **Arabis pycnocarpa**
Stems with appressed pubescence, many of the hairs branched . . . . . **Arabis pycnocarpa adpressipilis**

ARACEAE
A. Leaves simple, linear, often to 1 m or more long, less than 2 cm wide; fragrant when crushed . . . . . ACORUS
A. Leaves simple or compound, the blades ovate, broad, much more than 2 cm wide; inodorous or malodorous.
  B. Leaves compound; fruits scarlet . . . . . ARISAEMA
  B. Leaves simple; fruits not scarlet.
    C. Leaves hastate or sagittate . . . . . PELTANDRA
    C. Leaves neither hastate nor sagittate.
      D. Plant a floating aquatic; leaves widest near the tip . . . . . PISTIA
      D. Plant not a floating aquatic; leaves not widest near the tip.
        Leaves deeply cordate, short-acuminate, with blades rarely exceeding 1.5 dm long; spathe white, elevated on a peduncle more than 1 dm long . . . . . CALLA
        Leaves rounded, truncate to subcordate, obtuse or acute, exceeding 1.5 dm in length; spathe greenish or purplish-brown and/or striped or spotted in the same colors, short-pedunculate to sessile . . . . . SYMPLOCARPUS

ARACHIS *hypogaea*

ARALIA
1. Erect shrubs or trees, the stem and branches coarsely armed with stout thorns.
  2. Leaflets glabrous abaxially. . . . . *Aralia stipulata*
  2. Abaxial leaflet surfaces pubescent or with remotely disposed bristles on the principal veins.
    Lower leaflet surfaces downy on the laminae; longer pedicels to 6 mm long . . . . . *Aralia elata*
    Lower leaflet surfaces with acicular hairs on the principal veins abaxially; longer pedicels more than 6 mm long . . . . . *Aralia elata glabrescens*
1. Herbs or subshrubs, the stems and branches glabrous to hispid-prickly but never with stout thorns.
  3. Leaves basal; inflorescence scapose . . . . . **Aralia nudicaulis**
  3. Leaves cauline; inflorescences terminal or axillary.
    Stems and usually the leaf rachides hispid or hispid-prickly; umbels usually fewer than 12, in corymbiform racemes . . . . . **Aralia hispida**
    Stems and leaf rachides glabrous (rarely somewhat hispid when young); umbels more than 12, in elongate paniculate racemes . . . . . **Aralia racemosa**

ARALIACEAE
A. Leaves simple; plant a trailing, clambering, or climbing vine . . . . . HEDERA
A. Leaves compound; plant erect, not a vine.
  B. Leaves or their principal divisions pinnately compound . . . . . ARALIA
  B. Leaves or their principal divisions palmately compound or trifoliolate.
    Plant woody, with nodal spines . . . . . ELEUTHEROCOCCUS
    Plant herbaceous, without spines . . . . . PANAX

ARCTIUM
1. Heads sessile or short-stalked, in racemiform arrays; leaves abruptly acute . . . . . *Arctium minus*
1. Heads long-pedunculate, commonly in corymbiform arrays; leaves obtuse.
    Phyllaries densely arachnoid-tomentose . . . . . *Arctium tomentosum*
    Phyllaries glabrous or very thinly arachnoid-tomentose . . . . . *Arctium lappa*

ARCTOSTAPHYLOS uva-ursi coactilis

ARENARIA*serpyllifolia*

ARETHUSA bulbosa

ARGEMONE
1. Larger sepal horns more than 6 mm long; petals more than 3.7 cm long . . . . . *Argemone albiflora*
1. Sepal horns to 6 mm long; petals less than 3.7 cm long . . . . . *Argemone mexicana*

ARGENTINA anserina

ARISAEMA
1. Leaflets mostly 7-13; spadix exserted from the spathe . . . . . **Arisaema dracontium**
1. Leaflets 3 or rarely 5; spadix included, the spathe arching over it.
  2. Hood of spathe commonly more than 5 cm long and 3 cm wide, the flange along the rim more than 4 mm wide . . . . **Arisaema triphyllum**
  2. Hood of spathe to 5 cm long and to 3 cm wide, the flange along the rim less than 4 mm wide.
    Fresh spathe strongly fluted and white-ridged, the inner surface striped dark-purple and white . . . . **Arisaema triphyllum stewardsonii**
    Fresh spathe terete, without white and green corrugations, the inner surface solidly infused with dark-purple . . . . . **Arisaema triphyllum pusillum**

ARISTIDA
1. Column about 10-15 mm long, of a different texture than the lemma with which it is connected by a definitive ring-like articulation; all awns spirally coiled at the base . . . . . **Aristida tuberculosa**
1. Column less than 10 mm long, merely a continuation of the lemma, without a line of differentiation; awns not coiled at the base or only the central awn coiled at the base in *Aristida basiramea* and Aristida dichotoma.
  2. Longer awns more than 3.5 cm or more long; first glume with at least one pair of green lateral nerves . . . . . **Aristida oligantha**
  2. Awns less than 3.5 cm long; first glume without lateral nerves.

3. At least some of the central awns with a loose but distinct twist or loop at the base when dry.
   Central awns less than 9 mm long, the laterals less than 4 mm long; glumes about equal in length, surpassing the body of the lemma . . . . . **Aristida dichotoma**
   Central awns 9 mm or more long, the laterals more than 4 mm long; glumes notably unequal, the first one longer than the body of the lemma . . . . . *Aristida basiramea*
3. Central awns straight or bent, but without a spiral twist at the base.
   4. Lateral awns less than 5 mm long; central awn less than 14 mm long . . . . . **Aristida longispica**
   4. Lateral awns more than 5 mm long; longer central awns more than 14 mm long.
      Perennial, the proximal sheaths usually pilose; 1st glume a little longer than the 2nd . . . . . **Aristida purpurascens**
      Annual, the proximal sheaths glabrous; 1st glume a little shorter than the 2nd . . . . . **Aristida necopina**

ARISTOLOCHIA *clematitis*

ARISTOLOCHIACEAE

A. Plant acaulescent; stamens 12 . . . . . ASARUM
A. Plant caulescent; stamens 6.
   Leaves prevailingly acuminate, much longer than wide . . . . . ENDODECA
   Leaves obtuse to acute, about as long as wide . . . . . ARISTOLOCHIA

ARMORACIA *rusticana*

ARNOGLOSSUM

1. Principal leaves subentire, obviously longer than wide . . . . . **Arnoglossum plantagineum**
1. Principal leaves deltate-ovate to reniform, about as wide as long.
   Leaves strongly glaucous-whitened abaxially; proximal leaves deltate-ovate . . . . . **Arnoglossum atriplicifolium**
   Leaves not glaucous; proximal leaves round-reniform . . . . . **Arnoglossum reniforme**

ARONIA

1. Abaxial leaf surfaces and pedicels nearly or quite glabrous . . . . . **Aronia melanocarpa**
1. Abaxial leaf surfaces and pedicels thinly to densely villous . . . . . **Aronia prunifolia**

ARRHENATHERUM *elatius*

ARTEMISIA

1. Leaves glabrous or sparsely pubescent and becoming glabrate.
   2. Plants woody shrubs . . . . . *Artemisia abrotanum*
   2. Plants herbaceous.
      3. Leaves entire or a few mostly 1-3 lobed . . . . . *Artemisia dracunculus*
      3. At least the primary leaves pinnately divided or compound.
         4. Ultimate leaf divisions entire; disc florets sterile; usually in sand . . . . . **Artemisia campestris caudata**
         4. Ultimate leaf divisions toothed; disc florets fertile; usually in weedy urban habitats.
            Heads sessile or subsessile, erect; leaves of the array only gradually, if at all, reduced . . . . . *Artemisia biennis*
            Heads nodding on manifest peduncles; leaves of the array strongly reduced . . . . . *Artemisia annua*
1. Leaves manifestly pubescent to tomentose, at least abaxially.
   5. Cauline leaves entire, serrate, or irregularly dentate (occasionally a few leaves pinnately falcate-lobed).
      Cauline leaves evenly serrate; middle and proximal stem surfaces glabrous . . . . . **Artemisia serrata**
      Cauline leaves entire to irregularly coarsely toothed or falcate-lobed; middle and proximal stem surfaces tomentose . . . . . *Artemisia ludoviciana*
   5. Cauline leaves pinnate or pinnatifid.
      6. Leaves strongly bicolored, the adaxial surface green and glabrous or glabrate, and the abaxial surface densely tomentose and white, the ultimate divisions mostly 5 mm or more wide . . . . . *Artemisia vulgaris*
      6. Leaves not bicolored, more or less similarly pubescent on both surfaces, the ultimate divisions to 5 mm wide.
         7. Ultimate leaf divisions commonly more than 1.5 mm wide . . . . . *Artemisia absinthium*
         7. Ultimate leaf divisions less than 1.5 mm wide.
            8. Leaves subentire to once-pinnatifid . . . . . *Artemisia carruthii*
            8. Leaves 1-3 times divided.
               9. Larger leaves to 1 cm long; receptacle with long white hairs . . . . . *Artemisia frigida*
               9. Larger leaves more than 1 cm long; receptacle naked.
                  Ultimate leaf segments more than 5 times as long as wide. . . . . **Artemisia campestris caudata**
                  Ultimate leaf segments mostly less than 5 times as long as wide . . . . . *Artemisia pontica*

ARUNCUS dioicus

ASARUM

1. Leaves evergreen, glossy, the adaxial veinlets much more densely pubescent than the laminae . . . . . *Asarum europaeum*
1. Leaves deciduous, dull, the adaxial veinlets not or only scarcely more pubescent than the laminae.
   2. Calyx lobes with long-caudate tips more than 5 mm long. . . . . **Asarum canadense**
   2. Calyx lobes attenuate to acuminate or with short-caudate tips less than 5 mm long.
      Calyx lobes more than 1.2 cm long, ascending to spreading, acuminate . . . . . **Asarum canadense ambiguum**
      Calyx lobes less than 1.2 cm long, abruptly reflexed, acute or short-mucronate . . . . . **Asarum canadense reflexum**

ASCLEPIADACEAE

A. Plants erect. . . . ASCLEPIAS
A. Plants vines or vine-like.
Leaves cordate; flowers white . . . AMPELAMUS
Leaves round to subcordate at the base; flowers deep-purple . . . VINCETOXICUM

ASCLEPIAS

1. At least one set of leaves whorled.
Leaves linear, less than 1 cm wide . . . **Asclepias verticillata**
Leaves lanceolate to ovate, more than 1 cm wide . . . **Asclepias quadrifolia**
1. Leaves never whorled.
2. Leaves linear to narrowly oblong-lanceolate, mostly alternate.
3. Leaves fewer than 20, lanceolate to ovate; umbels solitary and terminal . . . **Asclepias lanuginosa**
3. Leaves more than 20, linear to linear-lanceolate; umbels usually 2-several and axillary.
Flowers yellow, deep-orange, or red; umbels normally two or more in terminal inflorescences; plant without milky juice; stems spreading-villous . . . **Asclepias tuberosa**
Flowers pale, greenish, or purple-tinged; umbels solitary and terminal or 2-several and axillary; plants with milky juice; stems appressed-hirtellous . . . **Asclepias hirtella**
2. Leaves oblong to lanceolate or ovate, the primary ones opposite.
4. Principal stem leaves sessile or subsessile, subcordate or cordate-clasping.
5. Pedicels glabrous. . . . **Asclepias sullivantii**
5. Pedicels pubescent.
Leaves not clasping, narrowed to an acute tip; peduncle strongly deflexed at the tip, causing the umbel to nod; pedicels to 1.5 cm long. . . . **Asclepias meadii**
Leaves broad, clasping, obtuse or mucronulate at the tip; peduncle erect, umbel not nodding; pedicels more than 1.5 cm long . . . **Asclepias amplexicaulis**
4. Principal stem leaves at least short-petiolate, cuneate, rounded, or subtruncate.
6. Plant with flowers.
7. Reflexed corolla lobes mostly less than 5 mm long.
Flowers pink to deep-purple (rarely white in albino forms); stems erect . . . **Asclepias incarnata**
Flowers white; stems usually decumbent and rooting at the base, finally becoming erect . . . **Asclepias perennis**
7. Reflexed corolla lobes 5 mm or more long.
8. Hoods of the corona without horns or crests; reflexed corolla lobes pale-green.
Stems more than 2.5 dm high, glabrate to puberulent or strigillose; umbels mostly 2-several and axillary; flowers 9 mm or more long. . . . **Asclepias viridiflora**
Stems to 2.5 dm high, spreading-hirsute; umbels solitary and terminal; flowers less than 9 mm long . . . **Asclepias lanuginosa**
8. Hoods of the corona with slender horn-like processes originating near their bases; reflexed corolla lobes rarely pale-green.
9. Flowers on slender flexuous pedicels; umbels nodding, 2-several and axillary; leaves membranaceous, cuneate, acuminate . . . **Asclepias exaltata**
9. Flowers on stout pedicels; umbels mostly erect, solitary to several, terminal or axillary; leaves thick, usually not cuneate and acuminate.
10. Pedicels, peduncles, and distal internodes densely white-pannose or tomentose; hoods 1 cm or more long . . . *Asclepias speciosa*
10. Pedicels, peduncles and distal internodes not white-pannose; hoods less than 1 cm long.
11. Reflexed corolla lobes and corona hoods deep-magenta or purple; leaves ovate to elliptic-oblong, acute or acuminate . . . **Asclepias purpurascens**
11. Reflexed corolla lobes and corona hoods yellowish, greenish, or purple-tinged; leaves various.
Plant slender, to 6 dm high; leaves to 7 cm long; umbels often solitary; reflexed corolla lobes about as long as the corona hoods. . . . **Asclepias ovalifolia**
Plant coarse, often more than 6 dm high; leaves often more than 7 cm long; umbels usually several; reflexed corolla lobes obviously longer than the corona hoods . . . **Asclepias syriaca**
6. Plant with follicles.
12. Follicles with scattered filiform to long-conic soft processes.
Pedicels thinly short-pubescent . . . **Asclepias syriaca**
Pedicels densely white-tomentose . . . *Asclepias speciosa*
12. Follicles without elongate process.
13. Follicles glabrous or glabrate on ascending or recurving pedicels.
Seeds without a coma; pedicels ascending . . . **Asclepias perennis**
Seeds with a silky coma; pedicels recurved . . . **Asclepias incarnata**
13. Follicles variously glabrate to pubescent, on strongly deflexed pedicels.
14. Leaves membranaceous, distinctly paler abaxially; pods slenderly fusiform, thinly short-pubescent . **Asclepias exaltata**
14. Leaves coriaceous, not distinctly paler abaxially; pods variously shaped and pubescent.
15. Follicles densely canescent . . . **Asclepias purpurascens**
15. Follicles sparsely pubescent, sericeous, or villous.
16. Umbels usually 2-several in the distal axils; coma sordid to tan . . . **Asclepias viridiflora**
16. Umbels solitary and terminal; coma usually white.
Follicles on pedicels more than 1 cm long; plant usually more than 2.5 dm high . . . **Asclepias ovalifolia**
Follicles sessile or on pedicels less than 1 cm long; plant less than 2.5 dm high . . . **Asclepias lanuginosa**

ASIMINA triloba

ASPARAGACEAE: One genus in our area . . . ASPARAGUS

ASPARAGUS *officinalis*

ASPERUGO *procumbens*

ASPLENIACEAE: One genus in our area . . . . . ASPLENIUM

ASPLENIUM

1. Fronds simple, entire, often rooting at the tip . . . . . **Asplenium rhizophyllum**
1. Fronds neither simple nor entire, never rooting at the tip.
   Pinnae of sterile fronds alternate, auriculate at the base . . . . . **Asplenium platyneuron**
   Pinnae of sterile fronds opposite, not auriculate at the base . . . . . *Asplenium trichomanes*

ASTERACEAE

A. Heads with ligulate ray flowers only, these all perfect; leaves alternate or basal; stems with milky juice . . . . . **Group 1**
A. Heads with both ray and disc florets or with ray flowers absent; leaves alternate, opposite, basal, or whorled; stems nearly always without milky juice.
   B. At least the proximal leaves opposite or whorled, the distal and array leaves occasionally alternate . . . . . **Group 2**
   B. Leaves all alternate or basal, rarely opposite or subopposite in the wing-stemmed Verbesina.
      C. Ray flowers present, distinctly yellow, creamy, or orange nearly or quite throughout. . . . . **Group 3**
      C. Ray flowers absent or present and not yellow (sometimes purple with yellow tips in Gaillardia).
         Ligules of ray flowers present, exceeding the involucre . . . . . **Group 4**
         Ligules of ray flowers absent or minute and not exceeding the involucre . . . . . **Group 5**

Group 1 (heads with ray flowers only)

A. Pappus reduced to merely a crown of scales or absent.
   Flowers blue, pink, or white; pappus a crown of scales . . . . . CICHORIUM
   Flowers yellow; pappus absent . . . . . LAPSANA
A. Pappus with well developed capillary bristles, the bristles sometimes alternating with scales.
   B. Pappus bristles plumose (that is, each beset with fine, ascending or spreading hairs pinnately arranged in one plane along two sides of the bristle).
      C. Stems scapose, the leaves all basal.
         Receptacle chaffy-bracted; central achenes with long, slender beaks; stems usually branched, the heads 2 to several . . . . . HYPOCHAERIS
         Receptacle without chaffy bracts; achenes essentially beakless; stems simple, the heads solitary . . . . . LEONTODON
      C. Stems leafy.
         Stems and leaves glabrous, the leaves entire; involucres more than 1.5 cm high, not subtended by bractlets; achenes beaked . . . . . TRAGOPOGON
         Stems and leaves hispid, the leaves often toothed; involucres to 1.5 cm high, subtended by bractlets; achenes beakless . . . . . PICRIS
   B. Pappus bristles smooth or merely scabrous or barbellate.
      D. Plants scapose, the leaves all basal; stems simple, the heads solitary.
         E. Involucres less than 10 mm high; scapes sparsely hispid or glandular-villous; pappus of 5 bristles alternating with 5 much shorter ovate scales . . . . . KRIGIA
         E. Involucres more than 10 mm high; scapes glabrous or rarely tomentose or lanate near the summit; pappus essentially of bristles only.
            Leaves linear, villous-ciliolate along the entire or merely crisped margins; achenes beakless, striate, but otherwise smooth . . . . . NOTHOCALAÏS
            Leaves lanceolate, glabrous, shallowly to deeply runcinate-lobed; achenes with slender beaks, conspicuously tuberculate, at least beyond the middle . . . . . TARAXACUM
      D. Plants leafy or if subscapose, then the heads 2 to several.
         F. Achenes muricate with ascending processes at the summit, abruptly terminating in a long filiform beak; cauline leaves inconspicuous, few, linear; basal leaves runcinate-pinnatifid; stems wiry, hispid proximally and glabrescent distally .CHONDRILLA
         F. Achenes not muricate at the summit, beakless or merely tapering into a long beak; herbage various.
            G. Achenes strongly flattened; leaves frequently with prickly or spinulose margins.
               H. Achenes beakless; flowers yellow, more than 35 per head . . . . . SONCHUS
               H. Achenes with long slender beaks or sometimes beakless (as in Lactuca floridana); flowers yellow, blue, red, or cream-colored, fewer than 35 per head.
                  Middle and distal leaves toothed or lobed, or prickly along the midrib abaxially . . . . . LACTUCA
                  Middle and distal leaves entire, without abaxial prickles . . . . . MULGEDIUM
            G. Achenes not noticeably flattened; leaves entire to variously lobed or denticulate, but never spinulose or prickly.
               I. Middle and distal cauline leaves narrowly linear, sessile, often sagittate-auriculate; proximal cauline and basal leaves becoming denticulate to runcinate-lobed; plants annual . . . . . CREPIS
               I. Middle and distal cauline leaves broader, petiolate to sessile or clasping, but never sagittate or auriculate; proximal cauline and basal leaves various, sometimes sagittate or hastate; plants perennial or if annual, then the leaves all basal.
                  J. Pappus of both scales and bristles; plants glabrous throughout (peduncles glandular in a rare form) . . . . . KRIGIA
                  J. Pappus of bristles only; plants glabrous or pubescent.
                     Heads erect, the flowers yellow or deep reddish-orange; leaves entire to merely denticulate or undulate . . . . . HIERACIUM
                     Heads drooping to suberect, the flowers white, whitish, creamy, pink, or purplish; principal leaves usually sinuate, sagittate, hastate, lobed, or divided . . . . . PRENANTHES

Group 2 (leaves opposite or whorled)

A. Plant a high-climbing or sprawling vine with petiolate, cordate leaves . . . . . MIKANIA

A. Plants erect or sprawling herbs; leaves various but not usually both cordate and petiolate.
  B. Staminate and pistillate flowers in separate heads, not showy, staminate heads in distal racemiform arrays, the pistillate becoming bur-like or nut-like, solitary in the axils of leaf-like bracts; ligules absent . . . . . AMBROSIA
  B. Staminate and pistillate flowers in the same heads, or flowers perfect, the heads usually showy; ligules usually present.
    C. Plants annual, foul-smelling; phyllaries beset with conspicuous, sessile oblong glands; leaves pinnatifid or bipinnatifid into linear or filiform segments.
      Pappus of 20 bristle-tipped scales . . . . . DYSSODIA
      Pappus of 0-2 elongate, bristle-tipped scales . . . . . TAGETES
    C. Plants annual or perennial, not usually foul-smelling; phyllaries glandular or not, but without sessile oblong glands; leaves various.
      D. Involucres of 2 distinct series of phyllaries, the inner and outer dissimilar and clearly visible from the outside.
        E. Plant wholly aquatic; stems weak; submersed leaves whorled, finely dissected into filiform, flaccid segments . . . . . MEGALODONTA
        E. Plants terrestrial or paludal, but never aquatic; stems firm, erect or suberect; leaves simple or dissected, but always firm and typically opposite.
          F. Inner series of phyllaries connate below, forming a cup-like involucre; leaves finely dissected and ligules usually absent (or a few up to 6 mm long) . . . . . THELESPERMA
          F. Inner series of phyllaries with margins free to the base; leaves not finely dissected, if so, then ligules usually present.
            G. Achenes usually with conspicuous, smooth marginal wings or keels, or if achenes wingless, then ligules usually yellow with a red blotch at the base; pappus absent, inconspicuous or of 2 barbless or merely awned with ascending barbs; ligules present . . . . . COREOPSIS
            G. Achenes wingless or only slightly keeled along the margins, or if somewhat winged, then wings ciliate along the margins; pappus of 2 to 6 retrorsely barbed or hispid (smooth) awns; ligules present or absent, but never with a red blotch at the base.
              Achenes with long slender beaks; ligules present, often not yellow . . . . . COSMOS
              Achenes beakless; ligules yellow or absent . . . . . BIDENS
      D. Involucres not of 2 distinct and dissimilar series or if somewhat so, then the inner series concealed behind the outer.
        H. Ligules yellow, or more than 3 mm long, or both.
          I. Plants sprawling or procumbent annuals or delicate perennials; leaves less than 4 cm long.
            Disc florets purple; leaves lance-oblong to lance-ovate . . . . . SANVITALIA
            Disc florets yellow; leaves deltate-ovate, broadly cuneate at the base . . . . . CALYPTOCARPUS
          I. Plants coarse erect perennials; larger leaves more than 4 cm long.
            J. Inner phyllaries membranaceous . . . . . SMALLANTHUS
            J. Inner phyllaries herbaceous.
              K. Disc florets sterile with undivided styles; leaves sessile or connate-perfoliate . . . . . SILPHIUM
              K. Disc florets fertile with divided styles; leaves sessile to more often petiolate, but never connate-perfoliate.
                Ligules persistent, fertile; phyllaries obtuse to subacute; leaves dentate, ovate . . . . . HELIOPSIS
                Ligules deciduous, sterile; phyllaries typically acute or acuminate; leaves various . . . . . HELIANTHUS
        H. Ligules absent, or less than 3 mm long and white or ochroleucous, but not yellow.
          L. Pappus without numerous capillary bristles; involucres and phyllaries usually as wide as or wider than long.
            M. Pappus a crown of aristate or fimbriate, oblong or oblanceolate, scales . . . . . GALINSOGA
            M. Pappus essentially absent.
              N. Leaves lanceolate, to 2.5 cm wide, attenuate to a sessile or scarcely petiolate base; pistillate flowers with corollas; stems with appressed hairs . . . . . ECLIPTA
              N. Leaves ovate, more than 2.5 cm wide, distinctly petiolate; pistillate flowers without corollas; stems with spreading, hispid, or villous hairs.
                Heads in bracteate, spiciform, or racemiform arrays; phyllaries 3 to 5 . . . . . IVA
                Heads in ebracteate, paniculiform arrays; phyllaries 10 . . . . . CYCLACHAENA
          L. Pappus of numerous capillary bristles; both involucres and phyllaries longer than wide.
            O. Leaves pinnately lobed or divided . . . . . POLYMNIA
            O. Leaves not pinnately lobed or divided.
              P. Corollas blue; receptacle conic . . . . . CONOCLINIUM
              P. Corollas white or roseate; receptacle flat or weakly convex.
                Q. Leaves less than 2.5 times as long as wide, evenly dentate; stems glabrous or minutely tomentulose . . . . . AGERATINA
                Q. Leaves more than 2.5 times as long as wide, coarsely dentate-serrate; stems pubescent with villous or incurved hairs.
                  Leaves whorled, never perfoliate; corollas purple or rose . . . . . EUTROCHIUM
                  Leaves opposite or if whorled, then perfoliate; corollas white, rarely purple in perfoliate plants . . . . . EUPATORIUM

Group 3 (ray flowers present, yellow; leaves alternate or basal)

A. Pappus of numerous capillary bristles.
  B. Leaves pungently spinulose along the margins with numerous, evenly spaced, subulate-tipped serrations . . . . . HAPLOPAPPUS
  B. Leaves not spinulose-serrate.
    C. Pappus of disc florets double, with an inner ring of long bristles and an outer ring of short bristles . . . . . HETEROTHECA
    C. Pappus bristles in only one series.
      D. Ligules very numerous in several series, many more than 25 per head, shorter than to surpassing the involucre.
        Plant 1 m or more high, with large cauline leaves; ligules much surpassing the involucre . . . . . INULA
        Plant low, subscapose with scaly leaves; ligules not surpassing the involucre . . . . . TUSSILAGO
      D. Ligules few to several, but always fewer than 25, usually surpassing the involucre.
        E. Cauline leaves divided or lobed.
          Principal leaves lyrate-pinnatifid; stems hollow or solid; phyllaries green throughout . . . . . PACKERA
          Principal leaves twice to thrice pinnatisect; stems solid; phyllaries generally with minute but distinctly darkened tips . . . . . JACOBAEA

E. Cauline leaves simple.
F. Arrays thyrsiform or much longer than wide, neither flat-topped nor corymbiform . . . . . SOLIDAGO
F. Arrays flat-topped or low-convex corymbiform.
Leaves linear and abundantly cauline, the proximal soon caducous . . . . . EUTHAMIA
Leaves linear to lanceolate, basally disposed, or the cauline progressively reduced distally . . . . . OLIGONEURON

A. Pappus a low crown or composed of scales, awns, or a few short teeth, or pappus absent.
G. Leaves deeply lobed or divided.
H. Principal leaves basal, the cauline leaves strongly reduced; phyllaries more than 5 mm wide; disc more than 2 cm across . . . .SILPHIUM
H. Cauline leaves well developed, the basal present or absent; phyllaries less than 5 mm wide; disc to 2 cm across.
I. Leaves often with more than 6 major lobes or divisions, to 5(6) cm long.
Disc more than 9 mm across, the receptacle strongly conic, causing the disc to be convex across the top . . . . . .COTA
Disc less than 9 mm across, the receptacle flat or nearly so, the disc flat across the top . . . . . ACHILLEA
I. Leaves usually with fewer than 6 major lobes or divisions, commonly more than 6 cm long.
Achenes laterally flattened, with winged or keeled margins; disc definitely higher than broad . . . . . RATIBIDA
Achenes distinctly 4-sided, not winged or keeled; disc shorter than to about as long as broad . . . . . RUDBECKIA
G. Leaves entire, dentate, or serrate, but never deeply lobed or divided.
J. Plants subscapose, leaves all or nearly all basal, the cauline leaves absent or few and very strongly reduced.
Heads solitary; leaves linear, less than 1.5 cm wide . . . . . TETRANEURIS
Heads 2 to several; leaves very large, ovate-deltate, subtruncate to more typically cordate, much more than 1.5 cm wide . . . . . SILPHIUM
J. Plants with well developed cauline leaves, the basal leaves present or absent.
K Phyllaries linear, squarrose, copiously sticky-viscid; leaves clasping, serrate-dentate . . . . . .GRINDELIA
K Phyllaries neither linear, squarrose, or viscid, or if so, then the leaves not clasping.
L. Ligules mostly 3(5)-toothed at the apex; leaves never auriculate-clasping.
M Stems winged, the leaf bases decurrent along the stem . . . . . HELENIUM
M Stems wingless, the leaf bases not decurrent.
Ligules minute, less than 5 mm long; leaves more than 3 mm wide . . . . . MADIA
Ligules larger, more than 5 mm long; leaves less than 3 mm wide . . . . . HELENIUM
L Ligules entire to merely emarginate at the apex, or if rarely toothed, then the leaves auriculate-clasping.
N. Stems winged, the leaf bases decurrent along the stem . . . . . .VERBESINA
N. Stems wingless, the leaf bases not decurrent along the stem.
O. Ligules to 5 mm long; leaves up to 3 mm wide . . . . . .AMPHIACHYRIS
O. Ligules more than 5 mm long; leaves usually more than 3 mm wide.
P. Receptacle flat or convex, broader than high; proximal leaves usually opposite . . . . . .HELIANTHUS
P. Receptacle conic or more or less cylindric, as long as broad or longer; leaves never opposite.
Plant glabrous throughout; leaves auriculate-clasping . . . . . DRACOPIS
Plants scabrous, pubescent, or partly glabrous; leaves not clasping, or if so, then plant pubescent . . . . . RUDBECKIA

Group 4 (ligules of ray flowers present, not yellow; leaves alternate or basal)

A. Ligules conspicuously 3-cleft or 3-toothed at the apex, purple or purple with yellow tips; pappus of 5-10 awn-tipped scales . . . . .GAILLARDIA
A. Ligules entire or essentially so at the tip, variously colored; pappus absent or various (if ligules 3-toothed, as in Symphyotrichum novae-angliae, then the pappus of capillary bristles).
B. Leaves deeply lobed, divided, or compound.
C. Ligules brownish-purple . . . . . RATIBIDA
C. Ligules white.
D. Heads small, the disc up to 4 mm wide, the involucre up to 5 mm high; ligules mostly 5, up to 3 mm long.
Leaves pinnately cleft into numerous, minute divisions . . . . . ACHILLEA
Leaves merely pinnatifid or bipinnatifid . . . . . PARTHENIUM
D. Heads larger, the disc usually more than 4 mm wide and the involucre mostly more than 5 mm high; ligules more than 5, more than 3 mm long.
E. Leaves with the ultimate divisions lanceolate to ovate, entire or coarsely toothed or incised . . . . . TANACETUM
E. Leaves dissected into numerous linear-filiform segments.
F. Receptacle naked, the achenes not subtended by chaffy scales.
Plant odorless; receptacle round-hemispheric; pappus a short crown; achene ribs strongly callus-thickened . . . . . TRIPLEUROSPERMUM
Plant aromatic; receptacle elongate-conical; pappus essentially absent; achene ribs not strongly callus-thickened . . . . . MATRICARIA
F. Receptacle chaffy, at least the central achenes subtended by chaffy scales.
Plant odorless; achenes bluntly 3-angled; pales blunt . . . . . .CHAMAEMELUM
Plant malodorous; achenes distinctly 8-10 ribbed; pales cuspidate or subulate . . . . . ANTHEMIS
B. Leaves entire, dentate, serrate, or undulate, but never deeply lobed or divided.
G. Pappus of numerous capillary bristles.
H. Heads in panicles or subcorymbiform racemes, but never decidedly flat-topped.
Ligules fewer than 60 (though as many as 100 in Symphyotrichum novae-angliae), arranged in one series; involucres with phyllaries in 3 to 5 series of unequal lengths . . . . . .SYMPHYOTRICHUM
Ligules more than (50)60, in two or more series; involucres with phyllaries in one series, all of them nearly or quite the same length . . . . . ERIGERON
H. Heads few to several on firm peduncles in flat-topped corymbs or umbels (occasionally obscurely so in Ionactis, which has numerous stiffly linear leaves).
I. Leaves linear, basally disposed; ligules creamy or white to yellow . . . . . OLIGONEURON
I. Leaves not linear, or if so, then prevailingly cauline and ligules blue.
J. Principal leaves cordate. . . . . EURYBIA
J. Leaves not cordate.

Leaves stiffly linear . . . . . IONACTIS
Leaves not linear . . . . . DOELLINGERIA

G. Pappus absent or a short crown of teeth or scales.
K. Larger ligules more than 2 cm long, light to dark-reddish or purple; disc 1.5 cm or more across . . . . . ECHINACEA
K Ligules up to 2 cm long, white, pink, or purplish; disc less than 1.5 cm across or ligules white and the disc up to 2 cm across.
L. Leaves ovate, crenate, or serrate, the larger ones more than 4 cm wide, the proximal petiolate, the distal becoming progressively smaller and sessile or even clasping.
Receptacle chaffy, the achenes subtended by chaffy scales; phyllaries ovate . . . . . PARTHENIUM
Receptacle naked, the achenes not subtended by scales; phyllaries linear to lanceolate . . . . . TANACETUM
L. Leaves linear, lanceolate, oblanceolate, or obovate (suborbicular), entire to serrate or dentate, less than 4 cm wide, and otherwise not as above.
M. Heads solitary; plant scapose, nearly always less than 2 dm high; leaves basal or basally disposed . . . . . BELLIS
M. Heads solitary to numerous; plants not scapose, more than 2 dm high; cauline leaves well developed.
N. Leaves linear, closely and shallowly serrulate (subentire); ligules up to 5 mm long, fewer than 11 or rarely doubled . . . . . ACHILLEA
N. Leaves various; ligules more than 5 mm long, more than 11.
Leaves all entire; heads numerous in somewhat leafy corymbiform or paniculiform arrays; discs up to 10 mm across . . . . . BOLTONIA
Leaves various, but not all entire; heads solitary at the ends of long peduncles; discs mostly more than 10 mm across . . . . . LEUCANTHEMUM

Group 5 (ligules absent or minute; leaves alternate or basal)

A. Spines of the involucre hooked at the tip.
Pappus present; corollas present; spines all ascending; staminate and pistillate flowers in the same heads . . . . . ARCTIUM
Pappus absent; corollas absent; spines spreading in all directions; staminate and pistillate flowers in separate heads . . . . . XANTHIUM
A. Spines of the involucre absent or subulate, not hooked at the tip.
B. Ray flowers absent, the marginal florets usually enlarged, irregular, often deeply cleft, ligule-like, or expanded into elongate tubes; phyllaries often spine-tipped or with margins fimbriate or pectinate, or both.
C. Phyllaries with expanded, usually fringed or erose appendages . . . . . CENTAUREA
C. Phyllaries obtuse to broadly acute, entire, coriaceous or scarious-margined.
D. Involucre less than 11 mm in diameter; heads in leafy-bracted corymbiform or paniculiform arrays . . . . . ACROPTILON
D. Involucre more than 11 mm in diameter; heads solitary on elongate peduncles.
Ligules of numerous filiform lobes . . . . . AMBERBOA
Ligules flat, with 3-5 sharp teeth distally . . . . . CATANANCHE
B. Ray flowers present or absent, the marginal florets not enlarged and ligule-like; phyllaries various, but not usually fimbriate or pectinate.
E. Leaves, involucre, or both spiny or prickly.
F. Pappus bristles absent or if present, then of flattened, elongate chaffy scales.
G. Outer phyllaries dilated and foliaceous; disc florets bright-orange . . . . . CARTHAMUS
G. Phyllaries not foliaceous; disc florets not orange.
Leaves pungently prickly-pinnatifid; heads aggregated in spherical clusters . . . . . ECHINOPS
Leaves not prickly-pinnatifid; heads not in spherical clusters . . . . . AMBROSIA
F. Pappus of numerous capillary bristles.
H. Pappus bristles plumose, the bristles each with numerous, fine, pinnately arranged hairs . . . . . CIRSIUM
H. Pappus simple or merely barbellate, but never plumose.
Receptacle deeply pitted, fleshy, without bristly hairs subtending the achenes . . . . . ONOPORDUM
Receptacle densely setose-bristly, not particularly pitted or fleshy . . . . . CARDUUS
E. Neither the leaves nor the involucres spiny or prickly.
I. Pappus setose or composed of awns, or a low crown of scales or teeth, or absent, but never of numerous capillary bristles.
J. Pappus of 12 to 20 hyaline scales about 1 mm long; leaves floccose-tomentose abaxially, pinnatifid or bipinnatifid . . . . . HYMENOPAPPUS
J. Pappus not as above; leaves various.
K. Receptacle chaffy, the achenes subtended by chaffy scales; phyllaries ovate, herbaceous, without scarious or hyaline margins . . . . . PARTHENIUM
K. Receptacle naked (in Artemisia rarely beset with long hairs), the achenes not subtended by chaffy scales; phyllaries linear to lanceolate, with scarious or hyaline margins.
L. Heads in flat-topped arrays; larger leaves more than 10 cm long . . . . . TANACETUM
L. Heads not in flat-topped arrays; leaves nearly always less than 10 cm long.
Heads few to numerous in spiciform, racemiform, or paniculiform arrays; receptacle flat, convex, or hemispherical; disc less than 5 mm across; plants often aromatic, but not pineapple-scented . . . . . ARTEMISIA
Heads solitary or few to numerous in more or less corymbiform arrays; receptacle conic; disc normally more than 5 mm across; plant pineapple-scented . . . . . MATRICARIA
I. Pappus of numerous capillary bristles.
M. Phyllaries scarious or hyaline, white, or white with tinctures of brown or pink; plants usually densely lanate or tomentose, at least on the abaxial leaf surfaces.
N. Cauline leaves typically reduced, ascending to subappressed, much differentiated from the conspicuous rosette of basal leaves . . . . . ANTENNARIA
N. Cauline leaves well developed, divaricate-spreading; basal leaves absent, inconspicuous, or merely similar to the cauline leaves.
O. Plant mostly dioecious, perennial, never with scent of balsam . . . . . ANAPHALIS
O. Plants monoecious or polygamous, annual or biennial, often balsam-scented.
P. Pappus bristles united at the base to form a ring, all of them falling together; arrays spiciform, much longer than broad . . . . . GAMOCHAETA
P. Pappus bristles all distinct, free to their bases; arrays corymbiform, more or less paniculiform, usually about as broad as long.

Involucre greenish to brown, up to 3 mm long; heads in numerous axillary, glomerulate clusters, the bracteal leaves exceeding the clusters . . . . . GNAPHALIUM
Involucre white or whitish, mostly more than 3 mm long; heads in terminal paniculiform arrays, exceeding the bracteal leaves . . . . . PSEUDOGNAPHALIUM

M. Phyllaries neither scarious nor hyaline throughout with pinkish or brownish tinctures; plants with or without tomentum (if phyllaries somewhat white or brownish then the plants without tomentum).
Q. Flowers pink, blue, purple, or yellow.
R. Basal leaves very large and strongly differentiated from the proximal cauline leaves, deeply cordate or occasionally subcordate or reniform (but not well developed at flowering time in early spring); cauline leaves strongly reduced, appressed or subappressed . . . . . PETASITES
R. Basal leaves absent, or present and not strongly differentiated from the proximal cauline leaves; cauline leaves well developed, spreading or divaricate, not or only gradually reduced distally.
S. Flowers yellow; phyllaries all of one series and nearly equal in length (involucre occasionally with a few minute bracts at the base) . . . . . SENECIO
S. Flowers pink, blue, or purple; phyllaries in more than one series of different lengths.
T. Basal leaves well developed and present at flowering time; cauline leaves linear to narrowly lanceolate; arrays spiciform or racemiform, much longer than broad . . . . . LIATRIS
T. Basal leaves absent at flowering time; cauline leaves mostly broader; arrays corymbiform.
Heads pinkish-purple; pappus white; leaves mostly ovate . . . . . PLUCHEA
Heads purple; pappus purple or sordid; leaves mostly lanceolate . . . . . VERNONIA
Q. Flowers white, cream-colored, or stramineous.
U. Involucres up to 4 mm high; stems sparsely to densely spreading-hirsute . . . . . CONYZA
U. Involucres more than 4 mm high; stems glabrous to puberulent or sparsely pilose.
V. Leaves, peduncles, and phyllaries puberulent or strigillose, conspicuously (under 10× magnification) resinous-punctate; heads 1-several in corymbiform or paniculiform arrays; phyllaries strongly striate-nerved . BRICKELLIA
V Plants glabrous to more or less pilose, without resinous-punctate glands; arrays various; phyllaries not or only scarcely striate-nerved.
W. Involucre with phyllaries in 2-5 series of different lengths; leaves linear, sometime scabrous along the margins.
Leaves linear, coarsely ciliolate-scabrous along the margins . . . . . BRACHYACTIS
Leaves linear to linear-lanceolate, the margins smooth or nearly so . . . . . SYMPHYOTRICHUM
W. Involucre with phyllaries in one series of the same length (the involucre often with a few minute bracts at the base); leaves various but never scabrous along the margins.
X. Pappus bristles fine, smooth; leaves lanceolate to ovate, never hastate, conspicuously sharply and coarsely serrate; annual . . . . . ERECHTITES
X. Pappus bristles coarse, barbellate-scabrous distally; leaves lanceolate to ovate, deltate, or reniform, not coarsely serrate, or if so, then the leaves with mostly hastate bases; perennials.
Leaves evenly serrate; florets more than 10 . . . . . HASTEOLA
Leaves entire to coarsely and irregularly dentate; florets fewer than 10 . . . . . ARNOGLOSSUM

ASTRAGALUS

1. Plants with dense spreading pubescence . . . . . **Astragalus tennesseensis**
1. Plants glabrate to strigose or with a few short ascending hairs.
2. Pubescence of malpighian hairs . . . . . **Astragalus canadensis**
2. Pubescence not malpighian, the hairs all basifixed.
3. Stipules broad, connate--at least at the base (this feature is most exaggerated among the proximal nodes); leaflets glabrous or rarely sparsely pilose . . . . . *Astragalus agrestis*
3. Stipules narrow, not or only scarcely connate; leaflets glabrate to pubescent.
4. Ovaries and pods pubescent, the pods essentially 2-celled.
Flowering calyx tube more than 5.5 mm long; racemes mostly surpassing the subtending leaf . . . . . *Astragalus crassicarpus trichocalyx*
Flowering calyx tube less than 5.5 mm long; racemes scarcely or not at all equaling the subtending leaf . . . . . *Astragalus cicer*
4. Ovaries and pods glabrous, the pods essentially 1-celled.
Corolla pink or purplish; plant low, diffuse, weak-stemmed, less than 0.5 m high . . . . . *Astragalus distortus*
Corolla white or cream-colored; plant tall, stout-stemmed, normally more than 0.5 m high . . . . . **Astragalus neglectus**

ATHYRIUM filix-femina

ATRIPLEX

1. Leaves and branches alternate, the leaf blades deltate to deltate-rhombic.
Fruiting bracteoles with teeth only at and beyond the middle; plant silvery-pubescent, the leaves nearly or quite entire . . . *Atriplex argentea*
Fruiting bracteoles with teeth essentially throughout; plant hoary-mealy, the leaves notably sinuate or dentate . . . . . *Atriplex rosea*
1. At least the lowest leaves and branches opposite; leaves variously shaped.
2. Fruiting bracteoles rotund, ultimately exceeding 1 cm in length, thin, reticulate-veined . . . . . *Atriplex hortensis*
2. Fruiting bracteoles deltate to deltate-rhombic, less than 1(1.2) cm long, thick, coriaceous, smooth or muricate, but not or only weakly reticulate-veined.
Blades of principal leaves deltate-hastate, the base nearly or quite truncate . . . . . *Atriplex prostrata*
Blades of the principal leaves linear to hastate, narrowly to broadly cuneate at the base . . . . . *Atriplex patula*

AUREOLARIA

1. Stems and leaves glabrous and glaucous or merely short-puberulent . . . . . **Aureolaria flava**
1. Stems and leaves villous or viscid-pubescent.
2. Corollas and pedicels glandular-pubescent on the outer surfaces; stems and leaves at least sparsely glandular-viscid . **Aureolaria pedicularia**
2. Corollas glabrous, the pedicels eglandular; stems and leaves not glandular-viscid.

Flowering pedicels less than 4 mm long, sometimes elongating to 6 mm in fruit; fruit rufous-pubescent . . . . . **Aureolaria virginica**
Longer flowering pedicels more than 4 mm long, often longer than 6 mm; fruit glabrous . . . . . **Aureolaria grandiflora pulchra**

AURINIA *saxatilis*

AVENA
1. Lemmas glabrous; awns straight or absent; spikelets primarily 2-flowered . . . . . *Avena sativa*
1. Lemmas white to brown-hairy; awns geniculate-twisted; spikelets primarily 3-flowered . . . . . *Avena fatua*

AVENELLA *flexuosa*

AZOLLA
1. Megaspores without pits, densely invested with tangled filaments; stems rarely more than 1 cm long . . . . . **Azolla caroliniana**
1. Megaspores conspicuously pitted, not or very thinly beset with tangled filaments; stems mostly more than 1 cm long . . . . . *Azolla microphylla*

BACOPA *rotundifolia*

BALLOTA *nigra*

BALSAMINACEAE: One genus in our area . . . . . IMPATIENS

BAPTISIA
1. Flowers to 1.6 cm long, the petals bright-yellow; calyx lobes up to 2 mm long; racemes numerous; leaflets less than 2 cm long . . . . . **Baptisia tinctoria crebra**
1. Flowers more than 1.6 cm long, the petals not bright-yellow; calyx lobes 2 mm or more long; racemes one to few; larger leaflets more than 2 cm long.
   2. At least the young herbage pubescent . . . . . **Baptisia leucophaea**
   2. Plant glabrous.
      3. Petals blue-violet; calyx lobes 3 mm or more long; stipules persistent, as long as or longer than the petioles.
         Petioles mostly more than 4 mm long; flowers to 2.5 cm long; mature legumes to 1.5 cm wide . . . . . *Baptisia australis*
         Petioles to 4 mm long; flowers more than 2.5 cm long; mature legumes more than 1.5 cm wide . . . . . *Baptisia australis minor*
      3. Petals white or cream-colored; calyx lobes less than 3 mm long; stipules deciduous, shorter than the petioles.
         Petals white, 2.1 cm or more long; larger calyx tubes more than 6 mm long . . . . . **Baptisia lactea**
         Petals cream-colored, less than 2.1 cm long; calyx tubes less than 6 mm long . . . . . **Baptisia ×deamii**

BARBAREA
1. All leaves divided or pinnatifid, the proximal with 5 or more pairs of lateral lobes; fruits more than 4 cm long, the pedicels more than 1.1 mm thick . . . . . *Barbarea verna*
1. Only the proximal leaves fully divided or pinnatifid, the lowest leaves with 0-4 pairs of lateral lobes; fruits less than 4 cm long, the pedicels less than 1 mm thick.
   Auricles of distal leaves long-ciliate; petals to 4.5 mm long; beak of fruit to 1.5 mm long . . . . . *Barbarea stricta*
   Auricles of distal leaves eciliate; petals more than 4.5 mm long; beak of fruit more than 1.5 mm long . . . . . *Barbarea vulgaris*

BARTONIA virginica

BASSIA *scoparia*

BECKMANNIA syzigachne

BELAMCANDA *chinensis*

BELLIS *perennis*

BERBERIDACEAE
A. Plants shrubs or subshrubs with spinulose leaves or spiny stems, or both.
   Stems spiny; leaves simple . . . . . BERBERIS
   Stems unarmed; leaves compound . . . . . MAHONIA
A. Plants herbaceous.
   B. Flowers 2 to several, paniculate or racemose; leaves compound, the leaflets several and distinctly petiolulate.
      Petals and stamens 6; fruit fleshy . . . . . CAULOPHYLLUM
      Petals and stamens 4; fruit a capsule . . . . . EPIMEDIUM
   B. Flowers solitary; leaves simple, merely deeply divided or 2-lobed.
      Leaves cauline, peltate, orbicular, deeply and radiately several-cleft; fruit a berry . . . . . PODOPHYLLUM
      Leaves basal, deeply 2-lobed, the segments half-ovate; fruit a capsule . . . . . JEFFERSONIA

BERBERIS
1. Flowers solitary or in sessile umbellate clusters; leaves entire; spines usually simple . . . . . *Berberis thunbergii*
1. Flowers racemose; leaves bristle-toothed; many spines forked or branched.
   Branches of the previous year gray; leaves copiously spinulose-toothed . . . . . *Berberis vulgaris*

Branches of the previous year brown; leaves scarcely toothed to subentire . . . . . **Berberis canadensis**

BERTEROA *incana*

BERULA erecta

BESSEYAbullii

BETULA

1. Larger leaves more than 6 cm long.
   Leaves with more than 8 distinct pairs of lateral veins; mature bark yellowish to silvery-gray . . . . . **Betula alleghaniensis**
   Leaves with fewer than 8 distinct pairs of lateral veins; mature bark white . . . . . **Betula papyrifera**
1. Leaves nearly all less than 6 cm long.
   2. Leaves widest well beyond the base.
      3. Leaves obtuse to broadly acute, with as many as 5 pairs of lateral veins, to 3.5 cm long, except for sprout leaves; staminate aments less than 3 cm long . . . . . **Betula pumila**
      3. Leaves acute, most with 5 or more pairs of lateral veins, often longer than 3.5 cm long; staminate aments more than 3 cm long.
         Many leaves with 6 or more distinct pairs of lateral veins, broadly rounded-cuneate . . . . . **Betula ×purpusii**
         Leaves rarely with 6 distinct pairs of lateral veins, cuneate . . . . . **Betula ×sandbergii**
   2. Leaves widest at or near the base, cuneate to subtruncate or cordate.
      4. Leaves pubescent, at least in the abaxial vein axils.
         Leaves acuminate . . . . . **Betula papyrifera**
         Leaves acute . . . . . **Betula nigra**
      4. Leaves glabrous throughout.
         Pistillate scales densely short-canescent on the abaxial face; bark tight or inconspicuously exfoliating as small, thin rectangular plates; leaves prevailingly long-caudate, generally with 3 or more minor teeth on each principal tooth . . . . . **Betula populifolia**
         Pistillate scales glabrate to sparsely villous on the abaxial face; bark conspicuously exfoliating as long strands; leaves merely acute, acuminate or short-caudate, the principal teeth generally with 1 or 2 minor teeth . . . . . *Betula pendula*

BETULACEAE

A. Plants fruiting as shrubs.
   B. Twigs copiously glandular-hispid (glabrate in the rare Corylus cornuta); leaves coarsely serrate to sinuate-serrate or doubly serrate; nut l cm or more long . . . . . CORYLUS
   B. Twigs never glandular-hispid, usually glabrous or merely glandular; leaves various; nut less than l cm long.
      Leaves less than 4 cm wide, serrate to dentate; winter buds sessile; fruiting bracts herbaceous . . . . . BETULA
      Leaves mostly more than 4 cm wide, serrulate to doubly serrate; winter buds stalked; fruiting bracts woody, cone-like . . . . . ALNUS
A. Plants fruiting as trees.
   C. Leaves broadly spatulate to cuneate-orbicular, widest toward the emarginate tip, about as wide as long; fruiting bracts woody, cone-like . . . . . ALNUS
   C. Leaves acute or acuminate, widest at or below the middle; fruiting bracts herbaceous.
      D. Bark smooth, gray, with sinewy ridges; veins of leaf not forking into the margin . . . . . CARPINUS
      D. Bark shredding, exfoliating, or otherwise not smooth and sinewy; veins of leaves usually forking into the teeth.
         Bark brownish-gray, shredded or stringy; petioles less than 10 mm long . . . . . OSTRYA
         Bark various, but not shredded or stringy; longer petioles more than 10 mm long . . . . . BETULA

BIDENS

1. Leaves simple or rarely a few incompletely divided into 2-4 decurrent basal lobes.
   2. Leaves mostly sessile to connate; heads usually nodding in fruit; achenes with a convex cartilaginous summit . . . . . **Bidens cernua**
   2. Leaves narrowing to petiolate or merely winged leaf bases; heads remaining erect; achenes not as above.
      3. Outer phyllaries densely white-hirsute ciliate throughout . . . . . *Bidens tripartita*
      3. Outer phyllaries smooth or very thinly ciliate.
         Disc florets 5-lobed, yellowish-orange; achenes commonly 4-awned and with a tuberculate or strigose midrib . . . . **Bidens connata**
         Disc florets 4-lobed, pale-yellow; achenes mostly 3-awned (rarely 4-awned), the midribs smooth . . . . . **Bidens comosa**
1. Leaves all, or mostly, pinnately divided or compound.
   4. Achenes narrowly linear, mostly more than 8 times as long as broad; leaflets ovate, mostly less than 3 times as long as wide . . . . . *Bidens bipinnata*
   4. Achenes ovate to oblong, less than 8 times as long as broad; leaflets linear to lanceolate, mostly more than 3 times as long as wide.
      5. Ligules absent or shorter than the involucre (rarely with an occasional ligule longer than the involucre); leaves with 3-5 petiolulate, uncleft leaflets.
         6. Outer phyllaries 2-5, smooth . . . . . **Bidens discoidea**
         6. Outer phyllaries mostly more than 5, weakly to strongly ciliate along the margins.
            Outer phyllaries fewer than 10; disc florets orange . . . . . **Bidens frondosa**
            Outer phyllaries 10 or more; disc florets yellow . . . . . **Bidens vulgata**
      5. Ligules yellow, conspicuous, longer than the involucre; leaves divided into 3-7 linear or lanceolate, often cleft or coarsely serrate divisions.
         7. Outer phyllaries usually more than 11, coarsely hispid-ciliate to ciliate-serrulate . . . . . **Bidens polylepis**
         7. Outer phyllaries fewer than 11, entire to ciliate.
            Achenes cuneate-oblong, less than 2.5 mm broad, the margins firm, merely strigose-ciliate; outer phyllaries entire or with mostly ascending cilia . . . . . **Bidens trichosperma**
            Achenes ovate or obovate, the larger usually more than 2.5 mm broad with friable or papery erose, hispid-ciliate margins; outer phyllaries spreading-ciliate . . . . . **Bidens aristosa**

BIGNONIACEAE
A. Vine, with compound leaves; flowers orange or scarlet . . . . . CAMPSIS
A. Tree, with simple leaves; flowers blue or violet, or white with yellow or dark markings.
Leaves palmately lobed, densely pubescent abaxially with stalked stellate hairs . . . . . PAULOWNIA
Leaves unlobed, pubescent abaxially with simple hairs . . . . . CATALPA

BLECHNACEAE: One genus in our area . . . . . WOODWARDIA

BLEPHILIA
1. Leaves long-petiolate, the distalmost 4 cm or more long, the bases broadly rounded to subcordate; the stem usually branched . . . . . **Blephilia hirsuta**
1. Leaves subsessile to short-petiolate, the distalmost less than 4 cm long, the bases mostly cuneate; the stem usually not branched . . . . . **Blephilia ciliata**

BOECHERA
1. Leaves all narrowed to an attenuate base . . . . . **Boechera canadensis**
1. At least the distal leaves auriculate-clasping at the base.
2. Fruiting pedicels and siliques remaining strictly erect . . . . . **Boechera stricta**
2. Pedicels and siliques soon becoming widely spreading or pendent.
3. Distal cauline leaves dentate, pubescent on both sides . . . . . **Boechera dentata**
3. Distal cauline leaves entire or nearly so, glabrous.
4. Plant essentially glabrous throughout . . . . . **Boechera laevigata**
4. Plant pubescent at the base.
Basal leaves stellate-pubescent on both sides . . . . . **Boechera grahamii**
Basal leaves glabrous or with scattered simple hairs . . . . . **Boechera missouriensis**

BOEHMERIA
1. Petioles mostly more than 1.5 cm long; leaf blades flat, widely spreading . . . . . **Boehmeria cylindrica**
1. Petioles mostly less than 1.5 cm long; many of the leaf blades conduplicate and more or less deflexed . . **Boehmeria cylindrica drummondiana**

BOLBOSCHOENUS
1. All or most of the spikelets borne on elongate peduncles; styles 3; achenes distinctly trigonous . . . . . **Bolboschoenus fluviatilis**
1. Many or most of the spikelets sessile; styles 2; achenes biconvex to scarcely trigonous . . . . . *Bolboschoenus maritimus*

BOLTONIA
1. Stems winged from the decurrent leaf bases . . . . . *Boltonia decurrens*
1. Stems without wings, the leaves not decurrent . . . . . **Boltonia asteroides**

BORAGINACEAE
A. Plant glabrous . . . . . MERTENSIA
A. Plants pubescent or scabrous.
B. Stems harshly scabrous with firm recurved prickles . . . . . ASPERUGO
B. Stems pubescent or hispid but without recurved prickles.
C. Principal leaves cordate . . . . . BRUNNERA
C. Leaves not cordate.
D. Plants in flower.
E. Stamens conspicuously exserted; flowers irregular . . . . . ECHIUM
E. Stamens not surpassing the corolla; flowers essentially regular.
F. Corolla rotate without a conspicuous tube or throat, the lobes recurved; anthers forming an erect cone, the filaments prolonged into an appendage that lies along the proximal half of the anther . . . . . BORAGO
F. Corolla not rotate, with a definite tube or throat, the lobes various; anthers not as above.
G. Ovary unlobed, the style terminal . . . . . HELIOTROPIUM
G. Ovary manifestly 4-lobed, the style nested between them.
H. Corolla blue or purple, or leaves white-mottled, or with the bases decurrent along the stem.
I. Flowers prevailingly more than 1 cm long.
Leaves white-mottled, not decurrent along the stem . . . . . PULMONARIA
Leaves not white-mottled, the bases strongly decurrent along the stem . . . . . SYMPHYTUM
I. Flowers rarely up to 1 cm long.
J. Calyx lobes in anthesis 5 mm or more long or leaves mostly 2 cm or more wide.
Calyx lobes less than 3 times as long as broad, oblong, obtuse, downy-pubescent . CYNOGLOSSUM
Calyx lobes more than 3 times as long as broad, linear-oblong, acute, coarsely hispid . . . . ANCHUSA
J. Calyx lobes in anthesis less than 5 mm long and leaves less than 2 cm wide.
K. Flowers all subtended by bracts . . . . . LAPPULA
K. All but the lowest flowers bractless.
Calyx both much longer than the pedicel and with coarse, appressed, simple hairs . . . . . PLAGIOBOTHRYS
Calyx shorter than to exceeding the pedicel, either closely strigose with simple hairs or with spreading, uncinate or glandular hairs . . . . . MYOSOTIS
H. Corolla not blue or purple (rarely white and fading to light blue), or, if so, then leaf bases not decurrent along the stem.
L. Style long-exserted from the corolla . . . . . ONOSMODIUM
L. Style included or scarcely exserted.
M. Style 2-lobed, the stigmas 2.

Perennial; flowers some shade of yellow, greenish, or white; leaves with evident lateral veins . . . . . LITHOSPERMUM
Taprooted annual; corollas white; leaves without lateral veins . . . . . BUGLOSSOIDES
M. Style simple, the stigma solitary.
N. Corolla yellow . . . . . AMSINCKIA
N. Corolla white or whitish.
O. Leaves mostly 2 cm or more wide . . . . . HACKELIA
O. Leaves less than 2 cm wide.
Flowers, or most of them, ebracteate . . . . . MYOSOTIS
Flowers all subtended by bracts . . . . . LAPPULA
D. Plants in fruit.
P. Nutlets covered with uncinate or hooked hairs or bristles.
Q. Leaves less than 1 cm wide . . . . . LAPPULA
Q. Leaves more than 1 cm wide.
Mature sepals more than 5 mm long . . . . . CYNOGLOSSUM
Mature sepals less than 5 mm long . . . . . HACKELIA
P. Nutlets without hooked or uncinate bristles.
R. All flowers subtended by bracts.
S. Leaves with lateral veins apparent.
Stems densely spreading-hirsute . . . . . ONOSMODIUM
Stems strigose with appressed hairs . . . . . LITHOSPERMUM
S. Leaves with lateral veins absent or very inconspicuous or white-mottled.
T. Plant coarsely hispid, with many of the hairs 2-3 mm long; nutlets rough . . . . . ECHIUM
T. Plants variously pubescent but the hairs less than 2 mm long; nutlets usually smooth or pitted.
U. Larger leaf blades more than 8 cm long . . . . . ANCHUSA
U. Leaf blades less than 8 cm long.
V. Taprooted annual; fruit conspicuously pitted or rugulose . . . . . BUGLOSSOIDES
V. Perennial; fruit smooth or nearly so.
Leaves white-mottled . . . . . PULMONARIA
Leaves not mottled . . . . . LITHOSPERMUM
R. All or at least the distal flowers of each raceme without subtending bracts.
W. Fruits all sessile . . . . . HELIOTROPIUM
W. Fruits, or at least the proximal ones, distinctly (though often shortly) pedicellate.
X. Mature calyx lobes up to 5 mm long.
Nutlets absolutely smooth and shining . . . . . MYOSOTIS
Nutlets dull and rugose . . . . . PLAGIOBOTHRYS
X. Mature calyx lobes more than 5 mm long.
Y. Leaves less than 1 cm wide, without winged petioles . . . . . AMSINCKIA
Y. Leaves mostly more than 1 cm wide, the petioles usually winged.
Cymes scorpioid; plant coarse, usually more than 6 dm high . . . . . SYMPHYTUM
Cymes not scorpioid; plant up to 6 dm high . . . . . BORAGO

BORAGO *officinalis*

BOTHRIOCHLOA
1. Panicles reddish or purplish in age; internode hairs about ¼ as long as the sessile spikelet . . . . . *Bothriochloa bladhii*
1. Panicles silvery in age; internode hairs about ½ as long as the sessile spikelet . . . . . *Bothriochloa laguroides torreyana*

BOTRYCHIUM
1. Sterile leaves pinnate, the proximal pinnae often pinnatifid with acute or obtuse lobes; blades usually more than 2 cm long . . . . . **Botrychium matricariifolium**
1. Sterile leaves pinnate with quadrate-flabellate lobes; blades less than 2 cm long.
Sterile blade scarcely as long as the stalk of the fertile blade, the lowest pair of pinnae the larger . . . . . **Botrychium simplex**
Sterile blade much exceeding the stalk of the fertile blade, the lowest pair of pinnae not notably larger than the next above . . . . . **Botrychium campestre**

BOTRYPUS virginianus

BOUTELOUA
1. Axis of inflorescence more than 8 cm long; spikes more than 10, less than 2 cm long . . . . . **Bouteloua curtipendula**
1. Axis of inflorescence less than 8 cm long; spikes fewer than 10, 2-5 cm long.
Leaves hirsute; rachis of inflorescence projecting 2 mm or more beyond the last spikelet; glumes tuberculate . . . . . **Bouteloua hirsuta**
Leaves glabrous or scabrous; rachis of inflorescence not projecting; glumes etuberculate . . . . . *Bouteloua gracilis*

BRACHYACTIS *ciliata*

BRACHYELYTRUM
1. Lemmas hispid with hairs 0.2 mm or more long . . . . . **Brachyelytrum erectum**
1. Lemmas scaberulous, with hairs less than 0.2 mm long . . . . . **Brachyelytrum aristosum**

BRASENIA schreberi

BRASSICA

1. At least the middle and distal leaves clasping.
   Sepals to 6.5 mm long, the petals to 10 mm long; beaks of siliques more than 9 mm long, often more than 12 mm long ..... *Brassica rapa*
   Sepals more than 6.5 mm long, the larger petals more than 10 mm long; beaks of siliques rarely more than 9 mm long, never more than 12 mm long ..... *Brassica napus*
1. Leaves not clasping.
   Fruits up to 2 cm long, strongly appressed to the rachis, the seedless portion of the tip less than 5 mm long; young stems hispid below ..... *Brassica nigra*
   Fruits becoming more than 2 cm long, not strongly appressed, the seedless portion of the tip more than 5 mm long; stems hispid to smooth ..... *Brassica juncea*

BRASSICACEAE

A. Petals yellow, yellowish, or orange (occasionally drying pink or purple) ..... **Group 1**
A. Fresh petals white, whitish, greenish, or some shade of pink or purple, or absent.
   Petals some shade of pink or purple ..... **Group 2**
   Petals white, whitish, greenish, or absent ..... **Group 3**

Group 1. (petals yellow, yellowish, or orange, or occasionally drying pink or purple)

A. All leaves entire to repand or dentate, but not lobed.
   B. Plants glabrous throughout (sometimes minutely and thinly puberulent in Lepidium).
      C. Stem leaves not clasping.
         Rosette leaves present at flowering time ..... BOECHERA
         Rosette leaves absent or inconspicuous at flowering time ..... RORIPPA
      C. Stem leaves auriculate-clasping.
         D. Cauline leaves linear-lanceolate, less than 1 cm wide ..... ISATIS
         D. Cauline leaves elliptic to ovate, usually more than 1 cm wide.
            E. At least some leaves sinuate or denticulate, acute or merely obtuse at the tip; beak of fruit more than 5 mm long ... BRASSICA
            E. Leaves strictly entire, broadly rounded at the tip; beak of fruit less than 5 mm long.
               Fruit a silicle ..... LEPIDIUM
               Fruit a silique ..... CONRINGIA
   B. Plants pubescent, at least near the base.
      F. Ovary and fruit soon becoming much longer than broad.
         Stem leaves clasping, the rosette leaves present at flowering time ..... TURRITIS
         Stem leaves non-clasping, the rosette leaves absent at flowering time ..... ERYSIMUM
      F. Ovary and fruit subglobose or rarely up to 3 times longer than broad.
         G. Petals more than 5 mm long.
            Leaves auriculate at the base ..... PAYSONIA
            Leaves not auriculate ..... PHYSARIA
         G. Petals less than 5 mm long.
            H. At least some of the stem leaves clasping.
               Distal portions of the stem glabrous or glabrate; fruits many-seeded, more than 3 mm broad ..... CAMELINA
               Distal portions of the stem densely pubescent throughout; fruits 1(2)-seeded, up to 3 mm broad ..... NESLIA
            H. None of the leaves clasping.
               I. Fruit clearly longer than broad; leaves loosely pubescent with few-pronged hairs ..... DRABA
               I. Fruit about as long as broad; pubescence of many-pronged hairs.
                  Plant perennial ..... AURINIA
                  Plant annual ..... ALYSSUM
A. At least the proximal leaves lobed, pinnatifid, or pinnate, the cauline leaves sometimes with only a small proximal pair of lobes.
   J. Petals, including the slender or tapered claw, up to 5 mm long, or if 6 mm long, then plant a creeping or rhizomatous perennial.
      K. Only the basal and proximal cauline leaves lobed or divided ..... BOECHERA
      K. All but occasionally the distal leaves lobed or divided.
         L. Lobes of leaves rounded, suborbicular to broadly oval or obovate, the terminal much larger than the laterals ..... BARBAREA
         L. Lobes of leaves acute or acutish, mostly distinctly longer than broad, the terminal similar to the laterals.
            M. Leaves twice to thrice pinnatisect; plants minutely stipitate-glandular or pubescent with branched hairs or both ..... DESCURAINIA
            M. Leaves once to twice divided; plants eglandular, glabrous or pubescent with simple hairs.
               Fruits linear, more than 5 times as long as broad; style very short, apiculate or scarcely evident; plants taprooted annuals or winter annuals ..... SISYMBRIUM
               Fruits subspherical to oblong, less than 5 times as long as broad or if longer, then the plant a rhizomatous perennial; style stout to elongate, but always manifest; plants annuals or perennials ..... RORIPPA
   J. Petals more than 5 mm long, plants never creeping perennials.
      N. Leaves confined to the proximal half of the stem, or, if rarely leafy distally, then plant a suffruticose perennial ..... DIPLOTAXIS
      N. Leaves present beyond the middle, plants never suffruticose.
         O. Pedicels in the proximal portion of the raceme subtended by foliaceous bracts; pinnae of leaves progressively larger distally ..... ERUCASTRUM
         O. Pedicels all bractless; pinnae of leaves various.
            P. Rosette leaves very often present at flowering time; plants glabrous throughout to remotely hispid below; distal leaves usually with at least one pair of lobes.
               Petals less than 9 mm long; terminal segment of pinnatifid leaves much broader than the lateral segments; valves of siliques with only 1 median vein and a pair of reticulate lateral veins ..... BARBAREA
               Petals more than 9 mm long; terminal segment of pinnatifid leaves not appreciably wider than the laterals; valves of siliques with 3 strong median veins ..... COINCYA

P. Rosette leaves usually absent or strongly withered at flowering time; plants glabrous or pubescent; distal leaves variously toothed or repand, but not distinctly lobed.
Q. Fruits short, the style forming a beak about as long as the subglobose fertile portion, the whole scarcely 1 cm long . . . . . RAPISTRUM
Q. Fruits elongate, the fertile portion much longer than wide, the whole more than 1 cm long.
R. Fruits bristly-hispid or leaves clasping; plants glabrous throughout . . . . . SINAPIS
R. Fruits not bristly-hispid, leaves not clasping; plants at least thinly hispid.
S. Petals pale-yellow, often with dark veins; fruits becoming strongly torulose and long-beaked . . . . . RAPHANUS
S. Petals pale to deep-yellow but without dark veins; fruits not or only weakly torulose, beaks present or absent.
T. Fruits widely spreading, beakless or nearly so, up to 1 mm broad; sepals up to 4 mm long . . . . . SISYMBRIUM
T. Plants without the above combination of characters.
U. Plants glabrous or glabrate throughout . . . . . BRASSICA
U. Plants sparsely to densely pubescent, at least proximally.
Siliques ascending or spreading, more than 2 cm long, the side of each valve with 2 or more prominent longitudinal veins in addition to those marking the sutures . . . . . SINAPIS
Siliques appressed, more or less than 2 cm long, the side of each valve with a single longitudinal vein . . . . . BRASSICA

Group 2. (fresh petals some shade of pink or purple)

A. At least the middle and proximal cauline leaves pinnately lobed or dissected.
Plant glabrous or nearly so; middle and proximal leaves auriculate-clasping at the base; mature pedicels up to 10 mm long; fruits slender, about 1 mm thick . . . . . IODANTHUS
Plant at least sparsely hispid; none of the leaves auriculate-clasping; pedicels soon exceeding 10 mm in length; fruits ample, much more than 1 mm thick . . . . . RAPHANUS
A. None of the cauline leaves pinnately lobed or dissected.
B. Plants glabrous or glabrate throughout.
C. Inflorescence umbelliform, about as long as broad . . . . . IBERIS
C. Inflorescence racemose, soon longer than broad.
D. Plant succulent, the leaves thick and leathery . . . . . CAKILE
D. Plants not succulent, the leaves not leathery.
Distal leaves auriculate-clasping, lanceolate to narrowly oblong, entire or nearly so; mature pedicels often more than 10 mm long . . . . . BOECHERA
Distal leaves tapered to non-clasping bases, lance-ovate to ovate, denticulate or serrulate or some rarely subentire; pedicels never more than 10 mm long . . . . . IODANTHUS
B. Plants pubescent or glandular, at least near the base or on the leaves.
E. Plant with clavate or stipitate-glandular hairs throughout . . . . . CHORISPORA
E. Plants eglandular.
F. Lower and middle cauline leaves opposite, cordate, and long-petiolate . . . . . LUNARIA
F. All leaves alternate or basal, not both cordate and long-petiolate.
G. Cauline leaves fewer than 10, ovate or lance-ovate, entire to repand or repand-dentate; petals less than 1.5 cm long.
Pubescence consisting of simple hairs . . . . . CARDAMINE
Pubescence consisting of stellate hairs . . . . . MALCOLMIA
G. Cauline leaves more than 10, lance-acuminate to ovate, or oblanceolate, entire to denticulate or serrulate; petals usually 1.5 cm or more long.
Leaves, stems, pedicels, and calyces densely appressed stellate-pubescent throughout; leaves entire . . . . . MATTHIOLA
Herbage sparsely pubescent with simple or forked hairs; leaves weakly to strongly serrate or denticulate . . . . . HESPERIS

Group 3. (petals white, whitish, greenish, or absent)

A. Leaves trifoliolate or deeply palmately divided . . . . . DENTARIA
A. Leaves neither trifoliolate nor palmately divided.
B. At least the distal leaves sessile and auriculate-clasping.
C. All cauline leaves pinnately compound; plant aquatic or subaquatic . . . . . NASTURTIUM
C. Leaves not all pinnately compound; plants never aquatic.
D. Ovaries and fruits soon becoming linear, well over 5 times as long as broad.
E. Middle and distal cauline leaves less than 7 mm wide; siliques less than 1.3 mm wide . . . . . ARABIS
E. Larger middle and distal cauline leaves either more than 7 mm wide, or the fruits more than 1.3 mm wide, or both.
Fruits flat, spreading-ascending to divaricate or reflexed, more or less than 1.5 mm wide . . . . . BOECHERA
Fruits 4-angled, subterete, appressed-ascending, to 1.5 mm wide . . . . . TURRITIS
D. Ovaries and fruits up to twice as long as broad.
F. Plants glabrous throughout.
Fruits soon exceeding 5 mm in length, the style virtually absent . . . . . THLASPI
Fruits less than 5 mm long, the style manifest, usually at least as long as the distal notch . . . . . LEPIDIUM
F. Plants pubescent, at least below the middle.
Basal leaves deeply incised-pinnate, present at flowering time; cauline leaves becoming strongly reduced, pinnate, or if entire, then less than 1 cm wide; fruits deltoid, truncate at the apex . . . . . CAPSELLA
Basal leaves absent or shriveled at flowering time; cauline leaves well developed, entire to denticulate, mostly well over 1 cm broad; fruits subglobose . . . . . LEPIDIUM
B. None of the leaves auriculate-clasping.
G. Plant wholly aquatic, the submersed leaves dissected into numerous linear-filiform segments . . . . . RORIPPA
G. Plants not aquatic or if aquatic, then the leaves not as above.
H. Leaves all or nearly all deeply lyrate-lobed, pinnatifid, or pinnately compound.
I. Lowest leaves 2-3 pinnate or pinnatifid or plant scapose.

J. Plant scapose, the cauline leaves absent or much reduced . . . . . TEESDALIA
J. Plants with few to several cauline leaves.
Distal leaves simple to merely lobed or once-pinnate; fruit suborbicular . . . . . LEPIDIUM
All leaves twice to thrice pinnate or pinnatifid; fruit narrowly oblong to linear . . . . . DESCURAINIA
I. Lowest leaves only once-pinnate or pinnatifid or the segments with a few deep teeth; plants not scapose.
K. Ovaries and wrinkled fruit deeply notched between the locules, giving the appearance of two globose, paired, one-seeded fruits per pedicel; leaves pinnatifid . . . . . LEPIDIUM
K. Ovaries soon elongating into linear fruits much longer than broad; leaves pinnately lobed or compound.
L. Petals more than 6 mm long.
Leaves pinnately compound, the entire lobes all similar; distal leaves linear, the proximal and basal usually suborbicular . . . . . CARDAMINE
Leaves lyrate-pinnatifid, the usually denticulate terminal lobe much larger than the reduced laterals; the distal leaves similar to the proximal and basal leaves, though generally reduced in size and degree of division . . . . RAPHANUS
L. Petals less than 6 mm long.
M. Plant aquatic, rooting extensively at the nodes; stems usually succulent . . . . . NASTURTIUM
M. Plants not aquatic; stems slender, firm.
N. Lateral lobes of most leaves often petiolulate, orbicular to ovate or lance-ovate, but never linear or linear-lanceolate . . . . . CARDAMINE
N. Lateral lobes of most leaves without petiolules, linear to linear-lanceolate.
Plant glabrous throughout, occasionally with ciliate petioles; leaves with lobes mostly spatulate, widest beyond the middle; fruits up to 1 mm wide; seeds wingless . . . . . CARDAMINE
Plant pubescent near the base; lobes of leaves oblong to lance-oblong or subrhombic, but not usually widest beyond the middle; fruits more than 1 mm wide; seeds wing-margined . . . . . PLANODES
H. Leaves simple, without deep lobes or pinnate segments.
O. Basal and proximal leaves distinctly petiolate, rounded to cordate at the base.
P. Stem leaves closely and deeply crenate to subpinnatifid; fruits obovoid, up to 6 mm long, but usually soon deciduous . . . . . ARMORACIA
P. Stem leaves shallowly dentate, irregularly sinuate, repand-dentate to subentire; fruits more than 6 mm long, persistent.
Q. Cauline leaves truncate to cordate, on petioles 5 mm or more long; petals less than 7 mm long; fruiting pedicels stout, about 5 mm long . . . . . ALLIARIA
Q. Cauline leaves not both cordate and on petioles as long as 5 mm; petals more than 7 mm long; fruiting pedicels slender or if stout, then much longer than 5 mm.
Cauline leaves fewer than 10, ovate or lance-ovate, entire to repand or repand-dentate; petals less than 1.5 cm long . . . . . CARDAMINE
Cauline leaves more than 10, lance-acuminate to acute and ovate or oblanceolate, denticulate or serrulate; petals usually 1.5 cm or more long . . . . . HESPERIS
O. Leaves narrowed to sessile or subsessile bases, never as above.
R. Ovaries and fruits soon becoming more than twice as long as broad.
S. Cauline leaves absent, clustered below the middle or cauline leaves present beyond the middle and the fruits ellipsoid and less than 6 mm long.
Leaves all basal; petals cleft nearly ½ their lengths . . . . . EROPHILA
At least the proximal ½ of the stem with cauline leaves; petals essentially entire . . . . . DRABA
S. Cauline leaves well developed, the fruits linear, soon more than 7 mm long.
Fruits less than 2 mm wide and 3 cm long. . . . . ARABIDOPSIS
Fruits soon more than 2 mm wide and 3 cm long . . . . . BOECHERA
R. Ovaries and fruits remaining less than twice as long as broad.
T. Fruits remaining strongly ascending or closely appressed to the inflorescence axis, densely stellate-canescent; stems and leaves densely stellate-canescent . . . . . BERTEROA
T. Fruits soon becoming divaricate, the pedicels at nearly right angles to the inflorescence axis, glabrous or pubescent; stems and leaves glabrous to variously pubescent.
U. Plants glabrous or minutely puberulent with simple hairs.
Petals very unequal, the abaxial pair much the larger; longer styles more than 1 mm long . . . . . IBERIS
Petals subequal; styles never more than 1 mm long . . . . . LEPIDIUM
U. Plants pubescent with either 2-pronged or stellate hairs.
Pedicels less than twice as long as the fruit, the fruit circular, up to 4 mm long; plant densely stellate-pubescent . . . . . ALYSSUM
Pedicels more than twice as long as the fruit, the fruit elliptic, up to 3 mm long; plant finely strigose with 2-pronged hairs . . . . . LOBULARIA

BRICKELLIA eupatorioides

BRIZA

1. Spikelets more than 11 per panicle, less than 8 mm long . . . . . *Briza minor*
1. Spikelets fewer than 11 per panicle, more than 8 mm long . . . . . *Briza maxima*

BROMUS

1. Spikelets conspicuously flattened, compressed, with the glumes and lemmas often sharply keeled.
2. Teeth at tip of lemma less than 0.5 mm long . . . . . *Bromus brizaeformis*
2. Teeth at tip of lemma more than 0.5 mm long.
3. Sheaths spreading to retrorsely pilose . . . . . *Bromus marginatus*
3. Sheaths glabrous or nearly so, occasionally ciliate near the summit.
Most awns more than 3 mm long . . . . . *Bromus carinatus*
Awns absent or less than 3 mm long . . . . . *Bromus catharticus*
1. Spikelets terete to more or less flattened, never compressed or sharply keeled.

4. Lemmas obtuse, occasionally with the midnerve excurrent to 2 mm but essentially awnless.
   Spikelets less than 5 mm broad; plant perennial . . . . . *Bromus inermis*
   Spikelets mostly more than 5 mm broad; plant annual . . . . . *Bromus secalinus*
4. Lemmas obtuse to acute, manifestly awned.
   5. Plants perennial, the subterranean portions often difficult to extract intactly.
      6. Lemmas ciliate along the proximal margins, glabrous over the outer surface or puberulent-scaberulous below . . . . **Bromus ciliatus**
      6. Lemmas pubescent over nearly or quite all of the outer surface.
         7. First glume usually 3-nerved; lemmas densely appressed-pilose with some hairs up to 1 mm or more long . . . . . **Bromus kalmii**
         7. First glume usually 1-nerved; lemmas glabrous or pubescent to puberulent with hairs much less than 1 mm long.
            8. Sheaths usually glabrous but always densely pubescent near the summit, flaring into two small but distinct flanges at the base of the leaf; nodes below the inflorescence more than ten . . . . . **Bromus latiglumis**
            8. Sheaths variable with respect to pubescence but never with flanges at the summit; nodes below the inflorescence fewer than ten.
               Second glume 3-nerved; pubescence of sheath collar not notably more dense than elsewhere on the sheath . . . . . **Bromus pubescens**
               Second glume prevailingly 5-nerved; pubescence of sheath collar notably more densely disposed than elsewhere on the sheath . . . . . **Bromus nottowayanus**
   5. Plants annual, the underground portions extracted easily with the rest of the plant.
      9. First glume narrowly linear, subulate, 1-nerved; the lemmas bifid, the long awns originating between two sharp scarious teeth 2 mm or more long.
         Second glume up to 1 cm long; awns less than 2 cm long . . . . . *Bromus tectorum*
         Second glume mostly more than 1 cm long; awns mostly more than 2 cm long . . . . . *Bromus sterilis*
      9. First glume lanceolate to lance-ovate, 3-5 nerved; the lemmas not bifid, but sometimes trifid and the awns less than 1.5 mm long.
         10. Lemmas densely pubescent . . . . . *Bromus hordeaceus*
         10. Lemmas glabrous or nearly so.
            11. Sheaths glabrous or the basal one thinly puberulent; awns of lemmas 0-6 mm long; many of the lemmas equaled or even surpassed by their paleas . . . . . *Bromus secalinus*
            11. At least the proximal sheaths pubescent or long-hirsute; awns of lemmas more or less than 6 mm long; lemmas equaling or surpassing their paleas.
               12. Larger lemmas, from midnerve to margin, more than 2.6 mm wide . . . . . *Bromus squarrosus*
               12. Larger lemmas, from midnerve to margin, less than 2.6 mm wide.
                  13. Panicle branches strongly ascending, shorter than the spikelets; panicle compact.
                     Lemmas plicate, conspicuously nerved . . . . . *Bromus hordeaceus pseudothominei*
                     Lemmas with the nerves flush . . . . . *Bromus racemosus*
                  13. Panicle branches ascending to more often spreading or drooping, as long as or longer than some of the spikelets; panicle open.
                     14. Sheaths densely pubescent with soft tangled hairs; longer awns more than twice as long as the shortest awn . . . . . *Bromus japonicus*
                     14. Sheaths spreading to retrorsely pilose with stiff straight hairs; longer awns less than twice as long as the shortest awn.
                        Lemmas less than 7.8 mm long, separated no more than 1.5 mm along the rachis . . . . *Bromus racemosus*
                        Lemmas more than 7.8 mm long, separated mostly more than 1.5 mm along the rachis . . . . . *Bromus commutatus*

BRUNNERA *macrophylla*

BUCHLOË *dactyloides*

BÜCHNERA americana

BUGLOSSOIDES *arvense*

BULBOSTYLIS capillaris

BUTOMACEAE: One genus in our area . . . . . BUTOMUS

BUTOMUS *umbellatus*

BUXACEAE
A. Leaves dentate, appearing alternate . . . . . PACHYSANDRA
A. Leaves entire, opposite . . . . . BUXUS

BUXUS *sempervirens*

CABOMBACEAE: One genus in our area . . . . . BRASENIA

CACTACEAE: One genus in our area . . . . . OPUNTIA

CAESALPINIACEAE
A. Plants herbaceous.
   Larger leaflets more than 7 mm wide, insensitive to touch; stipules deciduous . . . . . SENNA

Leaflets less than 7 mm wide, sensitive to touch; stipules persistent . . . . . CHAMAECRISTA
A. Plants woody.
B. Leaves simple . . . . . CERCIS
B. Leaves compound.
Leaflets ovate, acuminate, 1.5 cm or more wide, widest below the middle . . . . . GYMNOCLADUS
Leaflets oblong, obtuse or mucronate, less than 1.5 cm wide, widest near the middle . . . . . GLEDITSIA

CAKILE
1. Terminal segment of silique with a thick, bluntly pyramidal beak no longer than the seed-bearing body, the widest portion of the larger siliques 5 mm or more; petals commonly fewer than 4 or even absent . . . . . *Cakile edentula*
1. Terminal segment of silique with an attenuate beak notably longer than the seed-bearing body, the widest portion of the larger siliques less than 5 mm wide; petals usually 4 . . . . . **Cakile lacustris**

CALAMAGROSTIS
1. Awns of lemmas more than 3.2 mm long . . . . . *Calamagrostis ×acutiflora*
1. Awns of lemmas less than 3.2 mm long.
Panicle open in anthesis, the branches loosely spreading; blades usually flat, mostly 4 mm or more wide; culms essentially smooth just below the panicle . . . . . **Calamagrostis canadensis**
Panicle always strict, the branches appressed-ascending; blades involute, less than 4 mm wide; culms harshly scabrous for a few centimeters below the panicle . . . . . **Calamagrostis stricta inexpansa**

CALAMINTHA arkansana

CALAMOVILFA longifolia magna

CALIBRACHOA *parviflora*

CALLA palustris

CALLIRHOË
1. Involucral bracts absent . . . . . *Callirhoë alcaeoides*
1. Involucral bracts 3.
Leaves deltate-lanceolate, crenate to more or less lobed or pinnatifid near the base; peduncle with few-several flowers; calyx lobes less than 7 mm long . . . . . **Callirhoë triangulata**
Leaves subrotund, deeply palmately lobed, the primary lobes usually 3-lobed at the apex; peduncle usually 1-flowered; calyx lobes more than 7 mm long. . . . . *Callirhoë involucrata*

CALLITRICHACEAE: One genus in our area. . . . . CALLITRICHE

CALLITRICHE
1. Fruits as broad as long, rounded at the base, less than 1 mm long, rarely more than 0.8 mm long; stigmas about twice as long as the fruits; punctations of fruit not in distinct rows . . . . . **Callitriche heterophylla**
1. Fruits about 0.2 mm longer than broad, narrowed at the base, commonly more than 0.8 mm long; stigmas about equaling the fruits; punctations of fruit in distinct rows . . . . . **Callitriche palustris**

CALOPOGON
1. Clavate hairs at the tip of the lip pale-pink; flowering stem subequaling the leaf, to 30 cm high . . . . . **Calopogon oklahomensis**
1. Clavate hairs at the tip of the lip white or with a tincture of yellow; flowering stem notably longer than the leaf, more than 30 cm high . . . . . **Calopogon tuberosus**

CALTHA palustris

CALYLOPHUS serrulatus

CALYPTOCARPUS *vialis*

CALYSTEGIA
1. Herbage glabrous or sparsely pubescent along the stems and petioles; leaf blades deltate-ovate to narrowly sagittate-lanceolate, manifestly cordate, and less than twice the length of the petioles.
Larger bracteoles 1.5 cm or more wide, overlapping and saccate; sinus quadrate, the inner margin of the basal lobe reaching the blade 2 mm or more from the petiole . . . . . **Calystegia silvatica fraterniflora**
Bracteoles less than 1.5 cm wide, not or only scarcely overlapping, not or only weakly saccate; sinus not quadrate, the inner margin of the basal lobes reaching the blade within 2 mm of the petiole . . . . . **Calystegia sepium**
1. Herbage pubescent throughout; leaf blades subtruncate to cordate with simple rounded lobes.
2. Petioles to 2 cm long, less than ⅓ as long as the midvein of oblong to narrowly obovate blades . . . . . **Calystegia spithamaea**
2. Longer petioles more than 2 cm long, usually more than ⅓ as long as the midvein of the deltate, deeply cordate or hastate blades.
Flowers double, less than 4 cm long; leaves strongly hastate with widely spreading lobes . . . . . *Calystegia pubescens*
Flowers single, more than 4 cm long; leaves deeply cordate with rhombic lobes . . . . . **Calystegia sepium angulata**

CAMASSIA scilloides

CAMELINA
1. Fruits to 7 mm long and 5 mm wide; at least the proximal part of the stem puberulent with appressed and spreading hairs . . . . . *Camelina microcarpa*
1. Fruits more than 7 mm long and more than 5 mm wide; stem glabrous or with minute appressed hairs . . . . . *Camelina sativa*

CAMPANULA
1. Stem leaves serrate to denticulate-crenate, more than 1 cm wide, ovate, lanceolate, or narrowly deltate, acuminate or acute; flowers mostly subglomerate in elongate terminal spikes.
   Calyx with spreading trichomes more than 0.5 mm long . . . . . *Campanula trachelium*
   Calyx glabrous or retrorsely scabrid with hairs less than 0.5 mm long . . . . . *Campanula rapunculoides*
1. Stem leaves entire to shallowly serrate, less than 1 cm wide, linear to lance-elliptic; flowers solitary on slender pedicels.
   2. Stems smooth, glabrous to closely puberulent . . . . . **Campanula rotundifolia**
   2. Stems harshly scabrous with retrorse, stiff-hispid hairs.
      Corollas less than 9 mm long, the larger calyces to 4 mm long at anthesis; pedicels less than 4 cm long . . . . . **Campanula aparinoides**
      Corollas more than 9 mm long, the larger calyces usually more than 4 mm long; longer pedicels more than 4 cm long . . . . . **Campanula uliginosa**

CAMPANULACEAE
A. Flowers sessile or subsessile in the axils of sessile or cordate-clasping leaf-like bracts . . . . . TRIODANIS
A. Flowers glomerulate in elongate terminal spikes or long-pedunculate in terminal inflorescences; leaves petiolate or sessile, but never clasping.
   Flowers pedicellate, the corolla lobes shorter than the tube; perennial . . . . . CAMPANULA
   Flowers sessile, the corolla lobes much longer than the tube; winter annual or biennial . . . . . CAMPANULASTRUM

CAMPANULASTRUM americanum

CAMPSIS *radicans*

CANNABINACEAE
A. Plant erect, stems never spinulose; leaves compound, mostly alternate distally . . . . . CANNABIS
A. Plant twining, stems usually retrorsely spinulose; leaves not compound, mostly opposite distally . . . . . HUMULUS

CANNABIS *sativa*

CAPNOIDES sempervirens

CAPRIFOLIACEAE
A. Plants herbaceous; flowers axillary . . . . . TRIOSTEUM
A. Plants woody vines or shrubs; flowers axillary or not.
   Corollas campanulate, less than 10 mm long, with the lobes essentially all similar; fruits each maturing 2 seeds . . . . . SYMPHORICARPOS
   Corollas tubular, usually more than 10 mm long, with the lobes unequal; fruits each maturing 3 or more seeds . . . . . LONICERA

CAPSELLA *bursa-pastoris*

CARAGANA *arborescens*

CARDAMINE
1. Leaves simple, ovate, repand-dentate to subentire.
   Distal internodes thinly to copiously spreading-pubescent; cauline leaves not more than 5; flowers normally pink or purple-tinged; blooming period usually ending by mid-May . . . . . **Cardamine douglassii**
   Distal internodes glabrous, but often puberulent toward the base; cauline leaves mostly 5 or more; flowers white; blooming period extending into mid-June . . . . . **Cardamine bulbosa**
1. Leaves pinnately lobed or divided.
   2. Petals showy, more than 6 mm or more long; plant perennial . . . . . **Cardamine pratensis palustris**
   2. Petals small, less than 6 mm long or absent; plants annual or biennial (Cardamine pensylvanica rarely a short-lived perennial).
      3. Leaves auriculate at the base . . . . . *Cardamine impatiens*
      3. Leaves not auriculate at the base.
         4. Petioles of cauline leaves ciliate at the base.
            Stems at least sparsely pubescent nearly or quite throughout . . . . . *Cardamine flexuosa*
            Stems glabrous or thinly hispid at the base . . . . . *Cardamine hirsuta*
         4. Petioles of cauline leaves eciliate.
            Leaves pinnatifid, the terminal lobes linear, less than 2 mm wide . . . . . **Cardamine parviflora arenicola**
            Leaves pinnate, the terminal lobes broadly spatulate to ovate, more than 2 mm wide . . . . . **Cardamine pensylvanica**

CARDUUS
1. Heads solitary, nodding, the involucres more than 2.5 cm in diameter; peduncles naked or the proximal portions somewhat spiny-winged . . . . . *Carduus nutans*
1. Heads 1 to several, erect, the involucres up to 2.5 cm in diameter; peduncles spiny-winged throughout . . . . . *Carduus acanthoides*

CAREX
1. Spikes sessile, alike; achenes lenticular, the stigmas 2; proximal sheaths green, brown, or nigrescent, never with tinges of red; staminate and pistillate flowers mixed, except in dioecious individuals of Carex bromoides, Carex deweyana, or Carex sterilis.

2. Spikes androgynous, the dried stamens on maturing spikes usually exserted from the terminal scales of the spike, with the perigynia filling the middle and proximal scales; plants monoecious . . . . . GROUP 1
2. Spikes gynecandrous, the proximal scales on at least the terminal spike remaining empty of perigynia; plants monoecious or dioecious . . . . . GROUP 2

1. Some or all of the spikes pedunculate; achenes lenticular or trigonous, the stigmas 2 or 3; sheaths sometimes tinged with red; at least some of the spikes wholly pistillate, the staminate flowers on separate, usually terminal spikes.
3. Stigmas 2; achenes lenticular . . . . . GROUP 3
3. Stigmas 3; achenes trigonous.
4. Leaves, sheaths, or perigynia pubescent (perigynia sometimes nearly glabrous in Carex tonsa, in which the pistillate spikes are all clustered at the base of the dense tuft). . . . . GROUP 4
4. Plants, including the perigynia, glabrous throughout, or the leaf margins and/or culm angles scabrous (sheaths sometimes scaberulous-pubescent at the summit in *Carex acutiformis*).
Style persistent, not jointed with the achene, becoming hardened and of about the same texture as the achene; perigynia sometimes more than 7 mm long. . . . . GROUP 5
Style deciduous, jointed near the base, eventually disarticulating from the achene, leaving it beakless or merely short-apiculate; perigynia to 7 mm long. . . . . GROUP 6

GROUP 1

1. Culms solitary, colonial by elongating stolons or rhizomes, not forming tufts or tussocks.
2. Culms arising from the axils of old dried leaves on last year's prostrate culms; plant of sphagnum bog. §CHORDORRIZAE . . . . . **Carex chordorrhiza**
2. Culms arising from subterranean rhizomes; habitats various.
3. Perigynia 5-6 mm long; plants of dry sand prairie and Black Oak savanna. §AMMOGLOCHIN . . . . . **Carex siccata**
3. Perigynia 2-4.5 mm long; habitat various.
4. Summit of the hyaline band on sheath conspicuously copper-colored or dotted. §HELEOGLOCHIN
Sheaths pale, hyaline below the summit; perigynia not concealed by their subtending scales . . . . . **Carex diandra**
Sheaths strongly suffused with copper at and near the summit; perigynia essentially concealed by their subtending scales . . . . . **Carex prairea**
4. Summit of the hyaline band on the distal sheaths pale, not distinctly copper-colored or maculate.
5. Culms usually more than 5 dm tall; perigynia nerved on the ventral face, membranaceous, distinctly wing-margined; plants native in wetlands. §HOLARRHENAE . . . . . **Carex sartwellii**
5. Culms less than 5 dm tall; perigynia nerveless on the ventral face, coriaceous, nearly wingless; plants adventive in disturbed, usually dryish habitats. §DIVISAE
Leaves canaliculate, to 1.5 mm wide; rhizomes filiform; perigynia to 3 mm long . . . . . *Carex duriuscula*
Leaves flat, typically more than 1.5 mm wide; rhizomes stout; larger perigynia more than 3 mm long . . *Carex praegracilis*

1. Culms in tufts, cespitose, not solitary from stolons or rhizomes.
6. Perigynia fewer than 4 per spike; plant very delicate. §DISPERMAE . . . . . **Carex disperma**
6. Perigynia 4 or more per spike; plants mostly coarser.
7. Culms flaccid, usually sharply angled to winged, flattening under pressure, without strong cartilaginous nerves; leaf sheaths loose around the culms, with green mottling. §VULPINAE
8. Perigynia ovate, 3-5 mm long, quickly contracted into a beak shorter than to about as long as the body; sheaths weakly to strongly russet-maculate on the ventral band.
Larger perigynia often more than 4 mm long, the dorsal face notably 3-5 nerved . . . . . **Carex conjuncta**
Perigynia to 4 mm long, nearly or quite nerveless on the dorsal face . . . . . **Carex alopecoidea**
8. Perigynia lanceolate, the larger more than 5 mm long, tapering into a beak quite as long as or longer than the body; sheaths without russet maculae.
9. Beak twice or more as long as the body; larger leaves more than 8 mm wide.
Perigynia to 6 mm long; panicles to 8 cm long . . . . . **Carex stipata maxima**
Perigynia more than 6 mm long; larger panicles more than 8 cm long . . . . . **Carex crus-corvi**
9. Beak less than twice as long as the body; leaves to 8 mm wide.
Hyaline band of leaf sheaths cross-puckered, not thickened and cartilaginous at the summit . . . . . **Carex stipata**
Hyaline band of leaf sheaths essentially smooth, noticeably thickened at the summit . . . . . **Carex laevivaginata**
7. Culms slender, firm to wiry, not compressible under pressure, or if somewhat so, then with 2-several strong cartilaginous nerves on each face; leaf sheaths loose or tight around the culm, without green mottling.
10. Spikes numerous, more than 12, paniculate-spiciform.
11. Sheaths smooth, not cross-puckered on the ventral band, the distal portions copper-colored or dotted. §HELEOGLOCHIN
Sheaths pale, hyaline below the summit; perigynia not concealed by their subtending scales . . . . . **Carex diandra**
Sheaths strongly suffused with copper at and near the summit; perigynia essentially concealed by their subtending scales . . . . . **Carex prairea**
11. Sheaths cross-puckered, at least near the summit in age, never discolored or dotted. §MULTIFLORAE
12. Leaves primarily exceeding the culms; perigynia lance-ovate, tapering into the beak, the larger beaks more than 0.7 mm long; spikes often more than 5.5 cm long . . . . . **Carex vulpinoidea**
12. Leaves shorter than the culms; perigynia ovate, abruptly contracted into a beak to 0.7 mm long; spikes rarely more than 5.5 cm long.
Larger perigynia more than 1.8 mm wide, brownish to greenish-yellow, commonly with 4 or more nerves dorsally. . . . . **Carex annectens**
Perigynia to 1.8 mm wide, becoming golden-yellow, 0-3 nerved dorsally . . . . . **Carex annectens xanthocarpa**
10. Spikes fewer than 12, in simple spiciform inflorescences. §PHAESTOGLOCHIN
13. Larger leaves more than 4.5 mm wide; sheaths loose, pale with green mottling or septa.
14. Lower spikes remote along the axis, the inflorescence usually 3-10 cm long . . . . . **Carex sparganioides**
14. All or most of the spikes aggregated into an ovoid or oblong-cylindric head less than 5 cm long.
15. Pistillate scales obtuse to acute or weakly acuminate, the tips not or only scarcely reaching the bases of the beaks . . . . . **Carex cephaloidea**
15. Pistillate scales with the attenuate tips or awns routinely surpassing the bases of the beaks.

Ventral leaf sheath thickened at the summit, concave, commonly intact; long-attenuate to short-awned scales not reaching the tips of the beaks of the perigynia . . . . . **Carex aggregata**
Ventral leaf sheath scarcely thickened at the summit, truncate, commonly torn; awns of scales commonly reaching or exceeding the beaks of the perigynia . . . . . **Carex gravida**

13. Leaves to 4.5 mm wide; sheaths tight, green or pale throughout.
16. Individual spikes barely, if at all, distinguishable, aggregated into a dense terminal head less than 1.8 cm long.
17. Leaves not notably papillose on the adaxial surface; pistillate scale bodies to ⅔ as long as the perigynia; perigynia less than 2 mm wide.
Perigynia ovate, broadest well above the rounded to broadly cuneate base, the beaks serrulate; leaf blades often 3-5 mm wide . . . . . **Carex cephalophora**
Perigynia deltoid, broadest at the truncate to subcordate base, the beaks smooth or minutely serrulate; leaves less than 3 mm wide. . . . . *Carex leavenworthii*
17. Leaves distinctly finely papillose on the adaxial surface; pistillate scale bodies more than ⅔ as long as the perigynia; larger perigynia more than 2 mm wide.
18. Spikes aggregated in subglobose heads to 1.5 times as long as wide; perigynia nearly or quite nerveless on the ventral face. . . . . *Carex mesochorea*
18. Spikes aggregated in heads more than 1.5 times as long as wide; perigynia usually with several thickened veins on the ventral face.
Pistillate scales to 2 mm wide, clearly narrower than the perigynia, acute or with an awn to 1.7 mm long . . . . . **Carex muehlenbergii**
Larger pistillate scales more than 2 mm wide, nearly or quite as wide as the perigynia, with awns prevailingly more than 1.7 mm long . . . . . *Carex austrina*
16. Spikes normally quite discernible, in a close elliptic to oblong head usually more than 1.8 cm long, to often remote along the inflorescence axis.
19. Larger perigynia more than 4.2 mm long . . . . . *Carex spicata*
19. Perigynia less than 4.2 mm long.
20. Spikes pale-green to stramineous; perigynia of uniform texture, not spongy-thickened at the base; stems stiff, harshly scabrous below the inflorescence; leaves firm . . . . . **Carex muehlenbergii**
20. Spikes usually green; perigynia spongy-thickened and often wrinkled below the middle; stems slender, smooth or slightly scaberulous; leaves weak.
21. Margins of the perigynia smooth along the beak; spikes distinct, but not remote . . . . . *Carex texensis*
21. Margins of perigynia minutely scaberulous along the beak; proximal spikes remote.
Stigmas mostly coiled, 0.07 mm or more thick, shorter than to scarcely as long as the beak; larger leaves more than 1.9 mm wide . . . . . **Carex rosea**
Stigmas straight or merely flexed, to 0.06 mm thick, typically as long as or longer than the beak; leaves to 1.9 mm wide . . . . . **Carex radiata**

GROUP 2

1. Perigynia plump, with rounded to narrowly-rimmed margins, appressed or in some species reflexed or spreading at maturity.
2. Perigynia appressed or more or less spreading-ascending, with rounded margins.
3. Perigynia 4 mm or more long, tapering into a manifest beak. §DEWEYANAE
Perigynia lanceolate, obviously nerved on the convex face; leaves up to 2.5 mm wide . . . . . **Carex bromoides**
Perigynia ovate-lanceolate, nerveless or only weakly nerved below the middle on the convex face; larger leaves more than 2.5 mm wide . . . . . **Carex deweyana**
3. Perigynia up to 4 mm long, short-beaked or very nearly beakless. §GLAREOSAE
4. Perigynia up to 2.9 mm long; spikes (2) 3-several in stiff, racemose inflorescences.
Spikes globose, rarely more than 5 mm long; perigynia of proximal spikes fewer than 10, without pale papillae; scales not reaching the base of the beak; leaves bright-green, less than 2 mm wide, not papillose abaxially, the hyaline ventral band russet-maculate at least near the summit . . . . . **Carex brunnescens**
Spikes ovoid-cylindric, mostly longer than wide, the larger usually more than 5 mm long; perigynia typically more than 10 per spike, minutely pale-papillose above the middle; scales reaching the base of the beak; leaves minutely pale-papillose abaxially, the larger ones often wider than 2 mm, the hyaline ventral band without russet maculae . . . . . **Carex canescens**
4. Larger perigynia more than 2.9 mm long; spikes in a head or 2-3 and racemose in flexed capillary inflorescences.
Spikes remote, with fewer than 5 flowers. . . . . **Carex trisperma**
Spikes close, in a head at the tip of the culm, often with more than 5 flowers . . . . . **Carex tenuiflora**
2. Perigynia often spreading or reflexed at maturity, with narrowly rimmed margins. §STELLULATAE
5. Perigynia ovate, widest near the middle and tapering to more or less rounded at the base; beaks smooth . . . . . **Carex seorsa**
5. Perigynia widest at or near the rounded to truncate base; beaks serrulate.
6. Terminal spike either wholly staminate or pistillate with the staminate portion absent or less than 2 mm long . . . . . **Carex sterilis**
6. Terminal spike pistillate distally, with the staminate portion more than 2 mm long.
7. Perigynia nerveless on the ventral face or some with a few short nerves ending near the middle . . . . . **Carex interior**
7. Many of the perigynia with 1-several fine but distinct nerves extending beyond the middle.
8. Larger perigynia typically more than 3 mm long, widely flaring at the base, but only weakly clasping the stipe, the base rounded . . . . . **Carex echinata**
8. Perigynia less than 3 mm long, the base of perigynium with a strong tendency to be widely clasping around the stipe, the base subtruncate.
Larger leaves to 1.6 mm wide; inflorescence to 20 mm long . . . . . **Carex atlantica capillacea**
Larger leaves more than 1.6 mm wide; inflorescence mostly more than 20 mm long . . . . . **Carex atlantica**
1. Perigynia scale-like, with conspicuously winged margins, appressed or spreading, but never reflexed at maturity. §OVALES
9. Bracts foliaceous, the lowermost dilated proximally and subspathiform . . . . . **Carex sychnocephala**
9. Bracts absent or setaceous, not notably dilated proximally.
10. Pistillate scales equaling or exceeding the tips of the mature perigynia.
Perigynia ovate, to 4.5 mm long, notably nerved on the ventral face, the beaks ciliate-serrulate . . . . . **Carex argyrantha**

Perigynia lanceolate, the larger more than 4.5 mm long, nerveless on the ventral face, the beaks nearly or quite entire . . . . . *Carex praticola*

10. Pistillate scales exceeded by the tips of the mature perigynia.
    11. Spikes 1.5 cm or more long; larger perigynia 7 mm or more long; sterile culms conspicuous . . . . . **Carex muskingumensis**
    11. Spikes less than 1.5 cm long, rarely more than 1.2 cm long; perigynia less than 7 mm long; sterile culms present or absent.
        12. Larger perigynia more than 2 mm wide.
            13. Many of the scales notably and prevailingly aristate or awn-tipped.
                14. Larger perigynia 6 mm or more long, the larger beaks 2 mm or more long . . . . . **Carex missouriensis**
                14. Perigynia smaller.
                    Perigynia widest at or below the middle, to 3 mm wide; spikes clavate at the base, the lowest remote from the one above; leaves less than 2.6 mm broad . . . . . **Carex straminea**
                    Perigynia widest above the middle, the larger more than 3 mm wide; spikes not strongly clavate at the base, the lowest at least slightly overlapping the one above; larger leaves more than 2.6 mm broad . . . . . **Carex alata**
            13. Pistillate scales obtuse to acute or acuminate or a few weakly aristate.
                15. Perigynia bodies widest above the middle.
                    16. Perigynia nerveless or only weakly nerved on the ventral face.
                        Body of perigynium rounded at the base, the wings nearly as wide below the middle as above, tapering quickly into a narrow beak about 1 mm long . . . . . **Carex cumulata**
                        Body of perigynium rhombic, broadly cuneate at the base, the wings much reduced in width below the middle, gradually tapering into a beak about 1.5 mm long . . . . . **Carex suberecta**
                    16. Perigynia mostly strongly nerved on the ventral face.
                        Wings of perigynia ending 0.2-0.4 mm below the tip, the beaks nearly parallel-sided distally, characteristically spreading at maturity; pistillate scales acute at the tip . . . . . **Carex albolutescens**
                        Wings of perigynia extending to the narrowly deltate tips, the beaks mostly remaining appressed; pistillate scales acute, but rounded at the very tip . . . . . **Carex longii**
                15. Perigynia bodies widest at or below the middle.
                    17. Body of perigynium to 2.2 mm wide, the widest part about 1.1 mm from the base; achenes to 1.5 mm long . . . . . **Carex festucacea**
                    17. Larger perigynia more than 2.2 mm wide, the widest part more than 1.2 mm from the base; achenes 1.5 mm or more long.
                        18. Perigynia notably nerved on the ventral face; scales obtuse to acute, shorter than to barely reaching the base of the beak.
                            Larger perigynia more than 5 mm long, the wings becoming coppery-colored, translucent, and often erose along the shoulders . . . . . **Carex bicknellii**
                            Perigynia rarely more than 5 mm long, the wings green, opaque, and entire . . . . . **Carex molesta**
                        18. Perigynia nerveless or only faintly nerved on the ventral face; scales long-acute or acuminate, most of them much surpassing the base of the beak.
                            Spikes acute; tips of perigynia appressed, the bodies obviously longer than wide . . . . . **Carex suberecta**
                            Spikes obtuse; tips of perigynia spreading at maturity, the bodies not much longer than wide . . . . . **Carex brevior**
        12. Perigynia never more than 2 mm wide.
            19. Perigynia prevailingly cuneate at the base, the wing usually narrowed conspicuously below the middle; leaf sheaths loose near the summit, sharp-edged, commonly with a wing continuous with the midrib or edges of the blade; sterile leafy culms present.
                20. Spikes globose, the perigynia rosulate-spreading, the beaks typically becoming flexed outwardly, obscuring the scales; sheaths with the inner band green-striate, usually rusty tinged at the summit or in the ligule . . . . . **Carex cristatella**
                20. Spikes longer than wide, the perigynia appressed or ascending, leaving the scales quite apparent; sheaths with the inner band hyaline toward the summit, without tinctures of rust.
                    21. Inflorescence flexuous, all spikes, except the distal ones, not or only slightly overlapping the one above it, the larger with fewer than 35 perigynia; beaks of the perigynia notably divergent from the perigynia above it . **Carex projecta**
                    21. Inflorescence stiff, all spikes, except occasionally the proximal spikes, overlapping, the larger with more than 35 perigynia; beaks appressed to the perigynia above it.
                        Most perigynia 3.1 times as long as wide or longer, often 4 mm or more long . . . . . **Carex tribuloides**
                        Perigynia less than 3.1 times as long as wide, 3-4 mm long . . . . . **Carex sangamonensis**
            19. Perigynia cuneate to rounded at the base, typically notably winged all the way to the stipe; leaf sheaths tight (loose in Carex normalis), without strong edges or wings; sterile leafy culms usually absent (commonly present in Carex normalis).
                22. Perigynia mostly more than 2.5 times as long as wide, the larger ones usually 4 mm or more long, the distance from the top of the achene to the beak tip mostly more than 2.2 mm.
                    23. Perigynia with the tips widely spreading, the spikes remote from each other; pistillate scales obtuse to acute . . . . . **Carex echinodes**
                    23. Perigynia ascending, the spikes congested or the lowest nearly or quite touching the one above it; pistillate scales acuminate.
                        Perigynia nearly all less than 1.3 mm wide; longest internode between the spikes less than 3 mm long . . . . . **Carex crawfordii**
                        Perigynia mostly more than 1.3 mm wide; longest internode 3 mm or more long . . . . . **Carex scoparia**
                22. Perigynia less than 2.5 times as long as wide, less than 4 mm long, the distance from the top of the achene to the beak less than 2.2 mm.
                    24. Perigynia widest at or above the middle, prevailingly 1.7 mm wide or wider.
                        25. Perigynia widest about the middle, the widest part about 1.1 mm from the base . . . . . **Carex festucacea**
                        25. Perigynia widest above the middle, the widest part more than 1.2 mm from the base.
                            Wings of perigynia ending 0.2-0.4 mm below the tip, the beaks nearly parallel-sided distally, characteristically spreading at maturity; pistillate scales acute at the tip . . . . . **Carex albolutescens**
                            Wings of perigynia extending to the narrowly deltate tips, the beaks mostly remaining appressed; pistillate scales acute, but rounded at the very tip . . . . . **Carex longii**
                    24. Perigynia widest below the middle, many less than 1.7 mm wide.

26. Spikes longer than wide, often clavate at the base, congested into an ovoid spike to 2 cm long; the tips of the perigynia appressed or strongly ascending . . . . . **Carex bebbii**
26. Spikes nearly as wide as long, not or only shallowly clavate, well separated in spikes more than 2 cm long; tips of the perigynia spreading in age.
    27. Beaks of perigynia appressed or strongly ascending, stramineous or rufous at maturity, exceeding the scales by less than 0.9 mm; leaf sheaths green throughout at the summit, the collar commonly minutely papillose . . . . . **Carex tenera**
    27. Beaks of perigynia spreading, neither stramineous nor with rufous tinctures at maturity, many exceeding the scales by 0.9 mm or more; leaf sheaths often pale-mottled, utterly smooth at the summit.
        Proximal internodes of inflorescence less than 11 mm long, stiff; perigynia less than 4 mm long, to 2.2 times as long as wide; larger leaves more than 3.8 mm wide . . . . . **Carex normalis**
        Proximal internodes of inflorescence more than 11 mm long, commonly flexed or nodding; larger perigynia usually more than 4 mm long and more than 2.2 times as long as wide; leaves less than 3.8 mm wide . . . . . **Carex echinodes**

GROUP 3

1. Plants less than 4 dm tall; leaves less than 5 mm wide; spikes less than 3 cm long. §BICOLORES
    Median internodes of lateral spikes no more than 0.7 mm long, concealed by the densely disposed perigynia . . . . . **Carex garberi**
    Median internodes of lateral spikes 0.7 mm or more long, evident between the loosely disposed perigynia . . . . . **Carex aurea**
1. Plants becoming more than 4 dm tall; larger leaves usually more than 5 mm wide; larger spikes normally more than 3 cm long. §PHACOCYSTIS
    2. Pistillate scales setaceous-awned, much longer than the perigynia . . . . . **Carex crinita**
    2. Pistillate scales obtuse to acuminate, shorter than to about twice as long as the perigynia.
        3. Beaks of perigynia elongate, the larger ones more than 0.4 mm long.
            Perigynia notably nerved on the faces; beak bidentate . . . . . *Carex nebrascensis*
            Perigynia nerveless on the faces, or inconspicuously nerved near the base; beak entire or erose . . . . . **Carex torta**
        3. Beaks of perigynia absent or merely an apiculus to 0.4 mm long.
            4. Lowermost sheaths remaining intact, with well developed blades, not disintegrating into pinnate fibrillose filaments; perigynia broadest at or above the middle.
                Perigynia essentially nerveless; staminate spikes 2 or more . . . . . **Carex aquatilis**
                Perigynia conspicuously few-nerved; staminate spike 1 . . . . . **Carex nigra**
            4. Lowermost sheaths bladeless, typically disintegrating into pinnate fibrillose filaments; perigynia broadest mostly at or below the middle.
                5. Perigynia to 2.3 (2.5) mm long, nearly as wide as long, nerveless; scales notably longer than the perigynia throughout the spike; staminate scales brown or stramineous; lowest sheaths brown . . . . . **Carex haydenii**
                5. Central perigynia more than 2.3 mm long, more or less tapering to the tip, usually notably nerved; scales shorter than to not much exceeding the perigynia; staminate scales tinged with purple; lowest sheaths mostly deep-red or purple.
                    Ligule shallowly U-shaped, much shorter than the width of the blade . . . . . **Carex emoryi**
                    Ligule sharply V-shaped, longer than the width of the blade . . . . . **Carex stricta**

GROUP 4

1. Perigynia glabrous.
    2. Perigynia less than 3.5 mm long. §POROCYSTIS
        3. Terminal spike staminate throughout.
            Perigynia beakless, weakly nerved; proximal sheaths brown . . . . . **Carex pallescens**
            Perigynia with a distinct annular beak, thick-nerved; proximal sheaths red . . . . . **Carex torreyi**
        3. Terminal spike pistillate at the summit.
            Pistillate scales long-tapering, exceeding the perigynia . . . . . *Carex bushii*
            Pistillate scales obtuse to short-apiculate, shorter than the perigynia . . . . . **Carex hirsutella**
    2. Perigynia more than 3.5 mm long.
        4. Perigynia more than 6 mm long, with slender teeth 1 mm or more long. §CAREX . . . . . **Carex atherodes**
        4. Perigynia up to 6 mm long; teeth absent or much less than 1 mm long.
            5. Spikes erect, the terminal one entirely staminate; beak of perigynium notably curved. §GRISEAE . . . . . **Carex hitchcockiana**
            5. Spikes drooping, the terminal one pistillate above; beak of perigynium straight. §HYMENOCHLAENAE
                Pistillate scales obtuse to short-apiculate, shorter than the perigynia . . . . . **Carex formosa**
                Pistillate scales long-attenuate to awned, about equaling or exceeding the perigynia . . . . . **Carex davisii**
1. Perigynia pubescent or scabrous or if glabrous, then pistillate spikes embedded at the base of a dense leafy tuft.
    6. Leaves pubescent.
        7. Terminal spike staminate throughout; perigynia more than 3 mm long.
            Plant running; scales pubescent dorsally. §CAREX . . . . . *Carex hirta*
            Plant cespitose; scales glabrous. §HIRTIFOLIAE . . . . . **Carex hirtifolia**
        7. Terminal spike pistillate except near the base; perigynia less than 3 mm long. §POROCYSTIS
            Spikes thick-cylindric, less than 2 cm long; culms typically surpassed by the leaves; anthers to 1.6 mm long . . . . . **Carex swanii**
            Spikes slender, the larger more than 2 cm long; culms typically surpassing the leaves; longer anthers more than 1.6 mm long . . . . . **Carex virescens**
    6. Leaves glabrous or scabrous.
        8. Larger pistillate spikes 1.5 cm or more long.
            9. Perigynia more than 5 mm long.
                Spikes globose, about 3 cm in diameter. §LUPULINAE . . . . . **Carex grayi**
                Spikes elongate, about 1 cm in diameter. §CAREX . . . . . **Carex trichocarpa**
            9. Perigynia less than 5 mm long.
                10. Perigynia scabrid or rough-papillose.
                    Larger leaves more than 6 mm wide. §ANOMALAE . . . . . **Carex scabrata**
                    Leaves less than 6 mm wide. §THURINGIACA . . . . . *Carex flacca*

10. Perigynia distinctly pubescent. §PALUDOSAE
    Leaves without a midrib, filiform-convolute toward the tip, to 2 mm wide . . . . . **Carex lasiocarpa americana**
    Leaves with a distinct midrib, flat or only weakly convolute, the larger blades more than 2 mm wide . . . . . **Carex pellita**

8. Pistillate spikes all less than 1.5 cm long.
    11. Perigynia conspicuously 3-angled as a result of the sharply trigonous achenes or the staminate spike pedunculate or both. §DIGITATAE
        Pistillate scales cuspidate; terminal spike partly pistillate . . . . . **Carex pedunculata**
        Pistillate scales obtuse to acute; terminal spike entirely staminate . . . . . **Carex richardsonii**
    11. Perigynia subterete, the staminate spikes nearly or quite sessile. §ACROCYSTIS
        12. All or many of the pistillate spikes borne on short culms near the base of the plant, often difficult to discern without parting the leaves.
            13. Perigynia bodies glabrous . . . . . **Carex tonsa**
            13. Perigynia bodies pubescent, at least above the middle.
                Perigynia to 3 mm long, the beak to 1 mm long . . . . . **Carex umbellata**
                Perigynia more than 3 mm long, the longer beaks more than 1 mm long . . . . . **Carex rugosperma**
        12. Pistillate spikes elevated well above the basal portion of the plant on culms nearly or quite as long as the leaves.
            14. Larger overwintering leaves 3 mm or more wide . . . . . **Carex communis**
            14. Leaves all less than 3 mm wide.
                15. Body of perigynium, excluding the beak and swollen stipe, nearly or quite as wide as long; staminate spikes often more than 1.5 cm long and 2 mm wide.
                    Beak of perigynium more than 0.9 mm long, at least ½ as long as the body . . . . . **Carex inops heliophila**
                    Beak of perigynium less than 0.9 mm long, less than ½ as long as the body . . . . . **Carex pensylvanica**
                15. Body of perigynium clearly longer than wide; staminate spikes to 1.5 cm long and 2 mm wide.
                    16. Perigynium body much longer than its scale . . . . . **Carex peckii**
                    16 Perigynium body subequaling or shorter than its scale.
                        Median staminate scales acute to acuminate, with a strong, notably scabrous midnerve extending to the tip . . . . . **Carex albicans emmonsii**
                        Median staminate scales prevailingly obtuse to acute, the midrib scaberulous to smooth, mostly ending below the scarious tip . . . . . **Carex albicans**

GROUP 5

1. Perigynia obconic, very abruptly contracted into a slender beak, tightly packed into a dense spike, the lateral surfaces of the perigynium body concealed. §SQUARROSAE
    2. Pistillate scales with rough awns much exceeding the perigynia; culms obtusely angled . . . . . **Carex frankii**
    2. Pistillate scales shorter than the perigynia; culms acutely angled.
        Middle pistillate scales obtuse to acute at the tip; style nearly straight; spikes 1-3 or rarely 6 . . . . . **Carex typhina**
        Middle pistillate scales sharply acute to short-awned; style with a strong lateral bend near the base; spikes rarely more than 1 . . . . . **Carex squarrosa**
1. Perigynia not obconic, not or only gradually contracted into a beak, all but the proximal portions of the perigynium body easily visible.
    3. Spikes globose to broadly elliptic, scarcely if at all longer than broad.
        4. Leaves less than 3 mm wide.
            Leaves filiform-involute; culms more than 4 dm high; perigynia plump, ovoid, more than 2 mm wide, ascending. §VESICARIAE . . . . . **Carex oligosperma**
            Leaves flat; culms no more than 4 dm high; perigynia lance-linear, much less than 2 mm wide, deflexed. §LEUCOGLOCHIN . . . . . **Carex pauciflora**
        4. Leaves more than 3 mm wide.
            5. Perigynia less than 3.5 mm broad, lance-subulate; larger leaves more than 10 mm wide. §ROSTRALES . . . . . **Carex folliculata**
            5. Perigynia more than 3.5 mm broad, lance-ovate; leaves less than 10 mm wide. §LUPULINAE
                Perigynia cuneate at the base, often more than 12 per spike; achene rounded on the angles, the sides convex . . . . . **Carex grayi**
                Perigynia rounded at the base, as many as 12 per spike; achene sharply angled, the sides flat to concave . . . **Carex intumescens**
    3. Spikes long-elliptic to cylindric, clearly longer than broad.
        6. Perigynia 1 cm or more long; staminate spikes typically 1. §LUPULINAE
            Achene mostly about as long as broad, with conspicuous nipples on the summits of the angles . . . . . **Carex lupuliformis**
            Achene typically longer than broad, without distinct nipples on the summits of the angles . . . . . **Carex lupulina**
        6. Perigynia less than 1 cm long; staminate spikes 1 or more.
            7. Pistillate scales obtuse to awned, but not abruptly so. §VESICARIAE
                8. Perigynia 4 mm or more broad; achene asymmetrical with a deep crimp on one face . . . . . **Carex tuckermanii**
                8. Perigynia up to 4 mm broad; achene symmetrical.
                    9. Bract of lowest pistillate spike more than 2.7 times as long as the entire inflorescence . . . . . **Carex retrorsa**
                    9. Bract of lowest pistillate spike less than 2.7 times as long as the inflorescence.
                        Culms smooth below the inflorescence, the angles blunt; larger leaf blades more than 6 mm wide, the ligules truncate to obtuse, as long as wide or shorter . . . . . **Carex utriculata**
                        Culms scabrous below the lowest bract, the angles sharp; leaves to 6 mm wide, the ligules as long as or longer than wide . . . . . **Carex vesicaria**
            7. Pistillate scales prevailingly abruptly contracted into a scabrous awn.
                10. Longer awns of the pistillate scales longer than the blade of the scale. §VESICARIAE
                    11. Larger teeth of perigynia 0.7-2 mm long; leaf blades notably septate-nodulose.
                        Teeth of perigynia erect, up to 1.2 mm long . . . . . **Carex pseudocyperus**
                        Teeth of perigynia flaring, more than 1.2 mm long . . . . . **Carex comosa**
                    11. Teeth of perigynia to 0.7 mm long; leaf blades not notably septate.
                        Perigynia about 10-nerved, more than 2 mm broad; peduncle glabrous . . . . . **Carex lurida**
                        Perigynia with 15 or more nerves, up to 2 mm broad; peduncle scaberulous . . . . . **Carex hystericina**
                10. Pistillate scales awnless or with awns no longer than the blade of the scale.
                    12. Teeth of perigynia more than 1 mm long.

Perigynia to 8 mm long; abaxial leaf surfaces without papillae, the blades to 8 mm broad; teeth of perigynia erect or with the gap less than 1 mm wide §PALUDOSAE . . . . . **Carex laeviconica**
Larger perigynia more than 8 mm long; abaxial leaf surfaces conspicuously papillose, the blades often broader; teeth of perigynia spreading, the gap commonly more than 1 mm wide §CAREX . . . . . **Carex atherodes**

12. Teeth of perigynia less than 1 mm long. §PALUDOSAE
13. Perigynia up to 4 mm long. . . . . *Carex acutiformis*
13. Larger perigynia more than 4 mm long.
Ligule strongly V-shaped, notably longer than wide; proximal sheaths bladeless, soon becoming fibrillose; perigynia with the veins strongly expressed . . . . . **Carex lacustris**
Ligule rounded, about as long as wide; proximal sheaths blade-bearing, scarcely or not at all fibrillose; perigynia weakly nerved, the veins essentially flush. . . . . **Carex hyalinolepis**

GROUP 6

1. Terminal spike pistillate at the apex; leaves less than 1.6 mm wide or both.
2. Larger perigynia more than 4 mm long.
3. Larger perigynia up to 4.5 mm long. §DIGITATAE . . . . . **Carex pedunculata**
3. Larger perigynia more than 4.5 mm long. §HYMENOCHLAENAE
Perigynia less than 6.9 mm long. . . . . **Carex debilis rudgei**
Larger perigynia more than 6.9 mm long . . . . . **Carex debilis**
2. Perigynia up to 4 mm long.
4. Leaf blades less than 1.6 mm wide.
Perigynia to 2 mm long. §ALBAE . . . . . **Carex eburnea**
Larger perigynia more than 2 mm long. §LEPTOCEPHALAE . . . . . **Carex leptalea**
4. Larger leaf blades more than 1.6 mm wide.
5. Lowest pistillate spikes pendulous on flexuous peduncles. §HYMENOCHLAENAE
Spikes 3-5 mm broad; perigynia beaked, sharply 3-angled; proximal sheaths green or brownish . . . . . **Carex prasina**
Spikes up to 3.5 mm broad; perigynia beakless, bluntly 3-angled; proximal sheaths purple-tinged . . . . . **Carex gracillima**
5. Lowest pistillate spikes erect, sessile or on stiff peduncles.
6. Perigynia abruptly contracted into a beak ½ or more as long as the body. §CERATOCYSTIS . . . . . **Carex viridula**
6. Perigynia beakless or only subtly so.
Pistillate scales blunt, about as long as the perigynia. §SHORTIANAE . . . . . **Carex shortiana**
Pistillate scales acuminate to long-awned, exceeding the perigynia. §RACEMOSAE . . . . . **Carex buxbaumii**

1. Terminal spike entirely staminate (be alert for short, sessile staminate spikes masked by a much larger pistillate one); larger leaves more than 1.6 mm wide.
7. Larger leaves more than 1.2 cm wide.
8. Sheaths and staminate scales reddish or deep purplish-brown. §CAREYANAE
Cauline sheaths nearly or quite bladeless; perigynia to 5 mm long . . . . . **Carex plantaginea**
Cauline sheaths with well developed blades; larger perigynia more than 5 mm long . . . . . **Carex careyana**
8. Sheaths and staminate scales without purplish tints.
9. Pistillate scales less than ½ as long as the perigynia, obtuse to truncate. §LAXIFLORAE . . . . . **Carex albursina**
9. Pistillate scales more than ½ as long as the perigynia, acuminate to cuspidate.
10. Perigynia sharply triangular; larger leaves more than 1.7 cm wide. §CAREYANAE . . . . . **Carex platyphylla**
10. Perigynia obtusely angled; leaves less than 1.7 cm wide. §LAXIFLORAE
Angles of the bracteal sheaths smooth or nearly so; spikelets loosely flowered, middle internodes of rachis mostly more than 1.2 mm long . . . . . **Carex laxiflora**
Angles of the lowest bracteal sheaths notably serrulate; spikelets densely flowered, middle internodes of rachis mostly less than 1.2 mm long . . . . . **Carex blanda**
7. Leaves all less than 1.2 cm wide.
11. All or essentially all of the pistillate spikes drooping on elongate, slender, flexuous peduncles.
12. Perigynia abruptly contracted into a slender beak nearly or quite as long as the body or even longer.
Perigynia more than 5, not or only scarcely exceeded by the scales. §HYMENOCHLAENAE . . . . . **Carex sprengelii**
Perigynia 2-4 per spike, much exceeded by the leaf-like scales. §PHYLLOSTACHYAE . . . . . **Carex jamesii**
12. Perigynia nearly beakless or the beak obviously shorter than the body.
13. Basal sheaths green or brown. §CAREYANAE
14. Leaves 5 mm or less wide; lateral spikes completely pistillate . . . . . **Carex digitalis**
14. Larger leaves more than 5 mm wide; lowest 1-3 scales of lateral spikes staminate (*i.e.*, empty of perigynia).
Herbage glaucous, the larger leaves more than 8.3 mm wide; longer staminate spike 12 mm or more long . . . . . **Carex laxiculmis**
Herbage green, the leaves to 8.3 mm wide; longer staminate spike seldom more than 12 mm long . . . . **Carex copulata**
13. Basal sheaths red or purplish.
15. Pistillate spikes short, about as long as thick; perigynia beakless. §DIGITATAE . . . . . **Carex pedunculata**
15. Pistillate spikes elongate, more than 3 times as long as wide; perigynia tapered into a short beak. §HYMENOCHLAENAE
16. Perigynia less than 5 mm long.
Perigynia to 3 mm long, sessile. . . . . **Carex gracillima**
Larger perigynia more than 3 mm long, stipitate. . . . . **Carex arctata**
16. Larger perigynia more than 5 mm long.
Larger perigynia more than 6.8 mm long, the beak hyaline and erose-bidentate at the tip . . . . . **Carex debilis**
Perigynia to 6.8 mm long the beak green and bidentate . . . . . **Carex debilis rudgei**
11. All but occasionally the proximal pistillate spikes ascending or erect on usually short peduncles.
17. Perigynia horizontally spreading to reflexed, the pistillate spikes less than twice as long as broad. §CERATOCYSTIS
18. Perigynia up to 3 mm long, the beaks straight or nearly so . . . . . **Carex viridula**
18. Perigynia more than 3 mm long, the beaks of at least the proximal one deflexed at least 20°.
19. Pistillate scales with tinctures of brown or reddish-brown, contrasting with the perigynia . . . . . **Carex flava**
19. Pistillate scales concolorous with the perigynia.

Pistillate spikes to 10 mm wide, the longer beaks to 2.3 mm long . . . . . **Carex cryptolepis**
Larger pistillate spikes more than 10 mm wide, the beaks mostly more than 2.3 mm long . . . . . **Carex viridistellata**

17. Perigynia erect to ascending or if somewhat divergent, then the spikes more than twice as long as broad.
    20. Bract subtending lowest pistillate spike without or essentially without a sheath enclosing the peduncle.
        21. Staminate spike an extension of the pistillate spike; pistillate scales foliaceous. §PHYLLOSTACHYAE . . . . . **Carex jamesii**
        21. Staminate spike pedunculate, separate from the pistillate; pistillate scales not foliaceous.
            Pistillate spikes elongate, flexuous, mostly 3, more than 2.5 cm long. §HYMENOCHLAENAE . . . . . **Carex prasina**
            Pistillate spikes short, stiff, 1 or 2, less than 2.5 cm long. §LIMOSAE . . . . . **Carex limosa**
    20. Bract subtending lowest pistillate spike with a well developed sheath.
        22. Perigynium body conspicuously 3-angled, the body nearly filled by the achene.
            23. Larger leaves more than 6 mm wide; perigynia more than 4.5 mm long. §CAREYANAE . . . . . **Carex careyana**
            23. Leaves less than 6 mm wide; perigynia less than 4.5 mm long.
                Perigynia rhombic, scarcely longer than wide, nearly beakless; scales acute. §CAREYANAE . . . . . **Carex digitalis**
                Perigynia cylindric-ovoid, clearly longer than wide, quickly tapering into a short but distinct beak; scales awned. §GRISEAE. . . . . **Carex oligocarpa**
        22. Perigynium body subterete, longer than the achene and not completely filled by it.
            24. Lower sheaths strongly tinged with purple, in sharp visual contrast to the blanched-green bases of the leaf blades. §PANICEAE . . . . . **Carex woodii**
            24. Lower sheaths tan to brown, green or greenish-brown, or with tinctures of purple, not in strong contrast to bases of the leaf blades.
                25. At least some of the pistillate scales distinctly purple or brown-tinged along the margins.
                    26. Pistillate scales with long scabrous awns routinely surpassing the perigynia. §RACEMOSAE . . **Carex buxbaumii**
                    26. Pistillate scales obtuse or the proximal ones cuspidate or with short awns scarcely equaling the perigynia. §PANICEAE
                        Mature pistillate spikes rarely more than 5 mm wide; perigynia rarely more than 3.5 mm long; staminate spikes to 3.5 mm wide . . . . . **Carex tetanica**
                        Mature pistillate spikes more than 5 mm wide; larger perigynia more than 3.5 mm long; staminate spikes at least 3.5 mm wide . . . . . **Carex meadii**
                25. Margins of scales green, sordid, or scarious, but not purple.
                    27. Perigynia fusiform, tapering into a more or less asymmetrical beak. §LAXIFLORAE
                        28. Sides of perigynia with no more than 1 main nerve, occasionally with as many as 6 inconspicuous nerves . . . . . **Carex leptonervia**
                        28. Sides of perigynia each with 7 or more main nerves.
                            29. Angles of the bracteal sheaths smooth or nearly so; spikelets loosely flowered, the middle internodes of rachis mostly more than 1.2 mm long . . . . . **Carex laxiflora**
                            29. Angles of the lowest bracteal sheaths notably serrulate; spikelets densely flowered, the middle internodes of rachis mostly less than 1.2 mm long.
                                Staminate spike sessile or subsessile, surpassed by one or more of the bracts . . . . . **Carex blanda**
                                Staminate spike elevated well above the pistillate spikes and usually the tips of the bracts . . . . . **Carex gracilescens**
                    27. Perigynia beakless or abruptly contracted into a short beak.
                        30. Larger perigynia more than 3.5 mm long. §GRISEAE
                            31. Lower leaf blades thickly glaucous, strongly keeled and triangular at the tip; lowest pistillate scales acute to cuspidate, not awned . . . . . *Carex ×glaucodea*
                            31. Lower leaf blades green, flat or scarcely keeled at the tip; lowest pistillate scales with an awn more than 1 mm long.
                                Perigynia collapsed-angular distally, mostly more than 2.4 times as long as broad, gray-green, somewhat spreading; stipe of achene less than 0.3 mm in diameter, more than 1.6 times as long as broad. . . . . **Carex amphibola**
                                Perigynia tumescent and rounded distally, less than 2.4 times as long as broad, green, strongly ascending; stipe of achene more than 0.3 mm in diameter, less than 1.6 times as long as broad . . . . . **Carex grisea**
                        30. Perigynia to 3.5 mm long.
                            32. Lowest spike originating from the lowermost sheath; leaf blades to 3.5 mm wide. §GRANULARES . . . . . **Carex crawei**
                            32. Lowest spike originating from middle and distal sheaths; leaf blades often wider than 3.5 mm.
                                Staminate spike sessile or subsessile; veins of perigynia expressed. §GRANULARES . . . . . **Carex granularis**
                                Staminate spike long-pedunculate; veins of perigynia impressed. §GRISEAE . . . . **Carex conoidea**

CARPINUS caroliniana virginiana

CARTHAMUS *tinctorius*

CARUM *carvi*

CARYA

1. Bud scales valvate, the overwintering ones yellow-scurfy . . . . . **Carya cordiformis**
1. Bud scales imbricate, gray.
    2. Leaflets 7-9 or a rare leaf with 5, the abaxial surfaces densely pubescent, many of the hairs fasciculate or attached at a common point.
        Leaf rachis permanently and densely stellate-pubescent, the hairs in distinct dense fascicles, with few hairs solitary . . . **Carya tomentosa**
        Leaf rachis glabrate or the hairs mostly simple, rarely fasciculate . . . . . **Carya laciniosa**
    2. Leaflets 5-7, the abaxial surfaces glabrous or sparsely pubescent, or if densely so, then the margins with distinct tufts of hairs associated with the teeth and the leaflet number 5.

3. Serrations of leaflets with a persistent tuft of hairs on one or both sides of a tooth just below its apex; larger terminal buds more than 1.2 cm long. . . . . **Carya ovata**
3. Margins of leaflets glabrous and without tufts of hairs on the teeth; terminal buds up to 1.2 cm long.
Leaves mostly 5-foliolate . . . . . **Carya glabra**
Leaves prevailingly 7-foliolate . . . . . **Carya ovalis**

CARYOPHYLLACEAE

A. Calyx with sepals united, at least below the middle.
B. Leaves linear-subulate to filiform-subulate, less than 1 mm wide; styles 2.
Expanded basal portion of the leaves strongly ciliate, the axils often with axillary tufts of smaller leaves; sepals tapering to an acute tip . . . . . SCLERANTHUS
Expanded basal portion of the leaves eciliate, without axillary fascicles; sepals oblong, obtuse . . . . . PETRORHAGIA
B. Leaves linear to ovate, more than 1 mm wide; styles 2-5.
C. Flowers usually more than 100, each less than 1 cm long, in large panicles; calyx less than 5 mm long . . . . . GYPSOPHILA
C. Flowers fewer than 100, each usually more than 1 cm long; calyx almost always larger than 5 mm long.
D. Calyx subtended by 2 or more conspicuous bracts . . . . . DIANTHUS
D. Calyx ebracteate, naked at the base.
E. Calyx lobes 2-3 cm long, exceeding the petals; styles 5 . . . . . AGROSTEMMA
E. Calyx lobes shorter, not exceeding the petals; styles 2-5.
F. Styles 3-5; calyx normally with 10-30 conspicuous nerves, terete . . . . . SILENE
F. Styles 2; calyx obscurely nerved, terete or 5-angled.
Flowers glomerulate, the pedicels less than 5 mm long . . . . . SAPONARIA
Flowers in open, corymbiform cymes, the pedicels much longer than 5 mm . . . . . VACCARIA
A. Calyx with separate sepals.
G. Leaves whorled . . . . . SPERGULA
G. Leaves opposite.
H. Stipules present.
I. Styles 3; sepals 3 mm or more long; petals present . . . . . SPERGULARIA
I. Styles 2; sepals less than 3 mm long; petals absent.
Larger sepals more than 0.6 mm long; plants more or less erect . . . . . PARONYCHIA
Sepals up to 0.6 mm long; plant prostrate . . . . . HERNIARIA
H. Stipules absent.
J. Flowers long-pedicellate in umbellate, long-pedunculate inflorescences . . . . . HOLOSTEUM
J. Flowers never in umbels.
K. Styles 4 or 5.
L. Leaves linear-filiform, mucronate; sepals up to 2 mm long . . . . . SAGINA
L. Leaves linear-oblong to ovate; sepals more than 2 mm long.
Capsule ovoid, dehiscing into 5 bifid valves; larger leaves ovate to ovate-lanceolate, more than 2 cm long and 1 cm wide, often short-petiolate . . . . . MYOSOTON
Capsule cylindrical, longer than broad, dehiscing by usually 10 short apical teeth; leaves not as above . . . CERASTIUM
K. Styles usually 3.
M. Petals usually deeply bifid or notched at the tip.
Capsules dehiscent only at their summits, cylindric; plants viscid-pubescent . . . . . CERASTIUM
Capsules dehiscent throughout their lengths, ovoid or oblong; plants glabrous or pubescent only in lines . STELLARIA
M. Petals entire to weakly emarginate at the tip.
N. Leaves narrowly linear, less than 2 mm wide; capsule with 3 sharp teeth . . . . . MINUARTIA
N. Leaves lanceolate to ovate, at least some of them more than 2 mm wide; capsule with 6 sharp teeth.
Leaves lanceolate to elliptic, obtuse, mostly more than 1 cm long and 5 mm wide . . . . . MOEHRINGIA
Leaves ovate, acute, much less than 1 cm long and less than 5 mm wide . . . . . ARENARIA

CASTANEA*dentata*

CASTILLEJA

1. Floral bracts green; corolla more than 3.5 cm long; perennial . . . . . **Castilleja sessiliflora**
1. Floral bracts colored (usually scarlet, red, orange, or yellowish); corolla up to 3.5 cm long; annual or biennial . . . . . **Castilleja coccinea**

CATALPA

1. Corolla less than 3.5 cm across, the lower lobe entire; fruits less than 11 mm in diameter; crushed leaves malodorous . . . *Catalpa bignonioides*
1. Corolla 3.5 cm or more across, the lower lobe notched; fruits more than 11 mm in diameter; crushed leaves not malodorous *Catalpa speciosa*

CATANANCHE *caerulea*

CAULOPHYLLUM*thalictroides*

CEANOTHUS

1. Leaves narrowly elliptic to elliptic-lanceolate, less than 2 cm wide . . . . . **Ceanothus herbaceus**
1. Leaves ovate, the larger ones more than 2 cm wide . . . . . **Ceanothus americanus**

CELASTRACEAE

A. Leaves alternate; plants high-climbing twining vines; flowers usually imperfect . . . . . CELASTRUS
A. Leaves opposite; plants trailing or erect shrubs; flowers perfect . . . . . EUONYMUS

CELASTRUS

1. Leaves of long shoots broadly obovate to suborbicular, scarcely longer than wide; inflorescences axillary . . . . . *Celastrus orbiculatus*
1. Leaves of long shoots ovate, about twice as long as wide; inflorescences terminating new branchlets of the season . . . . . **Celastrus scandens**

CELOSIA *argentea*

CELTIS
1. Leaves up to 8 cm long, subentire, the teeth few, usually confined to beyond the middle . . . . . **Celtis tenuifolia**
1. Larger leaves more than 8 cm long, serrate nearly or quite throughout . . . . . **Celtis occidentalis**

CENCHRUS
1. Spines mostly 45 or more, the proximal portions rarely more than 1 mm wide . . . . . **Cenchrus longispinus**
1. Spines fewer than 45, the proximal portions mostly more than 1 mm wide . . . . . **Cenchrus spinifex**

CENTAUREA
1. All but rarely the distal leaves deeply pinnately lobed or compound.
    2. Phyllaries with elongate, divaricate terminal spines 1 cm or more long . . . . . *Centaurea calcitrapa*
    2. Phyllaries not spine-tipped or with spines less than 1 cm long.
        3. Phyllaries not spiny but merely pectinately fringed, the terminal element scarcely or not at all longer than the marginal ones . . . . . *Centaurea stoebe micranthos*
        3. Phyllaries conspicuously terminated by a stout spine longer and firmer than the marginal spines.
            Phyllaries white throughout; pappus absent . . . . . *Centaurea diffusa*
            Phyllaries nigrescent distally; pappus present . . . . . *Centaurea ×psammogena*
1. Leaves simple or the proximal sometimes pinnately incised or divided about halfway to the midrib (more so on unusual individuals).
    4. Phyllaries tapered or rounded distally to a toothed or lacerate tip.
        Annual or winter annual; outer phyllaries with a white-toothed margin . . . . . *Centaurea cyanus*
        Perennial; outer phyllaries with black-fringed margin . . . . . *Centaurea montana*
    4. At least the middle phyllaries distinctly expanded distally into a brownish or nigrescent tip.
        5. Terminal appendage of the middle and outer phyllaries with an irregularly jagged, unevenly fractured scarious margin; pappus absent . . . . . *Centaurea jacea*
        5. Terminal appendage of the middle and outer phyllaries with pectinate margins; pappus present or absent.
            6. Appendages elongate, narrow in general outline, those of the principal phyllaries strongly recurved from about the middle . . . . . *Centaurea phrygia*
            6. Appendages broadly deltate to suborbicular, flat or convex, not recurved.
                7. Involucre appearing black throughout, the green phyllary bodies scarcely evident from beneath the overlapping appendages; pappus black, less than 1 mm long . . . . . *Centaurea nigra*
                7. Involucre appearing black and green or pale-brown with dark-brown appendages; pappus absent, or if present not black.
                    Involucre appearing greenish with black markings, the pectinate appendages nigrescent, much shorter than the body of the phyllary bodies . . . . . *Centaurea nigrescens*
                    Involucre appearing pale-brown or with brown to dark-brown markings, the pectinate appendages about ½ as long as the phyllary bodies . . . . . *Centaurea ×moncktonii*

CENTAURIUM
1. Individual flowers sessile or subsessile, the calyx immediately subtended by a pair of bracts . . . . . *Centaurium erythraea*
1. Individual flowers stipitate, the calyx separated from the bracts by a manifest pedicel mostly 2.5 mm or more long . . . *Centaurium pulchellum*

CEPHALANTHUS occidentalis

CERASTIUM
1. Petals showy, usually more than 1 cm long, 2 to 3 times as long as the sepals; plants matted to erect perennials with persistent, marcescent branches and leaves from the previous year.
    2. Plant tomentose, the pubescence tangled and eglandular; sepals sericeous with long, appressed hairs . . . . . *Cerastium tomentosum*
    2. Plant pilose with more or less straight hairs, usually glandular; sepals glandular, short-pubescent.
        Leaves less than 4 mm wide; petals less than 1 cm long . . . . . *Cerastium arvense*
        Larger leaves more than 4 mm wide; petals 1 cm or more long . . . . . **Cerastium velutinum**
1. Petals subequal to the sepals or scarcely exceeding them; plants either matted perennials or erect annuals.
    3. At least the distal inflorescence bracts with conspicuous, scarious margins and tips.
        4. Plant a matted perennial; stamens 10; calyx lobes pilose, nearly or quite without glandular hairs . . . . . *Cerastium fontanum*
        4. Plant a small annual; stamens 4 or 5; calyx conspicuously glandular-pubescent.
            Distalmost bracts with only narrow scarious margins, the proximal often wholly herbaceous; petal veins forked; capsules usually remaining erect; seeds with minute acute or blunt papillae . . . . . *Cerastium pumilum*
            Distalmost bracts as much as half composed of scarious tissue; petal veins unbranched; capsules usually on deflexed pedicels; seeds smooth or bluntly papillose . . . . . *Cerastium semidecandrum*
    3. Even the distalmost inflorescence bracts completely herbaceous, without scarious margins.
        5. Longer pedicels more than twice the length of the capsules and routinely hooked at the tip, causing the capsule to be deflexed . . . . . **Cerastium nutans**
        5. Pedicels shorter than to not much longer than the capsules, not hooked at the tip.
            Sepal hairs all short and glandular, never extending beyond the tip . . . . . *Cerastium brachypodum*
            Some of the sepal hairs long and eglandular, the distal ones extending well beyond the tip . . . . . *Cerastium glomeratum*

CERATOCEPHALA *testiculata*

CERATOPHYLLACEAE: One genus in our area . . . . . CERATOPHYLLUM

CERATOPHYLLUM
1. Leaves once or twice forked, their bases not inflated, the divisions with broad-based, bristle-tipped teeth . . . . . **Ceratophyllum demersum**
1. Leaves mostly three-forked, their bases inflated and often septate, the divisions essentially entire, the teeth reduced to occasional slender bristles on the ultimate segments . . . . . **Ceratophyllum echinatum**

CERCIDIPHYLLACEAE: One genus in our area . . . . . CERCIDIPHYLLUM

CERCIDIPHYLLUM *japonicum*

CERCIS canadensis

CHAENOMELES *speciosa*

CHAENORHINUM *minus*

CHAEROPHYLLUM
1. Plants glabrous or glabrate . . . . . **Chaerophyllum procumbens**
1. Plants villous, at least at the base . . . . . *Chaerophyllum tainturieri*

CHAITURUS *marrubiastrum*

CHAMAECRISTA
1. Petiolar glands stalked; stamens 5; calyx less than 5 mm long; petals up to 8 mm long; fruits up to 4 cm long . . . . . **Chamaecrista nictitans**
1. Petiolar glands sessile; stamens 10; calyx more than 5 mm long; petals more than 9 mm long; fruits prevailingly longer than 4 cm.
   Pedicels and legumes strigose, with appressed hairs or with a few ascending-spreading hairs . . . . . **Chamaecrista fasciculata**
   Pedicels and legumes hirsute, with widely spreading divaricate hairs . . . . . **Chamaecrista fasciculata robusta**

CHAMAEDAPHNE calyculata

CHAMAEMELUM *nobile*

CHAMAESYCE
1. Ovaries and capsules pubescent.
   2. Hairs of ovary and capsule spreading; styles bifid to well below the middle . . . . . *Chamaesyce prostrata*
   2. Hairs of ovary and capsule appressed; styles bifid to near the middle.
      Seeds with weak, but distinct, transverse ridges; styles less than 0.5 mm long . . . . . **Chamaesyce maculata**
      Seeds essentially smooth; styles more than 0.5 mm long . . . . . *Chamaesyce humistrata*
1. Ovaries and capsules glabrous.
   3. Plants pubescent, at least in a line along the distal parts of the stems and branches.
      Stems prostrate; capsules up to 2 mm long; leaves less than 15 mm long . . . . . *Chamaesyce vermiculata*
      Stems erect or ascending; capsules 2 mm or more long; leaves often more than 15 mm long . . . . . **Chamaesyce nutans**
   3. Plants glabrous.
      4. Seeds with transverse ridges, giving the faces an undulating or corrugated appearance; leaves usually more or less minutely serrulate, at least beyond the middle.
         5. Leaves serrate from the tip to the base, at least along one margin, often more than 15 mm long . . . . . **Chamaesyce nutans**
         5. Leaves serrate only beyond the middle, less than 15 mm long.
            Leaves broadly oblong to ovate; seeds with the transverse ridges poorly developed or the faces merely shallowly pitted . . . . . *Chamaesyce serpyllifolia*
            Leaves linear-oblong; seeds characteristically transverse-rugulose with complete cross ridges . . . . . *Chamaesyce glyptosperma*
      4. Seeds with the faces smooth; leaves entire.
         6. Leaves up to 7 mm long, as long as to scarcely longer than wide; seeds about 1 mm long . . . . . **Chamaesyce serpens**
         6. Leaves frequently more than 7 mm long, linear-oblong to elliptic-oblong; seeds more than 1 mm long.
            Leaves linear-oblong; capsules and seeds mostly more than 1.8 mm long, the seeds more than 1.3 mm broad; glands virtually lacking appendages . . . . . **Chamaesyce polygonifolia**
            Leaves elliptic-oblong; capsules and seeds less than 1.8 mm long, the seeds less than 1.3 mm broad; glands with definite appendages . . . . . *Chamaesyce geyeri*

CHAMERION angustifolium

CHASMANTHIUM latifolium

CHEILANTHES feei

CHELIDONIUM *majus*

CHELONE
1. Leaves sessile or subsessile, linear to lance-ovate; corolla whitish nearly or quite throughout . . . . . **Chelone glabra**
1. Leaves distinctly petiolate, lance-elliptic or ovate; corolla roseate or purplish throughout . . . . . *Chelone obliqua speciosa*

CHENOPODIACEAE
A. Leaves reduced to scales or teeth; stems fleshy, jointed . . . . . SALICORNIA

A. Leaves present and evident; stems not both fleshy and jointed.
  B. Stems villous, at least beyond the middle, the leaves mostly puberulent . . . . . BASSIA
  B. Stems and leaves glabrous, glabrate, or farinose (or pubescent or arachnoid among the distal herbage), but never villous.
    C. Leaves linear, neither toothed nor lobed, never farinose, most of them spinulose-subulate at the tip.
      D. Leaves with a strong spine tip, the hyaline portion more than 0.5 mm long on well developed leaves; bracts lance-linear, similarly tipped, becoming divaricate-divergent . . . . . SALSOLA
      D. Leaves with a distinct hyaline mucro or short spine less than 0.5 mm long; bracts linear to ovate, acute or subulate, but not divaricately divergent in age.
        Leaves flat; bracts lance-ovate, dilated at the base, much shorter than the leaves, usually pubescent; stamens 1 or 2(5); sepals 1-3, inconspicuous. . . . . CORISPERMUM
        Leaves fleshy, plano-convex to subterete; bracts linear, resembling the leaves in size and shape, glabrous; stamens 5; sepals 5 . . . . . SUAEDA
    C. Leaves linear or otherwise, sometimes toothed or lobed, farinose or not, but not spinulose or spine-tipped (or only weakly so in the farinose-leaved Chenopodium pallescens).
      E. Ovary and fruit exposed, not enclosed by bracts or calyx tissue, subtended by 1 tiny sepal; stem leaves typically with 1 broad tooth on either side near the middle . . . . . MONOLEPIS
      E. Ovary and fruit enclosed or surrounded by bracts or calyx tissue; stem leaves various.
        F. Flowers imperfect, the pistillate enclosed between a pair of broad, usually deltate, conspicuous bracteoles . . . . . ATRIPLEX
        F. Flowers usually perfect; bracteoles absent.
          G. Calyx becoming broadly and thinly circular-winged by horizontal development of the sepals; leaves lanceolate, coarsely sinuate-dentate . . . . . CYCLOLOMA
          G. Calyx lobes flat to carinate but not as above; leaves various but usually not both lanceolate and coarsely sinuate-dentate.
            Plant either glandular-punctate or glandular-puberulent, strongly malodorous (often even in dried material) . . . . . DYSPHANIA
            Plant eglandular, inodorous or occasionally aromatic or malodorous . . . . . CHENOPODIUM

CHENOPODIUM

1. Principal leaves linear-oblong to linear-lanceolate, at least 3 times as long as wide and less than 8 mm wide, with not more than one pair of lateral nerves, entire or rarely with a single rounded tooth on either side.
  2. Larger leaves with a single pair of lateral nerves in addition to the midnerve . . . . . **Chenopodium pratericola**
  2. Leaves all with a single midnerve only.
    Pericarp adherent to the seed . . . . . **Chenopodium pallescens**
    Pericarp loose and separable from the seed as a unit . . . . . **Chenopodium subglabrum**
1. Principal leaves broader, commonly more than 8 mm broad, the larger entire or variously lobed.
  3. Calyx normally 3-parted; fruits often becoming fleshy and strawberry-red.
    4. Leaves cuneate or rounded at the base, subentire to sinuate-dentate . . . . . *Chenopodium rubrum*
    4. Leaves distinctly triangular-hastate and sharply incised-dentate.
      Spikes nearly or quite without foliaceous bracts . . . . . **Chenopodium capitatum**
      Spikes with narrowly triangular foliaceous bracts subtending each glomerule . . . . . *Chenopodium foliosum*
  3. Calyx typically 5-parted; fruits never fleshy and red.
    5. Larger seeds 1.7 mm or more broad.
      6. Leaves membranaceous, green on both sides; inflorescence compound, diffusely paniculate, the flowers solitary or few together . . . . . **Chenopodium simplex**
      6. Leaves thick, at least sparsely white-farinose; inflorescence simple, the flowers aggregated in glomerules.
        Inflorescence stiffly erect; most seeds less than 1.7 mm broad . . . . . **Chenopodium macrocalycium**
        Inflorescence lax and drooping; fully mature seeds 1.7 mm or more broad . . . . . **Chenopodium bushianum**
    5. Seeds all less than 1.7 mm broad.
      7. Leaves strongly triangular-hastate, their bases truncate to shallowly and broadly cordate, the margins entire or with a few shallow teeth; coarse perennial . . . . . *Chenopodium bonus-henricus*
      7. Leaves broadly rounded to cuneate at their bases, entire to dentate or sinuate; annual.
        8. Calyx lobes flat or flattish, closely appressed to the seed, the midnerves not sharply enlarged.
          Seeds strongly flattened, 1-1.5 mm broad . . . . . *Chenopodium murale*
          Seeds elliptic in cross section, about 1 mm broad . . . . . *Chenopodium urbicum*
        8. At least some calyx lobes with the midnerves sharply enlarged, becoming carinate or cucullate.
          9. Leaves fleshy, strongly bicolored, densely farinose abaxially, dull-green adaxially, many of them repand-sinuate or rhombic-dentate, prevailingly less than 2 cm long.
            Leaves repand-sinuate, more than 1.5 times as long as wide; seeds less than 0.8 mm broad . . *Chenopodium glaucum*
            Leaves rhombic-dentate, principally less than 1.5 times as long as wide; seeds more than 0.8 mm broad . . . . . *Chenopodium incanum*
          9. Leaves membranaceous to merely coriaceous, entire to dentate, or if somewhat repand, then not strongly bicolored, the larger more than 2 cm long.
            10. Pericarp distinctly reticulate-alveolate.
              11. Seeds less than 1.2 mm in diameter; leaves narrowly oblong, 3-4 times as long as wide or with the central lobe 2-3 times longer than the proximal lateral pair. . . . . *Chenopodium ficifolium*
              11. Seeds more than 1.2 mm in diameter; leaves narrowly to broadly deltate, less than 3 times as long as wide or the central lobe about as long as the proximal lateral pair.
                Pericarp opaque-pellucid near the center of seed, at the style base . . . . . **Chenopodium berlandieri**
                Pericarp concolorous, not opaque-pellucid at the style base . . . . . **Chenopodium macrocalycium**
            10. Pericarp smooth or indistinctly reticulate.
              12. Calyx lobes appearing stellate, widely spreading to deflexed . . . . . *Chenopodium strictum*
              12. Calyx lobes loosely spreading-ascending to tightly clasping the seed.
                13. Calyx lobes obtuse, nearly or quite without a keel, scarcely covering the mature seed . . . . . **Chenopodium standleyanum**
                13. Calyx lobes acute, carinate, well enclosing the mature seed.
                  Leaves regularly sinuate-lobed; flowers scarcely glomerulate, the inflorescence open and diffuse . . . . .

. . . . . **Chenopodium missouriense**
Leaves entire to sinuate; inflorescence with the flowers in close glomerules . . . . . *Chenopodium album*

CHIMAPHILA
1. Leaves widest below the middle, dark-green with a light-green midsection . . . . . **Chimaphila maculata**
1. Leaves widest above the middle, dark-green throughout . . . . . **Chimaphila umbellata cisatlantica**

CHIONANTHUS *virginicus*

CHIONODOXA
1. Perianth lobes white proximally, producing a pale central zone.
   Flowers 1-2 per scape . . . . . *Chionodoxa luciliae*
   Flowers mostly 4-6 per scape . . . . . *Chionodoxa forbesii*
1. Perianth lobes bright-blue throughout.
   Flowers more than 4 per scape . . . . . *Chionodoxa sardensis*
   Flowers as many as 4 per scape . . . . . *Chionodoxa lochiae*

CHONDRILLA *juncea*

CHORISPORA *tenella*

CHRYSOSPLENIUM americanum

CICHORIUM *intybus*

CICUTA
1. Leaflets linear, up to 5 mm wide (not including the coarse teeth); distal leaves usually with bulblets in the axils . . . . . **Cicuta bulbifera**
1. Leaflets lanceolate to ovate, the larger more than 5 mm wide; bulblets absent . . . . . **Cicuta maculata**

CIMICIFUGA racemosa

CINNA
1. Spikelets more than 4.1 mm long; ligules usually with tinctures of purple or madder . . . . . **Cinna arundinacea**
1. Spikelets less than 4.1 mm long; ligules usually colorless . . . . . **Cinna latifolia**

CIRCAEA
1. Calyx lobes less than 1.5 mm long; fruit (including bristles) up to 1.5 mm in diameter, not furrowed . . . . . **Circaea alpina**
1. Calyx lobes more than 1.5 mm long; fruit (including bristles) exceeding 1.5 mm in diameter, the faces furrowed . . . . . **Circaea canadensis**

CIRSIUM
1. Involucres up to 1.5 (2) cm high, the phyllaries all merely acute or acuminate, usually not spiny; leaves green abaxially or scarcely woolly; colony-forming perennial from creeping rootstocks . . . . . *Cirsium arvense*
1. Larger involucres more than 1.5 cm high, the phyllaries acute to spine-tipped; leaves green or tomentose abaxially; plants almost never forming colonies by subterranean rootstocks.
   2. Leaves green, variously pubescent or strigose, but without a whitened tomentum on either surface.
      3. Peduncles and distal portions of the stem spiny-winged by tissue decurrent from the leaf bases . . . . . *Cirsium vulgare*
      3. Peduncles and stems not spiny-winged.
         Involucres less than 3.5 cm high, the phyllaries without terminal spines . . . . . **Cirsium muticum**
         Involucres normally more than 3.5 cm high, the phyllaries with erect terminal spines . . . . . **Cirsium hillii**
   2. At least one surface of the leaves densely whitened with tomentum.
      4. Leaves white-tomentose adaxially, pinnately divided into very long, linear-oblong divisions prevailingly less than 1 cm broad, with marginal spines essentially absent; flowers yellowish-white; plant restricted to the dunes of Lake Michigan . . . . . **Cirsium pitcheri**
      4. Leaves green or greenish adaxially, coarsely pinnately divided, lobed, or incised, the divisions not as above; flowers purple; plants not restricted to the dunes of Lake Michigan.
         5. Stems strongly and persistently white-tomentose.
            Some cauline leaves clasping, the lateral lobes commonly more than 7 mm broad at the base; larger corolla tubes more than 15 mm long; larger achenes more than 5 mm long . . . . . *Cirsium undulatum*
            All cauline leaves non-clasping, the lateral lobes to 7 mm broad at the base; corolla tubes to 15 mm long; achenes to 5 mm long . . . . . *Cirsium flodmanii*
         5. Stems green, thinly arachnoid to glabrescent.
            Stem leaves undivided or shallowly cut to about ½ way to the midrib with undulating teeth . . . . . **Cirsium altissimum**
            Stem leaves all deeply divided, most of the lobes cut nearly to the midrib . . . . . **Cirsium discolor**

CISTACEAE
A. Plant shrubby; leaves scale-like, imbricate and tightly appressed; styles slender and elongate . . . . . HUDSONIA
A. Plants herbaceous, perennial; leaves linear to ovate, spreading to ascending, never imbricate; styles very short or none.
   Leaves densely canescent with stellate hairs; petals 5, yellow . . . . . CROCANTHEMUM
   Leaves glabrate to canescent with simple hairs; petals 3, reddish . . . . . LECHEA

CITRULLUS *lanatus*

CLADIUM mariscoides

CLAYTONIA virginica

CLEMATIS
1. Flowers and fruits numerous, cymose-paniculate; flowers white; sepals thin.
   Leaves trifoliolate, the leaflets acute or acuminate, coarsely serrate or dentate . . . . . **Clematis virginiana**
   Leaves mostly 5-foliolate, the leaflets acute or obtuse, entire or rarely repand-crenate . . . . . *Clematis terniflora*
1. Flowers and fruits 1-few on long axillary peduncles; flowers purplish or bluish; sepals thick.
   2. Leaves simple, acute to acuminate . . . . . *Clematis integrifolia*
   2. Leaves compound, the leaflets obtuse to acute.
      3. Sepals yellow; achenes less than 4 mm wide, spreading-pubescent; styles plumose with spreading hairs . . . . . *Clematis glauca*
      3. Sepals purple; achenes more than 4 mm wide, appressed-puberulent; styles glabrous or appressed-villous below the middle.
         Stamens pubescent; styles appressed-pilose below the middle; leaflets broadly rounded to subcordate at the base **Clematis pitcheri**
         Stamens glabrous; styles glabrous nearly throughout; leaflets broadly cuneate to rounded at the base . . . . . *Clematis viticella*

CLEOMACEAE
A. Stamens more than 6; fruit sessile or subsessile on the regular pedicel; petals emarginate . . . . . POLANISIA
A. Stamens 6; fruit stipitate, on a long stalk between the ovary and the regular pedicel; petals entire.
   Plant glabrous; leaflets 3; pods less than 5 cm long . . . . . PERITOMA
   Plant viscid; leaflets more than 3; pods more than 5 cm long . . . . . TARENAYA

CLINOPODIUMvulgare

CLINTONIA borealis

COELOGLOSSUM viride

COINCYA *monensis*

COLEATAENIA
1. Larger spikelets more than 2.9 mm long . . . . . **Coleataenia anceps**
1. Spikelets less than 2.9 mm long.
   Spikelets less than 2.2 mm long; ligule erose, up to 1 mm long . . . . . **Coleataenia rigidula**
   Spikelets more than 2.2 mm long; ligule ciliate, more than 1 mm long . . . . . **Coleataenia longifolia**

COLCHICACEAE: One genus in our area . . . . . UVULARIA

COLLINSIA
1. Corolla less than 9 mm long, the upper lip usually at least partly blue; cauline leaves to 7 mm wide, widest at or beyond the middle . . . . . *Collinsia parviflora*
1. Corolla more than 9 mm long, the upper lip white; cauline leaves more than 7 mm wide . . . . . **Collinsia verna**

COLLINSONIA canadensis

COLLOMIA *linearis*

COMANDRA umbellata

COMARUM palustre

COMMELINA
1. Plant annual, erect or decumbent, usually rooting at the nodes; margins of bract free; leaves lanceolate to lance-ovate . . *Commelina communis*
1. Plant perennial, erect or arching, not rooting at the nodes; margins of bract united at the base; leaves mostly linear to linear-lanceolate . . . . . **Commelina erecta deamiana**

COMMELINACEAE
A. Anther-bearing stamens 5 or 6, the filaments villous; petals uniform in size; flowers numerous in umbellate cymes from leaf-like bracts . . . . . TRADESCANTIA
A. Anther-bearing stamens 3, the filaments glabrous; petals dimorphic, 2 large and blue, one small and blue or white; flowers one to few in cymes from ovate or cordate spathiform bracts . . . . . COMMELINA

COMPTONIA peregrina

CONIOSELINUM chinense

CONIUM *maculatum*

CONOCLINIUM *coelestinum*

CONOPHOLIS americana

CONRINGIA *orientalis*

CONSOLIDA

1. At least the proximal 2 bracts dissected into 3 or more lobes; terminal lobe of petal more than 5 mm long; inflorescence racemose, usually with only 1-3 branches.
   - Spur less than 12 mm long; bracteoles nearly or quite touching the base of the flower . . . . . *Consolida orientalis*
   - Longer spurs more than 12 mm long; bracteoles ending at least 4 mm from the base of the flower . . . . . *Consolida ajacis*

1. Bracts all simple or the proximal 3-lobed; terminal lobe of petal to 5 mm long; inflorescence usually with more than 3 branches.
   2. Terminal lobe of petal less than 2 mm wide, the tip bifid to 0.5 mm . . . . . *Consolida pubescens*
   2. Terminal lobe of petal more than 2 mm wide, the tip bifid to mostly more than 0.5 mm.
      - Pedicels ascending, the larger bracteoles linear, more than 2 mm long . . . . . *Consolida regalis*
      - Pedicels divaricate-spreading, the bracteoles setaceous, to 2 mm long . . . . . *Consolida divaricata*

CONVALLARIA *majalis*

CONVALLARIACEAE

A. Plants scapose or subscapose, the principal leaves basal or essentially basal.
   - Flowers umbellate. . . . . CLINTONIA
   - Flowers not umbellate . . . . . CONVALLARIA

A. Plants with 2 or more cauline leaves.
   B. Flowers in terminal racemes or panicles.
      - Leaves usually 2, cordate at the base; perianth segments 4 . . . . . MAIANTHEMUM
      - Leaves usually more than 2, or if rarely only 2, then blades tapering at the base; perianth segments 6 . . . . . SMILACINA

   B. Flowers and fruits solitary or clustered on peduncles that appear to originate from the axils of cauline leaves.
      - Perianth segments united, tubular; flowers whitish, greenish, or greenish-yellow, often more than one per axil, both the proximal and distal leaf axils floriferous; leaves pubescent below or glabrous, eciliate . . . . . POLYGONATUM
      - Perianth segments separate; flowers pinkish, usually solitary, mostly confined to the distal leaf axils; blades ciliate, otherwise glabrous or glabrate. . . . . STREPTOPUS

CONVOLVULACEAE

A. Styles very deeply divided, each division 2-cleft, yielding four linear stigmas . . . . . EVOLVULUS

A. Styles simple or merely 2-3 cleft, the stigmas linear or capitate.
   B. Flowers numerous in a dense capitate cluster; calyx densely hirsute throughout . . . . . JACQUEMONTIA
   B. Flowers axillary, solitary on each peduncle; calyx glabrous or hirsute only below the middle.
      C. Calyces immediately subtended and largely concealed by two large foliaceous bracts . . . . . CALYSTEGIA
      C. Five-lobed calyx evident, the bracts absent or minute.
         - Stigmas 2-3 lobed, capitate; sepals more than 7 mm long . . . . . IPOMOEA
         - Stigmas deeply 2-cleft, linear, oblong or ovoid; sepals less than 7 mm long . . . . . CONVOLVULUS

CONVOLVULUS *arvensis*

CONYZA

1. Stems depressed and bushy-branched from near the base; heads solitary or few in diffuse corymbulose inflorescences; leaves linear-subulate . . . . . **Conyza ramosissima**
1. Stems erect, unbranched except within the cymose to racemose paniculate inflorescences; heads numerous; leaves linear to lanceolate . . . . . **Conyza canadensis**

COPTIS trifolia

CORALLORHIZA

1. Lip abruptly narrowed to an unlobed base.
   - Lip more than 4.8 mm long; in bloom before the middle of August . . . . . **Corallorhiza wisteriana**
   - Lip less than 4.8 mm long; in bloom after the middle of August . . . . . **Corallorhiza odontorhiza**

1. Lip with two small but distinct lateral lobes below the middle.
   - Plant small, mostly less than 1.5 dm high, greenish; in bloom before mid-July . . . . . **Corallorhiza trifida verna**
   - Plant mostly more than 1.5 dm high, yellowish-brown to yellowish-purple; in bloom after mid-July . . . . . **Corallorhiza maculata**

COREOPSIS

1. Leaves simple or a few with 1 or two lateral lobes; stems with fewer than 5 pairs of leaves, these usually confined to the proximal ⅔ of the stem . . . . . **Coreopsis lanceolata**

1. Leaves regularly lobed or divided; stems leafy throughout, with more or less than 5 pairs of leaves.
   2. Leaves pinnately compound, the leaflets petiolulate and ovate, and the terminal division less than 3 times as long as wide . . . . . *Coreopsis basalis*

   2 Leaves simple or variously divided, the ultimate divisions essentially without petiolules, always more than 3 times as long as wide.
      3. Plant with fewer than 7 nodes below the array.
         4. Annual; heads up to 3 cm broad, the discs red or deep reddish-brown; ligules yellow and often with a red spot at the base, up to 1.5 cm long . . . . . *Coreopsis tinctoria*
         4. Perennial or sometimes annual; heads (including ligules) more than 3 cm broad, the discs yellow; ligules yellow throughout, usually more than 1.5 cm long.
            - Lobes of middle and distal leaves narrowly lanceolate, the larger more than 5 mm wide . . . . . *Coreopsis grandiflora*
            - Lobes of middle and distal leaves linear, to 5 mm wide . . . . . *Coreopsis grandiflora harveyana*

3. Plant with more than 7 nodes below the array.
   5. Leaf segments linear-filiform, less than 3 mm wide . . . . . *Coreopsis verticillata*
   5. Leaf segments lanceolate to oblong, the larger more than 3 mm wide.
      Leaves stiffly trident-shaped, with 3 lance-oblong lobes, the blade tissue decurrent along the midrib to the base . . . . . **Coreopsis palmata**
      Principal leaves not stiffly trident-shaped, divided to the midrib into 3 lanceolate leaflets. . . . . **Coreopsis tripteris**

CORIANDRUM *sativum*

CORISPERMUM
1. Inflorescence nearly or quite the same width throughout, the median and distal flowers gradually if at all congested.
   Leaves flat, the midrib usually evident; distal portion of the inflorescence mostly more than 5 mm wide; larger seeds more than 2.8 mm across. . . . . **Corispermum americanum**
   Leaves convolute, the midrib obscure; distal portion of the inflorescence less than 5 mm wide; seeds less than 2.8 mm across . . . . . *Corispermum nitidum*
1. Inflorescence clavate, the median and distal flowers notably more congested and overlapping than the proximal ones.
   Fruit, excluding the apiculus, wingless, the larger to 3.2 mm long . . . . . *Corispermum villosum*
   Larger fruits more than 3.2 mm long, at least thinly winged . . . . . **Corispermum pallasii**

CORNACEAE: One genus in our area . . . . . CORNUS

CORNUS
1. Plant herbaceous, less than 3 dm high . . . . . **Cornus canadensis**
1. Plants erect shrubs or small trees, always more than 3 dm high.
   2. Leaves alternate, the terminal sometimes appearing subopposite . . . . . **Cornus alternifolia**
   2. Leaves opposite.
      3. Flowers in tight capitate clusters; fruits red, clearly longer than broad.
         Flowers yellow; bracts yellowish, subequaling or a little longer than the pedicels . . . . . *Cornus mas*
         Flowers greenish-white; bracts white, large and petaloid, much longer than the pedicels . . . . . **Cornus florida**
      3. Flowers in open cymes; fruits blue or white, about as broad as long.
         4. Twigs mostly yellow or yellowish-green with dark purple spots; many of the leaves subrotund . . . . . **Cornus rugosa**
         4. Twigs not yellow or if so, then not spotted; leaves notably longer than wide.
            5. Adaxial leaf surfaces rough-pubescent, with some of the hairs coarsely ascending . . . . . **Cornus drummondii**
            5. Adaxial leaf surfaces smooth or pubescent with soft or minute appressed hairs.
               6. Twigs gray; leaves with mostly 3-4 lateral veins per side; fruits sordid to pale-blue . . . . . **Cornus racemosa**
               6. Twigs red or reddish; otherwise without the above combination of characters.
                  7. Pith of two-year-old twigs browner than the ambient wood; fruits bright-blue . . . . . **Cornus obliqua**
                  7. Pith of two-year-old twigs whiter than the ambient wood; fruits white.
                     Abaxial leaf surfaces pilose, with hairs well disposed on the laminae . . . . . **Cornus baileyi**
                     Abaxial leaf surfaces strigillose, with pilose hairs absent or aggregated in the vein axils near the midrib. . . . . **Cornus sericea**

CORYDALIS
1. Bulbous perennial with purple, whitish, or roseate flowers . . . . . *Corydalis solida*
1. Taprooted annuals or biennials with yellow flowers.
   2. Flowers less than 10 mm long, including the small 1-2 mm spur; seeds about 2 mm broad . . . . . **Corydalis flavula**
   2. Flowers more than 10 mm long, the spur more than 2.5 mm long; seeds 1.4-2.2 mm broad.
      Seeds less than 1.7 mm broad; racemes of cleistogamous flowers common; wings well developed on the outer petals . . . . . *Corydalis micrantha*
      Seeds more than 1.7 mm broad; cleistogamous flowers rare; outer petals not winged . . . . . *Corydalis aurea*

CORYLUS
1. Petioles and twigs glandular; fruiting involucre without a long beak . . . . . **Corylus americana**
1. Petioles and twigs eglandular; fruiting involucre with a long beak . . . . . **Corylus cornuta**

CORYNEPHORUS *canescens*

COSMOS
1. Ligules white, pink, or red; leaf segments linear-filiform to narrowly lanceolate . . . . . *Cosmos bipinnatus*
1. Ligules bright-yellow or orange; leaf segments lanceolate to lance-elliptic or elliptic . . . . . *Cosmos sulphureus*

COTA *tinctoria*

COTINUS *coggygria*

COTONEASTER
1. Leaves to 2.5 cm long . . . . . *Cotoneaster divaricatus*
1. Larger leaves more than 2.5 cm long.
   Leaves soon glabrous, broadly ovate and abruptly acuminate, the longer petioles more than 5 mm long; calyx glabrous; flowers white, the cyme branches nearly or quite glabrous; fruit red . . . . . *Cotoneaster magnificus*
   Leaves persistently pubescent, lance-ovate to ovate, acute to acuminate, on petioles less than 5 mm long; calyx pubescent; flowers usually pinkish, the cyme branches densely pubescent; fruit black . . . . . *Cotoneaster lucidus*

CRASSULACEAE

A. Leaves all entire, flat, or terete . . . . . SEDUM
A. Leaves not entire, flat.
Leaves prevailingly alternate, the margins glabrous, more than 3 cm long; follicles stipitate, tapering at the base . . . . . HYLOTELEPHIUM
Leaves opposite or subopposite, the margins papillose-ciliate, many less than 3 cm long; follicles sessile, not tapering at the base . . . . . PHEDIMUS

CRATAEGUS

1. Leaves abundantly tomentose abaxially when young, remaining long-pilose along the veins abaxially; styles 5; stamens much shorter than the petals . . . . . **Crataegus mollis**
1. Leaves glabrous, pubescent when young, or persistently short-pubescent along the veins or in the vein axils; styles mostly 3-5; stamens nearly as long as the petals.
2. Leaves deeply trilobate to strongly pinnately incised, the veins running to the sinuses as well as the tips of the lobes.
Leaves broadly rounded to cordate at the base; thorns frequent, mostly more than 2 cm long; nutlets 3-5 . . . *Crataegus phaenopyrum*
Leaves cuneate at the base; thorns scarce, less than 2 cm long; nutlets usually 1 or 2 . . . . . *Crataegus monogyna*
2. Leaves scarcely to not at all lobed, the veins ending only in the tips of the lobes.
3. Floral leaves broadly rounded to truncate or subcordate at the base, generally wider well below the middle.
4. Leaves permanently pubescent abaxially at least along the veins or in the axils, or if glabrate in age, then the bases of many of the floral leaves subcordate.
At least some of the floral leaves cordate at the base . . . . . **Crataegus corusca**
Floral leaves broadly rounded to subtruncate at the base . . . . . **Crataegus coccinea**
4. Leaves of flowering branchlets glabrous abaxially from the start or rarely with a thin tuft of hairs abaxially near the petiole and basal vein axils, the bases broadly rounded to subtruncate.
5. Leaves glabrous adaxially or with scattered ascending hairs when young.
Leaves broadly rounded, widest at or just below the middle; petioles glandular . . . . . **Crataegus chrysocarpa**
Leaves truncate to cordate, widest at or near the base; petioles eglandular . . . . . **Crataegus pruinosa**
5. Leaves at least thinly short-strigose on the adaxial surfaces.
6. Sepals strongly lacerate-glandular . . . . . **Crataegus holmesiana**
6. Sepals entire or some of them irregularly beset with sessile glands or low serrations.
Most flowers more than 1.7 cm across; larger fruits more than 1 cm in diameter . . . . . **Crataegus virella**
Flowers to 1.7 cm across; fruits to 1 cm in diameter . . . . . **Crataegus macrosperma**
3. Floral leaves cuneate, narrowly to broadly tapered at the base, often with decurrent tissue along the petiole, oblanceolate to obovate or ovate, widest just below, at, or above the middle.
7. Most of the sepals glandular-serrate or laciniate.
8. Petioles glandular; stamens creamy-white.
Leaves pubescent, at least on the abaxial surface . . . . . **Crataegus faxonii**
Leaves glabrous on both sides . . . . . **Crataegus chrysocarpa**
8. Petioles eglandular; stamens with tinctures of red.
9. Branchlets persistently villous; hypanthium tomentose . . . . . **Crataegus calpodendron**
9. Branchlets glabrous, even when young; hypanthium glabrous or villous with untangled hairs.
10. Leaves with the lateral veins impressed; inflorescence glabrous or villous . . . . . **Crataegus succulenta**
10. Leaves with the lateral veins flush on the adaxial surface; inflorescence villous.
Stamens more than 11; leaves to 1.2 times as long as wide, often some more than 5.5 cm long . . . . . **Crataegus fulleriana**
Stamens fewer than 11; leaves more than 1.2 times as long as wide, or if less, then the leaves less than 5.5 cm long . . . . . **Crataegus scabrida**
7. Sepals entire or nearly so.
11. Floral leaves widest at or below the middle, with obvious, consistent pairs of lobes or coarse teeth, at least beyond the middle, more or less flabelliform.
Floral branches usually thornless; stamens 15-20 . . . . . **Crataegus margarettae**
Floral branches usually with thorns; stamens 5-10 . . . . . **Crataegus dodgei**
11. Floral leaves widest prevailingly beyond the middle, finely serrate, without obvious pairs of lobes, usually with an obvious tendency to be widest beyond the middle.
12. Leaves permanently pubescent abaxially, at least with appressed hairs along the veins . . . . . **Crataegus punctata**
12. Leaves soon glabrous or glabrate abaxially.
13. Leaves distinctly glossy on the adaxial surface, with a waxy, coriaceous cortex . . . . . **Crataegus crus-galli**
13. Adaxial leaf surface dull or weakly lustrous.
14. Terminal leaves of sterile shoots twice or more as wide as those of the floral shoots . . . . . **Crataegus acutifolia**
14. Leaves of floral and sterile shoots not strongly dissimilar in width.
Leaves simply serrate, without tooth-like lobes . . . . . **Crataegus disperma**
Leaves with distinct, tooth-like lobes . . . . . **Crataegus cuneiformis**

CREPIS

1 Stems abundantly viscid-pubescent proximally, with stipitate glands . . . . . *Crepis pulchra*
1. Stems without glandular-viscid hairs proximally.
Larger achenes more than 2.5 mm long, dark purplish-brown when mature; inner phyllaries strigillose on the inner surface . . . . . *Crepis tectorum*
Achenes up to 2.5 mm long, tawny or pale-brown when mature; inner phyllaries glabrous on the inner surface . . . . . *Crepis capillaris*

CROCANTHEMUM

1. Petaliferous flowers 1 or rarely 2, overtopped by lateral branches; larger capsules of apetalous flowers 3-4 mm in diameter; seeds dark-brown, minutely papillose (under 10× magnification) . . . . . **Crocanthemum canadense**

1. Petaliferous flowers 3-several in terminal corymbs; capsules of apetalous flowers less than 3 mm in diameter; seeds medium-brown, finely reticulate. . . . . **Crocanthemum bicknellii**

CROCUS L. {Gr. = saffron} **Iridaceae**

~ Acaulescent perennial ephemerals from deep bulbs; flowers produced from among the leaves in spathiform sheaths, the leaves linear, deep-green, the adaxial surface usually with a white midrib; perianth lobes 6, subequal, variously colored, flaring from an elongate floral tube; stamens 3, included; stigmas 3; capsule ripening at or beneath the surface.

1. Flowers yellow or yellow with dark stains, surpassed by some of the leaves . . . . . *Crocus chrysanthus*
1. Flowers not yellow, exceeding or subequaling the leaves . . . . . *Crocus vernus*

CROTALARIA sagittalis

CROTON

1. Leaves dentate; petioles with 1 or 2 glands at summit . . . . . *Croton glandulosus septentrionalis*
1. Leaves entire; petioles eglandular.
   2. Leaves 3 times as long as wide or longer; calyx of pistillate flowers more than 5-parted; stigmas 12 or more . . . . . *Croton capitatus*
   2. Leaves less than 3 times as long as wide; calyx of pistillate flowers 4 or 5-parted; stigmas 4 or 6.
      Styles 2, bifid to the base, yielding 4 stigmas; capsules 1-seeded . . . . . *Croton monanthogynus*
      Styles 3, bifid to the base, yielding 6 stigmas; capsules 3-seeded . . . . . *Croton lindheimerianus*

CROTONOPSIS elliptica

CRUCIATA *pedemontana*

CRYPSIS *schoenoides*

CRYPTOGRAMMA stelleri

CRYPTOTAENIA canadensis

CUCUMIS *melo*

CUCURBITA

1. Leaves triangular-ovate, deeply 3-5 lobed, not much longer than wide; petioles with conspicuous spinulose hairs that have notable annular markings. . . . . *Cucurbita pepo*
1. Leaves triangular, but not lobed, notably longer than wide; petiolar hairs without obvious annular markings . . . . . *Cucurbita foetidissima*

CUCURBITACEAE

A. Leaves pinnately divided . . . . . CITRULLUS
A. Leaves unlobed or palmately lobed or angled.
   B. Leaves palmately 3-7 lobed; corollas white or greenish; fruits prickly, less than 5 cm long.
      Leaves divided about ½ the distance to the petiole, the lobes long-tapering to an acute tip, ending in a filiform extension of the midrib; calyx and corolla 6-parted; fruit bladder-like, weakly prickly, 4-seeded . . . . . ECHINOCYSTIS
      Leaves divided less than ½ the distance to the petiole, the lobes broadly cuneate-rounded to an abruptly acuminate, scarcely caudate tip; calyx and corolla 5-parted; fruit bur-like, pungently spiny, 1-seeded . . . . . SICYOS
   B. Leaves deltate-ovate or rotund, unlobed to somewhat shallowly repand-denticulate or angulate; corollas yellow; fruits unarmed, more or less than 5 cm long.
      C. Leaves strongly deltate, tapering to an acute tip; flowers more than 5 cm long and 5 cm across . . . . . CUCURBITA
      C. Leaves rotund to angulate-deltate; flowers less than 5 cm long and 5 cm across.
         Leaves without hooked hairs; corollas less than 2.2 cm long; staminate flowers solitary . . . . . CUCUMIS
         Leaves with at least some hooked hairs; corollas more than 2.2 cm long; staminate flowers in clusters . . . . . THLADIANTHA

CUPHEA *viscosissima*

CUPRESSACEAE

A. Seeds produced in a small cone; leaves all scale-like and 2-ranked; leafy twigs flattened . . . . . THUJA
A. Seeds produced in drupe-like berries; leaves all subulate or in part scale-like and appressed, but not obviously 2-ranked; leafy twigs not flattened . . . . . JUNIPERUS

CUSCUTA

1. Plants forming a very thick, tight, spiraling, distinctive rope-like cluster up the stem or along the branches of its host . . . . . **Cuscuta glomerata**
1. Plants variously glomerate, but never distinctly rope-like and wound tightly around the stems and branches.
   2. Perianth segments (under 10× magnification) lustrous, fleshy-papillose (papillae not to be confused with concentrations of blister-like expressed cells); many of the flowers on pedicels 1 mm or more long; corolla lobes acute, incurved at the tips . . . . . **Cuscuta coryli**
   2. Perianth segments dull to lustrous, but not notably fleshy-papillose; pedicel length various.
      3. Flowers minute, scarcely 1.5 mm long, the capsules not much longer; calyx lobes with the free margins notably overlapping, with a strong tendency to form a crest at the angle where they overlap . . . . . **Cuscuta pentagona**
      3. Flowers and capsules usually larger; calyx lobes not or only scarcely overlapping along the free margins.
         4. Plants with well developed flowers.

5. Perianth mostly 4-lobed.
   Mature styles 1 mm or more long . . . . . **Cuscuta cephalanthi**
   Mature styles less than 1 mm long . . . . . **Cuscuta polygonorum**
5. Perianth mostly 5-lobed.
   Corolla lobes obtuse . . . . . **Cuscuta gronovii**
   Corolla lobes acute . . . . . **Cuscuta campestris**

4. Plants with well developed capsules.
6. Corolla persisting as a small, narrow-mouthed crown atop the capsule, the corolla therefore tearing below the lobes in age . . . . . **Cuscuta cephalanthi**
6. Corolla lobes remaining with the tube as the capsule enlarges to emerge from and obscure the corolla.
7. Capsules ovoid, mostly longer than broad, with a strong tendency for the stylopodium to be thicker than the other sutures . . . . . **Cuscuta gronovii**
7. Capsules depressed-globose, shorter than to about as long as broad, the stylopodium scarcely more thickened than the capsule sutures.
   Many of the capsules more than 2.8 mm broad, shiny and smoothish, the vascular strands more or less concolorous with the areolae, not forming a strong striate appearance . . . . . **Cuscuta polygonorum**
   Capsules less than 2.8 mm broad, the vascular strands notably paler than the areolae, giving the whole a striate-fibrous appearance . . . . . **Cuscuta campestris**

CUSCUTACEAE: One genus in our area . . . . . CUSCUTA

CYCLACHAENA *xanthiifolia*

CYCLOLOMA atriplicifolium

CYMBALARIA *muralis*

CYNODON *dactylon*

CYNOGLOSSUM

1. Plant leafy into the inflorescence; cauline leaves numerous, tapering to petiolate or merely sessile bases; flowers reddish-purple . . . . . *Cynoglossum officinale*
1. Plant leafless in the inflorescence; cauline leaves few, the distal ones sessile with broad clasping bases; flowers blue . . . . . **Cynoglossum boreale**

CYPERACEAE

A. Achenes enclosed in a perigynium; flowers all imperfect . . . . . CAREX
A. Achenes naked, not enclosed in a perigynium; flowers (except in Scleria) mostly perfect.
B. Achenes exposed, bony, spherical to ovoid, white, grayish, or buff (very rarely olive-brown); spikelets dimorphic . . . . . SCLERIA
B. Achenes never with all of the above characteristics; spikelets essentially alike.
C. Scales folded in half, mostly keeled, 2-ranked along the rachilla.
   Achenes conspicuously long-tuberculate with a persistent style; perianth bristles present; inflorescence axillary; stems hollow, terete . . . . . DULICHIUM
   Achenes etuberculate or merely apiculate, the styles deciduous; perianth bristles absent; inflorescence terminal; stems solid, mostly 3-angled . . . . . CYPERUS
C. Scales mostly flattish or rounded on the back, spirally arranged around the rachilla.
D. Achenes crowned with a persistent style base or tubercle, usually a different color and/or texture from the achene body from which it is separated by a basal constriction, or in Eleocharis quinqueflora and Eleocharis rostellata confluent and large.
E. Spikelets solitary; culms naked . . . . . ELEOCHARIS
E. Spikelets 2-several; culms leafy, at least at the base.
   Leaf blades cauline, flat . . . . . RHYNCHOSPORA
   Leaf blades mostly basal, capillary . . . . . BULBOSTYLIS
D. Achenes without a tubercle or merely minutely apiculate, with the apex confluent with and the same color as the body.
F. Perianth bristles subtending the achene very numerous, silky, greatly exceeding the scales . . . . . ERIOPHORUM
F. Perianth bristles 0-6 (8), not silky, shorter or longer than the scales.
G. Spikelets l-2 flowered; empty basal scales several; achenes ovoid, terete, pointed at the summit . . . . . CLADIUM
G. Spikelets with several to numerous flowers; empty basal scale one; achenes not as above.
H. Some of the perianth bristles broadly dilated apically; scales abruptly awned, giving the spikelets a bur-like appearance . . . . . FUIRENA
H. Perianth bristles all filiform or absent; spikelets not appearing bur-like.
I. Lowest bract appearing as a continuation of the stem, the inflorescence seemingly laterally disposed.
J. Achenes more than 1 mm long, smooth to transversely ridged or rugulose.
   Cespitose annuals to 8 dm high; anthers less than 1 mm long . . . . . SCHOENOPLECTIELLA
   Rhizomatous perennials, mostly more than 8 dm high; anthers more than 1 mm long . . . . . SCHOENOPLECTUS
J. Achenes less than 1 mm long, thinly to noticeably papillose, never transversely ribbed.
   Achenes less than 0.7 mm long . . . . . LIPOCARPHA
   Achenes more than 0.7 mm long . . . . . ISOLEPIS
I. Lowest bract spreading and leaf-like or minute, the inflorescence generally appearing terminal.
K. Perianth bristles absent.
   Style dilated at the base; plant less than 5 dm high . . . . . FIMBRISTYLIS
   Style uniform, not dilated at the base; plant rarely less than 5 dm high . . . . . SCIRPUS
K. Perianth bristles 1-8.
L. Spikelet solitary . . . . . TRICHOPHORUM

L. Spikelets 2 or more.
Spikelets less than 5 mm long, the scales glabrous . . . . . SCIRPUS
Spikelets more than 5 mm long, the scales puberulent abaxially . . . . . BOLBOSCHOENUS

CYPERUS

1. Scales with spreading or recurved, acuminate-cuspidate to awned tips.
   2. Scales tapering abruptly into a stout, recurved awn . . . . . **Cyperus squarrosus**
   2. Scales merely acuminate or cuspidate, the tips gently falcate.
      Scales becoming suffused with red along the margins, the larger more than 2 mm long . . . . . **Cyperus dentatus**
      Scale margins remaining pale or flushed with reddish-brown, to 2 mm long . . . . . **Cyperus acuminatus**
1. Scale tips appressed or at least not notably divergent.
   3. Stigmas 2; achenes lenticular.
      4. Achenes nearly as broad as long; scales pale, to 2 mm long . . . . . **Cyperus flavescens**
      4. Achenes obviously longer than broad; scales, at least in age, tinged with red or reddish-brown, more than 2 mm long.
         5. Scales with reddish pigment chiefly at the summit and extending along the margin toward the base, the larger more than 2.4 mm long; style divided nearly to the base, exserted more than 2 mm beyond the tip of the scale . . . . . **Cyperus diandrus**
         5. Scales with reddish pigment chiefly at the base, extending from midrib to margin and also toward the summit, to 2.4 mm long; style divided to about the middle, exserted up to 2 mm.
            Spikelets less than 1.6 cm long; styles scarcely evident at maturity . . . . . **Cyperus bipartitus**
            Longer spikelets more than 1.6 cm long; some styles usually evident at maturity . . . . . **Cyperus ×nieuwlandii**
   3. Stigmas 3; achenes trigonous.
      6. Spikelets racemose, arising along a distinct rachis.
         7. Spikelets less than 1 mm wide, the scales distant, the tips not or barely reaching the base of the scale above on the same side of the rachis . . . . . **Cyperus engelmannii**
         7. Spikelets more or less than 1 mm wide, the scales with tips overlapping the scale above on the same side of the rachis.
            8. Scales less than 1.7 mm long; scales with strong tinctures of red . . . . . **Cyperus erythrorhizos**
            8. Larger scales more than 1.7 mm long; scales usually stramineous.
               9. Scales 3 mm or more long.
                  Spikelets filiform, about 1 mm wide, the scales tinged with rust . . . . . **Cyperus ×deamii**
                  Spikelets linear, more than 1 mm wide, the scales stramineous . . . . . **Cyperus strigosus**
               9. Scales obviously less than 3 mm long.
                  10. Larger spikelets more than 2 mm wide . . . . . *Cyperus esculentus macrostachyus*
                  10. Spikelets not more than 2 mm wide.
                     Culms with 0-few leaves at base; spikelets disarticulating at the base of each scale (if the spikelet is pulled at the end, it will usually break somewhere other than at the base of the spikelet); rhizomes absent . . . . . **Cyperus odoratus**
                     Culms very leafy at base; spikelets disarticulating at their attachment to the rachis; slender rhizomes numerous . . . . . **Cyperus esculentus leptostachyus**
      6. Spikelets arising from a common point or along a very short rachis, aggregated into spherical, hemispherical, or flattish clusters or heads.
         11. Spikelets radiating in spherical or hemispherical, usually solitary heads (rarely l-3 satellite heads terminate peduncles that arise from the base of the primary cluster).
            12. Spikelets entire, the scales strongly overlapping, the tips appressed . . . . . *Cyperus echinatus*
            12. Spikelets dentate, the scales with free tips, not strongly overlapping.
               13. Spikelets yellowish to yellowish-brown; achenes to 0.8 mm broad . . . . . **Cyperus filiculmis**
               13. Spikelets pallid with tinctures of reddish-brown; achenes 0.8 mm or more broad.
                  Larger scales 2.6 mm or more long and more than 1.9 mm wide; achenes loosely invested . . . . . **Cyperus lupulinus**
                  Scales less than 2.6 mm long and 1.9 mm wide; achenes closely invested . . . . . **Cyperus lupulinus macilentus**
         11. Spikelets spreading to ascending, arising along a very short rachis, in mostly 2-7 flattish clusters.
            14. Achenes broadly ovoid, to 1.9 mm long, clearly more than ½ as broad, the faces routinely concave; culms smooth, to 1.1 mm wide . . . . . **Cyperus houghtonii**
            14. Achenes oblong to ovoid, the larger more than 1.9 mm long, about ½ as broad, the faces of mature achenes essentially flat; culms smooth to scabrous, more or less than 1.1 mm wide.
               Involucral bracts and spikelets strongly ascending; culms scabrous, usually more than 1.5 mm wide . . . . . **Cyperus schweinitzii**
               Involucral bracts and spikelets spreading-ascending; culms smooth to weakly scabridulous, mostly less than 1.5 mm wide . . . . . **Cyperus ×mesochorus**

CYPRIPEDIUM

1. Leaves 2, both basal; lip pink or magenta . . . . . **Cypripedium acaule**
1. Leaves more than 2, cauline.
   2. Lip yellow.
      Sepals and petals reddish-brown; lateral petals strongly twisted, solid-maroon or brownish-purple, up to 5 cm long; lip less than 3 cm long . . . . . **Cypripedium parviflorum makasin**
      Sepals and petals yellow to brownish-green or blotched with maroon; lateral petals merely undulate to spiraled, streaked with green and maroon, mostly 4-8 cm long; lip usually more than 3 cm long . . . . . **Cypripedium parviflorum pubescens**
   2. Lip white to pink or pink with white lines or patches.
      3. Lip projected below into a conical spur; lateral sepals separate . . . . . **Cypripedium arietinum**
      3. Lip a copious pouch, not projected below; lateral sepals united for virtually their entire length, appearing as one.
         4. Lip pink or pink with white lines; petals ovate, not spirally twisted . . . . . **Cypripedium reginae**
         4. Lip white; petals lanceolate, often with one or more spiral twists.
            Sepals and petals prevailingly with greenish tints . . . . . **Cypripedium candidum**
            Sepals and petals nearly solid-maroon . . . . . **Cypripedium ×andrewsii**

CYSTOPTERIS

1. Fronds rarely with fewer than 16 pairs of well developed pinnae, widest at the base . . . . . **Cystopteris bulbifera**

1. Fronds almost always with fewer than 16 pairs of pinnae, widest beyond the base.
   2. Rachides, midribs, and indusia at least sparsely disposed with gland-tipped hairs . . . . . **Cystopteris tennesseensis**
   2. Fronds without glandular hairs.
      3. Petiole pale-brown or stramineous throughout, or dark only at the base; rhizomes elongate, extending 1 to several cm beyond the leaf cluster, commonly villous with yellow hairs at one end; spores less than 35 μm long . . . . . **Cystopteris protrusa**
      3. Petioles with dark coloration extending well above the base; rhizomes short, less than 1 cm between the leaf clusters, without yellow hairs; spores more than 35 μm long.
         Indusia to 0.5 mm long; lobes of pinnae rounded-crenate; pinnae with a tendency to curve toward the apex of the frond . . . . . **Cystopteris tenuis**
         Indusia prevailingly more than 0.5 mm long; lobes of pinnae serrate, the marginal teeth pointed; pinnae not at all curved toward the apex of the frond . . . . . **Cystopteris fragilis**

DACTYLIS *glomerata*

DALEA
1. Leaflets more than 15.
   Calyx lobes narrowly deltate, glabrous abaxially . . . . . **Dalea foliosa**
   Calyx lobes long-caudate, densely villous . . . . . *Dalea leporina*
1. Leaflets fewer than 15.
   2. Inflorescence loose, the axis clearly visible . . . . . *Dalea enneandra*
   2. Inflorescence dense, the axis completely hidden by the flowers and fruits.
      Flowers magenta to purple; calyx and bracts pubescent; leaflets less than 2 mm wide . . . . . **Dalea purpurea**
      Flowers white; calyx and bracts glabrous or glabrate; leaflets usually more than 2 mm wide . . . . . **Dalea candida**

DANTHONIA spicata

DASIPHORA fruticosa

DASISTOMA macrophylla

DATURA
1. Plant glabrous or nearly so; flowers less than 10 cm long . . . . . *Datura stramonium*
1. Plant soft-hairy throughout; flowers more than 10 cm long.
   Petioles and at least the veins of abaxial leaf surfaces spreading-pilose; corolla glabrous or glabrate . . . . . *Datura inoxia*
   Petioles and abaxial leaf surfaces canescent; corolla puberulent, at least along the veins . . . . . *Datura wrightii*

DAUCUS *carota*

DECODON verticillatus

DELPHINIUM tricorne

DENDROLYCOPODIUM
1. Stem leaves tightly appressed, the proximal ones progressively reduced; lateral shoots flat, the leaf surfaces essentially sharing the same plane . . . . . **Dendrolycopodium obscurum**
1. Stem leaves spreading-appressed, not reduced proximally; lateral shoots subterete, the leaves with the adaxial surfaces facing the rachis.
   Leaves of lateral shoots with 1 rank on the adaxial side, 4 lateral ones, and 1 rank on the abaxial; leaves of main axis soft to the touch . . . . . **Dendrolycopodium hickeyi**
   Leaves of lateral shoots with 2 ranks on the adaxial side, 2 lateral ones, and 2 on the abaxial; leaves of main axis prickly to the touch . . . . . **Dendrolycopodium dendroideum**

DENNSTAEDTIACEAE: One genus in our area . . . . . PTERIDIUM

DENTARIA
1. Leaf segments broadly ovate . . . . . **Dentaria diphylla**
1. Leaf segments linear-oblong to lanceolate . . . . . **Dentaria laciniata**

DEPARIA acrostichoides

DESCHAMPSIA
1. Spikelets more than 3.3 mm long . . . . . **Deschampsia cespitosa**
1. Spikelets less than 3.3 mm long . . . . . *Deschampsia cespitosa parviflora*

DESCURAINIA
1. Inflorescence, and usually the stems and leaves, decidedly short-stipitate glandular . . . . . *Descurainia pinnata brachycarpa*
1. Herbage, including the inflorescence, eglandular . . . . . *Descurainia sophia*

DESMANTHUS illinoensis

DESMODIUM

1. Leaflets less than 3.5 cm long or if a little longer, then broadly rounded at the tip and about as long as wide.
   2. Plant prostrate, the stems running along the ground; leaflets all rounded at the apex, as wide as or often wider than long . . . . . **Desmodium rotundifolium**
   2. Plants with stems erect; leaflets broadly oval to elliptic, mostly longer than wide.
      Leaflets glabrous to glabrate adaxially, the lateral ones about as long as the petioles; stems not villous . . . . **Desmodium marilandicum**
      Leaflets pilose adaxially, the lateral ones usually at least twice as long as the petioles; stems villous . . . . . **Desmodium ciliare**
1. Larger leaflets more than 3.5 cm long, always notably longer than wide.
   3. Leaves all sessile, or subsessile on short petioles up to 3 mm long, the leaflets linear-oblong to narrowly lanceolate, more than 4 times as long as wide. . . . . **Desmodium sessilifolium**
   3. At least some of the mid-stem leaves on petioles more than 3 mm long, the leaflets narrowly oblong to ovate, nearly always less than 4 times as long as wide.
      4. Pubescence of the abaxial leaf surfaces dominated by hooked hairs or with hooked hairs mixed with longer straight hairs.
         Longer hairs of the inflorescence clearly longer than the thickness of the inflorescence axis . . . . . **Desmodium canescens**
         Longer hairs of the inflorescence shorter than the thickness of the inflorescence axis . . . . . **Desmodium illinoense**
      4. Leaves glabrous abaxially or the pubescence dominated by straight hairs.
         5. Articles more than 9 mm long, about ½ as wide as long; stipules 8 mm or more long, persistent.
            Leaflets glabrous or glabrate abaxially, many of them acuminate . . . . . **Desmodium cuspidatum**
            Leaflets pubescent abaxially, merely acute . . . . . **Desmodium cuspidatum longifolium**
         5. Articles up to 9 mm long, more than ½ as wide as long; stipules less than 8 mm long, usually soon deciduous.
            6. Flowers less than 6 mm long; calyx up to 3 mm long; articles 1-3 . . . . . **Desmodium obtusum**
            6. Larger flowers more than 6 mm long; larger calyces more than 3 mm long; articles more than 3.
               7. Abaxial leaf surfaces with a strong tendency to be more densely pubescent along the midveins with long strigose hairs and with more ascending hairs along the veinlets . . . . . **Desmodium canadense**
               7. Abaxial leaf surfaces uniformly pubescent on both the midveins and veinlets.
                  8. Terminal leaflet of larger leaves more than 3 times as long as wide, to 2.5 cm wide, the abaxial surfaces thinly strigose on both the laminae and the veins . . . . . **Desmodium paniculatum**
                  8. Terminal leaflet of larger leaves either more than 2 cm wide or less than 3 times as long as wide, or both, the pubescence various but not strigose on both the laminae and the veins.
                     Medial portions of the stem primarily with uncinate hairs, any long spreading hairs absent or mostly in the vicinity of the nodes. . . . . **Desmodium glabellum**
                     Medial portions of the stem thinly but decidedly beset with straight spreading hairs, often admixed with a minute puberulence of uncinate hairs. . . . . **Desmodium perplexum**

DEUTZIA *scabra*

DIANTHUS

1. Leaves elliptic to elliptic-oblong, more than 9 mm wide . . . . . *Dianthus barbatus*
1. Leaves linear, less than 9 mm wide.
   2. Plant annual or biennial; calyx and bracts conspicuously pubescent . . . . . *Dianthus armeria*
   2. Plants perennial; calyx and bracts minutely puberulent to glabrous.
      Leaves hard, stiff, acicular-subulate, with spinulose-ciliolulate margins; calyx more than 2 cm long; flowers clove-scented, the petals strongly lacerate . . . . . *Dianthus plumarius*
      Leaves lax, acute, the margins merely scabrous; calyx to 2 cm long; flowers not clove-scented, the petals merely dentate . . . . . *Dianthus deltoides*

DIARRHENA obovata

DICENTRA

1. Corolla with divaricately spreading spurs, the spurs obviously longer than broad; leaves green or scarcely pale abaxially; bulblets pink-tinged . . . . . **Dicentra cucullaria**
1. Corolla saccate, with broadly rounded spurs about as long as broad; leaves usually conspicuously glaucous abaxially; bulblets yellow or absent.
   Leaves finely divided into linear-oblong segments; corollas white or greenish-white . . . . . **Dicentra canadensis**
   Leaves coarsely divided into acute-deltate teeth; corollas pink to purple . . . . . *Dicentra eximia*

DICHANTHELIUM

1. Cauline leaves narrowly linear, more than 20 times as long as wide.
   2. Spikelets less than 2.7 mm long, very often on pedicels exceeding 8 mm long . . . . . **Dichanthelium linearifolium**
   2. Larger spikelets more than 2.7 mm long, the pedicels only rarely exceeding 8 mm.
      2nd glume and sterile lemma prolonged well beyond the cartilaginous fertile lemma, each forming opposing hooked beaks; spikelets 3.2 mm or more long. . . . . **Dichanthelium depauperatum**
      2nd glume and sterile lemma blunt to beaked, but not exceeding the fertile lemma; spikelets less than 3.2 mm long . . . . . **Dichanthelium perlongum**
1. Cauline leaves linear to lance-ovate, less than 20 times as long as wide.
   3. Spikelets glabrous or nearly so; leaves lanceolate to narrowly linear.
      4. Spikelets 1.2 mm or more broad . . . . . **Dichanthelium scribnerianum**
      4. Spikelets less than 1.2 mm broad.
         5. Nodes retrorsely barbed; spikelets less than 1.8 mm long . . . . . **Dichanthelium microcarpon**
         5. Nodes glabrous or short-puberulent; larger spikelets more than 1.8 mm long.
            Culms permanently erect, terete; fertile lemma lustrous, the cellular structure obscure . . . . . **Dichanthelium dichotomum**
            Culms soon reclining or trailing, generally flattened; fertile lemma subopaque, the reticulate cellular pattern evident . . . . . **Dichanthelium lucidum**
   3. Spikelets puberulent to pilose; leaves linear-lanceolate to lance-ovate.
      6. Larger cauline leaves more than 15 mm wide.

7. Spikelets less than 1.8 mm long . . . . . **Dichanthelium polyanthes**
7. Spikelets more than 1.8 mm long.
    At least the middle and proximal sheaths papillose-hispid . . . . . **Dichanthelium clandestinum**
    Sheaths all glabrous or ciliate on the margins . . . . . **Dichanthelium latifolium**

6. Cauline leaves always less than 15 mm wide.
8. Spikelets more than 2.6 mm long.
9. Larger, fully developed spikelets more than 3.1 mm long.
10. Spikelets papillose-hirsute, with the longer hairs more than 0.5 mm long . . . . . **Dichanthelium leibergii**
10. Spikelets short-puberulent, with the hairs all less than 0.5 mm long.
11. Spikelets more than 3.5 mm long, the larger first glumes more than 1.7 mm long . . . . . **Dichanthelium oligosanthes**
11. Spikelets less than 3.5 mm long, the first glumes up to 1.7 mm long.
    Spikelets 3.1 mm or more long. . . . . **Dichanthelium scribnerianum**
    Spikelets less than 3.1 mm long . . . . . *Dichanthelium helleri*
9. Spikelets less than 3.1 mm long.
12. Leaves all less than 7 mm wide.
    Larger vernal blades more than 8 cm long . . . . . **Dichanthelium deamii**
    Blades never more than 8 cm long . . . . . **Dichanthelium wilcoxianum**
12. Larger leaves more than 7 mm wide.
13. Ligule obsolete . . . . . **Dichanthelium commutatum**
13. Ligule evident.
    Ligule of two distinct rows of hairs . . . . . **Dichanthelium ovale**
    Ligule a single row of hairs . . . . . **Dichanthelium scribnerianum**

8. Spikelets less than 2.6 mm long.
14. Sheaths all essentially glabrous (except rarely the proximal), or merely ciliate along the margins, or with a few sparse hairs.
15. Larger spikelets l.9 mm or more long.
16. Ligule more than 1 mm long . . . . . **Dichanthelium scoparioides**
16. Ligule less than 1 mm long.
    Larger leaves more than 7 mm wide; plant of wet prairies . . . . . **Dichanthelium boreale**
    Leaves less than 7 mm wide; plant of moist to dry woodlands . . . . . **Dichanthelium dichotomum**
15. Spikelets less than 1.9 mm long.
17. Ligule 2 mm or more long; spikelets 1.4-1.6 mm long.
    Panicle with branches ascending, twice as long as broad or longer . . . . . **Dichanthelium spretum**
    Panicle with branches spreading, less than twice as long as broad . . . . . **Dichanthelium lindheimeri**
17. Ligule very short or obsolete; spikelets 1.5-1.8 mm long.
18. Spikelets elliptic-obovoid, about twice as long as broad . . . . . **Dichanthelium microcarpon**
18. Spikelets ovoid, nearly as broad as long.
    Nodes glabrous or minutely puberulent; distalmost leaves mostly more than 10 cm long and 15 mm wide; panicle scarcely ½ as broad as long; spikelets 1.5-1.6 mm long . . . . . **Dichanthelium polyanthes**
    Nodes thinly to densely ascending-pubescent; distalmost leaves less than 10 cm long and 15 mm wide; panicle nearly or quite as broad as long; spikelets 1.6-1.8 mm long . . . . . **Dichanthelium sphaerocarpon**

14. Sheaths variously pubescent.
19. Spikelets more than 2 mm long.
20. Pubescence on culms horizontally spreading; spikelets 2-2.3 mm long . . . . . **Dichanthelium villosissimum**
20. Pubescence on culms puberulent to appressed or ascending; spikelets more than 2.3 mm long.
21. Pubescence of surface of the sheaths with only a single type of hair; spikelets 2.4-3 mm long . . . . . **Dichanthelium commutatum**
21. Pubescence on surface of the sheaths both short-puberulent and long-pilose, the shorter hairs more concentrated distally; spikelets 2.2-2.4 mm long.
22. Distal internodes shortened, the sheath pubescence scant, the leaves approximate, with blades subequaling the panicle . . . . . **Dichanthelium scoparioides**
22. Distal internodes not shortened, the sheath pubescence silky, the blades not or only scarcely reaching the panicle.
    Distal sheaths short-puberulent; first glume ½ the length of the sterile lemma; ligule a single row of short hairs . . . . . **Dichanthelium commonsianum**
    Distal sheaths villous; first glume less than ⅓ the length of the sterile lemma; ligule a double row of long and short hairs . . . . . **Dichanthelium pseudopubescens**

19. Spikelets to 2 mm long.
23. Herbage with minute puberulence at least on the distal sheaths and with longer pilose hairs at least on the proximal sheaths.
    Larger spikelets more than 1.6 mm long . . . . . **Dichanthelium columbianum**
    Spikelets to 1.6 mm long. . . . . **Dichanthelium meridionale**
23. Sheaths with pilose hairs only.
24. Vernal blades glabrate to thinly pilose marginally on the adaxial surface . . . . . **Dichanthelium tennesseense**
24. Vernal blades pubescent throughout adaxially.
25. Spikelets less than 1.6 mm long . . . . . **Dichanthelium implicatum**
25. Spikelets 1.6 mm or more long.
26. Sheaths with horizontally spreading hairs 3 mm or more long . . . . . **Dichanthelium praecocius**
26. Sheaths variously pubescent, but if pilose, then hairs all less than 3 mm long and not horizontally spreading.
    Adaxial leaf surface spreading-pilose; 1st glume more than ⅓ the length of the spikelet; spikelets 1.8-1.9 mm long . . . . . **Dichanthelium subvillosum**
    Adaxial leaf surface appressed-pubescent or pilose only near the base; 1st glume less than ⅓ the length of the spikelet; spikelets 1.6-1.8 mm long . . . . . **Dichanthelium huachucae**

DIDIPLIS diandra

DIERVILLA lonicera

DIERVILLACEAE: One genus in our area . . . . . DIERVILLA

DIGITALIS *grandiflora*

DIGITARIA
1. First glume virtually absent or reduced to a tiny, truncate, hyaline scale; 2nd glume ovate, nearly as long as the indurated fertile lemma, mostly concealed beneath it, with mostly swollen or gland-tipped hairs; spikelets to 2.2 mm long.
   Culms erect; rachis wingless, less than 0.5 mm wide; proximal sheaths hirsute . . . . . **Digitaria filiformis**
   Culms usually decumbent and rooting at the nodes; rachis strongly flattened, more than 0.5 mm wide; proximal sheaths glabrous . . . . . *Digitaria ischaemum*
1. First glume short but distinct, deltate-acute, often tinged with green or purple; 2nd glume lanceolate, notably shorter than and revealing much of the fertile lemma, the pubescence merely villous; spikelets often more than 2.2 mm long.
   Spikelets less than 3.4 mm long, eciliate or with fine cilia less than 1 mm long; adaxial leaf surfaces often decidedly long-pubescent with pustular-based hairs . . . . . *Digitaria sanguinalis*
   Longer spikelets often more than 3.4 mm long, strongly ciliate with fine hairs about 1 mm long, often admixed with longer, stouter hairs; adaxial leaf surfaces with long pustular hairs aggregated near the base . . . . . *Digitaria ciliaris*

DIODIA *teres*

DIOSCOREA villosa

DIOSCOREACEAE: One genus in our area . . . . . DIOSCOREA

DIOSPYROS *virginiana*

DIPHASIASTRUM
1. Leaves on the ventral branch surface notably shorter and smaller than the distal lateral leaves, the tips not at all reaching the base of the decurrent base of the next one; horizontal stems running at the surface or just beneath the leaf litter; larger branches more than 2 mm wide; branch constrictions at the end of the previous year's growth absent . . . . . **Diphasiastrum digitatum**
1. Leaves on the ventral branch surface subequaling the distal lateral leaves, the tips nearly or quite reaching the base of the next one; horizontal stems deep within the humus; branches to 2 mm wide; branches commonly with a constriction and reduction in leaf size at the end of the previous year's growth, the new growth tapered proximally.
   Tips of the ventral leaves of the middle and distal portions of the branches reaching the base of the next one . . . . . **Diphasiastrum tristachyum**
   Tips of the ventral leaves of the branches nearly all ending short of the base of the next one . . . . . **Diphasiastrum ×habereri**

DIPLOTAXIS
1. Plant annual or biennial; leaves confined to the proximal half of the stem; sepals less than 5 mm long; fruit sessile on the pedicel . . . . . *Diplotaxis muralis*
1. Plant perennial; leafy nearly throughout; sepals 5 mm or more long; fruit stipitate on the pedicel . . . . . *Diplotaxis tenuifolia*

DIPSACACEAE: One genus in our area . . . . . DIPSACUS

DIPSACUS
1. Leaves deeply pinnate-lobed or laciniate; flowers white . . . . . *Dipsacus laciniatus*
1. Leaves undivided, subentire to merely spinulose-denticulate; flowers purplish . . . . . *Dipsacus fullonum*

DIRCA palustris

DISTICHLIS *stricta*

DODECATHEON meadia

DOELLINGERIA umbellata

DRABA
1. Plant leafy throughout; fruits less than 5 mm long and 1.3 mm broad . . . . . *Draba brachycarpa*
1. Plant subscapose, with leaves confined to the proximal half of the stem; fruits more than 5 mm long and 1.3 mm broad . . . . . **Draba reptans**

DRACOCEPHALUM *parviflorum*

DRACOPIS *amplexicaulis*

DROSERA
1. Blade portion of leaves spatulate, longer than wide; at least some of the leaves originating on nodes above the rosette; seeds papillose . . . . .

. . . . . **Drosera intermedia**
1. Blade portion of leaves suborbicular, nearly or quite as wide as long; leaves confined to the basal rosette; seeds finely striate . . . . . **Drosera rotundifolia**

DROSERACEAE: One genus in our area . . . . . DROSERA

DRYMOCALLIS arguta

DRYOPTERIDACEAE Wood Fern Family

~ Fronds coriaceous to more or less evergreen, 1-3 pinnate-pinnatifid; petioles in cross section with 3-several roundish vascular bundles proximally, arranged in an arc; sori borne on the veins of the abaxial frond surfaces, round to oblong; indusia obsolete or variously shaped, from round to linear, falcate or hood-like.

A. Fronds evergreen, leathery, pinnate; pinnae spinulose-serrate, asymmetrically 1-lobed at the base with the lobe aimed in a distal direction . . . . . POLYSTICHUM
A. Fronds various, but never with pinnae having a distinct, distally aimed basal lobe . . . . . DRYOPTERIS

DRYOPTERIS
1. Fronds prevailingly tripinnate, the ultimate pinnules with short spines at the tip.
   2. Lowest inferior pinnules of lowest pinnae longer than the next inferior pinnules; indusia eglandular . . . . . **Dryopteris carthusiana**
   2. Lowest inferior pinnules of lowest pinnae shorter than the next inferior pinnules (or nearly as long as them); indusia and usually the rachis capitate-glandular abaxially.
      Pinnae abruptly narrowed to the attenuate tip . . . . . **Dryopteris intermedia**
      Pinnae gradually narrowed to the short tip . . . . . **Dryopteris ×triploidea**
1. Fronds bipinnate to pinnatifid or only tripinnatifid among the proximal pinnae, the ultimate pinnules acute to acuminate, but not spinulose at the tip.
   3. Sori marginal; pinnules crenulate to subpinnatifid, obtuse; rhizomes erect or suberect . . . . . **Dryopteris marginalis**
   3. Sori not marginal; pinnules various; rhizomes short-creeping.
      4. Midveins of the pinnae conspicuously beset with scaly, split or erose appendages; petioles less than ¼ the length of the blade . . . . . **Dryopteris filix-mas**
      4. Scaly appendages absent along the major veins; petioles usually more than ¼ the length of the blade.
         5. Basal pinnae lance-elliptic to ovate.
            Sori bordering the midrib; blades abruptly acuminate at the tip . . . . . **Dryopteris goldiana**
            Sori midway between midrib and margin; blades gradually acuminate at the tip . . . . . **Dryopteris celsa**
         5. Basal pinnae narrowly to broadly deltate.
            6. Pinnae strictly bipinnate, the proximal ones subequaling the median ones . . . . . **Dryopteris clintoniana**
            6. Proximal pinnae shorter than the median ones, generally tripinnatifid.
               7. Proximal pair of pinnae to 6 cm long; indusia eglandular . . . . . **Dryopteris cristata**
               7. Proximal pair of pinnae more than 6 cm long; indusia glandular or eglandular.
                  Indusia glandular . . . . . **Dryopteris ×boottii**
                  Indusia eglandular . . . . . **Dryopteris ×uliginosa**

DUCHESNEA *indica*

DULICHIUM arundinaceum

DYSPHANIA
1. Plant glandular-punctate, glabrous or the stems thinly arachnoid . . . . . *Dysphania ambrosioides*
1. Plant glandular with gland-tipped hairs . . . . . *Dysphania botrys*

DYSSODIA *papposa*

EBENACEAE: One genus in our area . . . . . DIOSPYROS

ECHINACEA
1. Leaf blades broadly lanceolate to ovate, less than 5 times as long as wide, at least some of them dentate or serrate . . . . . **Echinacea purpurea**
1. Leaf blades linear to narrowly lanceolate to elliptic, 5 times as long as wide or longer, entire . . . . . **Echinacea pallida**

ECHINOCHLOA
1. Spikelets to 3 mm long, awnless, green throughout; leaf blades less than 6 mm wide . . . . . *Echinochloa colonum*
1. Spikelets usually more than 3 mm long, strongly mucronate to awned, occasionally with tinctures of purple; larger leaf blades 6 mm or more wide.
   2. Lower leaves and sheaths almost always hispid or pilose; 2nd glume with an awn more than 2 mm long . . . . . **Echinochloa walteri**
   2. Leaves and sheaths glabrous to pubescent with short appressed hairs; 2nd glume awnless or merely mucronate (do not confuse the often-awned sterile lemma with the 2nd glume).
      3. Fertile lemma acutely tapering into the membranaceous tip, without a clear demarcation and line of hairs; principal veins of spikelets strongly setose with viscid pustular-based hairs.
         Larger spikelets more than 3.9 mm long, the sterile lemmas usually with awns 10 mm or more long . . . . . **Echinochloa muricata**
         Spikelets less than 3.9 mm long, the sterile lemmas awnless or with awns less than 10 mm long . . . . . **Echinochloa muricata microstachya**

3. Shiny, coriaceous fertile lemma broadly rounded at the tip, passing abruptly into the membranaceous tip and separated from it by a line of minute hairs; veins of spikelets setose, the bases of the hairs not or only weakly pustular.
    4. Cartilaginous fertile lemma subequaling the 2nd glume, the distal portions generally concealed under undisturbed glumes; sterile lemmas often awned; spikelets disarticulating in age . . . . . *Echinochloa crus-galli*
    4. Cartilaginous fertile lemma longer and wider than the 2nd glume, the distal portions exposed at maturity; sterile lemmas abruptly acute, but not usually awned; spikelets persistent in age.
        Rachis nodes with 0-2 pustular-based setae; spikelets nearly or quite without nigrescent tinctures at maturity . . . . . *Echinochloa frumentacea*
        Rachis nodes with 2-several pustular-based setae; spikelets becoming nigrescent in age . . . . . *Echinochloa esculenta*

ECHINOCYSTIS lobata

ECHINODORUS berteroi lanceolatus

ECHINOPS *sphaerocephalus*

ECHIUM *vulgare*

ECLIPTA *prostrata*

EGERIA *densa*

EICHHORNIA *crassipes*

ELAEAGNACEAE

A. Leaves alternate; stamens 4 . . . . . ELAEAGNUS
A. Leaves opposite; stamens 8 . . . . . SHEPHERDIA

ELAEAGNUS

1. Branchlets of the year silvery throughout; calyx tube subequaling the lobes; fruit yellow or silver . . . . . *Elaeagnus angustifolia*
1. Branchlets of the year brown or silvery with tinctures of brown; calyx tube notably longer than the calyx lobes; fruit red with silver scales.
    Branchlets of the year with brown-margined scales throughout . . . . . *Elaeagnus umbellata*
    Branchlets of the year with silver scales or with brown, silver-margined scales . . . . . *Elaeagnus umbellata parvifolia*

ELEOCHARIS

1. Culm nearly or quite as thick as the spikelet.
    2. Culms with crosswalls, making them appear jointed . . . . . **Eleocharis equisetoides**
    2. Culms often septate-nodulose, but without crosswalls or at least not appearing jointed.
        3. Culms terete, sometimes with crosswalls . . . . . **Eleocharis palustris**
        3. Culms sharply 3-4 angled, without crosswalls.
            Culms 3-angled, to 2 mm wide; scales fewer than 10 . . . . . **Eleocharis robbinsii**
            Culms 4-angled, 2-6 mm wide; scales more than 10. . . . . **Eleocharis quadrangulata**
1. Culm obviously narrower than the spikelet.
    4. Plants tufted, often annual or weakly rhizomatous, the deep portions usually coming up easily with the culms.
        5. Achene body truncate at the summit, the base of the tubercle nearly or quite as wide as the achene body.
            6. Achene body glossy-black . . . . . **Eleocharis melanocarpa**
            6. Achene body light to dark-brown.
                Tubercle conspicuously depressed, less than ¼ the height of the achene . . . . . **Eleocharis engelmannii**
                Tubercle broadly deltoid, prevailingly more than ¼ the height of the achene . . . . . **Eleocharis obtusa**
        5. Achene body ovoid, curved to the summit, the base of the tubercle notably less than the width of the achene body.
            7. Distal sheath with a conspicuous, loose, white scarious tip . . . . . **Eleocharis olivacea**
            7. Distal sheath tight, usually with a green mucro.
                8. Achene body white, less than 1 mm long . . . . . **Eleocharis microcarpa**
                8. Achene body brownish to olive or black, usually 1 mm or more long.
                    9. Achene body glossy-black . . . . . **Eleocharis geniculata**
                    9. Achene body light-brown to greenish.
                        Achene light-brown, biconvex; stigmas 2 . . . . . **Eleocharis ovata**
                        Achene greenish, light-olive or yellowish, subterete; stigmas 3 . . . . . **Eleocharis intermedia**
    4. Plants strongly rhizomatous or mat-forming, the deeper portions usually remaining in the ground when the culms are pulled.
        10. Culms capillary, less than 0.6 mm wide, from matted slender rhizomes not much wider than the culms.
            Anthers more than 1.3 mm long; tips of sterile culms notably thickened; tubercle confluent with the achene . . . . . **Eleocharis quinqueflora**
            Anthers less than 1.3 mm long; tips of sterile culms acute to obtuse, not notably thickened; tubercle distinct from the achene . . . . . **Eleocharis acicularis**
        10. Culms wiry to stout, the larger ones 0.6 mm wide or wider, or if less, then the rhizomes thick, scaly and wider than the culms.
            11. Culms often rooting at the tips; achene body scarcely distinct from the tubercle . . . . . **Eleocharis rostellata**
            11. Culms not rooting at the tips; achene with a well differentiated tubercle.
                12. Stigmas 3; achenes finely cancellate to honeycomb-reticulate.
                    13. Culms strongly flattened or 2-edged.
                        Scales entire at the tip; achenes pale; culms notably twisted . . . . . **Eleocharis wolfii**
                        Scales strongly bifid at the tip; achenes golden to brown; culms not notably twisted . . . . . **Eleocharis compressa**

13. Culms subterete, 4-several ridged.
    Achene body yellow or golden, shallowly reticulate . . . . . **Eleocharis elliptica**
    Achene body dark-olivaceous, honeycomb-reticulate . . . . . **Eleocharis verrucosa**
12. Stigmas 2; achenes nearly or quite smooth.
    14. Empty scales at base of spikelet 2, usually green, firm and oblong, not strongly clasping the culm, or if so, then less than ¾ around the culm . . . . . **Eleocharis palustris**
    14. Empty scales at base of spikelet usually one, resembling the fertile ones, but strongly clasping at least ¾ of the culm.
        15. Lowest scale completely encircling the base of the spikelet; middle scales of the spikelets not more than 1.7 mm wide. . . . . **Eleocharis erythropoda**
        15. Lowest scale merely clasping the base of the spikelet; middle scales of well developed spikelets often more than 1.7 mm wide.
            Culms completely flattened, often twisted; tubercle deltoid . . . . . **Eleocharis xyridiformis**
            Culms terete or nearly so; tubercle conic . . . . . **Eleocharis macrostachya**

ELEUSINE *indica*

ELEUTHEROCOCCUS *sieboldianus*

ELLISIA nyctelea

ELODEA
1. Leaves rarely more than 1.5 mm wide, never more than 2 mm, commonly more than 5 times as long as wide; staminate spathes less than 6 mm long, the flowers sessile . . . . . **Elodea nuttallii**
1. Larger leaves all more than 1.5 mm wide, most of them 2 mm or more wide, to about 5 times as long as wide; staminate spathes more than 6 mm long, the flowers long-stalked . . . . . **Elodea canadensis**

×ELYHORDEUM
1. Leaf blades flat, lax, the larger more than 5 mm wide; spikes, excluding awn divergence, more than 7 mm wide . . . **×Elyhordeum montanense**
1. Leaf blades stiff, ascending, to 5 mm wide; spikes less than 7 mm wide . . . . . **×Elyhordeum macounii**

ELYMUS
1. Lemmas with long undulate-divergent awns; larger paleas more than 9 mm long; spike often flexuous-nodding in age . . . . . **Elymus canadensis**
1. Lemmas with essentially straight awns; paleas less than 9 mm long; spike straight.
    2. Glumes linear-setaceous to the base, mostly 0.4-0.5 mm wide; leaves soft-villous on one side; lemmas villous; spikes, not including awns, rarely more than 11 cm long, never more than 15 cm . . . . . **Elymus villosus**
    2. Glumes linear, dilated proximally, mostly 0.5 mm or more wide; leaves glabrate, scabrous, to somewhat pubescent; lemmas glabrous to hispid; spikes, not including awns, 5-25 cm long.
        3. Lemmas subulate or with awns to 4 mm long . . . . . **Elymus submuticus**
        3. Lemmas with awns more than 4 mm long.
            4. Glumes less than 1 mm wide, persistent on the spike rachis . . . . . **Elymus riparius**
            4. Glumes more than 1 mm wide, falling with the florets.
                5. Spikelets hispidulous to hirsute . . . . . **Elymus virginicus intermedius**
                5. Spikelets glabrous to scaberulous.
                    6. Spike partly included within the sheath of the distal bract . . . . . **Elymus virginicus**
                    6. Spike well exserted on an elongate peduncle, not included within the distal sheath.
                        Spikelets appressed, the spike to 2.4 cm broad from awn tip to awn tip; auricles brown . . . **Elymus virginicus jejunus**
                        Spikelets spreading-ascending, the spike more than 2.4 cm broad from awn tip to awn tip; auricles purplish or nigrescent in age . . . . . **Elymus macgregorii**

ELYTRIGIA
1. Lemmas glabrous, scabrous, or proximally puberulent . . . . . *Elytrigia repens*
1. Lemmas densely pubescent throughout.
    Lemmas with hairs less than 0.9 mm long . . . . . *Elytrigia dasystachya*
    Lemmas with villous hairs more than 0.9 mm long . . . . . *Elytrigia dasystachya psammophila*

ENDODECA serpentaria

ENEMION biternatum

EPIFAGUS virginiana

EPIGAEA repens

EPILOBIUM
1. Leaves entire.
    2. Leaves glabrous or scaberulous along the revolute margins . . . . . **Epilobium palustre**
    2. Leaves strigose or villous.
        Stems spreading-puberulent . . . . . **Epilobium strictum**
        Stems strigillose with appressed incurved hairs . . . . . **Epilobium leptophyllum**
1. Leaves sharply denticulate or serrulate.
    3. Stems with dense spreading pubescence.
        Petals less than 10 mm long; leaves sessile, with a few low callused teeth . . . . . *Epilobium parviflorum*

Petals more than 10 mm long; principal leaves clasping, sharply toothed . . . . . *Epilobium hirsutum*
3. Stems glabrous or strigillose-puberulent in lines distally.
Leaf margins nearly straight between the glandular teeth; coma of seeds white . . . . . **Epilobium ciliatum**
Leaf margins curved between the teeth, such that each gland terminates an area of tissue notably larger than itself; coma of seeds reddish-brown . . . . . **Epilobium coloratum**

EPIMEDIUM *pinnatum*

EPIPACTIS *helleborine* (

EQUISETACEAE: One genus in our area . . . . . EQUISETUM

EQUISETUM
1. Stem solid, without a central cavity; sheaths with 3 or 4 teeth; plant often sprawling . . . . . **Equisetum scirpoides**
1. Stem hollow, with a central cavity; sheaths of main stems with more than 4 teeth; plant usually erect.
2. Fertile stems succulent, tan to brown, not green.
Mature stems unbranched, smooth . . . . . **Equisetum arvense**
Mature stems branched, distinctly scabrous . . . . . **Equisetum sylvaticum**
2. Fertile stems green or greenish, or absent.
3. Stems both less than 4.5 mm in diameter and regularly branched at the middle and distal nodes.
4. Ridges of main stem joints with 2 rows of spinules . . . . . **Equisetum sylvaticum**
4. Ridges of main stem joints without spinules.
5. Branches hollow, rounded in the valleys . . . . . **Equisetum palustre**
5. Branches solid, with a distinct sulcus in the valleys.
Proximal whorl with the 1st internode of each branch equal to the subtending sheath . . . . . **Equisetum ×littorale**
Proximal whorl with the 1st internode of each branch longer than the sheath . . . . . **Equisetum arvense**
3. Stems unbranched to disparately branched or branched and more than 4.5 mm broad, or both.
6. None of the stem joints more than 3 mm in diameter.
7. Ridges of main stem obscurely tuberculate or with only one row of papillae; sheaths green . . . . . **Equisetum ×nelsonii**
7. Ridges of the stem with 2 distinct lines of papillae; sheaths dark-ringed.
Sheaths, including the teeth, more than 5 mm long . . . . . **Equisetum ×mackaii**
Sheaths less than 5 mm long . . . . . **Equisetum variegatum**
6. Larger stem joints more than 3 mm in diameter.
8. Teeth strongly persistent.
Stems annual, the ridges smooth . . . . . **Equisetum fluviatile**
Stems evergreen, the ridges tuberculate . . . . . **Equisetum hyemale**
8. Many of the sheaths with a tendency to lose their teeth in age.
9. Stem ridges smooth; sheaths all green, tending to expand or flare toward the summit, the sides not completely parallel . . . . . **Equisetum laevigatum**
9. Stem ridges with a line of tiny tubercles, causing them to seem rough when passed over with a fingernail; at least some of the proximal sheaths gray with a conspicuous black ring below.
All of the sheaths gray . . . . . **Equisetum hyemale**
Only the proximal and/or middle sheaths gray . . . . . **Equisetum ×ferrissii**

ERAGROSTIS
1. Plants repent, rooting at the nodes, the panicle less than 6 cm long . . . . . **Eragrostis hypnoides**
1. Plants not repent and not rooting at the nodes, the panicles nearly always more than 6 cm long.
2. Keels of lemmas and leaf margins sparsely but regularly tuberculate-glandular.
Larger spikelets broader than 2.2 mm; lemmas more than 1.9 mm long . . . . . *Eragrostis cilianensis*
Spikelets up to 2.2 mm broad; lemmas less than 1.9 mm long . . . . . *Eragrostis minor*
2. Keels of lemmas and leaf margins etuberculate.
3. Spikelets rarely more than 4-flowered, up to 3 mm long.
Spikelets on capillary pedicels 5 mm or more long; grains sulcate with a longitudinal furrow down one side; panicle often 20 cm or more long . . . . . **Eragrostis capillaris**
Spikelets on short pedicels mostly less than 5 mm long; grains not sulcate; panicle less than 20 cm long . . . . . **Eragrostis frankii**
3. Larger spikelets more than 4-flowered and more than 3 mm long.
4. Plants annual; panicles mostly less than 20 cm long; pulvini glabrous or sparsely pilose.
1st glume to 0.6 mm long, less than ½ as long as the lemma above it; pulvini of principal branches usually well beset with setose hairs; spikelets to 1.2 mm wide and 6 mm long; lateral nerves of lemma obscure . . . . . *Eragrostis pilosa*
1st glume 0.6 mm or more long, usually at least ½ as long as the lemma above it; pulvini of principal branches glabrous or with 1 or 2 short filiform hairs; larger spikelets 1.2 mm or more wide and more than 6 mm long; lemmas distinctly 3-nerved . . . . . **Eragrostis pectinacea**
4. Plants perennial; panicles soon exceeding 20 cm long; pulvini usually well developed, often beset with long hairs.
5. Spikelets appressed to the branchlets, longer than their pedicels, lead-gray; leaves to 3 mm wide . . . . . *Eragrostis curvula*
5. Spikelets spreading, shorter than to subequaling their pedicels, with tinctures of red or purple; larger leaves more than 3 mm wide.
Larger glumes more than 2.2 mm long; anthers more than 1 mm long; caryopses more than 0.8 mm long . . . . . *Eragrostis trichodes*
Glumes never more than 2.2 mm long; anthers less than 1 mm long; caryopses less than 0.8 mm long . . . . . **Eragrostis spectabilis**

ERANTHIS *hyemalis*

ERECHTITES hieraciifolius

ERICACEAE

A. Larger leaves more than 1 dm long; tree . . . . . OXYDENDRUM
A. Leaves less than 1 dm long; trees or shrubs.
  B. Leaves linear to linear-lanceolate, mostly more than 7 times as long as wide, revolute . . . . . ANDROMEDA
  B. Leaves oblong to ovate, never as much as 7 times as long as wide, revolute or not.
    C. Leaves dark-green and coriaceous adaxially, strongly revolute, pannose with dense, rufous-colored tomentum abaxially . . . . . LEDUM
    C. Leaves never both strongly revolute and rufous-pannose abaxially.
      D. Leaves copiously beset with scurfy peltate scales on both surfaces . . . . . CHAMAEDAPHNE
      D. Leaves glabrous, pubescent, or glandular, but never scurfy.
        E. Ovary superior, the fruit dry and dehiscent; leaves evergreen.
          F. Plant a low but erect shrub with opposite or ternate spatulate leaves . . . . . KALMIA
          F. Plants trailing shrubs with alternate ovate to spatulate leaves.
            Plant with hispid stems, petioles, and leaves, the leaves ovate, subcordate, and broadly elliptic . . . . . EPIGAEA
            Plant with glabrescent to merely puberulent herbage, the leaves spatulate, most of them widest beyond the middle . . . . . ARCTOSTAPHYLOS
        E. Ovary inferior or appearing so, the fruit fleshy; leaves deciduous or evergreen.
          G. Plant a trailing subshrub with evergreen leaves . . . . . GAULTHERIA
          G. Plant an erect or ascending shrub with deciduous leaves.
            H. Leaves copiously beset with yellow resinous glands abaxially . . . . . GAYLUSSACIA
            H. Leaves without glands.
              Leaves oblong, oval, or elliptic, blunt, glaucous abaxially, less than 18 mm long; corolla lobes almost separate; stems trailing . . . . . OXYCOCCUS
              Leaves lanceolate to ovate, obovate or elliptic, acute, more than 18 mm long; corolla lobes united for most of their lengths; stems spreading to erect . . . . . VACCINIUM

ERIGENIA bulbosa

ERIGERON

1. Stem leaves broadly rounded to the sessile or more or less auriculate-clasping bases; biennial or perennial.
    Ligules about 50, linear-oblong, more than 0.4 mm wide; heads, including ligules, mostly more than 2.5 cm across . . . **Erigeron pulchellus**
    Ligules about 100, linear-filiform, less than 0.4 mm wide; heads less than 2.5 cm across . . . . . **Erigeron philadelphicus**
1. Stem leaves tapering at the bases, never broadly sessile or clasping; annual or rarely biennial.
    Stems strigose, the pubescence mostly appressed, at least above the base; cauline leaves few, linear-lanceolate to lanceolate or oblanceolate, entire or subentire . . . . . **Erigeron strigosus**
    Stems with spreading pubescence; cauline leaves numerous, lanceolate to ovate, serrate to dentate . . . . . **Erigeron annuus**

ERIOCAULACEAE: One genus in our area . . . . . ERIOCAULON

ERIOCAULON aquaticum

ERIOCHLOA

1. Spikelets acute, awnless; larger leaves more than 7 mm wide . . . . . *Eriochloa villosa*
1. Spikelets abruptly tapering into an awn more than 0.3 mm long; leaves to 7 mm wide . . . . . *Eriochloa contracta*

ERIOGONUM *annuum*

ERIOPHORUM

1. Spikelet solitary; foliaceous involucral bracts absent . . . . . **Eriophorum vaginatum**
1. Spikelets 2 to several; foliaceous involucre present.
  2. Involucral bract one, usually shorter than the inflorescence . . . . . **Eriophorum gracile**
  2. Involucral bracts 2 to several, mostly longer than the inflorescence.
    3. Bristles tawny, elongating in August and September; scales strongly several-nerved; stamen one . . . . . **Eriophorum virginicum**
    3. Bristles white, elongating in May and June, rarely still manifest in August and September; scales one-nerved or nearly so; stamens 3.
      Summits of leaf sheaths and base of involucre strongly tinged dark-red; midnerve of scales not entering the scarious tips . . . . . **Eriophorum angustifolium**
      Sheaths and involucres without reddish tinges; midnerve of scales mostly prominent to the tip . . . . . **Eriophorum viridicarinatum**

ERODIUM *cicutarium*

EROPHILA

1. Young fruits strongly compressed, soon exceeding 3 mm long . . . . . *Erophila verna*
1. Young fruits spherical or pyriform, less than 3 mm long . . . . . *Erophila boerhaavii*

ERUCASTRUM *gallicum*

ERYNGIUM

1. Leaves oblong-ovate, cordate, long-petiolate, crenate . . . . . *Eryngium planum*
1. Leaves linear, sessile-sheathing, spinulose . . . . . **Eryngium yuccifolium**

ERYSIMUM

1. Petals well over 1 cm long; siliques becoming more than 5 cm long; flowering raceme more than 2.5 cm broad ..... *Erysimum capitatum*
1. Petals never more than 1 cm long; siliques less than 5 cm long (except in *Erysimum repandum*); flowering portions of raceme less than 2.5 cm broad.
   2. Sepals less than 3.5 mm long; fruiting pedicels less than 0.4 mm thick; siliques divaricately spreading, less than 3 cm long ..... *Erysimum cheiranthoides*
   2. Sepals more than 3.5 mm long; fruiting pedicels stout, 0.4 mm or more thick; siliques erect or if divaricate, then fruits much more than 3 cm long.
      3. Siliques divaricately spreading, the larger more than 5 cm long; anthers less than 1.5 mm long; 4-pronged hairs absent ..... *Erysimum repandum*
      3. Siliques strongly ascending or appressed to the raceme rachis, less than 5 cm long; anthers more than 1.5 mm long; 4-pronged hairs present or absent.
         Leaves denticulate, with 4-pronged hairs admixed with 2-3 pronged hairs ..... *Erysimum hieraciifolium*
         Leaves entire, 4-pronged hairs absent ..... *Erysimum inconspicuum*

ERYTHRONIUM

1. Flowers white; stigmas spreading to recurving, 2-3 mm long ..... **Erythronium albidum**
1. Flowers yellow; stigmas erect, up to 2 mm long ..... **Erythronium americanum**

ESCHSCHOLZIA *californica*

EUONYMUS

1. Plants trailing shrubs, rooting at the nodes.
   Leaves evergreen, ovate, mostly widest at or below the middle, the areas along the midribs and principal veins distinctly pale adaxially, and the veins often scabrid; flowers 4-parted; fruits smooth ..... *Euonymus fortunei*
   Leaves deciduous, obovate, mostly widest beyond the middle, the midribs green and smooth; flowers 5-parted; fruits warty ..... **Euonymus obovatus**
1. Plants erect shrubs or small trees.
   2. Petioles to 3 mm long ..... *Euonymus alatus*
   2. Petioles more than 3 mm long.
      3. Leaves pubescent on the abaxial surface; petals purple ..... **Euonymus atropurpureus**
      3. Leaves glabrous abaxially or merely scabrid-pubescent along the major veins; petals white to greenish or purple.
         4. Longer petioles ¼ or more as long as the blade ..... *Euonymus bungeanus*
         4. Petioles less than ¼ as long as the blade.
            5. Plant in flower.
               6. Anthers yellow.
                  Peduncles mostly 5-13 mm long, usually 7-flowered; twigs often 4-angled and narrowly winged ..... *Euonymus phellomanus*
                  Peduncles mostly more than 13 mm long, usually 2-6 flowered; twigs terete ..... *Euonymus europaeus*
               6. Anthers purple.
                  7. Petals purple ..... *Euonymus sanguineus*
                  7. Petals greenish.
                     Leaves less than 3 cm wide ..... *Euonymus maackii*
                     Leaves more than 3 cm wide ..... *Euonymus hamiltonianus*
            5. Plant in fruit.
               8. Peduncle of dichasium less than 15 mm long ..... *Euonymus phellomanus*
               8. Peduncle of dichasium more than 15 mm long.
                  9. Dichasium 1-5 flowered; leaves less than 10 cm long.
                     Leaves long-tapered at the base, widest beyond the middle; aril red ..... *Euonymus maackii*
                     Leaves rounded to broad-cuneate at the base, widest near the middle; aril orange ..... *Euonymus europaeus*
                  9. Dichasium 7-15 flowered; larger leaves often more than 10 cm long.
                     Fruit winged, more than 1.5 cm broad ..... *Euonymus sanguineus*
                     Fruit not winged, less than 1.5 cm broad ..... *Euonymus hamiltonianus*

EUPATORIUM

1. Principal leaf blades strongly cuneate to rounded at the base, on distinct petioles 5 mm or more long ..... **Eupatorium serotinum**
1. Leaves perfoliate, sessile, or attenuate to a subpetiolate base, but never on distinct petioles 5 mm or more long.
   2. Stems glabrous except in and near the array ..... **Eupatorium sessilifolium brittonianum**
   2. Stems coarsely hairy to downy-pubescent throughout.
      3. Principal leaves connate-perfoliate ..... **Eupatorium perfoliatum**
      3. Leaves all subpetiolate to sessile, but not perfoliate.
         Leaves with margins entire to more often finely serrate at or beyond the middle ..... **Eupatorium altissimum**
         Leaves with margins coarsely serrate throughout ..... **Eupatorium ×truncatum**

EUPHORBIA

1. At least the bracteal leaves deeply infused with yellow or with a definitive red or white blotch at the base.
   2. Bracteal leaves with a red or white blotch at the base ..... *Euphorbia cyathophora*
   2. Bracteal leaves strongly suffused with yellow.
      Leaves serrulate, glabrous abaxially ..... *Euphorbia helioscopia*
      Leaves entire, villous abaxially ..... *Euphorbia epithymoides*
1. All bracts and leaves green or greenish-yellow throughout.
   3. Appendages of cyathia white, conspicuous, giving them a petal-like appearance.

Distal leaves and bracts with broad white margins, the middle and proximal ones obovate to ovate ..... *Euphorbia marginata*
Distal leaves and bracts not white-margined, the middle and proximal ones mostly linear to oblong or oblanceolate ..... **Euphorbia corollata**

3. Appendages of cyathia absent or green and inconspicuous.
4. Plants pubescent.
Hairs of the abaxial leaf surfaces hispid, notably narrowed from base to apex, those of the distal margins deltate, many no longer than wide; seed bluntly muricate, the brownish to nigrescent surface contrasting with the minute pale reticulate pattern ..... *Euphorbia davidii*
Hairs of the abaxial leaf surfaces with narrowly acicular hairs, not or only scarcely tapered from the base to apex, those of the distal margins prevailingly longer than wide; seed scarcely muricate, the reticulation pattern essentially concolorous with the surface ..... *Euphorbia dentata*

4. Plants glabrous or glabrate.
5. Leaves broadly oblong-spatulate, minutely but distinctly serrulate, mostly auriculate-clasping at the base ..... **Euphorbia obtusata**
5. Leaves various but always entire.
6. Leaves filiform to narrowly linear, up to 2.6 mm wide ..... *Euphorbia cyparissias*
6. Leaves narrowly lanceolate to oblong or broadly obovate-spatulate, the larger ones more than 2.6 mm wide.
7. Leaves narrowly lanceolate or oblanceolate, acute; seeds smooth.
Leaves more than 4 mm wide ..... *Euphorbia virgata*
Leaves less than 4 mm wide ..... *Euphorbia ×pseudoesula*

7. Leaves obovate, obtuse or retuse; seeds pitted.
Seeds up to 1.5 mm long, with sulcate furrows on one face, as well as pitted on all the faces; middle cauline leaves on short, slender petioles ..... *Euphorbia peplus*
Seeds more than 1.5 mm long, pitted only, without sulcate furrows; middle cauline leaves sessile or nearly so ..... **Euphorbia commutata**

EUPHORBIACEAE

A. Leaves peltate, palmately lobed, the larger more than 1 dm wide ..... RICINUS
A. Leaves neither peltate nor palmately lobed, less than 1 dm wide.
B. Plants pubescent with forked or stellate hairs.
Petioles less than 4 mm long ..... CROTONOPSIS
Longer petioles more than 4 mm long ..... CROTON

B. Plants glabrous or pubescent with simple hairs.
C. Plants without milky juice; calyx present; stems pubescent ..... ACALYPHA
C. Plants with milky juice; calyx absent or rudimentary; stems glabrous or pubescent.
Leaves all opposite, less than 4 cm long, rounded at the base ..... CHAMAESYCE
Leaves not all opposite, more than 4 cm long, narrowed at the base ..... EUPHORBIA

EURYBIA

1. Arrays glandular. ..... **Eurybia macrophylla**
1. Arrays eglandular.
2. Leaves harshly scabrous; basal leaves usually absent ..... **Eurybia furcata**
2. Leaves glabrous or sparsely hispid; basal leaves often present at flowering time.
Leaves with no more than 15 teeth per margin ..... *Eurybia divaricata*
Most leaves with more than 15 teeth per margin ..... **Eurybia schreberi**

EUTHAMIA

1. Larger leaves more than 4 mm wide, generally with 5 or more veins evident without magnification.
Stems hirtellous nearly or quite throughout, though sometimes becoming glabrate proximally ..... **Euthamia nuttallii**
Stems glabrous throughout or merely sparsely hirtellous in lines below the array ..... **Euthamia graminifolia**

1. Leaves less than 4 mm wide, generally with only 1-3 distinct veins.
Larger leaves to 2.9 mm wide, prevailingly 1-nerved; involucres rarely more than 4.6 mm long ..... **Euthamia caroliniana**
Larger leaves more than 2.9 mm wide, commonly 3-nerved; larger involucres more than 4.6 mm long ..... **Euthamia gymnospermoides**

EUTROCHIUM

1. Stems not glaucous; heads mostly more than 8-flowered; arrays flat to weakly convex ..... **Eutrochium maculatum**
1. Stems glaucous; heads fewer than 8-flowered; arrays hemispheric to elongate.
Stems to 2 m high, pithy throughout or with a slender central cavity less than 6 mm in diameter 1 cm below the principal bracteal whorl; leaves rarely more than 4 per whorl, broadly elliptic to ovate, sharply serrate ..... **Eutrochium purpureum**
Stems often more than 2 m high, not pithy throughout, with a fistulose cavity usually more than 6 mm in diameter; leaves often more than 4 per whorl, lanceolate to lance-elliptic, obtusely serrate ..... **Eutrochium fistulosum**

EVOLVULUS *nuttallianus*

FABACEAE

A. Plants woody shrubs or trees.
B. Leaves simple or trifoliolate.
Shrub unarmed; leaves simple. ..... GENISTA
Shrub spiny; leaves trifoliolate ..... ONONIS

B. Leaves pinnately compound with 2 or more pairs of lateral leaflets.
C. Leaves pinnate to bipinnate with an even number of leaflets, whole leaves with the terminal leaflet absent; flowers greenish or yellow.
Leaflets more than 14; flowers greenish; fruits more than 10 cm long ..... GLEDITSIA

Leaflets less than 14; flowers yellow; fruits less than 10 cm long . . . . . CARAGANA
C. Leaves pinnate with an odd number of leaflets, whole leaves with the terminal leaflet present; flowers purple, pink, or white.
Leaflets more than 21 . . . . . AMORPHA
Leaflets fewer than 21 . . . . . ROBINIA
A. Plants annual or perennial herbs or high-climbing woody vines.
D. Plant a high-climbing or sprawling woody vine.
Leaves trifoliolate . . . . . PUERARIA
Leaves pinnate . . . . . WISTERIA
D. Plants not vines or if a vine, then the stems herbaceous.
E. Leaves simple . . . . . CROTALARIA
E. Leaves compound.
F. Leaves not trifoliolate, the leaflets either 2 or more than 3, the rachis ending in a tendril.
G. Leaves palmately compound.
Leaflets fewer than 6, strongly glandular-punctate; calyx less than 3 mm long . . . . . PSORALIDIUM
Leaflets more than 6, not glandular-punctate; calyx more than 3 mm long . . . . . LUPINUS
G. Leaves pinnately compound.
H. Fully intact leaves usually with an even number of leaflets, the terminal leaflet absent or replaced either by an elongate bristle or simple or branched tendril.
I. Leaves without tendrils.
Leaflets fewer than 5; plant less than 0.3 m high . . . . . ARACHIS
Leaflets more than 5; plant more than 0.3 m high . . . . . SESBANIA
I. Many of the leaves terminating in simple or branched tendrils.
J. Calyx lobes more than twice the length of the tube; tendrils all simple; pod 1-2 seeded . . . . . LENS
J. Calyx lobes shorter than to less than twice the length of the tube; many of the tendrils branched; pod typically more than 2-seeded.
K. Stipules longer than the leaflets . . . . . PISUM
K. Stipules shorter than the leaflets.
Style with a tuft of hairs at the summit . . . . . VICIA
Style pubescent along one side . . . . . LATHYRUS
H. Fully intact leaves with an odd number of leaflets, the terminal leaflet present.
L. Flowers and fruits in heads or umbelliform clusters.
M. Terminal leaflet of principal leaves notably larger than the laterals . . . . . ANTHYLLIS
M. Terminal leaflet about the same size as the laterals.
Flowers purplish or white; leaflets more than 5 . . . . . SECURIGERA
Flowers yellow or yellow-tinged with red; leaflets 5, the proximal pair stipuliform . . . . . LOTUS
L. Flowers in dense to elongate spikes or racemes.
N. Plants with sprawling, climbing, or twining vine-like stems . . . . . APIOS
N. Plants mostly erect or ascending, never with climbing vine-like stems.
O. Inflorescences axillary.
Leaflets abundantly yellow-punctate abaxially . . . . . GLYCYRRHIZA
Leaflets not yellow-punctate abaxially . . . . . ASTRAGALUS
O. Inflorescences terminal.
Stems densely spreading-pubescent; flowers in racemes . . . . . TEPHROSIA
Stems glabrate or with appressed pubescence; flowers in dense spikes . . . . . DALEA

F. Leaves predominantly trifoliolate, the rachis never ending in a tendril.
P. Leaflets finely but distinctly serrulate, at least beyond the middle; fruits usually one-seeded.
Q. Plant spiny; flowers solitary or paired in the leaf axils . . . . . ONONIS
Q. Plants not spiny; flowers neither solitary nor paired in the leaf axils.
R. Flowers and fruits in loose racemes 5 times as long as broad or longer . . . . . MELILOTUS
R. Flowers and fruits in heads, umbelliform clusters or short-cylindric spikes or racemes less than 5 times as long as broad.
Corollas variously colored but never blue, withering and persisting on the nearly or quite straight symmetrical fruits . . . . . TRIFOLIUM
Corollas yellow or blue (rarely whitish), soon deciduous, the fruits then becoming quite conspicuous, clearly asymmetrical and often more or less coiled (rarely more or less straight in the rare *Medicago* ×*varia*) . . MEDICAGO
P. Leaflets entire or merely shallowly lobed; fruits l-several seeded.
S. Stems climbing, sprawling, or twining, vine-like; flowers purplish or white.
T. Stems and peduncles glabrous . . . . . VIGNA
T. Herbage at least sparsely hirsute.
U. Hairs of peduncle spreading, many of them minutely uncinate . . . . . PHASEOLUS
U. Hairs of peduncle retrorsely appressed.
Bracts broadly spatulate, obtuse . . . . . AMPHICARPAEA
Bracts lanceolate, acute to acuminate . . . . . STROPHOSTYLES
S. Stems erect, ascending, or trailing, but never climbing or sprawling by twining; flowers variously colored.
V. Leaflets copiously glandular-punctate on both surfaces, particularly evident in dry specimens (under 10× magnification).
W. Petiolule of the terminal leaflet much longer than those of the lateral leaflets . . . . . ORBEXILUM
W. Petiolule of the terminal leaflet subequaling those of the lateral leaflets.
Plants green or grayish; leaves with 3 to 5 leaflets, the leaflets linear-oblong to oblong-lanceolate; calyx less than 4 mm long . . . . . PSORALIDIUM
Plants sericeous throughout; leaves usually trifoliolate, the leaflets elliptic; calyx more than 4 mm long . . . . . PEDIOMELUM
V. Leaflets not glandular-punctate, even when dry.

X. Leaves palmately compound, the petiolules of the terminal leaflets absent or at least no longer than those of the lateral leaflets.
  Y. Flowers 2-numerous in loose racemes; corollas yellow, white, creamy, or blue; stems either glabrous or densely white-villous . . . . . BAPTISIA
  Y. Flowers several to numerous in umbelliform or subcapitate clusters; corollas yellow, pink, purple, or whitish; stems tawny-villous or sparsely to densely strigillose distally.
    Flowers yellow or yellow tinged with red; stems glabrate to strigillose; lowest pair of leaflets appearing stipuliform, the leaves therefore sessile or nearly so . . . . . LOTUS
    Flowers not yellow; stems tawny-villous; leaves distinctly petiolate . . . . . TRIFOLIUM
X. Leaves pinnately compound, the petiolules of the terminal leaflets longer than those of the lateral leaflets.
  Z. Calyx strongly bilabiate, the lower lobe usually 3-parted; fruit a loment, indehiscent, jointed into 1-several segments covered by uncinate hairs.
    Calyx campanulate, the lobes scarcely developed, nowhere near ½ as long as the tube; stipe of fruit more than twice the length of the remnant calyx . . . . . HYLODESMUM
    Calyx campanulate to tubular, the lobes well developed and at least ½ as long as the tube; stipe of fruit less than twice as long as the calyx tube, often obscured within it . . . . . DESMODIUM
  Z. Calyx 5-cleft, the lobes usually subequal; fruit not a loment, indehiscent or not, but never with uncinate hairs.
    aa. Leaves sessile or subsessile; flowers solitary . . . . . ACMISPON
    aa. All or most of the leaves petiolate or if subsessile, then the flowers in clusters; flowers 1 to several in terminal or axillary clusters.
      bb. Calyx lobes dimorphic . . . . . GLYCINE
      bb. Calyx lobes all subequal in shape and length.
        Plants annual; stipules glabrous and scarious, conspicuously striate, ovate to lance-ovate; leaflets broadly obovate and emarginate . . . . . KUMMEROWIA
        Plants perennial or shrubby; stipules pubescent, linear-subulate to setaceous; leaflets various . . . . . LESPEDEZA

FAGACEAE

A. Leaves entire or with fewer than 9 pairs of lateral veins ending in teeth or lobes . . . . . QUERCUS
A. Leaf margins various, the blades with more than 9 pairs of lateral veins ending in teeth or lobes.
  B. Most or all of the teeth tipped with a firm, subulate, typically incurved cusp or awn 1 mm or more long; fruit very prickly, copiously beset with stout spines more than 1 cm long . . . . . CASTANEA
  B. Teeth blunt or sharp but never subulate-tipped; fruit smooth or with somewhat scaly or fringed cups, or bristly, but never with spines 1 cm or more long.
    Terminal buds solitary, the winter buds slender, more than 1 cm long and more than 4 times as long as broad; staminate flowers in subglobose heads; fruits bristly, the nuts sharply 3-angled; bark smooth, close; leaves shallowly dentate . . . . . FAGUS
    Terminal buds 2 to several, clustered at the tips of the branchlets, the winter buds broad, less than 1 cm long and less than 4 times as long as broad; staminate flowers in slender catkins; fruits not bristly, the nuts rounded; older bark furrowed or scaly; leaves coarsely dentate or lobed . . . . . QUERCUS

FAGOPYRUM *esculentum*

FAGUS

1. Leaves with more than 9 pairs of lateral veins . . . . . **Fagus grandifolia**
1. Leaves with no more than 9 pairs of lateral veins . . . . . *Fagus sylvatica*

FALLOPIA

1. Bases of sheathing stipules retrorsely long-hispid . . . . . **Fallopia cilinodis**
1. Bases of sheathing stipules not retrorsely long-hispid.
  2. Pedicels articulated well beyond the middle; perianth scabrid-pulverulent, less than 5.5 mm long, scarcely winged; achene surfaces finely but conspicuously striate-rugulose; plant annual . . . . . *Fallopia convolvulus*
  2. Pedicels articulated near the middle; perianth glabrate to weakly scabrid, more than 5.5 mm long at maturity, scarcely to abundantly winged; achene surfaces smooth; plant annual or perennial.
    3. Mature perianth, from the joint on the pedicel to the distal lobes of the wings, 10 mm or more long . . . . . **Fallopia scandens**
    3. Mature perianth less than 10 mm long.
      Mature perianth nearly rotund, the wings abruptly contracted to a short-decurrent base, their margins entire or nearly so . . . . . *Fallopia dumetorum*
      Mature perianth obovate, the wings either poorly developed or their margins notably dentate, lacerate, or wavy . . **Fallopia cristata**

FATOUA *villosa*

FESTUCA

1. Leaves flat, more than 2 mm wide; lemmas obtuse to acuminate, awnless or with only very short awns.
  Spikelet obovate, the 2nd glume mostly 4 mm or more long; spikelets clustered, overlapping each other at least ⅓ of their length on the proximal branches . . . . . **Festuca paradoxa**
  Spikelet lanceolate, the 2nd glume rarely more than 4 mm long; spikelets notably separated on the proximal branches, somewhat clustered on the distal branches . . . . . **Festuca subverticillata**
1. Leaves involute, less than 2 mm wide; lemmas usually awned.
  2. Lemmas awnless, less than 3 mm long; leaves capillary, less than 0.6 mm wide . . . . . *Festuca filiformis*
  2. Lemmas awned, more than 3 mm long; leaves involute, the larger more than 0.6 mm wide.
    3. Young leaf sheaths closed, becoming dark-red with contrasting pale nerves that become shreds as the older sheaths disintegrate; lemmas glabrous or scaberulous near the tip, the margins eciliate, obscurely 3-nerved or often more distinctly 3-5 nerved . . . . . *Festuca rubra*
    3. Leaf sheaths open, pale, remaining intact, the nerves inconspicuous; lemmas glabrate to more typically conspicuously pubescent, usually ciliate along the margins at the tip, essentially nerveless.

Anthers less than 2.2 mm long; inflorescence with strictly appressed branches . . . . . **Festuca saximontana**
Mature anthers more than 2.2 mm long; proximal panicle branches often spreading . . . . . *Festuca trachyphylla*

FICARIA
1. Leaves crowded at the base, the flowers on short subscapose stems . . . . . *Ficaria calthifolia*
1. Leaves cauline as well as basal.
   Most of the leaf axils with 1-few subglobose to ovoid bulblets . . . . . *Ficaria verna*
   Leaf axils without bulblets . . . . . *Ficaria verna fertilis*

FILIPENDULA
1. Petals white to creamy; leaves strongly whitened abaxially, with canescent-tomentose pubescence; terminal leaflets palmately 3-5 lobed . . . . . *Filipendula ulmaria*
1. Petals rose-colored; leaves green or greenish abaxially, glabrate to weakly pubescent; terminal leaflets palmately 7-9 lobed . . . **Filipendula rubra**

FIMBRISTYLIS
1. Leaves and culms pubescent, often scabrous; stigmas 2 . . . . . **Fimbristylis puberula**
1. Leaves and culms glabrous; stigmas typically 3 . . . . . **Fimbristylis autumnalis**

FLOERKEA proserpinacoides

FOENICULUM *vulgare*

FORSYTHIA
1. Internodes hollow . . . . . *Forsythia suspensa*
1. Internodes at least irregularly pithy.
   Pith of internodes closely chambered throughout . . . . . *Forsythia viridissima*
   Pith of internodes irregularly chambered . . . . . *Forsythia ×intermedia*

FRAGARIA
1. Terminal tooth of leaflets surpassing the neighboring distal marginal teeth.
   Stem pubescence spreading . . . . . *Fragaria vesca*
   Stem pubescence appressed . . . . . **Fragaria vesca americana**
1. Terminal tooth of leaflets shorter than to subequaling the neighboring distal marginal teeth.
   2. Stem pubescence appressed . . . . . **Fragaria virginiana**
   2. Stem pubescence spreading.
      Sepals less than 9 mm long . . . . . **Fragaria virginiana grayana**
      Larger sepals more than 9 mm long . . . . . *Fragaria ×ananassa*

FRANGULA *alnus*

FRASERA caroliniensis

FRAXINUS
1. Branchlets strongly 4-angled, quadrangular-winged . . . . . **Fraxinus quadrangulata**
1. Branchlets terete or elliptic, never sharply angled or winged.
   2. Leaflets sessile or on short petiolules unwinged for less than 3 mm; abaxial leaf surfaces green or pale-green, without papillae in the areolae.
      3. Leaflets prevailing more than 8; bark pale-gray, scaly or flaky; body of samara flat.
         Nodes of the leaf rachis tomentulose . . . . . **Fraxinus nigra**
         Nodes of the leaf rachis glabrous or glabrate . . . . . *Fraxinus excelsior*
      3. Leaflets nearly always fewer than 8; bark regularly furrowed in age; body of samara terete.
         Young twigs and petioles densely pubescent, the cortex scarcely visible . . . . . **Fraxinus pennsylvanica**
         Young twigs and petioles glabrous or with a few scattered white hairs . . . . . **Fraxinus lanceolata**
   2. Leaflets with the proximal and middle petiolules well developed, the unwinged portion 3 mm or more long; abaxial leaf surfaces glaucous and minutely papillose in the areolae.
      4. Petioles, leaf rachides, and petiolules sparsely to densely pubescent.
         Unwinged portions of the petiolules less than 1 cm long; fruits to 7 mm wide . . . . . **Fraxinus biltmoreana**
         Longest unwinged portions of the petiolules more than 1 cm long; fruits more than 7 mm wide . . . . . **Fraxinus profunda**
      4. Petioles, leaf rachides, and petiolules glabrous or nearly so.
         Summit of the leaf scar truncate or very broadly V-shaped, the bud appearing to sit upon it; larger samaras more than 3.8 cm long, with the wings 5 mm or more wide . . . . . **Fraxinus smallii**
         Summit of the leaf scar deeply U-shaped or V-shaped, the bud appearing nestled within the concavity; samaras nearly always less than 3.8 cm long and the wings rarely 5 mm wide . . . . . **Fraxinus americana**

FROELICHIA
1. Stems very slender, rarely more than 0.5 m high; leaves less than 11 mm wide; fruiting calyx (with wool removed) conspicuously pectinate-spinulose along 2 sides . . . . . *Froelichia gracilis*
1. Stems stout, usually more than 0.5 m high; larger leaves more than 11 mm; fruiting calyx (with wool removed) denticulate-erose to subentire . . . . . *Froelichia floridana*

FUIRENA pumila

FUMARIA *officinalis*

FUMARIACEAE

A. Plant a delicate climbing biennial vine; corollas spongy . . . . . ADLUMIA
A. Plants erect or suberect herbs; corollas not spongy.
  B. Corollas white or pink, with 2 saccate or divergent spurs; leaves basal . . . . . DICENTRA
  B. Corollas yellow, pink, or reddish-purple, with only one petal spurred or saccate; leaves alternate.
    C. Flowers reddish-purple; fruit globose, one-seeded . . . . . FUMARIA
    C. Flowers yellow or pink with yellow tips; fruit a several-seeded slender capsule.
      Flowers pink with yellow tips; seeds less than 1.7 mm long . . . . . CAPNOIDES
      Flowers yellow or with tinctures of pink or rose throughout; seeds more than 1.7 mm long . . . . . CORYDALIS

GAILLARDIA *pulchella*

GALANTHUS

1. Inner tepals with green markings only at the tips . . . . . *Galanthus nivalis*
1. Inner tepals with green markings proximally as well as distally . . . . . *Galanthus elwesii*

GALEARIS spectabilis

GALEOPSIS

1. Stems finely pubescent with recurved appressed hairs . . . . . *Galeopsis ladanum*
1. Stems bristly-hispid with spreading hairs . . . . . *Galeopsis tetrahit*

GALINSOGA

1. Pappus of ray florets absent or vestigial; pappus scales of disc florets awnless, obtuse or acute; leaves subentire to bluntly and shallowly dentate or serrate . . . . . *Galinsoga parviflora*
1. Pappus of ray florets well developed; pappus scales of disc florets tipped by a weak but distinct awn; leaves all distinctly dentate-serrate . . . . . *Galinsoga quadriradiata*

GALIUM

1. Ovaries and fruits hispid or with uncinate bristles.
  2. Principal leaves in whorls of more than 4.
    3. Perennials, the stems glabrous or with a few spreading hairs.
      Inflorescences all terminal; corolla tube at least ½ the length of the lobes . . . . . *Galium odoratum*
      Inflorescences terminal and axillary; corolla tube much less than ½ the length of the lobes . . . . . **Galium triflorum**
    3. Annuals, the stems harshly scabrous.
      4. Larger leaves more than 2 cm long . . . . . **Galium aparine**
      4. Larger leaves less than 2 cm long.
        Leaves less than 9 mm long, with the marginal cilia antrorsely ascending; fruits less than 1.2 mm broad . . . . *Galium parisiense*
        Leaves more than 9 mm long, with the marginal cilia divergent or retrorse; fruits more than 1.2 mm broad . . . *Galium spurium*
  2. Leaves not more than 4 per whorl.
    5. Leaves linear to linear-lanceolate, rarely more than 5 mm wide; flowers white in an ample panicle . . . . . **Galium boreale**
    5. Leaves lanceolate to ovate or oval, the larger ones more than 5 mm wide; flowers usually greenish or purple, few to several in small clusters.
      6. Stems pilose or hispid, at least along the angles.
        Flowers and fruits distinctly pedicellate; leaves to 2.5 cm long . . . . . **Galium pilosum**
        Flowers and fruits sessile along the inflorescence branches; larger leaves more than 2.5 cm long . . . . . **Galium circaezans hypomalacum**
      6. Stems glabrous or glabrate.
        Leaves lanceolate, usually acuminate, mostly more than 2.5 times as long as wide; corollas glabrous, usually purple . . . . . **Galium lanceolatum**
        Leaves ovate, obtuse, up to 2.5 times as long as wide; corollas usually pubescent, greenish-yellow . . . . . **Galium circaezans**
1. Ovaries and fruits smooth or smoothish.
  7. Leaves mucronate, subulate, or strongly acute at the apex.
    8. Leaves and stems very harsh, strongly retrorsely scabrous . . . . . **Galium asprellum**
    8. Leaves and stems smooth or antrorsely scaberulous.
      9. Leaves up to 6 per whorl, linear to narrowly oblong; stems usually scaberulous along the angles . . . . . **Galium concinnum**
      9. Principal whorls with more than 6 leaves, oblanceolate to obovate; stems smooth or finely hairy.
        10. Larger leaves more than 2.5 cm long, pale abaxially . . . . . *Galium sylvaticum*
        10. Leaves less than 2.5 cm long, green abaxially.
          Leaves linear-elliptic, glabrous on both sides; flowers white . . . . . *Galium album*
          Leaves linear-acicular, puberulent abaxially, smooth to rough-pubescent adaxially; flowers yellow . . . . . *Galium verum*
  7. Leaves obtuse, blunt at the apex.
    11. Flowers 8 or more in terminal inflorescences.
      Larger leaves more than 3 cm long, 3-5 nerved . . . . . **Galium boreale**
      Leaves less than 3 cm long, 1-nerved . . . . . **Galium palustre**

11. Flowers fewer than 8 in the distal portions of the branches.
    12. Corolla lobes 4, mostly longer than wide.
        Leaves less than 1.5 cm long, the principal ones deflexed . . . . . **Galium labradoricum**
        Larger leaves more than 1.5 cm long, divergent, but not particularly deflexed . . . . . **Galium obtusum**
    12. Corolla lobes prevailingly 3, as wide as or wider than long.
        13. Peduncles up to 4 mm long, shorter than the subtending leaves; leaves up to 10 mm long; fruits up to 1 mm in diameter; stems abundantly branched, mat-forming . . . . . **Galium brevipes**
        13. Longer peduncles more than 4 mm long, prevailingly longer than the subtending leaves; leaves often more than 10 mm long; fruits usually more than 1 mm in diameter; stems branched, but not usually mat-forming.
            Flowers and fruits on elongate, arcuate, scabrous pedicels, the larger pedicels more than 6 mm long; leaves primarily in whorls of 4. . . . . **Galium trifidum**
            Flowers and fruits on stout, straight, glabrous pedicels up to 6 mm long; leaves often more than 4 per whorl . . . . . **Galium tinctorium**

GAMOCHAETA *purpurea*

GAULTHERIA
1. Leaves less than 1.5 cm long; flowers 4-parted; fruit white; stems prostrate . . . . . **Gaultheria hispidula**
1. Leaves more than 1.5 cm long; flowers 5-parted; fruit red; stems with the flowering branches ascending . . . . . **Gaultheria procumbens**

GAURA
1. Leaves linear-lanceolate, rarely more than 1 cm wide and 4 cm long . . . . . *Gaura coccinea*
1. Larger leaves lanceolate, more than 1 cm wide and 4 cm long.
    2. Capsules usually glabrous; petals pink, up to 2 mm long; anthers less than 1.3 mm long . . . . . *Gaura parviflora*
    2. Capsules densely puberulent; petals white or pale-pink, about 5 mm long; anthers more than 1.3 mm long.
        Hairs of main stem prevailingly widely spreading and straight . . . . . *Gaura biennis*
        Hairs of main stem mostly curly, appressed, or strongly ascending . . . . . **Gaura longiflora**

GAYLUSSACIA baccata

GENISTA*tinctoria*

GENTIANA
1. Leaves less than 2.5 cm long; corolla dark-blue, the interior conspicuously speckled and the exterior tinged with brown or greenish-brown, the calyx abruptly attenuated into linear-subulate lobes as long as the tube . . . . . *Gentiana septemfida*
1. Larger leaves almost always more than 2.5 cm long; corolla and calyx various.
    2. Corolla lobes truncate to shallowly rounded or reduced to a short tooth, prevailingly exceeded by the intervening erose or fimbriate plaits.
        Corolla lobes truncate or reduced to small points . . . . . **Gentiana andrewsii**
        Corolla lobes low-rounded, occasionally approximating the plaits . . . . . **Gentiana andrewsii dakotica**
    2. Corolla lobes rounded to acute, subequaling or surpassing the plaits.
        3. Calyx lobes without a keeled midrib, linear to oblong, subequaling or even exceeding the tube; corolla lobes deep-blue.
            Corolla lobes widely spreading during anthesis, exceeding the plaits by 5 mm or more . . . . . **Gentiana puberulenta**
            Corolla lobes erect, closed during anthesis, rarely exceeding the plaits more than 5 mm . . . . . **Gentiana ×billingtonii**
        3. Calyx lobes with a well developed keel-like midrib bracketing it to the tube; corolla lobes pale-yellowish to blue.
            4. Calyx lobes elongate, subequaling the tube . . . . . **Gentiana saponaria**
            4. Calyx lobes ovate to oblong, notably shorter than the tube.
                5. Corollas creamy to white throughout; calyx lobes broadly ovate, not much longer than wide . . . . . **Gentiana alba**
                5. Corollas with tinctures of blue; calyx lobes elliptic-oblong, notably longer than wide.
                    Corolla lobes as long as wide, clearly exceeding the plaits . . . . . **Gentiana ×curtisii**
                    Corolla lobes wider than long or nearly so, scarcely exceeding the plaits . . . . . **Gentiana ×pallidocyanea**

GENTIANACEAE
A. Leaves minute, subulate, scale-like, less than 5 mm long . . . . . BARTONIA
A. Leaves neither minute, subulate, nor scale-like, more than 5 mm long.
    B. Leaves primarily in whorls of 4; stems coarse, over 1 m high . . . . . FRASERA
    B. Leaves opposite; stems less than 1 m high.
        C. Corolla tube much shorter than the lobes . . . . . SABATIA
        C. Corolla tube as long as or longer than the lobes.
            D. Corollas small, pink or pinkish, the tubes less than 3 mm in diameter . . . . . CENTAURIUM
            D. Corollas larger, blue, purplish, white or cream-colored, the tubes more than 3 mm in diameter.
                E. Flowers 4-merous, the lobes fringed, shorter than to subequaling the pedicels . . . . . GENTIANOPSIS
                E. Flowers 5-merous, the corolla lobes entire, sessile or much exceeding their pedicels.
                    Flowers less than 2.4 cm long, distinctly pedicellate . . . . . GENTIANELLA
                    Flowers more than 2.4 cm long, sessile in involucrate clusters . . . . . GENTIANA

GENTIANELLA quinquefolia

GENTIANOPSIS

1. Distal leaves lance-ovate to deltate-ovate, broadly rounded to subcordate; corolla lobes fringed similarly at the tip and on the sides; capsules distinctly stipitate . . . . . **Gentianopsis crinita**
1. Distal leaves linear to linear-lanceolate; corolla lobes denticulate at the tip, long-fringed laterally; capsule sessile . . . . . **Gentianopsis virgata**

GERANIACEAE

A. Leaves simple and palmately lobed to trifoliolate, with one pair of lateral leaflets; anther-bearing stamens usually 10; seeds often reticulate . . . . . GERANIUM
A. Leaves pinnately compound, with 2 or more pairs of lateral leaflets; anther-bearing stamens 5; seeds smooth . . . . . ERODIUM

GERANIUM

1. Petals more than 11 mm long; plants rhizomatous perennials; fruiting sepals 1 cm or more long.
    2. Stamens and style much exceeding the petals; calyx densely and finely stipitate-glandular . . . . . *Geranium macrorrhizum*
    2. Stamens and style shorter than the petals; calyx not stipitate-glandular.
        Cauline leaves numerous . . . . . *Geranium sanguineum*
        Cauline leaves few, large, mostly basal except for the single pair subtending the peduncles . . . . . **Geranium maculatum**
1. Petals less than 11 mm long; plants annuals or short-lived perennials; fruiting sepals rarely as much as 1 cm long.
    3. Sepals obtuse or acute, awnless or merely callus-tipped.
        Stems copiously long-pilose with spreading eglandular hairs much longer than the short glandular puberulence; mericarps glabrous . . . . . *Geranium molle*
        Stems with short puberulence only, any non-glandular hairs about the same length; mericarps strigose . . . . . *Geranium pusillum*
    3. Sepals attenuated into long caudate tips or awns.
        4. Principal leaf divisions deeply pinnatifid to pinnately lobed all the way to a subpetiolate base . . . . . **Geranium robertianum**
        4. Principal leaf divisions deeply divided, but not completely to the base.
            5. Pedicels, not peduncles, remaining shorter than the calyx.
                Petals pale-pink; fruits with ascending hairs, many of the hairs more than 0.5 mm long; seeds obscurely reticulate . . . . . **Geranium carolinianum**
                Petals deep-pink; fruits with spreading hairs up to 0.5 mm long; seeds conspicuously reticulate . . . . . *Geranium dissectum*
            5. Pedicels soon longer than the calyx.
                6. Pedicels copiously glandular-villous with spreading hairs.
                    Principal leaves deeply 5-lobed, the divisions deeply lobed . . . . . **Geranium bicknellii**
                    Principal leaves 3-lobed, the divisions shallowly lobed . . . . . *Geranium nepalense thunbergii*
                6. Pedicels nearly or quite without glandular hairs.
                    Stems spreading-villous; stylar beak at the end of the fruit less than 3 mm long . . . . . *Geranium sibiricum*
                    Stems strigose; stylar beak at the end of the fruit 3 mm or more long . . . . . *Geranium columbinum*

GEUM

1. Calyx campanulate to urceolate, magenta or purplish, the lobes appressed or ascending; proximal portion of the styles plumose.
    Plant caulescent; styles geniculate-twisted near the middle, less than 1 cm long; basal leaves with 2-6 strongly reduced lateral leaflets . . . . . **Geum rivale**
    Plant subscapose; styles straight, some elongating to more than 1 cm long; basal leaves with many more than 6 gradually reduced lateral leaflets . . . . . **Geum triflorum**
1. Calyx neither campanulate nor urceolate, green, the lobes soon reflexed; proximal portion of the styles glabrous, not plumose.
    2. Plant maturing fruit by the end of May; calyx small, less than 4 mm long, without bractlets; petals minute, 1-2 mm long; mature fruiting heads up to 1.2 cm broad, stipitate within the calyx . . . . . **Geum vernum**
    2. Plants beginning anthesis after the end of May; calyx more than 4 mm long, bracteate between the sepals; petals more than 2 mm long; larger fruiting heads more than 1.2 cm broad, virtually sessile.
        3. Plants in flower.
            4. Fresh petals white.
                Stems and peduncles glabrate, puberulent, short-stipitate glandular, or puberulent with vesicular hairs to 1 mm long; peduncles slender . . . . . **Geum canadense**
                Stems and peduncles copiously pilose-hispid with divaricate or retrorse hairs about 1-2 mm long; peduncles stout . . . . . **Geum laciniatum**
            4. Fresh petals yellow.
                5. Larger petals more than 5 mm long, equaling or exceeding the sepals . . . . . **Geum aleppicum**
                5. Petals less than 5 mm long, shorter than to scarcely equaling the sepals.
                    Petals bright-yellow; deciduous distal segment of style glabrous or with a few short hairs near the base . . . *Geum urbanum*
                    Petals pale-yellow; deciduous distal segment of style copiously beset with long bristles . . . . . **Geum virginianum**
        3. Plants in fruit.
            6. Receptacle glabrous (this feature is apparent after removing a few achenes; one should not be misled by the usually hirsute achenes); stems and peduncles both puberulent and abundantly pubescent with long divaricate or reflexed hairs . . . . . **Geum laciniatum**
            6. Receptacle hispid or hirsute; stem and peduncle pubescence various.
                7. Cauline leaves mostly compound, typically with 5-7 leaflets; stems and peduncles densely coarse-pilose as well as puberulent . . . . . **Geum aleppicum**
                7. Cauline leaves mostly simple, three-cleft or ternate with the terminal lobe occasionally three-cleft; stems and peduncles glabrous to short-puberulent, sometimes with a few long-filiform hairs intermixed.
                    8. Deciduous terminal segment of style glabrous or with a few short hairs scarcely longer than the width of the segment; larger stipules more than 12 mm broad . . . . . *Geum urbanum*
                    8. Deciduous terminal segment of style copiously hirsute with stiff trichomes much longer than the width of the segment; stipules rarely more than 12 mm broad.

Stems glabrate to appressed-pubescent proximally; stipules less than 2 cm long . . . . . **Geum canadense**
Stems long-villous proximally; larger stipules 2 cm or more long . . . . . **Geum virginianum**

GILLENIA *stipulata*

GINKGO *biloba*

GINKGOACEAE: One genus in our area . . . . . GINKGO

GLADIOLUS ×*gandavensis*

GLANDULARIA
1. Bracts conspicuously surpassing the calyces; corollas less than 1 cm long . . . . . *Glandularia bipinnatifida*
1. Bracts not surpassing the calyces; corollas more than 1 cm long.
   Calyx lobes short, deltate to deltate-lanceolate . . . . . *Glandularia peruviana*
   Calyx lobes long, linear-setaceous . . . . . *Glandularia canadensis*

GLECHOMA *hederacea*

GLEDITSIA triacanthos

GLYCERIA
1. Spikelets linear, the larger more than 10 mm long; sheaths conspicuously compressed-keeled.
   2. Leaves to 5 mm wide; lemmas essentially glabrous . . . . . **Glyceria borealis**
   2. Larger leaves more than 5 mm wide; lemmas uniformly scaberulous-puberulent.
      Larger leaves to 8 mm wide; lemma distinctly 3-toothed at the apex . . . . . *Glyceria declinata*
      Larger leaves more than 8 mm wide; lemma scarious and erose at the tip . . . . . **Glyceria septentrionalis**
1. Spikelets ovate, to 10 mm long; sheaths terete or subterete, rounded on the back.
   3. Second glume less than 1.5 mm long.
      Larger leaves usually more than 5 mm wide; lemma green, the tip scarcely scarious . . . . . **Glyceria striata**
      Leaves to 5 mm wide; lemma infused with purple, the tip broadly scarious . . . . . **Glyceria striata stricta**
   3. Second glume more than 1.5 mm long.
      4. Cauline leaves mostly 7 or more, the middle and proximal sheaths finely but distinctly scabrous near the summit; longer glumes more than 2.5 mm long. . . . . *Glyceria maxima*
      4. Cauline leaves fewer than 7, the sheaths all glabrous; longer glumes no more than 2.5 mm long.
         Larger lemmas more than 3 mm long, abruptly acute at the apex . . . . . **Glyceria canadensis**
         Lemmas less than 3 mm long, blunt . . . . . **Glyceria grandis**

GLYCINE *max*

GLYCYRRHIZA *lepidota*

GNAPHALIUM uliginosum

GOODYERA pubescens

GOSSYPIUM *hirsutum*

GRATIOLA
1. Corollas 12 mm or more long, bright-yellow throughout; capsules up to 3 mm long; leaves essentially entire, widest at or near the wide subclasping base; perennial . . . . . **Gratiola aurea**
1. Corollas rarely more than 12 mm long, creamy to white or white with purple lines within; capsules 3 mm or more long; leaves usually serrulate, tapered to the base, usually widest just below or beyond the middle; annuals.
   2. Leaves linear to linear-lanceolate, to 4.5 mm wide at the widest point, with a single primary nerve . . . . . **Gratiola quartermaniae**
   2. Leaves lanceolate to elliptic or oblanceolate, mostly more than 4.5 mm wide at the widest point, the primary veins 3 to 5.
      Fruiting pedicels less than 11 mm long; capsules mostly 5 mm or more long; stems glabrous throughout . . . . . **Gratiola virginiana**
      Longer fruiting pedicels 11 mm or more long; capsules less than 5 mm long; stems glandular-puberulent distally . . . . **Gratiola neglecta**

GRINDELIA *squarrosa*

GROSSULARIACEAE: One genus in our area . . . . . RIBES

GYMNOCARPIUM dryopteris

GYMNOCLADUS dioicus

GYPSOPHILA
1. Pedicels and inflorescence branches glandular-puberulent . . . . . *Gypsophila scorzonerifolia*
1. Pedicels and inflorescence branches glabrous.
   Calyx less than 2.5 mm long . . . . . *Gypsophila paniculata*
   Calyx more than 2.5 mm long . . . . . *Gypsophila elegans*

HACKELIA virginiana

HALERPESTES cymbalaria

HALORAGIDACEAE
A. At least many of the leaves whorled, all dissected; stamens more than 3 . . . . . MYRIOPHYLLUM
A. Leaves alternate, dimorphic, the emersed leaves unlobed or reduced to scales or warts; stamens usually 3.
   Leaves reduced to scales or warty knobs . . . . . MYRIOPHYLLUM
   Leaves fully developed . . . . . PROSERPINACA

HAMAMELIDACEAE
A. Leaves coarsely, palmately lobed, the divisions acute . . . . . LIQUIDAMBAR
A. Leaves unlobed, the margins wavy-crenate . . . . . HAMAMELIS

HAMAMELIS virginiana

HAPLOPAPPUS *ciliatus*

HASTEOLA suaveolens

HEDEOMA
1. Leaves rhombic-lanceolate to ovate, distinctly petiolate, often toothed . . . . . **Hedeoma pulegioides**
1. Leaves linear, sessile, entire . . . . . **Hedeoma hispida**

HEDERA *helix*

HELANTHIUM parvulum

HELENIUM
1. Leaves numerous, linear-filiform, less than 2.1 mm wide, not decurrent along the stem; annual . . . . . *Helenium amarum*
1. Leaves few to several, wider than 2.1 mm, conspicuously decurrent along the stem; perennials.
   2. Disc dark-brown or purplish; ray florets sterile . . . . . *Helenium flexuosum*
   2. Disc yellow; ray florets usually fertile.
      Leaves at least weakly serrate, less than 7 times as long as wide . . . . . **Helenium autumnale**
      Leaves entire, more than 7 times as long as wide . . . . . **Helenium autumnale canaliculatum**

HELIANTHUS
1. Disc florets brown to reddish-purple; receptacle flat or nearly so; leaves mostly alternate; plants annual.
   Receptacular chaff, particularly that toward the center, conspicuously bearded at the tip with white multicellular hairs; phyllaries lanceolate, gradually tapering to an acute, acuminate, or subcaudate tip . . . . . *Helianthus petiolaris*
   Receptacular chaff not white-bearded; phyllaries ovate or obovate, abruptly contracted into a caudate, often subinvolute tip . . . . . *Helianthus annuus*
1. Disc florets yellow or occasionally reddish-brown or purple; receptacle usually convex to conical; leaves opposite or alternate; plants perennial.
   2. Disc florets reddish-brown; phyllaries prevailingly broadly tapered to acute or obtuse tips, ciliolate, otherwise glabrous . . . . . **Helianthus pauciflorus**
   2. Disc florets yellow; phyllaries acuminate to narrowly attenuate, variously pubescent.
      3. Basal leaves conspicuous or absent at flowering time; stems with fewer than 6 pairs of leaves, progressively reduced distally . . . . . **Helianthus occidentalis**
      3. Basal leaves usually absent or inconspicuous; stems with more than 6 pairs of leaves, usually well developed distally.
         4. Leaves conduplicate.
            Leaves sessile or tapered to indistinct petioles; abaxial surface hispid . . . . . *Helianthus maximiliani*
            Leaves tapered to distinct petioles; abaxial surface minutely canescent . . . . . *Helianthus ×intermedius*
         4. Leaves flat.
            5. Leaves prevailingly alternate or if mostly opposite, then the stem with 20 or more nodes; leaves less than 5 cm wide.
               6. Stems smooth below the array.
                  Leaves linear, less than 5 mm wide . . . . . *Helianthus salicifolius*
                  Leaves lanceolate, more than 5 mm wide . . . . . **Helianthus grosseserratus**
               6. Stems hispid or scabrous below the array.
                  7. Abaxial leaf surfaces hispid or spreading-villous; longer cilia of phyllaries 0.8 mm or more long.
                     Petioles nearly or quite absent; leaves less than 3 cm wide . . . . . **Helianthus giganteus**

Petioles of principal leaves well developed; larger leaves commonly more than 3 cm wide . **Helianthus ×luxurians**
7. Abaxial leaf surfaces finely soft-pubescent or canescent; cilia of phyllaries less than 0.8 mm long.
8. Leaves lanceolate, tapered to slender, scarcely winged petioles; middle and proximal stems glabrous . . . . . **Helianthus grosseserratus**
8. Leaves ovate, sessile or nearly so; stems puberulent nearly or quite throughout.
Phyllaries velutinous on the abaxial face . . . . . **Helianthus ×brevifolius**
Phyllaries not velutinous on the abaxial face. . . . . **Helianthus ×doronicoides**
5. All but the distalmost leaves opposite, the stem with fewer than 20 nodes or if more, then leaves more than 5 cm wide.
9. Stems glabrous, glaucous, glabrate, or sparsely hirtellous within or just below the array.
10. Leaves broadly rounded to truncate or even subclasping at the base, sessile or subsessile on unwinged petioles mostly less than 0.7 cm long; lateral veins departing from the midrib no more than 1 mm from the summit of the petiole.
11. Most of the internodes with pustular-based hairs or their remnants . . . . . **Helianthus hirsutus**
11. Most of the internodes smooth or remotely beset with appressed hairs.
Petioles absent or less than 0.5 cm long; phyllaries to 12 mm long . . . . . **Helianthus divaricatus**
Longer petioles more than 0.5 cm long; longer phyllaries more than 12 mm long **Helianthus ×divariserratus**
10. Middle and proximal leaves gradually or abruptly decurrent to a petiole mostly 0.7 cm or more long; lateral veins departing from the midrib 1 mm or more into the blade from the summit of the petiole.
12. Abaxial leaf surfaces densely pubescent with soft appressed hairs . . . . . **Helianthus grosseserratus**
12. Abaxial leaf surfaces hispid with scattered broad-based hairs.
Leaves thin and usually submembranaceous, smooth or merely sparsely hirsute or hirtellous abaxially, typically coarsely dentate, the principal blades ovate; petioles of larger leaves well developed and often more than 3 cm long . . . . . **Helianthus decapetalus**
Leaves thick, coarse, pale to whitish and usually densely short-pubescent abaxially, subentire to shallowly dentate, the principal blades lanceolate to lance-ovate; petioles less than 3 cm long . . . **Helianthus strumosus**
9. Stems strigose, hispid, pubescent, or scabrous from caducous hairs at least near the middle, never glaucous.
13. Larger leaves with blades more 6 cm wide, tapered to long winged petioles more than 1.5 cm long . . . . . **Helianthus tuberosus**
13. Leaves rarely more than 6 cm wide, sessile or on winged petioles less than 1.5 cm long.
14. Leaves lance-ovate to ovate or deltate-ovate, sessile, subcordate to clasping at the base; blades with dense, ashy-gray pubescence on both surfaces . . . . . **Helianthus mollis**
14. Leaves narrowly lanceolate to ovate, contracted or tapered to petiolate bases or if petioles obscure, then the leaf bases attenuate, never both sessile and subcordate or clasping; blades variously pubescent or scabrous on one or both surfaces, but never with ashy-gray pubescence.
15. Leaves rounded or abruptly contracted at the base, sessile or on wingless petioles less than 1 cm long . . . . . **Helianthus hirsutus**
15. Leaves gradually tapered at the base to a winged, scarcely distinct petiole**.**
16. Phyllaries thinly scabrous-hispid, at least near the midrib abaxially . . . . . **Helianthus ×laetiflorus**
16. Phyllaries appressed-villous throughout abaxially.
Cauline leaves reduced distally, shorter than the internodes; phyllaries with the marginal cilia less than 0.8 mm long . . . . . **Helianthus ×cinereus**
Cauline leaves scarcely reduced distally, subequaling or exceeding the internodes; phyllaries with the marginal cilia more than 0.8 mm long . . . . . **Helianthus giganteus**

HELIOTROPIUM *europaeum*

HEMEROCALLIDACEAE: One genus in our area . . . . . HEMEROCALLIS

HEMEROCALLIS
1. Flowers yellow. . . . . *Hemerocallis lilioasphodelus*
1. Flowers orange . . . . . *Hemerocallis fulva*

HEPATICA
1. Lobes of leaves subrotund, obtuse, the angles broadly rounded . . . . . **Hepatica americana**
1. Lobes of leaves triangular, mostly longer than broad, the angles acute . . . . . **Hepatica acutiloba**

HERACLEUM
1. Principal rays of umbel fewer than 37, the fruiting pedicels less than 2 cm long; abaxial leaf surfaces downy with soft hairs; plant less than 2.5 m high . . . . . **Heracleum maximum**
1. Principal rays of umbel more than 37, the fruiting pedicels more the 2 cm long; abaxial leaf surfaces short-hispid; plant more than 2.5 m high . . . . . *Heracleum mantegazzianum*

HERNIARIA *glabra*

HESPERIS *matronalis*

HESPEROSTIPA
1. Longer glumes less than 3 cm long; lemmas less than 15 mm long; leaves up to 15 cm long . . . . . *Hesperostipa comata*
1. Longer glumes more than 3 cm long; lemmas more than 15 mm long; many leaves more than 15 cm long . . . . . **Hesperostipa spartea**

HETERANTHERA dubia

HETEROTHECA
1. Middle and distal leaves sessile and clasping; ray achenes with pappus absent or merely a short crown . . . . . *Heterotheca subaxillaris*
1. Leaves tapering to attenuate, subpetiolate or merely sessile bases; ray achenes with pappus bristles present.
   2. Many of the principal cauline leaves shallowly but distinctly sparsely serrate; plant more than 4 dm high.
      Peduncles and distal leaf surfaces eglandular or nearly so . . . . . **Heterotheca camporum**
      Peduncles and distal leaf surfaces conspicuously glandular . . . . . *Heterotheca camporum glandulissima*
   2. Leaves all entire; plant to 4 dm high.
      Involucres without leafy bracts or with an occasional one much shorter than the phyllaries . . . . . **Heterotheca villosa**
      Involucres subtended by leafy bracts notably longer than the phyllaries . . . . . *Heterotheca villosa foliosa*

HEUCHERA
1. Petioles glabrous or hispidulous; hypanthium regular or nearly so, to 5.5 mm long . . . . . **Heuchera americana**
1. Petioles hirsute; hypanthium strongly oblique, more than 5.5 mm long . . . . . **Heuchera richardsonii**

HIBISCUS
1. Shrub or small tree . . . . . *Hibiscus syriacus*
1. Annuals or perennials.
   2. Leaves deeply palmate-pinnatifid; annual . . . . . *Hibiscus trionum*
   2. Leaves serrate, lobed or unlobed; perennial.
      Leaves glabrous or glabrate abaxially, many of them strongly lobed or hastate at the base . . . . . **Hibiscus laevis**
      Leaves densely pannose-tomentose abaxially, unlobed or with a pair of acute lobes near the middle . . . . . **Hibiscus palustris**

HIERACIUM
1. Plants scapose, the stems leafless or with 1-3 strongly reduced leaves.
   2. Heads prevailingly fewer than 3, the larger more than 9 mm long; peduncles soon becoming more than 1.5 cm long; leaves spatulate, obtuse . . . . . *Hieracium flagellare*
   2. Heads generally more than 3, to 9 mm long; peduncles rarely more than 1.5 cm long; leaves tapering to acute apices.
      3. Leaves with setose hairs confined to the midrib and margins, without stellate pubescence; stolons absent . . . . *Hieracium piloselloides*
      3 Leaves with setose hairs on the laminae as well as thinly to densely stellate-pubescent, at least along the veins abaxially; stolons usually at least tardily developed.
         Flowers reddish-orange; pappus bristles to 4 mm long; leaves prevailingly obtuse . . . . . *Hieracium aurantiacum*
         Flowers yellow; longer pappus bristles more than 4 mm long; leaves acute . . . . . *Hieracium caespitosum*
1. Plants with leafy stems.
   4. Stem leaves more than 24 . . . . . **Hieracium umbellatum**
   4. Stem leaves fewer than 24.
      5. Pubescence of proximal stem and rosette leaves with many of the hairs more than 1 cm long . . . . . **Hieracium longipilum**
      5. Pubescence with hairs all shorter than 1 cm long.
         6. Distal stems and herbage nearly glabrous, with only scattered hairs; panicle nearly as broad as long, the branches elongate and slender; heads with as many as 30 florets . . . . . **Hieracium paniculatum**
         6. Plants abundantly hairy and/or glandular throughout; panicles usually notably longer than broad, the branches stout; heads frequently with more than 30 florets.
            7. Achenes tapered to a slender summit; heads with fewer than 40 florets . . . . . **Hieracium gronovii**
            7. Achenes with essentially straight sides, truncate at the summit, never distinctly tapered above; heads usually with more than 40 florets.
               Pappus tawny; involucres up to but prevailingly less than 9 mm high; leaves entire, the basal soon deciduous, often absent by flowering time . . . . . **Hieracium scabrum**
               Pappus sordid; larger involucres more than 9 mm high; larger leaves usually dentate or undulate, the basal rosette mostly well developed at flowering time . . . . . *Hieracium lachenalii*

HIEROCHLOË hirta

HIPPOCASTANACEAE: One genus in our area . . . . . AESCULUS

HIPPURIDACEAE: One genus in our area . . . . . HIPPURIS

HIPPURIS vulgaris

HOLCUS *lanatus*

HOLOSTEUM*umbellatum*

HOMALOSORUS pycnocarpos

HORDEUM
1. Many awns more than 3 cm long, or awns 0.5 mm or more wide, or both.
    Awns of lemmas filiform-setaceous, less than 0.25 mm wide; lemmas less than 1.5 mm broad; leaves without auricles at the base, up to 5 mm wide . . . . . **Hordeum jubatum**
    Awns of lemmas stout, 0.5 mm or more wide; lemmas much broader than 2 mm; leaves auricled at the base, more than 5 mm wide . . . . . *Hordeum vulgare*
1. All awns less than 3 cm long and less than 0.5 mm wide.
    2. Spikes, including awns, broader than 1.5 cm; culms geniculate, copiously branching at the decumbent base . . . . . *Hordeum marinum gussoneanum*
    2. Spikes, including awns, less than 1.5 cm broad; culms not geniculate, erect or nearly so from the solitary or branching base.
        Plant annual; four of the six glumes per spikelet group dilated at the base, to broader than 0.5 mm . . . . . *Hordeum pusillum*
        Plant perennial; all six glumes per spikelet group setose throughout, less than 0.5 mm broad . . . . . *Hordeum brachyantherum*

HOSTA
1. Leaf blades lanceolate to lance-ovate, less than 10 cm wide, with fewer than 7 pairs of lateral veins; scape less than 60 cm long . . . . . *Hosta lancifolia*
1. Leaf blades broadly ovate, more than 10 cm wide, with 7 or more pairs of lateral veins; scape more than 60 cm long . . . . . *Hosta ventricosa*

HOSTACEAE: One genus in our area . . . . . HOSTA

HOUSTONIA
1. At least the proximal leaves petiolate; peduncles single-flowered; corolla salverform, the lobes broadest above the base; stamens included . . . . . **Houstonia caerulea**
1. Leaves sessile; peduncles with 2-several flowers in loose to crowded cymes; corolla funnelform, the lobes broadest at the base; stamens exserted.
    Larger cauline leaves distinctly 3-nerved, ovate, more than 5 mm wide . . . . . **Houstonia purpurea**
    Leaves with only the midnerve prominent, narrowly elliptic to oblanceolate, less than 5 mm wide . . . . . **Houstonia longifolia**

HUDSONIA tomentosa

HUMULUS
1. Petioles as long as to commonly much longer than the 5-9 lobed leaves; abaxial leaf surfaces coarsely spinulose-pubescent with simple, strongly pustular trichomes at least along the principal veins; fruiting bracts acuminate, coarsely hispid; anthers without resinous globules . . . . . *Humulus japonicus*
1. Petioles shorter than to scarcely longer than the 0-3 lobed leaves; abaxial leaf surfaces glabrate or with soft pubescence sometimes mixed with a few anvil-like pustular-based hairs, particularly along the principal veins; fruiting bracts obtuse, virtually glabrous; anthers usually with large globular glands along the furrow.
    2. Leaves densely pubescent along the midvein abaxially, with 10 or more hairs per millimeter . . . . . **Humulus lupulus pubescens**
    2. Leaves with fewer than 10 hairs per millimeter along the midvein.
        Midrib nearly or quite glabrous abaxially . . . . . *Humulus lupulus*
        Midrib with 2-10 hairs per millimeter . . . . . *Humulus lupulus lupuloides*

HUPERZIA
1. Leaves widest beyond the middle, some of them with 4 or more teeth . . . . . **Huperzia lucidula**
1. Leaves lanceolate, with mostly parallel sides, nearly or quite entire . . . . . **Huperzia porophila**

HYACINTHACEAE
A. Perianth segments clearly united below the middle.
    B. Perianth urceolate-cylindric, the throat not expanded. . . . . MUSCARI
    B. Perianth rotate to campanulate or funnelform, the throat notably expanded.
        C. Perianth campanulate to funnelform, the tube of the perianth subequaling or longer than the lobes . . . . . HYACINTHUS
        C. Perianth rotate, the tube much shorter than the lobes.
            Filaments united into a corona with projecting lobes . . . . . PUSCHKINIA
            Filaments broad and flat, but separate . . . . . CHIONODOXA
A. Perianth segments nearly or quite distinct at the base.
    D. Perianth segments white or scarious, with a conspicuous green stripe . . . . . ORNITHOGALUM
    D. Perianth segments white to deep-blue, without a green stripe or green medial tinctures.
        E. Pedicels mostly more than 10 mm long; perianth segments 3-nerved . . . . . CAMASSIA
        E. Pedicels less than 10 mm long; perianth segments 1-nerved.
            Inflorescence racemose . . . . . HYACINTHOIDES
            Inflorescence a 1-several flowered corymbiform raceme . . . . . SCILLA

HYACINTHOIDES
1. Flowers fewer than 17, many of them nodding. . . . . *Hyacinthoides non-scripta*
1. Flowers more than 17, rarely nodding . . . . . *Hyacinthoides ×massartiana*

HYACINTHUS *orientalis*

HYBANTHUS concolor

HYDRANGEA
1. All or nearly all of the flowers sterile and broadly petaloid . . . . . *Hydrangea arborescens sterilis*
1. Only the peripheral flowers sterile and petaloid.
   Leaves broadly rounded at the base, the teeth as broad as or broader than long . . . . . **Hydrangea arborescens**
   Leaves cuneate at the base, the teeth prevailingly longer than broad . . . . . *Hydrangea arborescens oblonga*

HYDRANGEACEAE: One genus in our area . . . . . HYDRANGEA

HYDRASTIS canadensis

HYDROCHARITACEAE
A. Plants acaulescent or nearly so; leaves all basal . . . . . VALLISNERIA
A. Plants caulescent; leaves opposite or whorled.
   At least the distal leaves in whorls of 4 or more, most of them 2 cm or more long; flowers nectariferous, entomophilous; petals showy, exceeding the sepals in length . . . . . EGERIA
   Leaves no more than 3 per whorl, less than 2 cm long; flowers with explosive anthers, pollinated by water or hydrophilous; petals obsolete or at least no longer than the sepals . . . . . ELODEA

HYDROCOTYLE
1. Leaves peltate . . . . . **Hydrocotyle umbellata**
1. Leaves not peltate, the petiole attached at the base of the cordate blade . . . . . *Hydrocotyle ranunculoides*

HYDROPHYLLACEAE
A. Flowers solitary in the axils.
   Calyx with reflexed appendages at the sinuses . . . . . NEMOPHILA
   Calyx without appendages . . . . . ELLISIA
A. Flowers in several-flowered cymes.
   Basal and proximal leaves on petioles more than 2.5 cm long; cauline leaves palmately lobed or pinnate and the inflorescence eglandular . . . . . HYDROPHYLLUM
   Basal and proximal leaves sessile or on petioles less than 2.5 cm long; cauline leaves pinnately lobed and the inflorescence glandular . . . . . PHACELIA

HYDROPHYLLUM
1. Leaves predominantly pinnately compound or lobed, divided into 5-7 lobes or leaflets . . . . . **Hydrophyllum virginianum**
1. Leaves predominantly palmately lobed or some with a small pair of pinnae at the base.
   Calyx lobes copiously pilose, with conspicuous reflexed processes in the sinuses; stems usually densely pilose or pubescent; biennial . . . . . **Hydrophyllum appendiculatum**
   Calyx lobes glabrous or sparsely hispidulous, without processes in the sinuses; stems glabrous or nearly so; perennial . . . . . **Hydrophyllum canadense**

HYLODESMUM
1. Leaflets obtuse to acute or short-acuminate; flowering stem originating from the base of the plant . . . . . **Hylodesmum nudiflorum**
1. Leaflets conspicuously acuminate; inflorescence terminating leafy stems . . . . . **Hylodesmum glutinosum**

HYLOTELEPHIUM
1. Leaves sessile, serrulate to more typically coarsely denticulate; flowers deep roseate-purple; leaves of flowering stems alternate . . . . . *Hylotelephium telephium*
1. Leaves sessile to short-petiolate, shallowly repand to bluntly dentate; flowers white to usually pink-tinged; at least the distal pair of leaves of flowering stems usually opposite . . . . . *Hylotelephium erythrostictum*

HYMENOPAPPUS scabiosaeus

HYOSCYAMUS *niger*

HYPERICACEAE
A. Petals pink or flesh-colored; stamens in 3 groups of 3, alternating with 3 hypogynous glands . . . . . TRIADENUM
A. Petals yellow or yellowish; stamens variously numbered, hypogynous glands absent . . . . . HYPERICUM

HYPERICUM
1. Stamens no more than 20.
   2. Leaves minute, subulate, scale-like, closely appressed . . . . . **Hypericum gentianoides**
   2. Leaves herbaceous, linear to ovate, spreading.
      3. Bracts subtending the pedicels at least 0.5 mm wide, mostly dilated and foliaceous, scarcely distinct from the leaves **Hypericum boreale**
      3. Bracts subtending the pedicels not more than 0.5 mm wide, linear-subulate, distinct from the leaves.
         4. Leaves mostly more than 3 times as long as wide, linear to lanceolate, narrowly oblong or elliptic, neither cordate nor clasping; sepals widest well below the middle.
            Sepals less than 4.5 mm long; leaves 1-nerved, linear to narrowly elliptic, oblong or oblanceolate, tapering to the base . . . . . **Hypericum canadense**

Larger sepals 4.5 mm or more long; leaves 3-7 nerved, lanceolate, widest at or near the rounded base . . . . . **Hypericum majus**

4. Leaves less than 3 times as long as wide, ovate-deltate to broadly elliptic-oblong, distinctly cordate or clasping; sepals various.
   Sepals subulate to lanceolate, tapering below the middle to the tip; capsules narrowed to the summit; stems simple below the inflorescence . . . . . **Hypericum gymnanthum**
   Sepals oblong, obtuse, scarcely more tapered distally than proximally; capsules rounded at the summit; stems usually copiously branched below the inflorescence . . . . . **Hypericum mutilum**

1. Stamens more than 20.
   5. Petals maculate with black glandular-punctate dots or lines.
      Midrib of leaves strongly decurrent along the stems and branches, causing them to be angled; stems much branched; petals with glands primarily marginal; leaves less than 1 cm wide, typically with numerous axillary fascicles; seeds usually more than 1 mm long . . . . . *Hypericum perforatum*
      Midrib of leaves not decurrent, the stems terete, simple or with a few branches distally; petals, sepals, stems, and leaves beset with copious black-punctate glands throughout; larger leaves more than 1 cm wide, usually not fasciculate; seeds less than 1 mm long . . . . . **Hypericum punctatum**
   5. Petals solid yellow, without black glands.
      6. Plants distinctly woody nearly or quite throughout.
         7. Pistils 3-merous; flowers 1-5 in lateral dichasia from the distal 2-4 nodes . . . . . **Hypericum prolificum**
         7. Pistils prevailingly 5-merous; flowers 1-31 in terminal dichasia, nearly or quite absent from the penultimate axils.
            Larger leaves more than 11 mm wide, broadly obtuse, 3.5-5 cm long, the margins flat or irregularly revolute; dichasium prevailingly 15-31 flowered; larger flowering sepals of proximal central flower 10-12 mm long . . . . . **Hypericum swinkianum**
            Leaves less than 11 mm wide, obtuse to acute, mostly 2.5-3.5 cm long, the margins weakly to markedly revolute; dichasium 1-7 flowered, rarely 15; larger flowering sepals usually less than 10 mm long . . . . . **Hypericum kalmianum**
      6. Plants herbaceous or merely suffruticose.
         8. Flowers more than 3 cm across; capsules more than 1 cm long; plant more than 7 dm high . . . . . **Hypericum ascyron**
         8. Flowers less than 3 cm across; capsules less than 1 cm long; plants less than 7 dm high.
            Sepals flat or merely widely bowed or conduplicate; stems typically 2-several from a short erect caudex off of the rhizome . . . . . **Hypericum sphaerocarpum**
            Sepals tightly and distinctly revolute-margined beyond the middle; stems arising singly from horizontal rhizomes . . . . . **Hypericum adpressum**

HYPOCHAERIS *radicata*

HYPOPITYS monotropa

HYPOXIDACEAE: One genus in our area . . . . . HYPOXIS

HYPOXIS hirsuta

HYSTRIX patula

IBERIS

1. Inflorescence elongating in fruit; evergreen subshrub; petals usually white . . . . . *Iberis sempervirens*
1. Inflorescence remaining umbelliform; annual; petals usually pink or pale with tinctures of pink . . . . . *Iberis umbellata*

ILEX

1. Leaves evergreen, coarsely spinose-dentate . . . . . *Ilex opaca*
1. Leaves deciduous, subentire with low serrations . . . . . **Ilex verticillata**

ILIAMNA remota

IMPATIENS

1. Leaves with the teeth broadly rounded and mucronate; petioles eglandular.
   Flowers yellow, the spur less than 6 mm long; larger leaves of flowering branches usually more than 8 cm long . . . . . **Impatiens pallida**
   Flowers orange, the fully developed spur more than 6 mm long; leaves of flowering branches rarely more than 8 cm long . . . . . **Impatiens capensis**
1. Leaves with the teeth sharply serrate; petioles glandular.
   2. Leaves opposite or whorled . . . . . *Impatiens glandulifera*
   2. Leaves alternate.
      Leaves ovate; peduncles slender, elongate, glabrous, the flowers more than 4 in loose racemes . . . . . *Impatiens balfourii*
      Leaves narrowly oblanceolate; peduncles absent or very short, hirtellous, the flowers fewer than 4 axillary clusters . . . . . *Impatiens balsamina*

INULA *helenium*

IODANTHUS pinnatifidus

IONACTIS linariifolia

IPOMOEA
1. Sepals conspicuously pilose or hirsute below the middle; stigmas 3-lobed; corollas primarily blue or purple with occasional white or variegated forms.
   Sepals up to 1.5 cm long, acute to acuminate; leaves prevailingly entire . . . . . *Ipomoea purpurea*
   Sepals more than 1.5 cm long, attenuated into long, linear, caudate lobes; leaves nearly always deeply 3-lobed . . . . . *Ipomoea hederacea*
1. Sepals glabrous or merely ciliate along the margins; stigmas capitate or 2-lobed; corollas white, white with a purple throat, or bright-scarlet.
   2. Sepals with long, linear, caudate appendages at the tips; corollas bright-scarlet; stamens and styles exserted; stigmas capitate . . . . . *Ipomoea coccinea*
   2. Sepals without linear, caudate tips; corollas not scarlet; stamens and styles included; stigmas 2-lobed.
      Sepals wholly glabrous, obtuse; corollas more than 3 cm long, white, usually with a purple throat; perennial . . . . . **Ipomoea pandurata**
      Sepals ciliate along the margins, acute to acuminate; corollas less than 3 cm long, white; annual . . . . . *Ipomoea lacunosa*

IPOMOPSIS *rubra*

IRIDACEAE
A. Leaves up to 8 mm wide.
   Leaves dull-green throughout; flowers up to 2 cm across . . . . . SISYRINCHIUM
   Leaves dark-green with a bright-white midrib; flowers more than 2 cm across . . . . . CROCUS
A. Larger leaves more than 8 mm wide.
   B. Flowers in spiciform inflorescences . . . . . GLADIOLUS
   B. Flowers in rhipidiate cymes or spathiform clusters.
      Petals and sepals similar; flowers orange; bracts not spathiform . . . . . BELAMCANDA
      Petals and sepals dimorphic; flowers mostly blue or yellow, rarely orange; bracts spathiform . . . . . IRIS

IRIS
1. Stems very short or nearly absent, the plant less than 20 cm high; sepals less than 2 cm long; leaves less than 1 cm wide . . . . . *Iris pumila*
1. Stems stout, the plants more than 20 cm high; sepals more than 2 cm long; larger leaves wider than 1 cm.
   2. Adaxial surfaces of sepals prominently pubescent.
      Flowers pale-yellow to almost white . . . . . *Iris flavescens*
      Flowers blue to light-violet, sometimes tipped with yellow . . . . . *Iris germanica*
   2. Adaxial surfaces of sepals glabrous.
      3. Stems hollow . . . . . *Iris sibirica*
      3. Stems solid.
         Flowers light to deep-blue or purple . . . . . **Iris virginica shrevei**
         Flowers yellow . . . . . *Iris pseudacorus*

ISANTHUS brachiatus

ISATIS *tinctoria*

ISOËTACEAE: One genus in our area . . . . . ISOËTES

ISOËTES
1. Sporangia to 7 mm long; megaspores prevailingly more than 0.4 mm in diameter; growing in calcareous soil . . . . . **Isoëtes butleri**
1. Larger sporangia more than 7 mm long; megaspores rarely more than 0.4 mm in diameter; growing in non-calcareous soil . . . . . **Isoëtes melanopoda**

ISOLEPIS *cernua*

ISOTRIA
1. Stems pale gray-green; sepals greenish, up to 2.5 cm long, less than twice as long as the petals . . . . . **Isotria medeoloides**
1. Stems purple; sepals infused with purple or brown, more than 2.5 cm long, mostly more than twice as long as the petals . . . **Isotria verticillata**

IVA *annua*

JACOBAEA *vulgaris*

JACQUEMONTIA *tamnifolia*

JEFFERSONIA diphylla

JUGLANDACEAE
A. Prevailing number of leaflets 11 to 23, the median leaflets usually the largest . . . . . JUGLANS
A. Prevailing number of leaflets 5 to 9, the terminal leaflets usually the largest . . . . . CARYA

JUGLANS

1. Abaxial leaf surfaces prevailingly stellate-pubescent . . . . . **Juglans cinerea**
1. Abaxial leaf surfaces glabrate or pubescent with mostly simple hairs . . . . . **Juglans nigra**

JUNCACEAE

A. Plants cobwebby-pubescent or pilose, at least along the sheath margins and at the sheath summit; capsules 3-seeded . . . . . LUZULA
A. Plants completely glabrous; capsules many-seeded . . . . . JUNCUS

JUNCAGINACEAE

A. Stems scapose, all sheaths arising from near the base; leaves terminally closed; flowers ebracteate; capsules one-seeded . . . . . TRIGLOCHIN
A. Stems leafy; leaves with a terminal pore; flowers with leaf-like bracts; capsules 2-seeded . . . . . SCHEUCHZERIA

JUNCUS

1. Inflorescence appearing to originate from the side of the culm, the involucral bract fistulose, terete, seemingly a continuation of the culm; sheaths bladeless.
    2. Inflorescence chestnut-brown; culms solitary from creeping rootstocks, the individual ones often well separated and forming distinct rows; stamens 6 . . . . . **Juncus balticus**
    2. Inflorescence green or light-brown; culms densely tufted; stamens usually 3.
        Sepals longer than the petals, mostly more than 3 mm long; stems with fewer than 8 coarse vein ridges per millimeter . . . **Juncus pylaei**
        Sepals subequaling the petals, less than 3 mm long; stems with 8 or more fine ridges per millimeter . . . . . **Juncus effusus**
1. Inflorescence appearing terminal or if seemingly somewhat lateral, then the involucral bracts flat or involute-grooved above; sheaths with blades.
    3. Leaves flat or involute, but not septate-nodulose.
        4. Plant annual, floriferous for ½ or more of its height, rarely more than 10 cm tall . . . . . **Juncus bufonius**
        4. Plants perennial, usually more than 10 cm tall, the inflorescence usually much less than ½ the height of the plant.
            5. Leaves with well developed blades as high as the middle of the stem.
                6. Flowers glomerulate, not individually bracteolate; sepals reddish-brown.
                    Pedunculate heads fewer than 30; stamens shorter than the sepals; cauline leaf blades to 4 mm wide, with fewer than 5 principal veins . . . . . **Juncus marginatus**
                    Pedunculate heads more than 30; stamens as long as or longer than the sepals; larger cauline leaves more than 4 mm wide, typically with 5 principal veins . . . . . **Juncus biflorus**
                6. Flowers borne singly on individual pedicels, each with a pair of bracteoles at the base in addition to the bractlet at the base of each pedicel; sepals usually dark-striped, not reddish-brown.
                    Involucral bract commonly exceeding the inflorescence; anthers to 1 mm long, about 1.5-2 times as long as the filament . . . . . *Juncus compressus*
                    Involucral bract rarely exceeding the inflorescence; anthers more than 1 mm long, at least 3 times as long as the filament . . . . . *Juncus gerardii*
            5. Leaves with well developed blades only at or near the base of the stem.
                7. Seeds 0.5 mm or more long, with distinct, long to short, white caudate tips; tepals closely appressed, shorter than to subequal to the usually dark-brown capsule; leaves terete, the margins connate at the tip, weakly grooved-sulcate along the adaxial surface and open only near the base or not at all.
                    Seeds more than 0.7 mm long, with long-caudate tips at the ends of slender bodies . . . . . **Juncus vaseyi**
                    Seeds less than 0.7 mm long, the tips very short at the ends of ellipsoid bodies . . . . . **Juncus greenei**
                7. Seeds less than 0.5 mm long, without distinctly caudate white tips; tepals appressed to spreading, mostly exceeding the usually stramineous capsule; leaves flat or involute, but open all the way to the tip.
                    8. Margin of leaf sheath protruding at the summit (base of blade) into a friable, scarious, easily fractured auricle, often more than 4 mm long.
                        Flowers borne widely spaced along usually diffuse branches of the inflorescence, the internodes generally much longer than the tepals; cyme usually 1 dm or more long; capsules less than ¾ the length of the tepals . . . . **Juncus anthelatus**
                        Flowers borne congested or separated along the branches of the inflorescence, the internodes about as long as the tepals; cyme rarely 1 dm long; capsules ¾ or more than length of the tepals . . . . . **Juncus tenuis**
                    8. Margin of leaf sheath firm to scarious, weakly protruding beyond the summit into a submembranaceous to cartilaginous blunt auricle, less than 4 mm long.
                        9. Auricles of sheaths firm, cartilaginous, pale to yellowish to the margins . . . . . **Juncus dudleyi**
                        9. Auricles of sheaths submembranaceous to firm, not cartilaginous, with scarious margins or with sordid tinctures.
                            Mature capsules brownish, broadly elliptic to subglobose, mostly shorter than the tepals; leaves nearly terete, channeled. . . . . **Juncus dichotomus**
                            Mature capsules stramineous, becoming elliptic, subequaling the tepals; leaves flat or involute . . . . **Juncus interior**
    3. Leaves fistulose, terete, septate-nodulose with conspicuous cross partitions between the veins. (If the nails of thumb and forefinger are pressed together, one on either side of the base of the leaf and drawn along its length, the partitions can be detected--though normally they are quite apparent from visual inspection.)
        10. At least some of the seeds with a white caudate tip 0.2 mm or more long at one or both ends.
            11. Perianth to 2.5 mm long, the tepals strongly scarious-margined to the obtuse or subacute tip . . . . . **Juncus brachycephalus**
            11. Perianth more than 2.5 mm long, the tepals thinly margined, the scarious tissue ending below the acuminate tip.
                Flowers mostly 5 or more in hemispherical or spherical heads; longer seeds more than 1.2 mm long; mature capsules subequaling the perianth . . . . . **Juncus canadensis**
                Flowers prevailingly fewer than 5 in narrowly turbinate heads; seeds to 1.2 mm long; mature capsules clearly exceeding the perianth. . . . . **Juncus brevicaudatus**
        10. Seeds without caudate tips or with very short dark ones.
            12. Flowers in dense spherical heads, the flowers radiating in all directions.
                13. Many of the capsules distinctly longer than the sepals.

14. Leaves strongly compressed, the proximal ones more than 2 mm wide . . . . . *Juncus validus*
14. Leaves terete, to 2 mm wide.
    Stamens 3; auricles at summit of leaf sheath more than 1 mm long . . . . . **Juncus scirpoides**
    Stamens 6; auricles at summit of leaf sheath up to 1 mm long . . . . . **Juncus nodosus**
13. Capsules all shorter than to subequaling the sepals.
15. Stamens 6; capsules subulate, often nearly or quite as long as the sepals.
    Perianth 4 mm or more long . . . . . **Juncus torreyi**
    Perianth less than 4 mm long . . . . . **Juncus acuminatus**
15. Stamens 3; capsules shorter than to about equal to the sepals.
    Capsules obtuse to apiculate, much shorter than the sepals; sepals much longer than the petals; plant with elongate rhizomes . . . . . **Juncus brachycarpus**
    Capsules acute or mucronate, about equaling the sepals; sepals about equaling the petals; elongate rhizomes absent . . . . . **Juncus acuminatus**
12. Heads single-flowered, glomerulate or hemispherical, but the flowers not radiating in all directions.
16. Stamens 3.
17. Longer capsules about twice as long as the perianth . . . . . **Juncus diffusissimus**
17. Capsules no more than 1.5 times as long as the perianth.
    Heads more than 200 . . . . . **Juncus nodatus**
    Heads fewer than 200 . . . . . **Juncus acuminatus**
16. Stamens 6.
18. Heads 1-2 flowered . . . . . **Juncus pelocarpus**
18. Heads prevailingly more than 2-flowered.
19. Lower cauline leaf blade 1, stout, exceeding the inflorescence, the distal leaf sheaths nearly or quite bladeless; plant 5 dm or more high . . . . . **Juncus militaris**
19. Cauline sheaths each with a blade, all exceeded by the inflorescence; plants less than 5 dm high.
20. Petals blunter than the sepals and distinctly shorter than the sepals . . . . . **Juncus alpinoarticulatus**
20. Petals acute to acuminate, subequaling or exceeding the sepals.
    Capsules subequaling the perianth . . . . . **Juncus acuminatus**
    Capsules distinctly exceeding the perianth . . . . . **Juncus articulatus**

JUNIPERUS

1. Leaves all widely spreading and acicular, jointed at the base, the larger more than 9 mm long . . . . . **Juniperus communis**
1. Leaves appressed or wide spreading scale-like or acicular, the leaf bases decurrent along the branchlet, less than 9 mm long.
2. Plant usually an erect shrub or tree, obviously higher than broad; leaves appressed and scale-like or if acicular, then the internodes of the branchlets usually evident . . . . . **Juniperus virginiana**
2. Plant prostrate or low-mounding, usually broader than high; leaves various, but the internodes of the branchlets concealed by the appressed or subappressed scales or needles.
3. Leaves all linear-lanceolate and subulate, the larger more than 6 mm long . . . . . *Juniperus procumbens*
3. Leaves all or prevailingly scale-like, less than 6 mm long.
4. Scale leaves acute or cuspidate; shrub prostrate, the principal branches lying along the ground.
    Branchlets swept upward and appearing secund; leaves all uniformly scale-like, to 2.1 mm long . . . . . **Juniperus horizontalis**
    Branchlets neither swept upward nor appearing secund; leaves more or less acicular and more than 2.1 mm long . . . . . **Juniperus virginiana**
4. Scale leaves blunt to acute; shrub erect, commonly with widely spreading branches in several layers above the ground.
    Scale leaves blunt; acicular leaves often ternate . . . . . *Juniperus chinensis*
    Scale leaves acute to subulate; acicular leaves opposite . . . . . *Juniperus sabina*

JUSSIAEA *repens glabrescens*

JUSTICIA americana

KALLSTROEMIA *parviflora*

KALMIA angustifolia

KERRIA *japonica*

KICKXIA *elatine*

KOELERIA macrantha

KOELREUTERIA *paniculata*

KRIGIA

1. Plants scapose; heads solitary, the involucres up to 7 mm high; pappus elements 10; annual . . . . . **Krigia virginica**
1. Plants caulescent; heads 2 to several, the involucres 7 mm or more high; pappus elements 20 or more; perennial . . . . . **Krigia biflora**

KUMMEROWIA

1. Hairs of stem antrorsely appressed ..... *Kummerowia stipulacea*
1. Hairs of stem retrorsely appressed ..... *Kummerowia striata*

LACTUCA

1. Leaves broadly ovate, undivided ..... *Lactuca sativa*
1. Leaves not ovate, usually divided.
   2. Leaves manifestly prickly along the midrib abaxially or if smooth, then the cauline leaves unlobed.
      Larger involucres 15 mm or more high; achenes black or blackish, with 1-3 nerves on each face ..... **Lactuca ludoviciana**
      Involucres less than 15 mm high; achenes lighter with several nerves on each face ..... *Lactuca serriola*
   2. Leaves smooth or merely pubescent along the midrib abaxially (rarely with a few prickles in Lactuca saligna); leaves lobed.
      3. Pappus sordid, brownish, or grayish ..... **Lactuca biennis**
      3. Pappus white.
         4. Involucres mostly more than 15 mm high.
            Flowers brick-red or salmon-colored, no more than 25 per head; leaves toothed but not prickly margined ... **Lactuca hirsuta**
            Flowers blue or yellow, commonly more than 25 per head; leaves distinctly prickly ..... **Lactuca ludoviciana**
         4. Involucres rarely more than 15 mm high.
            5. Flowers bluish; at least some of the achenes beakless, the pappus appearing sessile; leaves rarely sagittate at the base ..... **Lactuca floridana**
            5. Flowers yellow or yellow and rarely drying to blue; the achenes all with long slender beaks, the pappus therefore appearing stalked; leaves often sagittate at the base.
               Heads fewer than 12-flowered, few to numerous in strict, elongate, virgate arrays; stems white, less than 1 m tall; leaves usually linear, essentially entire, less than 1 cm wide; achenes with more than 4 nerves on each face ..... *Lactuca saligna*
               Heads more than 12-flowered, numerous in broadly paniculate arrays; stems green or light-green, often more than 1 m tall; leaves of various shapes, but the larger always more than 1 cm wide; achenes with fewer than 4 nerves on each face ..... **Lactuca canadensis**

LAMIACEAE

A. Calyx with a distinct shield-like crest or protuberance on the upper side ..... SCUTELLARIA
A. Calyx variously shaped, but never as above.
   B. Stems very densely clothed by a white pannose tomentum; leaves broadly ovate to suborbicular, crenate, subcoriaceous and rugose.
      Calyx teeth strongly hooked; stamens and style included within the corolla tube ..... MARRUBIUM
      Calyx teeth cuspidate; stamens and style exceeding the corolla tube ..... STACHYS
   B. Stems glabrous to pubescent or canescent, but not densely pannose-tomentose; leaves various.
      C. Plants prostrate; stems retrorsely pubescent; leaves punctate, glabrous, ciliate, ovate, less than 1 cm long ..... THYMUS
      C. Plants without the above combination of characters.
         D. Corollas nearly regular, the lobes equal or essentially so.
            E. Leaves definitely not entire.
               F. Inflorescence racemose, the flowers pedicellate and solitary in the axils of the short ovate bracts ..... PERILLA
               F. Flowers sessile or subsessile, several to numerous in dense cymules in the axils of foliage leaves or bracts.
                  Plants not aromatic; anther-bearing stamens 2; corollas white ..... LYCOPUS
                  Plants strongly aromatic; anther-bearing stamens 4; corollas often not white ..... MENTHA
            E. Leaves entire or subentire.
               G. Calyx strongly bilabiate, one lip nearly twice as long as the other; stamens long-exserted and curved downward ..... TRICHOSTEMA
               G. Calyx regular or only weakly 2-lipped; stamens included or if exserted then the filaments straight.
                  H. Flowers 1 to 3 in the axils of leaf-like bracts, bluish; stamens not or only scarcely exserted from the corolla tube; calyx campanulate, the lobes exceeding the tube ..... ISANTHUS
                  H. Flowers mostly 4 or more in cymes terminating the stems and branches, whitish or purple; stamens mostly exserted; calyx tubular, the lobes shorter than the tube.
                     Leaves broadly ovate, less than twice as long as wide, obtuse ..... ORIGANUM
                     Leaves linear to lance-ovate, more than twice as long as wide, acute ..... PYCNANTHEMUM
         D. Corollas strongly irregular, manifestly bilabiate or the upper lip absent in Teucrium and Ajuga.
            I. Corollas appearing 1-lipped, the upper lip scarcely evident or essentially absent.
               Leaves lanceolate to lance-ovate, coarsely dentate, acute or acuminate, rounded at the base, distinctly petiolate; stems more than 3 dm high ..... TEUCRIUM
               Leaves oblong-spatulate to ovate, entire to shallowly and irregularly sinuate-dentate or crenate, sessile or the proximal ones tapered to a broad flat petiole; stems trailing to erect, less than 3 dm high ..... AJUGA
            I. Corollas variously but distinctly 2-lipped, the upper lip manifest.
               J. Upper lip of the corolla galeate, hood-like, or arched, with a deep concavity at the distal end.
                  K. Calyx tube with more than 10 conspicuous strong nerves.
                     L. Plants creeping, rooting at the nodes; leaves about as wide as long, deltate-orbicular to reniform, crenate, less than 5 cm long ..... GLECHOMA
                     L. Plants erect, not rooting at the nodes; leaves obviously longer than wide, serrate or dentate, the larger usually more than 5 cm long.
                        M. Inflorescence bracts with the nerves exiting the margins into long-spinulose teeth; calyx with 4 small similar lobes and one large, very broad lobe ..... DRACOCEPHALUM
                        M. Inflorescence bracts not spinulose; calyx regular to variously bilabiate, but never as above.
                           N. Fertile stamens 4.

Stems densely soft-pubescent; stamens shorter than to subequaling the upper lip, essentially included; calyx teeth linear-subulate . . . . . NEPETA
Stems glabrous to pubescent; stamens long-exserted or much surpassing the upper lip; calyx teeth deltate-ovate to lanceolate, acute . . . . . AGASTACHE

N. Fertile stamens 2.
O. Calyx scarcely or not at all bilabiate . . . . . MONARDA
O. Calyx strongly bilabiate.
Flowers numerous, sessile, crowded into dense axillary clusters or compact terminal spikes . . . . . BLEPHILIA
Flowers few to several, mostly pedicellate, in loose to more or less crowded axillary or terminal inflorescences . . . . . SALVIA

K. Calyx tube with up to 10 conspicuous strong nerves (in Galeopsis, which has coarsely pungent subulate calyx lobes, there are 10 strong nerves and as many as 10 short intermediate nerves).
P. Flowers solitary or clustered in terminal spikes or racemes, the inflorescence leafless or leafy only among the proximal clusters.
Q. Flower clusters densely crowded in subcapitate or elongate thick-cylindric spikes; calyx strongly bilabiate, 10-nerved, closed in fruit; floral bracts mostly broad-ovate to subreniform, strongly ciliate . . . . . PRUNELLA
Q. Plants without the above combination of characters.
Flowers in loose to more or less dense terminal spikes, solitary in the axils of small lanceolate floral bracts; calyx scarcely nerved to appearing nerveless, slightly enlarged and inflated in fruit . . . . . PHYSOSTEGIA
Flowers clustered, the clusters each subtended by an often conspicuous bract; calyx usually distinctly nerved, not enlarged or inflated in fruit . . . . . STACHYS
P. Flowers clustered in the axils of foliaceous bracts, the inflorescence appearing leafy throughout.
R. Principal leaves palmately 3-5 cleft . . . . . LEONURUS
R. Leaves entire to coarsely crenate or serrate but never deeply cleft.
S. Flower clusters stalked, on peduncles 2 mm or more long; flowers normally distinctly pedicellate . . . . . BALLOTA
S. Flowers and flower clusters sessile.
T. Stems coarsely hirsute with divaricate or antrorse pubescence . . . . . GALEOPSIS
T. Stems glabrescent to densely and finely puberulent with cinereous or canescent hairs.
U. Leaves linear or lanceolate, entire to subentire . . . . . GALEOPSIS
U. Leaves broadly ovate to oblong-ovate, coarsely toothed or incised.
V. Calyx teeth divergent; upper lip of corolla densely woolly . . . . . CHAITURUS
V. Calyx teeth erect or ascending; upper lip of corolla glabrate to pubescent, but not woolly.
Corollas yellow; plant colony-forming by stolons . . . . . LAMIASTRUM
Corollas pink or white; plant annual or perennial by short rhizomes . . . . . LAMIUM

J. Upper lip of the corolla neither galeate nor concave, usually shorter than the lower lip.
W. Leaves numerous, linear to lanceolate, entire or nearly so, sessile; flowers densely compacted into essentially flat-topped, head-like cymules, the cymules terminating branches in corymbiform inflorescences . . . PYCNANTHEMUM
W. Plants without the above combination of characters.
X. Fertile stamens 2.
Y. Calyx scarcely or not at all bilabiate.
Flowers sessile, in dense axillary or terminal head-like clusters; flowers not fringed . . . . . MONARDA
Flowers distinctly pedicellate, in loose, terminal, paniculate racemes; flowers fringed . . . . COLLINSONIA
Y. Calyx strongly bilabiate.
Z. Flowers numerous, sessile, crowded into dense axillary clusters or compact terminal spikes . . . BLEPHILIA
Z. Flowers few to several, mostly pedicellate, in loose to more or less crowded axillary or terminal inflorescences.
Calyx tube gibbous, less than 4 mm long; corollas inconspicuous, scarcely or not at all surpassing the calyces; flower clusters axillary . . . . . HEDEOMA
Calyx tube not gibbous, more than 5 mm long; corollas showy, much exserted beyond the calyces; flower clusters terminal . . . . . SALVIA
X. Fertile stamens 4.
aa. Leaves ovate to deltate-ovate, cordate to subtruncate at the base, coarsely crenate to serrate.
Plant densely soft white-puberulent; petioles not ciliate . . . . . NEPETA
Plant glabrous or sparsely hirsute; petioles ciliate . . . . . MELISSA
aa. Leaves linear to narrowly or broadly elliptic or ovate, entire or with a few low serrations, tapered to broadly cuneate at the base, but never truncate or cordate.
bb. Calyx strongly bilabiate, one lip nearly twice as long as the other; stamens subequal in length, much exserted and recurved . . . . . TRICHOSTEMA
bb. Calyx nearly or quite regular to weakly bilabiate; stamens unequal, in two distinct pairs of different lengths, scarcely or not at all exserted, often more or less curved, but never as above.
cc. Cauline leaves broadly elliptic-ovate, the larger 1 cm or more wide, entire or divided.
Calyx densely spreading villous . . . . . PEROVSKIA
Calyx glabrous or glabrate . . . . . CLINOPODIUM
cc. Cauline leaves linear to narrowly elliptic, lanceolate, or narrowly ovate, less than 1 cm wide, never divided.
dd. Plant glabrous . . . . . CALAMINTHA
dd. Plants pubescent.
Leaves lance-ovate or oblong, mostly less than 3 times as long as wide; calyx tubular and gibbous, with hairs in the throat . . . . . ACINOS

Leaves linear or linear-oblong, much more than 3 times as long as wide; calyx campanulate, without hairs in the throat . . . . . SATUREJA

LAMIASTRUM *galeobdolon*

LAMIUM
1. Middle and distal leaves obtuse, sessile-clasping at the base . . . . . *Lamium amplexicaule*
1. Leaves acute, all or nearly all of them on distinct petioles.
   Leaves dark-green with a pale midrib area; flowers more than 1.5 cm long . . . . . *Lamium maculatum*
   Leaves essentially uniform in color, purplish or green, without a pale central stripe; flowers up to 1.5 cm long . . . . . *Lamium purpureum*

LAPORTEA canadensis

LAPPULA
1. Margins of nutlets clearly with a single row of bristles . . . . . *Lappula occidentalis*
1. Margins of nutlets with a least 2 rows of bristles . . . . . *Lappula squarrosa*

LAPSANA *communis*

LARDIZABALACEAE: One genus in our area . . . . . AKEBIA

LARIX
1. Cones to 2 cm long, the scales no more than 15, glabrous . . . . . **Larix laricina**
1. Cones more than 2 cm long, the scales more than 35, pubescent . . . . . *Larix decidua*

LATHYRUS
1. Leaflets two.
   2. Stems wingless; flowers less than 2 cm long . . . . . *Lathyrus tuberosus*
   2. Stems broadly winged; flowers more than 2 cm long.
      3. Peduncles fewer than 4-flowered; ovary and fruit pubescent; annuals.
         Leaves more than 4 times as long as wide; flowers less than 1.8 cm long . . . . . *Lathyrus hirsutus*
         Leaves less than 4 times as long as wide; flowers more than 1.8 cm long . . . . . *Lathyrus odoratus*
      3. Peduncles 4-several flowered; ovary and fruit glabrous; perennials.
         Flowers less than 1.9 cm long; stipule lobes linear-attenuate, less than or scarcely ½ as wide as the stem . . . . . *Lathyrus sylvestris*
         Flowers more than 1.9 cm long; stipule lobes lanceolate to ovate, abruptly acuminate-caudate, more than ½ as wide as the stem . . . . . *Lathyrus latifolius*
1. Leaflets mostly more than two.
   4. Stipule attached at the middle of the cordate to hastate base; leaflets thick, fleshy . . . . . **Lathyrus japonicus glaber**
   4. Stipule attached obliquely, therefore with a single lobe at the base; leaflets not thick and fleshy.
      5. Flowers white to creamy; stipules broadly ovate, foliaceous, somewhat dentate, at least along the often rounded lobe margin . . . . . **Lathyrus ochroleucus**
      5. Flowers violet-purple, rarely white; stipules lanceolate to lance-ovate, entire, the basal lobe sharply acute.
         6. Leaves mostly with 5 or more pairs of broadly ovate leaflets; flowers 10 or more per raceme; calyx almost always finely puberulent . . . . . **Lathyrus venosus**
         6. Leaves rarely with more than 4 pairs of leaflets, these elliptic to lance-ovate; flowers fewer than 10 per raceme; calyx glabrous.
            Larger portions of stem stout, 1.2 mm or more in diameter, usually conspicuously wing-angled . . . . . **Lathyrus palustris**
            Larger portions of stem slender, less than 1.2 mm in diameter, wingless or scarcely 2-angled . . . **Lathyrus palustris myrtifolius**

LAURACEAE
A. At least some leaves 1-3 lobed; flowers and fruits terminal, the cluster lax, long-pedunculate; fruit blue; plant becoming a tree, with the new twigs yellow-brown . . . . . SASSAFRAS
A. None of the leaves lobed; flowers and fruits terminal and axillary, the clusters tight, sessile or subsessile; fruit red; shrub, with new twigs brownish . . . . . LINDERA

LECHEA
1. Stems and branches with spreading villous pubescence . . . . . **Lechea mucronata**
1. Pubescence appressed or incurved.
   2. Narrow outer sepals equaling or longer than the broad inner sepals.
      Leaves of stems and branches narrowly linear, less than 1.7 mm wide . . . . . **Lechea tenuifolia**
      Leaves of stems and branches ovate to elliptic-lanceolate, the larger more than 1.7 mm wide . . . . . **Lechea minor**
   2. Narrow outer sepals shorter than the broad inner sepals.
      3. Broad inner sepals 1-nerved (sometimes more evident on the adaxial surface); capsules up to 1.2 mm broad . . . . . **Lechea racemulosa**
      3. Inner sepals 3-nerved; capsules usually more than 1.2 mm broad.
         4. Leaves with a sharp brown callus at the tip . . . . . **Lechea pulchella**
         4. Leaves green or scarcely obtusely callused at the tip.
            Plants appearing green, thinly appressed-pilose; larger capsules with 5-6 seeds; mature seeds invested by a white-reticulate membrane, lenticular or bluntly 3-angled . . . . . **Lechea intermedia**

Plants appearing ashy-green, rather thickly appressed-pilose, particularly on the younger tissues; capsules 3-4 seeded; seeds smooth, distinctly 3-angled with a convex outer face . . . . . **Lechea stricta**

LEDUM groenlandicum

LEERSIA
1. Spikelets rotund, nearly as broad as long . . . . . **Leersia lenticularis**
1. Spikelets lance-oblong, notably longer than broad.
   Leaves harshly scabrous; spikelets 4-6 mm long; culms terete . . . . . **Leersia oryzoides**
   Leaves smooth to scaberulous; spikelets up to 4 mm long; culms flattened . . . . . **Leersia virginica**

LEMNA
1. Fronds spatulate or oblong, much longer than wide, often connected to one another by linear stipes, the resulting colony submersed and forming a suspended mass . . . . . **Lemna trisulca**
1. Fronds ovate, elliptic, or orbicular, often adjoined, but rarely by long linear stipes; plants usually floating on or near the surface.
   2. Larger air spaces in the frond 0.3 mm or more in diameter, the red color mostly originating from the margins, the principal lateral nerves mostly 4 or 6 . . . . . **Lemna gibba**
   2. Air spaces less than 0.3 mm in diameter, the red tinges absent or originating from the node; principal lateral nerves 0-2.
      3. Fronds with strong tinctures of red, commonly more strongly developed on the abaxial surface near the node.
         Fronds more or less inflated, with a papule only above the node and near the apex on the dorsal surface . . . . . **Lemna obscura**
         Fronds flat, with papillae on the intervening line between the node and the apex on the dorsal surface . . . . . **Lemna turionifera**
      3. Fronds without reddish tinctures or with diffuse tinctures near the node on both sides.
         4. Fronds elliptic-oblong, nearly parallel-sided on well developed units, usually of 4-8 attached fronds . . . . . **Lemna valdiviana**
         4. Fronds rotund to broadly elliptic, the fronds commonly solitary or in attached aggregations of fewer than 4.
            5. Fronds nerveless or with a single nerve scarcely ½ the length from the node to the apex . . . . . **Lemna minuta**
            5. Fronds 3-5 nerved.
               6. Root sheath not winged, the root tip blunt. . . . . **Lemna minor**
               6. Root sheath deltate-winged, the root tips mostly sharp-pointed.
                  Wing of root sheath mostly less than twice as long as wide; frond usually with a single papule above the node, smaller than the distal one . . . . . *Lemna aequinoctialis*
                  Wing of root sheath typically more than twice as long as wide; frond with 1-3 papules larger than the distal one . . . . . **Lemna perpusilla**

LEMNACEAE
A. Plants with one or more roots; fronds strongly flattened.
   Roots solitary (rarely absent); fronds with up to 5 distinct nerves; ventral surface green, purple, or reddish . . . . . LEMNA
   Roots in fascicles of 3 or more; fronds typically with more than 5 nerves, often purplish ventrally . . . . . SPIRODELA
A. Plants rootless; fronds globular, ellipsoid, or linear-attenuate.
   Fronds globular or ellipsoid, thick, 0.5-1.5 mm long . . . . . WOLFFIA
   Fronds linear-attenuate, 3-12 mm long . . . . . WOLFFIELLA

LENS *culinaris*

LENTIBULARIACEAE: One genus in our area . . . . . UTRICULARIA

LEONTODON *saxatilis*

LEONURUS
1. Calyx glabrate, conspicuously 5-angled, thickly veined, the teeth hard-subulate, 2 of them usually strongly deflexed; corollas with an abundant beard atop the upper lip, with hairs well over 1 mm long . . . . . *Leonurus cardiaca*
1. Calyx thinly to densely canescent, merely 5-10 nerved, the green-subulate teeth not much inclined to deflex; corollas scarcely bearded, puberulent to short-villous, with hairs less than 1 mm long . . . . . *Leonurus sibiricus*

LEPIDIUM
1. Distal leaves sagittate-clasping to perfoliate.
   2. Distal leaves broadly rounded, cordate-clasping to perfoliate, scarcely longer than wide . . . . . *Lepidium perfoliatum*
   2. Distal leaves linear-oblong to lanceolate, sagittate-clasping.
      3. Annual; fruit soon winged distally . . . . . *Lepidium campestre*
      3. Perennial; fruit wingless.
         4. Ovary and fruit puberulent . . . . . *Lepidium appelianum*
         4. Ovary and fruit glabrous.
            Ovary and fruit broadest below the middle, becoming cordate or reniform in age . . . . . *Lepidium draba*
            Ovary and fruit broadest at or beyond the middle, rounded at the base in age . . . . . *Lepidium chalepense*
1. Distal leaves narrowed to the base.
   5. Distal cauline and bracteal leaves dissected or lobed.
      Fruits to 1.7 mm long and wider than long, rugose, the style much shorter than the notch . . . . . *Lepidium didymum*
      Fruits more than 1.7 mm long and longer than wide, smooth, the style subequaling the notch . . . . . *Lepidium sativum*
   5. Distal cauline and bracteal leaves simple, entire to coarsely serrate.

6. Cauline leaves lance-ovate to ovate, simple or with a pair of smaller lobes, the larger more than 1 cm wide; glaucous perennial over 50 cm high. . . . . *Lepidium latifolium*
6. Cauline leaves linear to linear-lanceolate, simple or pinnatifid, less than 1 cm wide; annuals or biennials mostly less than 50 cm high.
7. Petals present, as long as or longer than the sepals . . . . . **Lepidium virginicum**
7. Petals absent or shorter than the sepals.
Leaves and their teeth or lobes rounded at the tip, at least the proximal 1-2 pinnatifid; plant with a distinctly foul odor . . . . . *Lepidium ruderale*
Leaves and their teeth or lobes acute at the tip, the proximal leaves entire to 1-pinnatifid; inodorous . . *Lepidium densiflorum*

LEPTOCHLOA
1. First glume less than 2.2 mm long . . . . . *Leptochloa fascicularis*
1. First glume more than 2.2 mm long . . . . . *Leptochloa acuminata*

LEPTOLOMA cognata

LESPEDEZA
1. Many flower clusters on peduncles longer than the leaflets of subtending leaves.
2. Stems with spreading pubescence.
Stems trailing; flowers with tinctures of violet . . . . . **Lespedeza procumbens**
Stems erect; flowers creamy-white . . . . . **Lespedeza hirta**
2. Stems sericeous, with appressed pubescence.
3. Leaflets narrowly linear, silky-sericeous . . . . . **Lespedeza leptostachya**
3. Leaflets ovate to orbicular; pubescence various.
4. Petals less than 9 mm long; legume less than 6.5 mm long; erect or sprawling perennial less than 1 m high . . **Lespedeza frutescens**
4. Petals more than 9 mm long; legume more than 6.5 mm long; erect shrub or subshrub more than 1 m high.
Calyx lobes shorter than to subequaling the tube . . . . . *Lespedeza bicolor*
Calyx lobes notably longer than the tube . . . . . *Lespedeza thunbergii*
1. All flower clusters sessile or on peduncles shorter than the leaflets of subtending leaves.
5. Stems spreading-pubescent.
6. Leaflets less than 2.5 times as long as wide. . . . . **Lespedeza ×longifolia**
6. Leaflets more than 2.5 times as long as wide.
Calyces more than 7 mm long; flowers creamy-white . . . . . **Lespedeza capitata**
Calyces less than 7 mm long; flowers white to pale-pink . . . . . **Lespedeza ×simulata**
5. Stems minutely puberulent to appressed-pubescent.
7. Calyx lobes more than 4.5 mm long . . . . . *Lespedeza davurica*
7. Calyx lobes less than 4.5 mm long.
8. Leaflets narrowly cuneate-oblong, widest at the tip; leaves crowded, on petioles up to 5 mm long; petaliferous flowers whitish . . . . . *Lespedeza cuneata*
8. Leaflets narrowly oblong to elliptic-ovate, widest at about the middle; leaves not particularly crowded, the petioles more than 5 mm long; petaliferous flowers usually pink to pale-magenta.
Leaflets narrowly oblong, usually with appressed pubescence adaxially, mostly 3 times or more as long as wide . . . . . **Lespedeza virginica**
Leaflets oblong-ovate to elliptic, glabrous, glabrate or finely appressed-pubescent adaxially, less than 3 times as long as wide . . . . . **Lespedeza violacea**

LEUCANTHEMUM
1. Larger phyllaries more than 3 mm wide; involucres more than 2 cm in diameter . . . . . *Leucanthemum ×superbum*
1. Phyllaries to 3 mm wide; involucres to 2 cm in diameter.
Cauline leaves crenate-dentate with ascending teeth . . . . . *Leucanthemum vulgare*
Cauline leaves dentate-lobed with spreading teeth . . . . . *Leucanthemum vulgare pinnatifidum*

LEUCOJUM *aestivum*

LEUCOSPORA multifida

LEYMUS *arenarius*

LIATRIS
1. Heads sessile, each with fewer than 15 florets.
2. Involucres more than 11 mm high, the bracts acuminate and often also mucronate; corolla tube pilose within; pappus evidently plumose, the bristles with lateral pinnae more than 0.5 mm long . . . . . *Liatris punctata nebraskana*
2. Involucres up to 11 mm high, the bracts mostly rounded or obtuse to subacute; corolla tube glabrous within; pappus merely barbellate.
Phyllaries with reflexed or spreading, usually tapering tips; stems hirtellous (rarely glabrate) . . . . . **Liatris pycnostachya**
Phyllaries with appressed, obtuse to acuminate mucronate tips; stems glabrous to glabrate . . . . . **Liatris spicata**
1. Heads sessile to pedunculate, each with more than 15 florets.
3. Stems glabrous or glabrate; phyllaries sharp-pointed and appressed; heads 1 to 20; corolla lobes pubescent within; pappus bristles with lateral pinnae more than 0.5 mm long . . . . . **Liatris cylindracea**

3. Stems pubescent or glabrate; phyllaries spreading or reflexed at the rounded tips; heads usually more than 20; corolla lobes glabrous; pappus merely barbellate.
   4. Middle phyllaries non-bullate, glabrous, hirsutulous or cinereous abaxially; distal phyllaries uniformly narrow with entire, slightly erose or ciliate scarious margins; heads sessile to very often on peduncles as long as or longer than the involucres **Liatris scariosa nieuwlandii**
   4. Middle phyllaries bullate, glabrous abaxially; distal phyllaries with broad, uneven, irregularly lacerate, eciliate scarious margins; heads all sessile or on peduncles shorter than the involucres.
      Leaves hirtellous on both leaf surfaces . . . . . **Liatris aspera**
      Leaves glabrous to glabrate . . . . . **Liatris aspera intermedia**

LIGUSTRUM

1. Branchlets and panicles uniformly puberulent to glabrous . . . . . *Ligustrum vulgare*
1. Branchlets and panicles puberulent with longer hairs intermixed . . . . . *Ligustrum obtusifolium*

LILIACEAE

A. Perianth segments less than 5 cm long; leaves 2, basal . . . . . ERYTHRONIUM
A. Perianth segments 5 cm or more long; leaves more than 2, at least 2 or more caulescent.
   Leaves more than 8; perianth orange, with numerous dark spots . . . . . LILIUM
   Leaves fewer than 8; perianth yellow, white or red, without dark spots . . . . . TULIPA

LILIUM

1. Principal stem leaves whorled. . . . . **Lilium michiganense**
1. All but sometimes the bracteal leaves alternate.
   2. Flowers solitary; leaves less than 12 mm wide . . . . . **Lilium philadelphicum andinum**
   2. Flowers mostly 2 or more; larger leaves more than 12 mm wide.
      3. Stems at least thinly appressed-floccose . . . . . *Lilium lancifolium*
      3. Stems glabrous or thinly floccose at the base of the leaves.
         Tepals erect or slightly splayed, surpassing the stamens, not papillose adaxially; floral bracts lanceolate . . . . *Lilium pensylvanicum*
         Tepals recurved, the stamens well exserted, papillose adaxially; floral bracts ovate . . . . . *Lilium henryi*

LIMNANTHACEAE: One genus in our area. . . . . FLOERKEA

LINACEAE: One genus in our area . . . . . LINUM

LINARIA

1. Leaves less than 5 mm wide, linear to narrowly oblanceolate, sessile to more or less petiolate. . . . . *Linaria vulgaris*
1. Leaves more than 5 mm wide, lance-ovate to deltate, at least the distalmost clasping.
   Distal cauline leaves ovate to lance-ovate, mostly twice as long as wide or longer; capsules shorter than the sepals . . . . . *Linaria dalmatica*
   Distal cauline leaves deltate, about as long as wide; capsules subequaling or exceeding the sepals . . . . . *Linaria macedonica*

LINDERA benzoin

LINDERNIA

1. All except the proximal pedicels much longer than the subtending leaves . . . . . **Lindernia anagallidea**
1. Pedicels shorter than or a few scarcely longer than the subtending leaves . . . . . **Lindernia dubia**

LINNAEA borealis longiflora

LINNAEACEAE: One genus in our area . . . . . LINNAEA

LINUM

1. Petals blue, purple or reddish; pedicels soon more than 1 cm long.
   2. Margins of inner sepals entire, the tips obtuse, usually short-mucronate, the midvein similar to the 2 lateral nerves, confined to below the middle; perennial . . . . . *Linum perenne*
   2. Margins of the inner sepals ciliolate or ciliate, the tips long-acuminate to short-caudate, the midvein generally stouter and longer than the lateral nerves; annual or perennial.
      3. Sepals all ciliate-margined, the longer cilia of the sepals more than 0.3 mm long . . . . . *Linum grandiflorum*
      3. Outer sepals entire, the inner sepals with a ciliolate margin much less than 0.3 mm long.
         Sepals less than 5.8 mm long; capsules to 6 mm long . . . . . *Linum bienne*
         Sepals more than 5.8 mm long; capsules more than 6 mm long . . . . . *Linum usitatissimum*
1. Petals yellow; pedicels up to 1 cm long.
   4. Both the inner and outer sepals glandular-ciliolulate, 4 mm or more long; leaves commonly with a pair of dark subglobose glands at the base.
      Sepals soon deciduous; capsules with dark cartilaginous thickenings at the base; valves of capsule obtuse to broadly acute . . . . . *Linum rigidum compactum*
      Sepals persistent; capsules without basal thickenings; valves of capsule narrowly acute . . . . . **Linum sulcatum**
   4. At least the outer sepals entire, to 4 mm long; leaves eglandular.
      5. Capsules conic above the middle, 2-3 mm high . . . . . **Linum intercursum**
      5. Capsules depressed, up to 2 mm high.

6. All leaves alternate (the proximal rarely opposite); inner sepals strongly glandular-ciliolulate . . . . . **Linum medium texanum**
6. Leaves alternate or opposite; inner sepals entire to weakly glandular beyond the middle.
Inflorescence corymbiform; leaf bases obscurely decurrent to the next leaf base . . . . . **Linum virginianum**
Inflorescence paniculate; leaf bases strongly decurrent into a striate-winged angle to the leaf base below . . . . . **Linum striatum**

LIPARIS
1. Lip purple or purplish, more than 6 mm long; capsules shorter than to about equaling the pedicels . . . . . **Liparis liliifolia**
1. Lip yellowish-green, less than 6 mm long; capsules definitely longer than the pedicels . . . . . **Liparis loeselii**

LIPOCARPHA
1. Inner scales absent or less than 0.3 mm long . . . . . **Lipocarpha micrantha**
1. Inner scales more than 0.3 mm long . . . . . **Lipocarpha drummondii**

LIQUIDAMBAR *styraciflua*

LIRIODENDRON tulipifera

LIRIOPE *muscari*

LITHOSPERMUM
1. Leaves with lateral veins evident.
Leaves lance-ovate to ovate, the larger more than 2 cm wide . . . . . **Lithospermum latifolium**
Leaves lanceolate to lance-elliptic, up to 2 cm wide . . . . . *Lithospermum officinale*
1. Leaves with only a midvein evident.
2. Plants in flower.
3. Corolla lobes erose-denticulate or fimbriate; early flowers chasmogamous, evidently sterile, the tubes more than 14 mm long, the flowers later in the season fertile and cleistogamous, much exceeded by the calyx lobes, the tubes about 3 mm long . . . . . **Lithospermum incisum**
3. Corolla lobes entire; flowers all chasmogamous and fertile, the tubes 6-14 mm long and exceeding the calyx lobes.
Foliage hispid with coarse, usually papillose-based hairs; interior surface of corolla tubes puberulent at the base . . . . . **Lithospermum croceum**
Foliage canescent with fine, downy, appressed hairs; interior surface of corolla tubes glabrous throughout . . . . . **Lithospermum canescens**
2. Plants in fruit.
4. Leaves linear, up to 5(8) mm wide; fruiting pedicels mostly arching or recurved; nutlets with a basal collar, pitted . . . . . **Lithospermum incisum**
4. Leaves narrowly lanceolate to oblong or elliptic-oblong or ovate, the larger more than 5 mm wide; fruiting pedicels all erect; nutlets without a basal collar, not pitted.
Foliage hispid with coarse, usually papillose-based hairs; nutlets mostly more than 3 mm long; calyx lobes more than 8 mm long . . . . . **Lithospermum croceum**
Foliage canescent with fine, downy, appressed hairs; nutlets up to 3 mm long; calyx lobes less than 8 mm long . . . . . **Lithospermum canescens**

LOASACEAE: One genus in our area . . . . . MENTZELIA

LOBELIA
1. Stem leaves linear to narrowly oblanceolate, less than 3 mm wide . . . . . **Lobelia kalmii**
1. Stem leaves lanceolate to elliptic or ovate, more than 3 mm wide.
2. Flowers less than 15 mm long; sepals up to 5 mm long.
3. Hypanthium ovoid, soon becoming strongly inflated; stems pubescent throughout or sometimes glabrate in the usually branched inflorescence . . . . . **Lobelia inflata**
3. Hypanthium campanulate or obconic, not inflated; stems glabrous, pubescent in lines or puberulent near the base, the inflorescence unbranched.
Auricles at the base of the sepals indistinct to stubby, less than 0.5 mm long . . . . . **Lobelia spicata**
Auricles at the base of the sepals filiform, more than 0.5 mm long . . . . . **Lobelia spicata leptostachys**
2. Flowers more than 15 mm long; sepals more than 5 mm long.
4. Corollas rose to purple . . . . . **Lobelia ×speciosa**
4. Corollas either red or blue.
Corollas bright-red (rarely white), 3 cm or more long; calyx not auriculate at the base . . . . . **Lobelia cardinalis**
Corollas blue (rarely white), less than 3 cm long; calyx with conspicuous auricles at the base . . . . . **Lobelia siphilitica**

LOBELIACEAE: One genus in our area . . . . . LOBELIA

LOBULARIA *maritima*

LOLIUM
1. Glumes prevailingly more than 0.8 times as long as the axis of florets . . . . . *Lolium temulentum*
1. Glumes all less than 0.8 times as long as the axis of florets.
Spikelets prevailingly 10-20 flowered; lemmas mostly long-awned; larger leaves 5 mm or more wide . . . . . *Lolium multiflorum*
Spikelets up to 10-flowered; lemmas awnless or with short awns; leaves less than 5 mm wide . . . . . *Lolium perenne*

LONICERA

1. Flowers and fruits in whorls of 3-several, the whorls subtended by connate-perfoliate leaves at the ends of branches; sprawling woody vines or vine-like shrubs.
   2. Distalmost connate pair of leaves as wide as to wider than long, broadly rounded at the tip.
      Corollas with 5, nearly equal, ascending or spreading lobes . . . . . *Lonicera sempervirens*
      Corollas distinctly 2-lipped, the lobes divergent . . . . . **Lonicera reticulata**
   2. Distalmost connate pair of leaves deltate-ovate, mostly longer than wide, acute at the tip.
      3. Leaves green on both sides, at least sparsely strigose adaxially . . . . . **Lonicera hirsuta**
      3. Leaves bicolored, glaucous abaxially, glabrous adaxially.
         4. Corollas more than 3 cm long . . . . . *Lonicera ×heckrottii*
         4. Corollas less than 3 cm long.
            Leaves glabrous abaxially . . . . . **Lonicera dioica**
            Leaves sparsely pubescent abaxially . . . . . **Lonicera dioica glaucescens**
1. Flowers and fruits paired in the axils of free, usually petiolate, leaves; habits various.
   5. Plant a climbing or sprawling woody vine . . . . . *Lonicera japonica*
   5. Plants erect shrubs.
      6. Leaves strongly long-acuminate at the tip; flower clusters sessile or subsessile in the leaf axils; peduncles minute or up to 5 mm long, shorter than the petioles of their subtending leaves . . . . . *Lonicera maackii*
      6. Leaves obtuse, acute or somewhat narrowly tapering (rarely long-acuminate); flower clusters on peduncles longer than the petioles of their subtending leaves.
         7. Branchlets solid, with white pith.
            8. Pedicels shorter than the petioles . . . . . *Lonicera subsessilis*
            8. Pedicels subequaling or exceeding the petioles.
               Corollas nearly regular; branchlets glabrous . . . . . **Lonicera canadensis**
               Corollas strongly bilabiate; branchlets puberulent . . . . . **Lonicera oblongifolia**
         7. Branchlets hollow. [The species that follow belong to the ubiquitous Eurasian Fly Honeysuckles and their various hybrids. The key is only a guide. The preponderance of back-crosses and probably unknown combinations make certain identification of many specimens more of an art than a science. A good knowledge of which features delimit each of the four species offers the best chance of assigning the putative parents of each hybrid.]
            9. Leaves prevailingly widest beyond the middle and up to twice as long as wide.
               Bractlets and calyx lobes hirsute on the surface as well as on the margins . . . . . *Lonicera xylosteum*
               Bractlets and calyx lobes merely ciliate along the margins . . . . . *Lonicera ×xylosteoides*
            9. Leaves mostly widest at or below the middle or if widest beyond the middle, then more than twice as long as wide.
               10. Plants glabrous throughout or with an occasional gland on the calyx lobes and bractlets; corollas not turning yellow with age.
                  Leaves widest below the middle . . . . . *Lonicera tatarica*
                  Leaves prevailingly widest beyond the middle . . . . . *Lonicera ×notha*
               10. Plants sparsely to densely pubescent; corollas turning yellow with age.
                  11. Bractlets notably exceeding half the length of the ovary.
                     12. Calyx lobes, bractlets, and bracts without stipitate glands (do not confuse pollen grains with glands) . . . . . *Lonicera morrowii*
                     12. Calyx lobes, bractlets, and bracts stipitate-glandular.
                        Flowers 14 mm or more long; bracts densely hirsute and glandular, the bractlets copiously ciliate and glandular on the margins only . . . . . *Lonicera ×muscaviensis*
                        Flowers less than 14 mm long; bracts and margins of bractlets only sparsely hairy and glandular (some glands of bractlets typically on the surface also) . . . . . *Lonicera ×minutiflora*
                  11. Bractlets up to half the length of the ovary.
                     13. Corolla more than 13 mm long.
                        Most of the leaves notably wider beyond the middle . . . . . *Lonicera ×notha*
                        Leaves, except sometimes those at the ends of the branchlets, widest at or below the middle . *Lonicera ×bella*
                     13. Corolla up to 13 mm long.
                        Corolla tube less than 4 mm long, glabrous . . . . . *Lonicera ruprechtiana*
                        Corolla tube 4-5 mm long, glabrate to pubescent . . . . . *Lonicera ×muendeniensis*

LOPHOTOCARPUS *calycinus*

LOTUS *corniculatus*

LUDWIGIA

1. Leaves opposite; stems prostrate . . . . . **Ludwigia palustris americana**
1. Leaves alternate; stems erect or ascending.
   2. Flowers and fruits pedicellate on stalks 3 mm or more long; petals yellow, about equaling the calyx lobes . . . . . **Ludwigia alternifolia**
   2. Flowers and fruits sessile; petals minute or absent.
      Stems and leaves glabrous or glabrate; capsules glabrous, the longer ones more than 4 mm long . . . . . **Ludwigia polycarpa**
      Stems and leaves pubescent; capsules strigillose with short incurved hairs, less than 4 mm long . . . . . **Ludwigia sphaerocarpa deamii**

LUNARIA *annua*

LUPINUS

1. Leaflets fewer than 12 . . . . . **Lupinus perennis occidentalis**
1. Leaflets 12 or more . . . . . *Lupinus polyphyllus*

LUZULA
1. Flowers white or whitish; inflorescence 30 cm or more high . . . . . *Luzula luzuloides*
1. Flowers stramineous to chestnut-brown to green, but never white; inflorescence less than 30 cm high.
   2. Flowers solitary at the ends of slender branches . . . . . **Luzula acuminata**
   2. Flowers in compact glomerules, the latter sessile or some elevated on elongate inflorescence branches.
      Plants with sordid-white bulblets at the base . . . . . **Luzula bulbosa**
      Plants without bulblets . . . . . **Luzula multiflora**

LYCIUM
1. Leaves narrowly to broadly lanceolate, acute; calyx mostly more than 3.5 mm long . . . . . *Lycium barbarum*
1. Leaves broadly lanceolate to ovate-oblong, obtuse; calyx to 3.5 mm long . . . . . *Lycium chinense*

LYCOPERSICON *esculentum*

LYCOPODIACEAE
A. Leaves of aerial stems divaricately spreading, with most of them deflexed, shiny; sporangia in the leaf axils . . . . . HUPERZIA
A. Leaves divaricate, spreading-ascending or appressed, but never mostly deflexed, usually not shiny; sporangia in terminal strobili.
   B. Strobili erect on leafy peduncles . . . . . LYCOPODIELLA
   B. Strobili sessile or on peduncles with remote or scale-like, much reduced leaves.
      C. Ultimate branchlets flat or quadrangular, to 5 mm wide . . . . . DIPHASIASTRUM
      C. Ultimate branchlets terete or compressed, 5-12 mm wide.
         Leaves of aerial stems caudate, ending in scarious bristly tips mostly 2 mm long or longer . . . . . LYCOPODIUM
         Leaves of aerial stems acute to long-acuminate, but never with long bristly tips . . . . . DENDROLYCOPODIUM

LYCOPODIELLA
1. Internodes of horizontal stems less than 1 mm in diameter . . . . . **Lycopodiella inundata**
1. Internodes of horizontal stems more than 1 mm in diameter.
   Leaves of erect shoots to 6 mm long, ascending . . . . . **Lycopodiella subappressa**
   Larger leaves of erect shoots more than 6 mm long, widely spreading to divaricate . . . . . **Lycopodiella margueritae**

LYCOPODIUM
1. Strobili 2 or more per peduncle; leaves of erect branches spreading . . . . . **Lycopodium clavatum**
1. Strobilus 1 per peduncle; leaves of erect branches ascending . . . . . **Lycopodium lagopus**

LYCOPUS
1. Calyx lobes deltate, blunt, without a prominent midvein, shorter than to subequaling the nutlets.
   Nutlets uniformly warty-toothed across the top, the inner margins as high as the outer, so that the four nutlets together form a flat plane; stamens and style included, scarcely evident without dissection; larger leaves 3 cm or more wide . . . . . **Lycopus virginicus**
   Nutlets with the toothed outer rims more elevated than the inner, the four together forming a shallow pocket, this often filled across the bottom with clusters of oil droplets; stamens and style evident and often more or less exserted; leaves rarely more than 3 cm wide . . . . . **Lycopus uniflorus**
1. Calyx lobes attenuate-cuspidate to long-subulate, with a prominent midvein, conspicuously surpassing the nutlets.
   2. Principal leaves sessile.
      Stems stout, hispid, often simple; principal leaves scabrous, more than 3 times as long as wide, with mostly more than 6 pairs of teeth . . . . . *Lycopus asper*
      Stems slender, glabrous or merely puberulent, often branched; principal leaves smooth or smoothish, to 3 times as long as wide, with up to 6 pairs of teeth . . . . . **Lycopus amplectens**
   2. Leaves distinctly petiolate or narrowly cuneate with petiolate or subpetiolate bases.
      3. Leaves all merely serrate, very often closely puberulent on the abaxial surfaces; summit of nutlet undulate; plant producing long slender stolons from the proximal internodes . . . . . **Lycopus rubellus**
      3. Lower and median leaves pinnately incised, at least at the base, glabrous abaxially or with appressed hairs along the midrib; summit of nutlet entire; plant rhizomatous, without surficial runners.
         Calyx lobes less than 2 mm long; leaves commonly more than 3.1 times as long as wide . . . . . **Lycopus americanus**
         Longer calyx lobes more than 2 mm long; leaves no more than 3.1 times as long as wide . . . . . *Lycopus europaeus*

LYSIMACHIA
1. Plant prostrate, trailing, often mat-forming; leaves opposite, broadly quadrate-ovate to suborbicular, normally about as wide as long . . . . . *Lysimachia nummularia*
1. Plant erect or ascending; leaves alternate, opposite, or whorled, always longer than wide.
   2. Flowers in terminal racemes or panicles, with all or most or the bracts much shorter than the foliage leaves.
      3. Plants pubescent.
         Petals white; at least the distal leaves alternate; sepals green except for the pale margin . . . . . *Lysimachia clethroides*
         Petals yellow; all or nearly all of the leaves opposite or whorled; sepals green, bordered with a distinct red line just inside the pale margin . . . . . *Lysimachia vulgaris*
      3. Plants glabrous.
         4. Lowest bracts of the inflorescence essentially foliage leaves . . . . . **Lysimachia ×producta**
         4. Bracts all much reduced, smaller than the foliage leaves.

Styles less than 4.5 mm long; staminal ring well developed, with numerous yellow atomiferous glands; lateral or axillary racemes absent . . . . . **Lysimachia terrestris**
Styles more than 4.5 mm long; staminal ring absent or short and glabrous; lateral or axillary racemes common . . . . . **Lysimachia ×commixta**

2. Flowers solitary or in clusters or spikes in the axils of foliage leaves.
   5. Larger petioles more than 1.5 cm long, strongly ciliate their entire length; leaf blades rounded at the base . . . . . **Lysimachia ciliata**
   5. Petioles absent or if approaching 1.5 cm long, then not ciliate; leaves mostly tapering to the base.
      6. Pedicels very short to about equaling the calyx lobes; flowers numerous in close racemes at the ends of axillary peduncles, 6-merous, the corolla lobes linear . . . . . **Lysimachia thyrsiflora**
      6. Pedicels slender, soon becoming longer than the calyx lobes; flowers one to several in the leaf axils, 5-merous, the corolla lobes not linear.
         7. Leaves linear to narrowly lanceolate, less than 7 mm wide . . . . . **Lysimachia quadriflora**
         7. Leaves lanceolate to ovate, the larger more than 7 mm wide.
            8. Plants densely viscid-villous . . . . . *Lysimachia punctata*
            8. Plants glabrous or glabrate.
               9. Principal leaves in whorls of 3 or more; corolla lobes entire; sepals up to 4 mm long . . . . . **Lysimachia quadrifolia**
               9. Leaves opposite or whorled; corolla lobes erose-denticulate and more or less cuspidate at the tips; sepals more than 4 mm long.
                  Calyx lobes narrowly deltate, widest at or below the middle, at least some of them with 3-5 distinct nerves, the larger more than 2.2 mm wide; stems usually stout, commonly more than 4 mm in diameter; stoloniferous rhizomes absent . . . . . **Lysimachia hybrida**
                  Calyx lobes lanceolate, parallel-sided to the middle, 1-nerved or with 2 obscure lateral nerves; stems slender, less than 4 mm in diameter; prolonged horizontal stolons or rhizomes present . . . . . **Lysimachia lanceolata**

LYTHRACEAE

A. Plants coarse and arching, suffruticose; at least many of the leaves whorled and distinctly petiolate; petals 1 cm or more long . . . . . DECODON
A. Plants annual or perennial herbs; leaves opposite or if whorled, then sessile; otherwise not as above.
   B. Petals and sepals normally 6; calyx tube longer than broad.
      Leaves distinctly petiolate; flowers irregular . . . . . CUPHEA
      Leaves sessile; flowers regular . . . . . LYTHRUM
   B. Petals and sepals 4 or 5 when present; calyx tube fully as broad as long.
      C. Middle and proximal leaves with mostly 2-5 flowers per axil, the flowers very often strongly purplish-tinged . . . . . AMMANNIA
      C. Leaves with flowers primarily solitary in the axils, the flowers not purplish.
         Leaves narrowly elliptic to oblanceolate, widest at or near the middle, at least some of them usually 3 mm or more wide; calyx tube with conspicuous deltate appendages between the calyx lobes . . . . . ROTALA
         Leaves less than 3 mm wide, widest at the base or, in stranded forms, gradually tapered; calyx tube without appendages between the calyx lobes . . . . . DIDIPLIS

LYTHRUM

1. Leaves primarily opposite or whorled, the larger more than 5 cm long; flowers primarily 2-several in the leaf axils; stamens usually more than 10 . . . . . *Lythrum salicaria*
1. Leaves primarily alternate or the middle and proximal opposite or subopposite, less than 5 cm long; flowers all or nearly all solitary in the leaf axils; stamens usually fewer than 10.
   Annual; principal stem leaves linear-oblong, tapered-cuneate at the base . . . . . *Lythrum hyssopifolia*
   Perennial; principal stem leaves lanceolate, widest at or near the rounded or subcordate base . . . . . **Lythrum alatum**

MACLEAYA *cordata*

MACLURA *pomifera*

MADIA *glomerata*

MAGNOLIA

1. Petals less than 2 cm wide; leaves less than 4 cm wide . . . . . *Magnolia stellata*
1. Larger petals more than 2 cm wide; leaves more than 4 cm wide.
   Flowers white, the three sepals indistinguishable from the petals; leaves obtuse to broadly acute . . . . . *Magnolia ×loebneri*
   Flowers with tinctures of purple, the three sepals notably shorter than the petals; leaves abruptly acuminate . . . . *Magnolia ×soulangeana*

MAGNOLIACEAE

A. Leaves lobed, truncate at the base, shallowly and broadly emarginate at the tip . . . . . LIRIODENDRON
A. Leaves unlobed, rounded or tapering at both ends . . . . . MAGNOLIA

MAHONIA *aquifolium*

MAIANTHEMUM

1. Leaves with ciliolate margins, the abaxial surfaces very often pubescent . . . . . **Maianthemum canadense interius**
1. Leaves eciliolate except for the cordate bases, and otherwise glabrous throughout . . . . . **Maianthemum canadense**

MALAXIS

1. Pedicels less than 3.5 mm long; lip drooping, slender, entire . . . . . **Malaxis monophyllos**
1. Lower pedicels longer than 3.5 mm long; lip ascending, 2-lobed with a short median tooth . . . . . **Malaxis unifolia**

MALCOLMIA *africana*

MALUS

1. Most leaf blades doubly serrate or dentate, or lobed, at least distally, or those of the vigorous shoots lobed (look carefully at the leaves of the terminal shoots).
    2. Leaves of vigorous shoots lobed or appearing pinched asymmetrically, incipiently lobed; flowers less than 2.5 cm across; fruits less than 1 cm in diameter . . . . . *Malus toringo*
    2. Leaves all serrate or serrate-dentate; flowers more than 2.5 cm across; fruits more than 1 cm in diameter.
        Calyx lobes, hypanthia, pedicels, and petioles densely and persistently tomentose; leaves thick and coriaceous, the veins regularly impressed adaxially and expressed abaxially . . . . . **Malus ioensis**
        Calyx lobes, hypanthia, pedicels, and petioles glabrous to densely tomentose, but the tomentum thinning or disappearing, often in patches, by the end of anthesis; leaves rather thin, the veins more or less flush with the surface . . . . . **Malus coronaria**
1. Leaf margins evenly serrate or crenate-serrate, never coarsely dentate or lobed.
    3. Many of the leaves with strong tinctures of purple . . . . . *Malus ×purpurea*
    3. Leaves green to bronze, but without tinctures of purple.
        4. Plant in flower.
            5. Pedicels to 2.5 cm long, mostly 1 mm or more in diameter; hypanthium densely and permanently tomentose . . . . . *Malus pumila*
            5. Some pedicels longer than 2.5 cm in fully opened flowers, less than 1 mm in diameter; hypanthium glabrous to tomentose.
                6. Hypanthium glabrous or thinly floccose.
                    Flowers pure white . . . . . *Malus baccata*
                    Flowers with tinctures of pink . . . . . *Malus floribunda*
                6. Hypanthium densely tomentose.
                    7. Flowers pink only in bud, soon pure white . . . . . *Malus prunifolia*
                    7. Flowers pink or some fading to white.
                        Flowers more than 3.2 cm across . . . . . *Malus ×micromalus*
                        Flowers less than 3.2 cm across . . . . . *Malus ×astracanica*
        4. Plant in fruit.
            8. Calyx deciduous; pedicels glabrous.
                Fruits to 1 cm in diameter . . . . . *Malus floribunda*
                Larger fruits more than 1 cm in diameter . . . . . *Malus baccata*
            8. Calyx persistent; pedicels usually at least thinly tomentose.
                9. Calyx perched at the summit of the fruit; fruit rarely more than 2 cm in diameter . . . . . *Malus prunifolia*
                9. Calyx in a cavity at the summit of the fruit; fruit more or less than 2 cm in diameter.
                    10. Fruit less than 2 cm in diameter . . . . . *Malus ×micromalus*
                    10. Fruit more than 2 cm in diameter.
                        Longer pedicels more than 3 cm long . . . . . *Malus ×astracanica*
                        Pedicels to 3 cm long . . . . . *Malus pumila*

MALVA

1. Leaves deeply divided into 3-7 pinnatifid segments.
    Pedicels and calyces closely and densely stellate-pubescent, usually with a few long simple hairs intermixed . . . . . *Malva alcea*
    Pedicels and calyces with long pustular-based hairs only or with only very scattered stellate hairs intermixed . . . . . *Malva moschata*
1. Leaves not or only shallowly lobed, not pinnatifid.
    2. Petals more than 1.5 cm long, deep-purple or pink; bractlets lance-ovate to oblong; stems erect, glabrous or glabrate . . . . . *Malva sylvestris mauritiana*
    2. Petals less than 1.5 cm long, white or tinged with purple; bractlets linear to linear-lanceolate; stems prostrate or procumbent to ascending or erect, glabrous to pubescent.
        3. Stems erect, smooth or with a few spreading trichomes distally; pedicels about as long as the calyx . . . . . *Malva verticillata crispa*
        3. Stems prostrate to procumbent or ascending, glabrate to pubescent; pedicels much exceeding the calyx.
            4. Longer pedicels less than 1 cm long, even in fruit . . . . . *Malva parviflora*
            4. Longer pedicels more than 1 cm long.
                Stems glabrate, ascending; mericarps strongly rugose, sparsely pubescent; petals scarcely exceeding the calyx lobes *Malva pusilla*
                Stems pubescent, prostrate to procumbent; mericarps smooth, densely velutinous with short hairs; petals about twice as long as the calyx lobes . . . . . *Malva neglecta*

MALVACEAE

A. Calyx without a series of involucral bracts.
    B. Leaves deeply palmately divided, the 5-11 divisions coarsely serrate or dentate; inflorescence terminal.
        Petals white, less than 8 mm long; calyx lobes less than 4 mm long . . . . . NAPAEA
        Petals pink or white, more than 8 mm long; calyx lobes more than 4 mm long . . . . . CALLIRHOË
    B. Leaves undivided or only shallowly 3-lobed; flowers axillary.
        C. Leaves ovate to 3-lobed, cuneate, the terminal lobes larger than the laterals, long-acute to acuminate . . . . . ANODA
        C. Leaves oblong to ovate, rounded to cordate at the base, essentially unlobed, obtuse, acute, or abruptly acuminate.
            Leaves serrulate, broadly cordate-ovate, abruptly acuminate, the larger well over 5 cm long . . . . . ABUTILON
            Leaves serrate, narrowly deltate-ovate to lanceolate, elliptic or oblong, less than 5 cm long . . . . . SIDA
A. Calyx subtended by an involucre of 2-several bracts.
    D. Involucral bracts 6 or more.
        E. Styles and carpels numerous; involucral bracts narrowly to broadly triangular, fewer than 10 . . . . . ALTHAEA
        E. Styles and carpels 5; involucral bracts filiform-linear, more than 10.
            Leaves deeply palmately 5-lobed and more than 6 cm wide . . . . . ABELMOSCHUS

Leaves 0-3 lobed or pinnatifid and less than 6 cm wide . . . . . HIBISCUS
D. Involucral bracts fewer than 6.
F. Leaves unlobed, lanceolate to elliptic, entire or remotely and obscurely serrulate . . . . . MALVASTRUM
F. Leaves lobed or if unlobed, then ovate or rotund.
G. Involucral bracts deeply incised . . . . . GOSSYPIUM
G. Involucral bracts entire.
H. Stigmas terminal and capitate; confined to Altorf Island in the Kankakee River . . . . . ILIAMNA
H. Stigmas linear along the inner faces of the style branches; plants more broadly distributed.
Petals truncate, erose-denticulate at the tip . . . . . CALLIRHOË
Petals obcordate or emarginate, never erose-denticulate . . . . . MALVA

MALVASTRUM hispidum

MARRUBIUM *vulgare*

MARSILEA *quadrifolia*

MARSILEACEAE: One geunus in our area . . . . . MARSILEA

MARTYNIACEAE: One genus in our area . . . . . PROBOSCIDEA

MATRICARIA
1. Ligules absent; disc florets often 4-lobed; plant pineapple-scented when crushed . . . . . *Matricaria discoidea*
1. Ligules present; disc florets 5-lobed; plant aromatic, but not pineapple-scented . . . . . *Matricaria chamomilla*

MATTEUCCIA struthiopteris

MATTHIOLA *incana*

MAZUS
1. Plant short-pubescent, erect or nearly so, annual; corollas less than 12 mm long . . . . . *Mazus pumilus*
1. Plant glabrous, perennial by horizontal stolons; corollas more than 12 mm long . . . . . *Mazus miquelii*

MEDEOLA virginiana

MEDICAGO
1. Plants prostrate to decumbent; flowers less than 5 mm long, yellow; fruits reniform, not tightly coiled.
Fruits spirally arranged; spiny . . . . . *Medicago minima*
Fruits not spirally arranged, without spines . . . . . *Medicago lupulina*
1. Plants erect or ascending; flowers more than 5 mm long, blue-purple, yellowish, or white; fruits coiled or forming an open C-shape.
2. Corollas blue-purple above the middle, fading to pale or scarious toward the base or white throughout in albino forms; fruits coiled 1.5-5 times . . . . . *Medicago sativa*
2. Corollas yellow or yellow with purplish tips or discontinuous purplish blotches beyond the middle; fruits coiled less than 2 times.
Corollas yellow; fruits sickle-shaped, coiled only ½ turn . . . . . *Medicago falcata*
Corollas yellow with purplish blemishes; fruits coiled a full turn or more . . . . . *Medicago ×varia*

MEGALODONTA beckii

MELAMPYRUM lineare

MELANTHIACEAE
A. Flowers and fruits sessile or on pedicels to 5 mm long . . . . . STENANTHIUM
A. Longer pedicels more than 5 mm long.
Stems puberulent . . . . . MELANTHIUM
Stems glabrous. . . . . ANTICLEA

MELANTHIUM virginicum

MELASTOMATACEAE: One genus in our area . . . . . RHEXIA

MELICA nitens

MELILOTUS
1. Ovary and fruit short-pubescent; fruit nearly or quite smooth, more than 3.6 mm long . . . . . *Melilotus altissimus*
1. Ovary and fruit glabrous; fruit strongly reticulate to rugose, less than 3.6 mm long.
Corollas white, to 5 mm long. . . . . *Melilotus albus*

Corollas yellow, the larger 5-6 mm long ..... *Melilotus officinalis*

MELISSA *officinalis*

MENISPERMACEAE: One genus in our area ..... MENISPERMUM

MENISPERMUM canadense

MENTHA

1. Leaf margins curled and lacerate-serrate.
   Plant glabrous or glabrate ..... *Mentha crispata*
   Plant pubescent ..... *Mentha crispa*
1. Leaf margins low-dentate to serrate but not lacerate or crisped.
   2. Leaves sessile or essentially so.
      3. Leaves prevailingly more than twice as long as wide.
         Plant glabrous or glabrate ..... *Mentha spicata*
         Plant notably pubescent, at least on the abaxial leaf surfaces ..... *Mentha longifolia*
      3. Leaves nearly all less than twice as long as wide.
         4. Calyx and bracts pubescent, the verticils appearing green; calyx teeth narrowly deltate, less than 1 mm long ..... *Mentha ×villosa*
         4. Calyx and bracts canescent, the verticils appearing grayish or whitish; calyx teeth subulate, 1 mm or more long.
            Principal leaves cordate at the base ..... *Mentha suaveolens*
            Leaves broadly rounded at the base ..... *Mentha ×rotundifolia*
   2. Leaves distinctly petiolate.
      5. Verticils 1-3, closely aggregated in a subglobose terminal cluster or with 1 or 2 proximal verticils remote and leafy-bracted.
         6. Calyx glabrous; leaves glabrous or glabrate, subtruncate to cordate; plant sterile ..... *Mentha aquatica citrata*
         6. Calyx pubescent; leaves pubescent, broadly rounded to subtruncate; plant fertile.
            Pedicels and calyx pubescent throughout ..... *Mentha aquatica*
            Pedicels glabrous, the calyx pubescent only on the lobes ..... *Mentha ×piperita*
      5. Distinct verticils 4-numerous in leafy-bracted or spiciform inflorescences.
         7. Calyx tube glabrous or nearly so.
            Distal verticils indistinctly separated, not or scarcely exceeded by the bracts ..... *Mentha ×piperita*
            Distal verticils distinctly separated or approximate, prevailingly exceeded by the bracts ..... *Mentha ×gracilis*
         7. Calyx tube pubescent.
            8. Leaves ovate to suborbicular, the distal ones abruptly reduced, rounded at the base; calyx to 2.5 mm long, the lobes usually deltate, rarely more than 0.8 mm long ..... *Mentha arvensis parietariaefolia*
            8. Leaves lanceolate to lance-ovate or rhombic, not abruptly reduced distally, cuneate; larger calyces more than 2.5 mm long, the lobes narrowly triangular, the longer usually more than 0.8 mm long.
               Distal verticils often with notably reduced, scarcely foliaceous bracts; stamens not exserted; plant sterile ..... *Mentha ×verticillata*
               Distal verticils with the bracts distinctly foliaceous; stamens exserted; plant fertile ..... **Mentha canadensis**

MENTZELIA

1. Petals more than 4 cm long; filaments all filiform, less than 0.5 mm wide ..... *Mentzelia decapetala*
1. Petals up to 4 cm long; filaments dilated, more than 0.5 mm wide ..... *Mentzelia nuda*

MENYANTHACEAE

A. Leaves trifoliolate ..... MENYANTHES
A. Leaves simple, orbicular, cordate ..... NYMPHOIDES

MENYANTHES trifoliata

MERTENSIA virginica

MICRANTHES pensylvanica

MICROSTEGIUM *vimineum*

MIKANIA scandens

MILIUM effusum

MIMOSA *quadrivalvis nuttallii*

MIMOSACEAE

A. Rachis and peduncles with recurved prickles; fruit prickly ..... MIMOSA
A. Rachis and peduncles unarmed; fruit smooth ..... DESMANTHUS

MIMULUS
1. Corolla yellow, less than 1.5 cm long; leaves suborbicular, about as wide as long . . . . . **Mimulus glabratus jamesii**
1. Corolla blue-violet, more than 1.5 cm long; leaves lanceolate, oblong, elliptic, or ovate, obviously longer than wide.
    Leaves sessile, clasping, subentire or with low, usually straight-backed teeth; stems wingless; longer fruiting pedicels more than 1.5 cm long . . . . . **Mimulus ringens**
    Leaves cuneate or rounded at the base with distinct petioles, serrate with mostly concave-backed teeth; stems winged or angled; pedicels never more than 1.5 cm long . . . . . **Mimulus alatus**

MINUARTIA
1. Leaves terete, fleshy; inflorescence branches at least thinly glandular-villous . . . . . **Minuartia patula**
1. Leaves linear-setaceous, mostly flat; inflorescence branches glabrous.
    Axillary fascicles abundant; petals clearly exceeding the sepals . . . . . **Minuartia michauxii**
    Axillary fascicles nearly or quite absent; petals shorter than to subequaling the sepals . . . . . **Minuartia dawsonensis**

MIRABILIS
1. Leaves ovate, broadly cuneate to truncate or subcordate at the base, the larger petioles 8 mm or more long.
    Flowers more than 2 cm long, the colored portions salverform; involucre green-herbaceous . . . . . *Mirabilis jalapa*
    Flowers less than 2 cm long, the colored portions campanulate; involucre membranaceous, crepe-like . . . . . *Mirabilis nyctaginea*
1. Leaves linear, lanceolate or oblong, broadly to narrowly attenuate to petioles less than 8 mm long.
    2. Leaves narrowly linear, less than 6 mm wide . . . . . *Mirabilis linearis*
    2. Leaves lanceolate or oblong, more than 6 mm wide.
        Stem villous with the longer hairs more than 1 mm long . . . . . **Mirabilis hirsuta**
        Stem glabrous or sparsely pubescent in 2 lines with incurved hairs to 0.5 mm long . . . . . *Mirabilis albida*

MISCANTHUS
1. Fertile lemmas awnless; plant running from elongate rhizome . . . . . *Miscanthus sacchariflorus*
1. Fertile lemmas awned; plant robustly cespitose.
    Leaf blades with conspicuous yellowish bands or blotches . . . . . *Miscanthus sinensis zebrinus*
    Leaf blades green throughout, with a pale cartilaginous midrib . . . . . *Miscanthus sinensis gracillimus*

MITCHELLA repens

MITELLA
1. Plants scapose; basal leaves obtuse, scarcely to not at all 3-lobed; flowers greenish-yellow . . . . . **Mitella nuda**
1. Plants with a pair of subsessile cauline leaves below the inflorescence; basal leaves manifestly 3-lobed, the lobes acute; flowers white . . . . . **Mitella diphylla**

MOEHRINGIA lateriflora

MOLLUGINACEAE: One genus in our area . . . . . MOLLUGO

MOLLUGO *verticillata*

MONARDA
1. Corollas scarlet, more than 3 cm long; bracts infused with scarlet . . . . . *Monarda didyma*
1. Corollas neither scarlet nor 3 cm long; bracts green or infused with pink or lavender.
    2. Flower clusters in two or more axillary glomerules in an interrupted, spike-like inflorescence.
        Bracts acute, acuminate, or short-subulate, but never long-awned at the tip; flowers yellowish . . . . . **Monarda punctata**
        Bracts attenuated into long, subulate, often branched cusps or awns; flowers white or pinkish . . . . . *Monarda citriodora*
    2. Flower clusters solitary and terminal at the tips of the flowering branches.
        3. Leaves sessile or on petioles less than 0.5 mm long . . . . . *Monarda bradburiana*
        3. Leaves distinctly petiolate, the larger petioles more than 0.5 mm long.
            Petioles often more than 2 cm long, sparsely villous, with spreading hairs mostly 0.5-1.5 mm long; corollas white to creamy . . . . . **Monarda clinopodia**
            Petioles less than 2 cm long, short-puberulent to canescent, with hairs all less than 0.3 mm long; corollas lavender . . . . . **Monarda fistulosa**

MONOLEPIS *nuttalliana*

MONOTROPA uniflora

MONOTROPACEAE
A. Flowers solitary; fresh plant white . . . . . MONOTROPA
A. Flowers 2 to several; fresh plant not white . . . . . HYPOPITYS

MORACEAE

A. Annual herb . . . . . FATOUA
A. Tree.
Leaves entire; branches often with stout thorns; fruit more than 5 cm in diameter . . . . . MACLURA
Leaves dentate to denticulate, often with 1-several lobes; branches unarmed; fruit less than 5 cm in diameter . . . . . MORUS

MORELLA

1. Leaf blades short-pubescent on the adaxial surfaces . . . . . *Morella pensylvanica*
1. Leaf blades glabrous on the adaxial surfaces . . . . . *Morella cerifera*

MORUS

1. Leaves glabrous adaxially, obtuse to acute or weakly short-acuminate.
Leaves nearly always unlobed, many of them more than 8 cm long . . . . . *Morus alba*
Leaves commonly 1-5 lobed, rarely more than 8 cm long . . . . . *Morus alba tatarica*
1. Leaves scabrous or strigose on the adaxial surface, mostly abruptly acuminate.
Larger leaves more than 1.5 dm long, the apex usually prolonged into an entire caudate tip 8 mm or more long, the abaxial leaf surface softly pubescent; teeth of leaves abruptly short-acuminate . . . . . **Morus rubra**
Leaves to 1.5 dm long, the acuminate tip rarely more than 8 mm long; abaxial surface pubescent along the veins . . . . . *Morus 'Illinois Everbearing'*

MUHLENBERGIA

1. Panicles broadly and diffusely spreading with slender divergent branches, usually more than 2.5 cm thick; spikelets about 1.5 mm long, awnless, on capillary pedicels often 1 cm or more long . . . . . *Muhlenbergia asperifolia*
1. Panicles slender and strict or with spreading-ascending branches, less than 2.5 cm thick; spikelets mostly more than 1.5 mm long, often awned, the pedicels less than 1 cm long.
2. Plants in dense matted tussocks; leaves linear-setaceous, soon becoming involute, less than 2 mm wide; culms wiry; panicles contracted; spikelets awnless.
Ligules scarcely 0.5 mm long, truncated . . . . . **Muhlenbergia cuspidata**
Ligules more than 0.5 mm long, tapered to an obtuse tip . . . . . **Muhlenbergia richardsonis**
2. Plants not in tussocks; leaves flat, the larger ones more than 2 mm wide; culms, panicles, and spikelets various.
3. Culms smooth, shiny, glabrous throughout.
4. Glumes absent or minute and 0.1-0.5 mm long . . . . . **Muhlenbergia schreberi**
4. Glumes present and conspicuous, more than 0.5 mm long.
5. Glumes ovate, abruptly cuspidate; culms erect, rarely branching, the panicles terminal . . . . . **Muhlenbergia sobolifera**
5. Glumes linear to narrowly lanceolate, awned, but not distinctly cuspidate; culms erect to typically decumbent and freely branching distally.
6. Glumes with stiff scabrous awns, the longer glumes (including the awn) more than 4.5 mm long and much exceeding the lemmas. . . . . *Muhlenbergia racemosa*
6. Glumes less than 4.5 mm long, often long-attenuate, shorter than to not much exceeding the awnless to awned lemmas.
Glumes less than 2 mm long; ligule obsolete, to 0.5 mm long . . . . . **Muhlenbergia bushii**
Longer glumes more than 2 mm in length; ligule 0.6-1.5 mm long . . . . . **Muhlenbergia frondosa**
3. Culms dull, puberulent to merely, but distinctly, scaberulous-puberulent below the nodes.
7. Distal sheaths puberulent; leaves mostly 6-10 mm wide; glumes ovate, abruptly acuminate . . . . . **Muhlenbergia tenuiflora**
7. Distal sheaths glabrous; leaves rarely more than 6 mm wide; glumes narrowly attenuate (rarely ovate and abruptly cuspidate in Muhlenbergia sobolifera).
8. Lemmas glabrous or rarely short-pubescent at the base . . . . . **Muhlenbergia glabrifloris**
8. Lemmas copiously long-pilose proximally.
9. Panicles stiffly erect, stout, mostly 5-10 mm broad; glumes clearly longer than the lemma.
Culms simple or sparingly branched, the internodes puberulent nearly or quite throughout; ligule to 0.7 mm long . . . . . **Muhlenbergia glomerata**
Culms much branched with ascending branches, the internodes puberulent only at the summit; larger ligules more than 0.7 mm long . . . . . *Muhlenbergia racemosa*
9. Panicles slender, nodding to flexuous, usually less than 5 mm broad; glumes shorter than to subequaling the lemma.
10. Glumes ovate and abruptly cuspidate; internodes minutely scaberulous below the nodes . . . **Muhlenbergia sobolifera**
10. Glumes lance-subulate, tapering from the base to the apex; internodes conspicuously short-pubescent below the nodes.
Lemmas usually with long slender awns 5 mm or more long; panicles silvery-green or whitish, loosely flowered, some of them occasionally more than 5 mm broad . . . . . **Muhlenbergia sylvatica**
Lemmas awnless or with short awns less than 5 mm long; panicles pale-green to purplish, more or less compactly flowered, usually less than 5 mm broad . . . . . **Muhlenbergia mexicana**

MULGEDIUM *pulchellum*

MUSCARI

1. Leaves flat, erect, more than 3 mm wide . . . . . *Muscari botryoides*
1. Leaves subterete or nearly so, recurved at the apex, up to 3 mm wide . . . . . *Muscari neglectum*

MYOSOTIS
1. Calyx with short, straight, appressed, eglandular hairs.
   Calyx lobes shorter than to nearly as long as the tube; corolla mostly 6 mm or more across, the tube exceeding the calyx; mature nutlets shorter than the style; inflorescence ebracteate; plant creeping and stoloniferous . . . . . *Myosotis scorpioides*
   Calyx lobes as long as or longer than the tube; corolla up to 6 mm across, the tube about equaling the calyx; mature nutlets longer than the style; inflorescence usually with bracts in the proximal portion; plant not stoloniferous . . . . . **Myosotis laxa**
1. Calyx (particularly the tube) coarsely appressed-hispid or with the hairs mostly hooked or glandular at the tip.
   2. Calyx lobes unequal, coarsely appressed-hispid, most or all of the hairs simple; corolla white . . . . . **Myosotis verna**
   2. Calyx lobes all subequal, the hairs spreading, with hooked or glandular tips; corolla blue.
      3. Fruiting pedicels subequaling to exceeding the calyx in length.
         Limb of fresh corolla flat, widely spreading, to 3.5 mm broad; annual or biennial . . . . . *Myosotis arvensis*
         Limb of fresh corolla concave, more than 3.5 mm broad; weak perennial . . . . . *Myosotis sylvatica*
      3. Pedicels all distinctly shorter than the calyx.
         Stems bearing flowers only above the leaves; calyx without uncinate hairs . . . . . *Myosotis discolor*
         Stems with the proximal flowers bracteate; calyx tube with at least a few uncinate hairs . . . . . *Myosotis stricta*

MYOSOTON *aquaticum*

MYOSURUS *minimus*

MYRICACEAE
A. Leaves pinnately lobed . . . . . COMPTONIA
A. Leaves entire or nearly so . . . . . MORELLA

MYRIOPHYLLUM
1. Leaves all alternate, scale-like or wart-like; bracts alternate . . . . . **Myriophyllum tenellum**
1. Leaves all or prevailingly alternate, fully developed and pinnately divided; bracts whorled or alternate.
   2. Bracts all with the margins deeply dentate or pectinate.
      3. Foliage leaves prevailingly emergent; plants dioecious . . . . . *Myriophyllum aquaticum*
      3. Foliage leaves prevailingly submersed; plants monoecious.
         Bracts coarsely toothed with a few narrow, mostly alternate teeth; stamens 4 . . . . . **Myriophyllum pinnatum**
         Bracts deeply pectinate with numerous opposite or subopposite lobes; stamens 8 . . . . . **Myriophyllum verticillatum**
   2. At least the distal bracts entire or with closely and finely serrulate margins.
      4. Median and distal bracts and flowers alternate . . . . . **Myriophyllum alterniflorum**
      4. Bracts and flowers mostly in whorls of 3 or more.
         5. Bracts shorter than to scarcely equaling the flowers; stems becoming whitened in drying, the longer internodes more than 9 mm long; stamens 8.
            Leaf segments more than 12 per side; turions absent . . . . . *Myriophyllum spicatum*
            Leaf segments as many as 12 per side; turions often produced . . . . . **Myriophyllum sibiricum**
         5. Bracts longer than the flowers; stems not usually whitened in drying, the internodes usually less than 9 mm long; stamens 4.
            Bracts oblanceolate to narrowly elliptic, more than 1.5 mm wide; petals 1.5 mm or more long; fruit up to 1.5 mm long . . . . . **Myriophyllum heterophyllum**
            Bracts linear to lanceolate, nearly always less than 1.5 mm wide; petals up to 1.5 mm long; fruit becoming longer than 1.5 mm . . . . . **Myriophyllum hippuroides**

MYRSINACEAE
A. Stems slender with small, alternate, scale-like leaves and a whorl of larger lanceolate leaves at the summit; petals white . . . . . TRIENTALIS
A. Cauline leaves all essentially alike, opposite or whorled (rarely alternate); petals yellow, blue, scarlet, or rarely white.
   Petals scarlet or purplish-blue; capsules circumscissile, opening near the middle, with the top coming off like a cap; leaves broadly deltate-ovate or deltate, sessile; prostrate or ascending annual . . . . . ANAGALLIS
   Petals yellow or very rarely white; capsules longitudinally dehiscent; leaves various, but not as above; prostrate to erect perennials . . . . . LYSIMACHIA

NAJADACEAE: One genus in our area . . . . . NAJAS

NAJAS
1. Leaves firm, coarsely and conspicuously toothed . . . . . *Najas marina*
1. Leaves mostly flaccid, entire or with finely spinulose margins.
   2. Leaves to 0.5 mm wide, with the expanded basal portion of the leaf prolonged-truncate.
      Marginal leaf teeth evident at 10×; fruits to 2.5 mm long . . . . . *Najas minor*
      Marginal leaf teeth not evident at 10×; longer fruits more than 2.5 mm long . . . . . **Najas gracillima**
   2. Larger leaves more than 0.5 mm wide, the expanded basal portion tapering into the blade.
      Leaves long-tapering to a fine point, less than 0.7 mm wide; style (with stigmas) more than 0.6 mm long; seeds smooth and glossy, yellow to brown, becoming more than 2.5 mm long . . . . . **Najas flexilis**
      Leaves obtuse to merely acute, the larger ones more than 0.7 mm wide; style (with stigmas) up to 0.6 mm long; seeds pitted, often purple-tinged, to 2.5 mm long . . . . . **Najas guadalupensis**

NAPAEA dioica

NARCISSUS
1. Corona subequaling the perianth.

2. Perianth tube much longer than wide; flowers white or pale-cream . . . . . *Narcissus triandrus*
2. Perianth tube about as wide as long or even wider; at least the corona with tinctures of yellow.
Perianth lobes spreading-ascending, the tube more than 7 mm long. . . . . *Narcissus pseudonarcissus*
Perianth lobes deflexed, the tube to 7 mm long . . . . . *Narcissus cyclamineus*

1. Corona notably shorter than the perianth.
3. Corona about ½ as long as the perianth lobes.
Corona concolorous with the perianth. . . . . *Narcissus ×odorus*
Corona colored differently from the perianth . . . . . *Narcissus ×incomparabilis*
3. Corona much less than ½ as long as the perianth lobes.
4. Perianth lobes bright-yellow . . . . . *Narcissus jonquilla*
4. Perianth lobes white or nearly so.
Flowers 1 per spathe. . . . . *Narcissus poeticus*
Flowers 2 or more per spathe . . . . . *Narcissus ×medioluteus*

NARTHECIACEAE
A. Flowers with tinctures of blue; leaves linear, evergreen . . . . . LIRIOPE
A. Flowers white to creamy; leaves ovate, deciduous . . . . . ALETRIS

NASSELLA *viridula*

NASTURTIUM
1. Siliques becoming more than 1.7 cm long, the longer beaks of fruit more than 0.9 mm long . . . . . *Nasturtium microphyllum*
1. Siliques to 1.7 cm long, the beaks all less than 0.9 mm long . . . . . *Nasturtium officinale*

NELUMBO lutea

NELUMBONACEAE*:* One genus in our area . . . . . NELUMBO

NEMOPANTHUS mucronatus

NEMOPHILA
1. Appendages linear-lanceolate, widest at the base; corolla lobes white, purple-veined, with a deep-purple blotch at the tip *Nemophila maculata*
1. Appendages oblong, as wide near the middle as at the base or wider; corolla blue, usually with a pale throat . . . . . *Nemophila menziesii*

NEPETA
1. Corollas white, with pale-purple spots; calyx lobes linear-subulate . . . . . *Nepeta cataria*
1. Corollas blue or purple; calyx lobes narrowly deltate, acute.
Larger leaves more than 2.5 cm long. . . . . *Nepeta ×faassenii*
Larger leaves less than 2.5 cm long . . . . . *Nepeta racemosa*

NESLIA *paniculata*

NICANDRA *physalodes*

NICOTIANA
1. Inflorescence glabrous or glabrate, eglandular. . . . . *Nicotiana longiflora*
1. Inflorescence glandular-viscid.
Leaves contracted at the base to a distinct petiole, less than 2.5 dm long; corolla tube not scarcely longer than to about twice as long as the calyx. . . . . *Nicotiana rustica*
Leaves tapered to a sessile base, the larger more than 2.5 dm long; corolla tube many times longer than the calyx . . . . .*Nicotiana sylvestris*

NIGELLA *damascena*

NOTHOCALAÏS cuspidata

NOTHOSCORDUM *bivalve*

NUPHAR
1. Perianth segments conspicuously red-tinged for ⅓ to ½ their lengths; leaf blades floating, the basal sinuses with lobes touching or proximate distally; petioles hemispherical in cross section, one side being conspicuously flattened, with a slightly convex ridge running the length of the flattened side . . . . . **Nuphar variegata**
1. Perianth segments essentially all yellow; leaf blades often erect or suberect, the basal sinuses with the lobes widely divergent, the inside margins normally becoming 4 cm or more apart; petioles elliptic to circular in cross section . . . . . **Nuphar advena**

NUTTALLANTHUS canadensis

NYCTAGINACEAE: One genus in our area . . . . . MIRABILIS

NYMPHAEA
1. Abaxial leaf and sepal surfaces purple-tinged, the petiole not striped; inner filaments narrower than the anthers; seeds less than 2.7 mm long; flowers notably fragrant . . . . . **Nymphaea odorata**
1. Abaxial leaf and sepal surfaces green, the petiole with dark stripes; filaments all broader than the anthers; seeds more than 2.7 mm long; flowers inodorous. . . . . **Nymphaea odorata tuberosa**

NYMPHAEACEAE
A. Leaves elliptic to suborbicular, longer than wide in outline; perianth segments scarcely expanding in anthesis, yellow, sometimes red-tinged at the base . . . . . NUPHAR
A. Leaves orbicular, fully as wide as long; perianth segments widely expanding, white . . . . . .NYMPHAEA

NYMPHOIDES *peltata* (

NYSSA sylvatica

NYSSACEAE: One genus in our area . . . . . NYSSA

OENANTHE *javanica*

OENOTHERA
1. Stems absent or much shorter than the flowers.
   Leaves sinuate-laciniate . . . . . *Oenothera triloba*
   Leaves entire. . . . . *Oenothera macrocarpa*
1. Stems well developed and much longer than the flowers.
   2. Petals white to pink.
      Stems strigose throughout with incurved hairs; inflorescence not glandular; capsules strongly 4-winged, up to 2 cm long . . . . . *Oenothera speciosa*
      Stems glabrous proximally, with a whitish exfoliating epidermis; inflorescence glandular-puberulent; capsules not 4-winged, often more than 2 cm long. . . . . *Oenothera nuttallii*
   2. Petals yellow, sometimes tinged with red.
      3. At least the middle and proximal leaves coarsely pinnately lobed to pinnatifid or sinuate-laciniate; plant often depressed or ascending.
         Petals more than 2.5 cm long; styles mostly more than 5 cm long, the stigma lobes extended well beyond the anthers at anthesis . . . . . *Oenothera grandis*
         Petals less than 2.5 cm long; styles less than 5 cm long, the stigma lobes not or only scarcely elevated above the anthers at anthesis . . . . . **Oenothera laciniata**
      3. Leaves serrate, denticulate, or entire, but never as above; plants usually erect.
         4. Ovaries and fruits ovoid or clavate, strongly and sharply 4-8 winged or ridged, at least above the middle.
            5. Ovaries and capsules pubescent with eglandular hairs . . . . . **Oenothera pilosella**
            5. Ovaries and capsules sparsely pubescent with delicate glandular hairs.
               Petals to 10 mm long; anthers less than 2.6 mm long; style to 10 mm long . . . . . .**Oenothera perennis**
               Petals, anthers, and style longer. . . . . **Oenothera fruticosa**
         4. Ovaries and fruits linear-oblong, more or less quadrangular to terete, never strongly 4-8 keeled nor winged.
            6. Petals rhombic-ovate, pointed at the tip; capsules up to 3 mm broad and up to 2 cm long; leaves linear to linear-lanceolate, mostly less than 1 cm wide.
               Petals to 1.7 cm long, the stigma surrounded by the anthers at anthesis . . . . . .**Oenothera clelandii**
               Petals longer than 1.7 cm, the stigma extended well beyond the anthers at anthesis . . . . . **Oenothera rhombipetala**
            6. Petals variously shaped, obcordate, emarginate, obtuse, or at least not pointed at the tip; capsules more than 3 mm broad and longer than 2 cm; larger leaves more than 1 cm wide.
               7. Calyx tube and petals, each more than 3 cm long. . . . . *Oenothera glazioviana*
               7. Calyx tube and petals, each less than 3 cm long.
                  8. Calyx, ovary, and capsule densely appressed-pubescent; glandular hairs absent or inconspicuous.
                     Calyx canescent with hairs to 0.85 mm long; cauline leaves rarely more than 1.5 cm wide . . **Oenothera oakesiana**
                     Calyx with appressed or ascending hispid hairs mostly more than 0.85 mm long; larger leaves more than 1.5 cm wide . . . . . **Oenothera villosa**
                  8. Calyx, ovary, and capsule glabrous to villous with sparse to densely spreading or ascending hairs, commonly with glandular hairs admixed.
                     9. Inflorescences and capsules glabrous or nearly so, eglandular except on the calyx . . . . . **Oenothera nutans**
                     9. Inflorescences and capsules decidedly villous or hispid, often puberulent and usually finely stipitate-glandular.
                        Sepal tips completely free at the base, separated by tissue that, when the tips are separated, remains as a distinct lobe or knob . . . . . **Oenothera parviflora**
                        Sepal tips confluent at the base, commonly remaining two together, but even in separated sepals, the evidence of primordial connection simply a low ridge . . . . . **Oenothera biennis**

OLEACEAE
A. Trees with pinnately compound leaves . . . . . FRAXINUS
A. Shrubs with simple leaves.

B. Leaves serrate; flowers yellow, the lobes much longer than the tube . . . . . FORSYTHIA
B. Leaves entire; flowers white to lilac-purple, the lobes no longer than the tube.
C. Leaves broad-ovate to deltate, cordate or truncate; flowers usually lilac-purple; fruit a capsule . . . . . SYRINGA
C. Leaves elliptic, oblong, or oval, obtuse or acute; flowers white; fruit fleshy.
Leaves less than 5 cm long . . . . . LIGUSTRUM
Larger leaves more than 5 cm long . . . . . CHIONANTHUS

OLIGONEURON
1. Stems and leaves densely pubescent throughout . . . . . **Oligoneuron rigidum**
1. Stems and leaves glabrous.
2. Ligules bright-yellow.
Array branches and pedicels densely pubescent; many of the leaves longitudinally folded, conduplicate-falcate with attenuated, acute tips, the larger sometimes 3-nerved . . . . . **Oligoneuron riddellii**
Array branches and pedicels glabrous; leaves flat, obtuse to subacute, never 3-nerved . . . . . **Oligoneuron ohioense**
2. Ligules white or creamy.
3. Ligules white; larger involucres more than 5.5 mm long, the dilated portion of the phyllaries with tinctures of green **Oligoneuron album**
3. Ligules creamy; larger involucres to 5.5 mm long, the dilated portion of the phyllaries without green tinctures.
Leaves prevailingly 3-nerved . . . . . **Oligoneuron ×bernardii**
Leaves 1-nerved or a few weakly 3-nerved . . . . . **Oligoneuron ×krotkovii**

ONAGRACEAE
A. Leaves opposite; perianth segments 2; stamens 2; fruit bristly with uncinate hairs . . . . . CIRCAEA
A. Leaves alternate or opposite; perianth segments 4 or 5 or absent; stamens 4 or more; fruit without bristly hairs.
B. Hypanthium not or only scarcely prolonged beyond the ovary, but never tubular; leaves alternate or opposite.
C. Petals pink (rarely white); seeds with a tuft of hairs at one end.
Leaves all alternate . . . . . CHAMERION
At least the middle and proximal leaves opposite . . . . . EPILOBIUM
C. Petals yellow, greenish, or absent; seeds without a tuft of hair.
Stamens 4; capsules less than twice as long as broad, less than 1 cm long; leaves alternate or opposite; plant terrestrial or paludal . . . . . LUDWIGIA
Stamens 8 or 10; capsules much more than twice as long as broad, more than 1 cm long; leaves alternate; plant a floating aquatic or rarely stranded and rooting in mud . . . . . JUSSIAEA
B. Hypanthium much prolonged beyond the ovary into a tubular stalk below the petals; leaves alternate.
D. Plant glabrous and glaucous below the inflorescence; leaves sessile and usually clasping; floral tube very delicate and filiform, not expanded toward the summit . . . . . STENOSIPHON
D. Plants pubescent below the inflorescence; leaves rounded to attenuate at the base, not clasping; floral tube filiform to funnelform.
E. Fruits fusiform, essentially indehiscent, up to 1 cm long; petals pink or white, up to 7 mm long . . . . . GAURA
E. Fruits long-cylindric to clavate, capsular with numerous seeds, often more than 1 cm long; petals yellow or if pink or white, then more than 7 mm long.
Stigma capitate, shallowly 4-lobed; suffruticose perennial from a woody crown . . . . . CALYLOPHUS
Stigma deeply 4-lobed; annuals, biennials, or perennials, a woody crown absent . . . . . OENOTHERA

ONOCLEA sensibilis

ONOCLEACEAE
A. Sterile blades mostly simple, pinnatifid . . . . . ONOCLEA
A. Sterile blades fully pinnate-pinnatifid . . . . . MATTEUCCIA

ONONIS *campestris*

ONOPORDUM *acanthium*

ONOSMODIUM
1. Corollas to 10 mm long; nutlets flared at the base . . . . . **Onosmodium molle**
1. Corollas more than 10 mm long; nutlets tapered at the base . . . . . **Onosmodium occidentale**

OPHIOGLOSSACEAE
A. Sterile leaves simple and entire; fertile blade simple; veins conspicuously anastomosing . . . . . OPHIOGLOSSUM
A. Sterile leaves dissected; fertile blade branched; veins merely forked.
B. Sterile leaves obviously longer than wide, less than 7 cm long . . . . . BOTRYCHIUM
B. Sterile leaves about as wide as long, more than 7 cm long (rarely less in Sceptridium multifidum).
Blades of sterile leaves sessile at the base of the fertile stalk . . . . . BOTRYPUS
Blades of sterile leaves long-stalked from the base of the plant . . . . . SCEPTRIDIUM

OPHIOGLOSSUM pusillum

OPUNTIA
1. Areoles with 1-6 stout, white or gray deflexed spines per areole; plants producing thickened, tuber-like primary or adventitious roots . . . . . .

. . . . . **Opuntia macrorhiza**
1. Areoles with no more than 2 stout spines per areole, often none; tubers absent . . . . . **Opuntia cespitosa**

ORBEXILUM
1. Leaflets lance-ovate to ovate, acuminate, at least some of them more than 2 cm wide . . . . . **Orbexilum onobrychis**
1. Leaflets linear-oblong to lanceolate, obtuse or acute, up to 2 cm wide . . . . . **Orbexilum pedunculatum**

ORCHIDACEAE
A. Leaves whorled . . . . . ISOTRIA
A. Leaves alternate, subopposite, basal, or absent.
  B. Leaves absent at flowering time or if present, then not green.
    C. Flowers deep crimson-pink, solitary, more than 2.5 cm long . . . . . ARETHUSA
    C. Flowers not deep-pink, 2 to several, usually less than 2.5 cm long.
      D. Flowers white; spike appearing spirally twisted . . . . . SPIRANTHES
      D. Flowers not white; spike not appearing spiraled.
        E. Flowers with a long slender spur about 2 cm long . . . . . TIPULARIA
        E. Flowers spurless or merely gibbous.
          Subterranean portions cormose; stems pale to greenish or greenish-purple . . . . . APLECTRUM
          Subterranean portions white-coralloid rhizomatous; stems brownish-yellow to brownish-purple . . . . . CORALLORHIZA
  B. At least one leaf green and present at flowering time.
    F. Lip largely inflated into a deep sac more than 1.5 cm long; fertile anthers 2 . . . . . CYPRIPEDIUM
    F. Lip variously formed, but never as above; fertile anther 1.
      G. Lip conspicuously spurred at the base.
        H. Flowers showy, bicolored, white and pink (rarely concolorous pink or white); lip entire or sinuate-margined distally; leaves 2, broadly ovate, basal . . . . . GALEARIS
        H. Plants not as above.
          Leaves more than 2, about 3 times as long as wide . . . . . COELOGLOSSUM
          Leaves 1-few, more than 3 times as long as wide or rotund with 2 basal leaves . . . . . PLATANTHERA
      G. Lip not spurred or merely gibbous at the base.
        I. Leaves 3 or more, basal or cauline; spike often appearing spirally twisted and white-flowered.
          J. Plant scapose; leaves all basal and white-reticulate . . . . . GOODYERA
          J. Plant not scapose or if subscapose, then leaves not white-reticulate.
            K. Flowers fewer than 6; leaves fleshy, ovate to orbicular, rarely more than 15 mm long . . . . . TRIPHORA
            K. Flowers more than 6; leaves thin, linear-oblong to lance-ovate, mostly much longer than 15 mm.
              Leaves all cauline; flowers racemose, green to purple, more than 1 cm long . . . . . EPIPACTIS
              Leaves cauline and basal (the basal often withered at flowering time); flowers white, up to 1 cm long in spirally twisted spikes . . . . . SPIRANTHES
        I. Leaves 1 or 2, basal or cauline; spike never appearing both spirally twisted and white-flowered.
          L. Flowers greenish to purplish-brown, more than 10 or if fewer, then usually yellowish-green; leaves broadly ovate, more than 2 cm wide.
            Leaves 2, basal . . . . . LIPARIS
            Leaf 1 or rarely 2, cauline . . . . . MALAXIS
          L. Flowers solid-pink to crimson (rarely white), 1-5(10) flowered; leaves up to 2 cm wide.
            M. Flowers 2-10, the lip oriented upward; leaves linear to linear-lanceolate . . . . . CALOPOGON
            M. Flowers 1-3, the lip horizontal to deflexed; leaves linear to ovate.
              Flowers solitary (rarely 2), the lip deflexed; leaves linear to linear-lanceolate, arising from near the base of the stem and long-sheathing . . . . . ARETHUSA
              Flowers 1-3, the lip horizontal; leaves ovate near the middle of the stem . . . . . POGONIA

ORIGANUM *vulgare*

ORNITHOGALUM
1. Flowers in racemose inflorescences, the pedicels shorter than the bracts . . . . . *Ornithogalum nutans*
1. Flowers in corymbose inflorescences, the pedicels prevailingly longer than the bracts . . . . . *Ornithogalum umbellatum*

OROBANCHACEAE Broom Rape Family

~ Root parasites without chlorophyll or hemiparasites with chlorophyll, with poorly developed root systems, the plants often developing nigrescent tinctures in drying; flowers perfect, irregular; calyx 2-5 lobed; corolla 2-lipped, generally 5-lobed; fertile stamens 4, borne on the corolla tube, a 5th one sterile or absent; ovary superior, 1-2 locular or appearing 4-locular, the style terminal, the stigma usually capitate; fruit a many-seeded, 2-valved capsule.

ADD Castillejas and Pedicularis

A. Plants without chlorophyll.
  B. Flowers and fruits 1 to 10, either solitary and terminating a long scape-like stem or not solitary and on pedicels 1 cm or more long . . . . . OROBANCHE
  B. Flowers and fruits numerous, sessile or subsessile in racemes or spicate inflorescences.
    Stems slender, usually much branched, less than 5 mm in diameter . . . . . EPIFAGUS

Plants pinecone-like, the stems thick, unbranched, more than 5 mm in diameter . . . . . CONOPHOLIS
A. Plants with chlorophyll.
C. Calyx prevailingly with fewer than 5 distinct lobes
D. Principal leaves all simple . . . . . MELAMPYRUM
D. Principal leaves lobed or divided.
Leaves pinnatifid, the segments crenate or crenate-serrate . . . . . PEDICULARIS
Leaves prevailingly 3-5 cleft into linear lobes . . . . . CASILLEJA
C. Calyx lobes 5.
E. Inflorescence terminal, the flowers in bracteate spikes or racemes.
F. Bracts minute, not longer than the calyx . . . . . BÜCHNERA
F. Bracts foliaceous, longer than the calyx.
Corollas yellow, the calyx to 1 cm long . . . . . DASISTOMA
Corollas magenta, the calyces soon more than 1 cm long . . . . . AGALINIS
E. Inflorescence not terminal, the flowers in the axils of well developed leaves.
G. Leaves all unlobed; corolla magenta . . . . . AGALINIS
G. Principal leaves lobed or compound; corolla yellow.
Corolla densely woolly within; flowers sessile or on pedicels up to 3 mm long . . . . . DASISTOMA
Corolla not woolly within; flowers on pedicels usually more than 3 mm long . . . . . AUREOLARIA

OROBANCHE
1. Scale leaves pubescent; flowers usually 2-several, purple; calyx lobes deltate, shorter than to subequaling the tube . . . . . **Orobanche fasciculata**
1. Scale leaves glabrous; flowers solitary, white, cream, lilac, or violet; calyx lobes lance-subulate, clearly longer than the tube . **Orobanche uniflora**

ORTHILIA secunda

ORYZOPSIS asperifolia

OSMORHIZA
1. Styles less than 1.6 mm long; involucral bracts mostly 3 or 4, less than 1 mm wide; flowers never more than 10 per umbellet . . . . . **Osmorhiza claytonii**
1. Styles 1.6 mm or more long; involucral bracts 5 or 6, the larger ones 1 mm or more wide; flowers very often more than 10 per umbellet . . . . . **Osmorhiza longistylis**

OSMUNDA
1. Blades bipinnate; sporangia borne only on the distal half of the fertile frond . . . . . **Osmunda spectabilis**
1. Blades pinnate-pinnatifid; sporangia borne only near the center of the fertile frond or fertile and sterile fronds separate **Osmunda claytoniana**

OSMUNDACEAE
A. Fertile fronds with sterile pinnae . . . . . OSMUNDA
A. Fertile fronds without sterile pinnae . . . . . OSMUNDASTRUM

OSMUNDASTRUM cinnamomeum

OSTRYA virginiana

OXALIDACEAE: One genus in our area . . . . . OXALIS

OXALIS
1. Plants acaulescent, the leaves and peduncles all basal; flowers pale, usually with pink to purple tinctures.
Plants bulbous; flowers 2-few per scape, the sepals with callus tips . . . . . **Oxalis violacea**
Plants from slender scaly rhizomes; flowers 1 per scape, the sepals not callus-tipped . . . . . **Oxalis montana**
1. Plants caulescent, the peduncles axillary; flowers yellow.
2. Capsules glabrate or with scattered septate hairs; stems with spreading septate hairs . . . . . **Oxalis stricta**
2. Capsules well beset with strigose non-septate hairs; stems without septate hairs.
Stems often rooting at the nodes; stipules persistent, broadly oblong; stems spreading-villous . . . . . *Oxalis corniculata*
Stems erect or decumbent, but not usually rooting at the nodes; stipules narrowly lance-linear or absent; stems strigose . **Oxalis dillenii**

OXYCOCCUS
1. Bracts greenish, herbaceous, mostly more than 2 mm long, located above the middle of the pedicel; corolla lobes 6 mm or more long; leaves thick-margined to revolute, sometimes more than 10 mm long . . . . . **Oxycoccus macrocarpos**
1. Bracts usually reddish, often involute, up to 2 mm long, located at or below the middle of the pedicel; corolla lobes up to 6 mm long; leaves strongly revolute, less than 10 mm long. . . . . **Oxycoccus palustris**

OXYDENDRUM *arboreum*

OXYPOLIS rigidior

PACHYSANDRA *terminalis*

PACKERA

1. Stems with well developed leaves nearly or quite throughout; annual or biennial . . . . . *Packera glabella*
1. Stem leaves few, typically sessile or obscurely petiolate, much reduced, the principal leaves chiefly basal and petiolate; perennials.
   2. Heads congested on densely floccose peduncles less than 1.5 cm long . . . . . **Packera plattensis**
   2. Heads loosely disposed on glabrate to thinly floccose peduncles mostly more than 1.5 cm long.
      3. Proximal leaf blades more than twice as long as wide.
         4. Basal and rosette leaf blades narrowly elliptic, prevailingly 3.5 or more times as long as wide; cauline leaves gradually reduced distally; asexual reproduction prevailingly by rhizomes . . . . . **Packera paupercula**
         4. Basal and rosette leaf blades elliptic to oblong, the wider ones less than 3.5 times as long as wide; cauline leaves quickly and dramatically reduced distally; asexual rosettes arising exclusively from adventitious roots . . . . . **Packera paupercula savannarum**
      3. Proximal leaf blades to twice as long as wide.
         5. Proximal leaves broadly rounded to a winged petiole . . . . . **Packera obovata**
         5. Proximal leaves truncate to cordate, abruptly contracted to a wingless petiole.
            6. Blades of proximal and rosette leaves distinctly cordate at the base . . . . . **Packera aurea**
            6. Blades of proximal and rosette leaves truncate to subcordate at the base.
               7. Involucre at least thinly floccose . . . . . **Packera paupercula pseudotomentosa**
               7. Involucre glabrous.
                  Basal leaves truncate-subcordate at the base . . . . . **Packera pseudaurea semicordata**
                  Basal leaves broadly attenuate at the base . . . . . **Packera crawfordii**

PAEONIA *lactiflora*

PANAX

1. Leaflets 3 to 5, up to 8 cm long, narrowed to sessile or subsessile bases; styles usually 3; fruit yellowish . . . . . **Panax trifolius**
1. Leaflets usually 5, the larger mostly more than 8 cm long, distinctly stalked on petiolules 1 cm or more long; styles usually 2; fruit red . . . . . **Panax quinquefolius**

PANICUM

1. Sheaths glabrous or nearly so, though often somewhat ciliate along the margins.
   2. Spikelets warty-papillose over the surface, nearly or quite nerveless . . . . . **Panicum verrucosum**
   2. Spikelets smooth, often conspicuously nerved.
      3. Plants perennial; culms simple, not geniculate . . . . . **Panicum virgatum**
      3. Plants annual; culms branching and often geniculate at the proximal nodes.
         Spikelets 2.2 mm or more long, ovate; most pedicels less than 3 mm long . . . . . **Panicum dichotomiflorum**
         Spikelets nearly all less than 2.2 mm long, widest at the middle; many of the pedicels more than 3 mm long . . . . . **Panicum dichotomiflorum puritanorum**
1. Sheaths pubescent or pilose.
   4. Spikelets 1.2 mm or more wide.
      Panicle much more than twice as long as wide, usually included at the base, the branches strongly appressed and without pulvini; sterile lemma and palea stramineous to orange at maturity . . . . . *Panicum miliaceum*
      Panicle about twice as long as wide, ultimately exserted, the branches spreading-ascending with definitive yellowish pulvini; sterile lemma and palea deep-brown, nigrescent in age . . . . . *Panicum miliaceum ruderale*
   4. Spikelets less than 1.2 mm wide.
      5. Panicles twice as long as broad or longer, the middle and proximal branches ascending at an angle of less than 30° off the vertical axis . . . . . **Panicum flexile**
      5. Panicles much less than twice as long as broad, the middle and proximal branches diverging at an angle of more than 30°.
         6. Terminal panicle usually ½ or more the height of the plant; spikelets long-acuminate, gradually tapered into a beak one-fifth or more the entire length of the spikelet . . . . . **Panicum capillare**
         6. Terminal panicle usually less than ½ the height of the plant; spikelets abruptly contracted into a beak scarcely one-tenth as long as the entire length of the spikelet.
            7. Terminal panicle long-exserted on a peduncle nearly ½ as long as the panicle . . . . . **Panicum philadelphicum**
            7. Terminal panicle included or exserted on a peduncle much less than ½ the length of the panicle.
               Spikelets no more than 0.8 mm wide, mostly aggregated in groups of 2 to 6 at the ends of the panicle branches . . . . . **Panicum tuckermanii**
               Spikelets mostly more than 0.8 mm wide, solitary or in loose pairs at the ends of the panicle branches **Panicum gattingeri**

PAPAVER

1. Middle and distal leaves clasping . . . . . *Papaver somniferum*
1. Leaves all tapering to non-clasping bases.
   2. Petals to 4 cm long; peduncles with divaricate hairs; annual . . . . . *Papaver rhoeas*
   2. Petals more than 4 cm long; peduncles with appressed hairs; perennial.
      Petals with a dark blotch at the base; peduncles generally less than ⅓ the length of the stem . . . . . *Papaver pseudo-orientale*
      Petals without a dark blotch; peduncles leafless for at least ⅓ of the length of the stem . . . . . *Papaver orientale*

PAPAVERACEAE
A. Leaves spiny-toothed . . . . . ARGEMONE
A. Leaves not spiny.
  B. Leaves all basal; petals 8 or more . . . . . SANGUINARIA
  B. Leaves cauline; petals 4 or absent.
    C. Leaves ternately dissected into linear segments about 1 mm wide . . . . . ESCHSCHOLTZIA
    C. Leaves not as above.
      D. Leaves simple, broadly cordate, more or less deeply lobed but never pinnatifid or pinnate-pinnatifid, the abaxial surfaces very glaucous and white-puberulent; petals absent; plant usually more than 1 m tall . . . . . MACLEAYA
      D. Plants not as above.
        E. Flowers not yellow; capsule opening only at the tip . . . . . PAPAVER
        E. Flowers yellow; capsule dehiscent over its entire length.
          Petals more than 1.5 cm long; capsule bristly-pubescent; style about 1 cm long; stigmas usually 3 . . . . . .STYLOPHORUM
          Petals less than 1.5 cm long; capsule glabrous; style sessile to subsessile; stigmas 2 . . . . . CHELIDONIUM

PARIETARIA pensylvanica

PARNASSIA glauca

PARNASSIACEAE: One genus in our area . . . . . PARNASSIA

PARONYCHIA
1. Stems and branches puberulent with retrorsely curved hairs . . . . . **Paronychia fastigiata**
1. Plant glabrous . . . . . **Paronychia canadensis**

PARTHENIUM
1. Leaves pinnatifid or bipinnatifid; annual . . . . . *Parthenium hysterophorus*
1. Leaves merely crenate or serrate; perennial . . . . . **Parthenium integrifolium**

PARTHENOCISSUS
1. Leaves 3-foliolate or 3-lobed . . . . . *Parthenocissus tricuspidata*
1. Leaves 5-foliolate.
  Plant often high-climbing by adhesive discs, but also common on the forest floor; inflorescence with a distinct central axis . . . . . **Parthenocissus quinquefolia**
  Plant clambering, sprawling, or trailing; tendrils without adhesive discs; inflorescence dichotomously branched, without a central axis . . . . . **Parthenocissus inserta**

PASCOPYRUM *smithii*

PASPALUM
1. Spikes more than 10 per inflorescence . . . . . **Paspalum fluitans**
1. Spikes fewer than 10 per inflorescence.
  2. Spikes 2, terminal in conjugal pairs (or with 1-3 approximate additional spikes) . . . . . *Paspalum notatum*
  2. Spikes 1-few, well separated in racemose inflorescences.
    3. Spikelets more than 2.6 mm long, ovoid, borne singly along the rachis; sterile lemma 5-nerved . . . . . **Paspalum laeve**
    3. Spikelets less than 2.6 mm long, orbicular, borne in pairs along the rachis; sterile lemma 2-3-nerved (including marginal nerves).
      Leaves with hairs of various lengths, usually ciliate . . . . . **Paspalum setaceum stramineum**
      Leaves with an even disposition of pubescence . . . . . **Paspalum setaceum muehlenbergii**

PASTINACA *sativa*

PAULOWNIA *tomentosa*

PAYSONIA *'Kathryn'*

PEDICULARIS
1. Stems usually villous, the leaves alternate; plant ending bloom long before the end of July . . . . . **Pedicularis canadensis**
1. Stems nearly or quite glabrous, the leaves opposite or subopposite; plant beginning bloom after the end of July . . . . . **Pedicularis lanceolata**

PEDIOMELUM *argophyllum*

PELLAEA glabella

PELTANDRA virginica

PENNISETUM *alopecuroides*

PENSTEMON

1. Distal and bracteal leaves broadly clasping, subrotund, prevailingly less than 1.5 times as long as wide; stems glabrous and glaucous; corollas more than 3.2 cm long . . . . . *Penstemon grandiflorus*
1. Leaves all sessile to petiolate, lanceolate to oblong-lanceolate or narrowly ovate, more than 1.5 times as long as wide; stems glabrous to pubescent, glaucous or not; corollas less than 3.2 cm long (except in Penstemon cobaea).
   2. Corollas more than 3.2 cm long . . . . . *Penstemon cobaea*
   2. Corollas less than 3.2 cm long.
      3. Corollas copiously glandular-pubescent internally; leaves entire or nearly so . . . . . *Penstemon tubaeflorus*
      3. Corollas glabrous internally or eglandular-pubescent on the inner surfaces of the lobes; leaves entire to serrate.
         4. Throat of the corolla scarcely ridged, inflated, thus differentiated from the narrower tube; lower corolla lobes subequaling the upper lobes; larger leaves routinely more than 1.5 cm wide.
            Sepals to 8 mm long, ovate at the base, the margins scarious, abruptly attenuated into a narrow green tip rarely exceeding 3 mm long; anthers characteristically with a few coarse, white, thick hairs on the side opposite the suture . . . . . **Penstemon digitalis**
            Sepals sometimes more than 8 mm long, lanceolate at the base, tapering gradually into a long, narrow tip, the non-scarious portion very often more than 3 mm long; anthers without thick hairs on the back . . . . . **Penstemon calycosus**
         4. Throat of the corolla flattened, essentially undifferentiated from the tube, strongly ridged along the lower side; lower corolla lobes much surpassing the upper lobes; leaves rarely more than 1.5 cm wide, and never wider than 2 cm.
            5. Leaves glabrous . . . . . **Penstemon gracilis**
            5. Leaves pubescent.
               6. Stems villous with spreading or tangled multicellular hairs, much longer than the short puberulence; corolla usually 2.3 cm or more long, violet or pale-violet, the lower lip strongly arched upward, nearly closing off the throat **Penstemon hirsutus**
               6. Stems prevailingly puberulent with very short, often recurved hairs or with a few longer hairs intermixed; corolla up to 2.2 cm long, white externally (or rarely pale-violet), the lower lip not directed upward, the throat open.
                  Corolla white or with purple lines within; longer peduncles more than 1 cm long . . . . . **Penstemon pallidus**
                  Corolla pale-violet; peduncles all less than 1 cm long . . . . . *Penstemon gracilis wisconsinensis*

PENTHORACEAE*:* One genus in our area . . . . . PENTHORUM

PENTHORUM sedoides

PERIDERIDIA americana

PERILLA *frutescens*

PERITOMA *serrulata*

PEROVSKIA

1. Leaves shallowly to deeply 1-2 pinnatisect . . . . . *Perovskia abrotanoides*
1. Leaves undivided . . . . . *Perovskia atriplicifolia*

PERSICARIA

1. Ocreae scarcely or not at all bristly or ciliate along the summit.
   2. Plants perennial by long horizontal rhizomes; flowers deep-rose or red.
      Inflorescence cylindrical, usually more than 4 cm long; peduncles abundantly glandular to densely pubescent or both; stipules without a herbaceous flange . . . . . **Persicaria coccinea**
      Inflorescence typically conic to conic-ovoid, usually less than 4 cm long; peduncles glabrous (in stranded or paludal forms, occasionally pubescent or even glandular); stipules often with a herbaceous flange . . . . . **Persicaria amphibia stipulacea**
   2. Plants annual, the roots easily extracted with a firm tug; flowers white to pink.
      3. Either the styles or the stamens long-exserted from the calyx . . . . . *Persicaria bicornis*
      3. Styles and stamens included.
         4. Peduncles conspicuously stipitate-glandular; larger perianths, measured from the joint, more than 3.4 mm long . . . . . **Persicaria pensylvanica**
         4. Peduncles smooth or with sessile glands; perianths less than 3.4 mm long.
            Inflorescence abundantly scabrous-glandular; larger achenes more than 2.1 mm broad; leaves narrowly lanceolate to lance-oblong, tapered to a scarcely acute tip . . . . . *Persicaria scabra*
            Inflorescence smooth to weakly glandular; achenes less than 2.1 mm broad; leaves lanceolate, long-attenuate to an acuminate tip . . . . . **Persicaria lapathifolia**
1. Ocreae with nerves exiting at the summit as manifest bristles or cilia.
   5. Peduncles, ocreae, or stems coarsely spreading-hispid, prickly, or glandular.
      6. Larger leaves more than 4.5 cm wide, broadly rounded to subcordate at the base, distinctly petiolate; hairs all eglandular . . . . . *Persicaria orientalis*
      6. Leaves less than 4.5 cm wide, sessile or subsessile; pubescence glandular or not.
         7. Stems with recurved prickles . . . . . *Persicaria bungeana*
         7. Stems without prickles.
            Peduncles with long-stipitate glands; spikes less than 8 mm thick; leaves tapered at both ends; ocreae appressed to the stem at the summit . . . . . **Persicaria careyi**
            Peduncles eglandular or rarely with short-stipitate glands; spikes usually more than 8 mm thick; leaves rounded at the base; ocreae with an annular flange at the summit . . . . . **Persicaria amphibia stipulacea**
   5. Peduncles, ocreae, and stems either glabrous or with appressed hairs.

8. Calyx without either punctation or scales.
   9. Cilia of ocreolae much more than 2 mm long . . . . . *Persicaria longiseta*
   9. Cilia of ocreolae always less than 2 mm long.
      10. Inflorescence dense, more than 5 mm broad, the ocreolae closely overlapping; hairs of ocreae fine and flexuous; annual . . . . . *Persicaria maculosa*
      10. Inflorescence slender, usually less than 5 mm broad, the ocreolae not or only scarcely overlapping; hairs of ocreae thick, stiff, tapering from base to apex; perennial.
          Marginal cilia of ocreae to 7 mm long; hairs of the ocreae adnate for more than a third of their length . . . . . **Persicaria hydropiperoides**
          Longer marginal cilia of ocreae more than 7 mm long; hairs of the ocreae adnate for less than a third of their length . . . . . **Persicaria setacea interjecta**
8. Calyx either glandular-punctate or beset with scattered peltate scales.
   11. Calyx scaly; leaves linear-lanceolate, less than 1 cm wide . . . . . **Persicaria opelousana**
   11. Calyx glandular-punctate; leaves lanceolate, usually l cm or more wide.
      12. Calyx greenish or green with purplish tinctures distally; ocreae swollen with concealed cleistogamous flowers; achene surfaces minutely cancellate. . . . . **Persicaria hydropiper**
      12. Calyx white; ocreae without cleistogamous flowers; achene surfaces absolutely smooth.
          Larger leaves more than 2.5 cm wide; inflorescence with the fascicles essentially uninterrupted; at least the distal ocreolae overlapping, the proximal ones with marginal cilia absent or no more than 0.7 mm long . . . . . **Persicaria robustior**
          Leaves rarely more than 2.5 cm wide; inflorescence with the fascicles largely interrupted; ocreolae not overlapping, ciliate, with the larger ones more than 0.7 mm long. . . . . **Persicaria punctata**

PETASITES *hybridus*

PETRORHAGIA *saxifraga*

PETUNIA
1. Flowers white; corolla tube scarcely expanded below the spreading lobes, to 7 mm in diameter at the summit . . . . . *Petunia axillaris*
1. Flowers usually red, violet, or purple; corolla tube gradually expanded below the spreading lobes, more than 7 mm in diameter at the summit.
   Corollas more than 4.5 cm long . . . . . *Petunia ×hybrida*
   Corollas less than 4.5 cm long . . . . . *Petunia violacea*

PHACELIA
1. Filaments glabrous, shorter than the corolla tube; style less than 3 mm long . . . . . **Phacelia ranunculacea**
1. Filaments villous, subequaling or exceeding the corolla; style more than 3 mm long . . . . . *Phacelia bipinnatifida*

PHALARIS
1. Panicle up to 4 cm long, about ½ as broad as long; glumes more than 6 mm long . . . . . *Phalaris canariensis*
1. Panicle more than 5 cm long, much more than twice as long as broad; glumes less than 6 mm long.
   Leaves green throughout . . . . . *Phalaris arundinacea*
   Leaves with white or yellowish stripes . . . . . *Phalaris arundinacea picta*

PHASEOLUS *vulgaris*

PHEDIMUS
1. Leaf blades flabelliform to broadly obovate, about as wide as long, entire-cuneate below the middle, then broadly obtuse and denticulate beyond the middle; flowers roseate. . . . . *Phedimus spurius*
1. Leaf blades ovate to spatulate, obtuse, clearly longer than wide, repand-dentate to dentate, often from below the widest portion; flowers usually white or yellow.
   Leaves papillose along the margins at 10×; sepals ovate, abruptly narrowed to an oblong tip . . . . . *Phedimus kamtschaticus*
   Leaves smooth along the margins at 10×; sepals oblong . . . . . *Phedimus florifer*

PHEGOPTERIS
1. Rachis winged only above the proximal two pairs of pinnae; blade stalk pilose and with scattered brown scales . . . . . **Phegopteris connectilis**
1. Rachis winged between all the pinnae; blade stalk smooth or with remote, lightly colored scales . . . . . **Phegopteris hexagonoptera**

PHELLODENDRON *amurense*

PHEMERANTHUS rugospermus

PHILADELPHACEAE
A. Flowers 5-parted, in panicles; stamens less than 15, usually 10 . . . . . DEUTZIA
A. Flowers mostly 4-parted, in simple cymes or racemes; stamens more than 15 . . . . . PHILADELPHUS

PHILADELPHUS
1. Flowers in cymes of 1-3.
   2. Pedicels and calyx glabrous . . . . . *Philadelphus laxus*
   2. Pedicels and calyx pubescent.

3. Styles united, appearing as one . . . . . *Philadelphus hirsutus*
3. Styles 4, separate.
Leaves more than 4 cm long . . . . . *Philadelphus verrucosus*
Leaves less than 4 cm long . . . . . *Philadelphus ×polyanthus*

1. Many of the flowers or cymes in racemes of 5-21.
4. Calyx glabrous; leaves pubescent only on the veins abaxially.
Flowers in racemes of 5-7 . . . . . *Philadelphus coronarius*
Flowers in panicles of 9-21 . . . . . *Philadelphus californicus*
4. Calyx pubescent; leaves pubescent throughout abaxially.
Twigs with close bark . . . . . *Philadelphus pubescens*
Twigs exfoliating . . . . . *Philadelphus verrucosus*

PHLEUM *pratense*

PHLOX

1. Stems ligneous, trailing or decumbent; leaves lance-linear to linear, thick and coriaceous, pungent-tipped, with pale rounded margins.
2. Petal lobes with notches ½ or more their length; middle internodes of erect stems very often more than 1.5 cm long; larger leaves usually longer than 2 cm. . . . . **Phlox bifida**
2. Petal lobes subentire to shallowly notched much less than ½ their length; middle internodes of erect stems less than 1.5 cm long; leaves less than 2 cm long.
Stamens wholly included; styles less than 4 mm long . . . . . *Phlox nivalis*
At least the anthers protruding from the throat; styles more than 4 mm long . . . . . *Phlox subulata*

1. Stems herbaceous, mostly erect; leaves linear to oval, herbaceous, obtuse to long-attenuate, without pale rounded margins.
3. Flowers and fruits in cylindrical, thyrsoid, or panicled inflorescences at least twice as long as broad; stems purplish-maculate . . . . . **Phlox maculata**
3. Flowers and fruits in corymbose inflorescences about as broad as long; stems usually not maculate.
4. Leaves lanceolate to ovate, less than 5 times as long as wide.
5. Distal and bracteal leaves alternate . . . . . *Phlox drummondii*
5. Leaves all opposite.
Blooming period finished by mid June; stems villous . . . . . **Phlox divaricata**
Blooming period beginning in early July; stems glabrous or merely puberulent distally . . . . . **Phlox paniculata**
4. Leaves linear to linear-lanceolate, more than 5 times as long as wide.
6. Plant glabrous throughout or occasionally only weakly puberulent distally . . . . . **Phlox glaberrima interior**
6. Plants pilose.
Inflorescence abundantly glandular-pubescent . . . . . **Phlox pilosa**
Inflorescence with multicellular, eglandular hairs . . . . . **Phlox pilosa fulgida**

PHRAGMITES

1. Leaves notably marked by yellow stripes . . . . . *Phragmites australis 'Variegatus'*
1. Leaves green throughout.
Ligules, excluding the apical fringe, no more than 0.4 mm long; 1st glume rarely more than 4.5 mm long; proximal and middle internodes without tinctures of maroon . . . . . *Phragmites australis*
Ligules more than 0.4 mm long; larger 1st glumes more than 4.5 mm long; proximal and middle internodes of culm with tinctures of maroon . . . . . **Phragmites americanus**

PHRYMA leptostachya

PHRYMACEAE: One genus in our area . . . . . PHRYMA

PHYLA

1. Leaves lanceolate to lance-ovate, usually more than 1 cm wide, acute or acuminate, evenly toothed from below the middle, with at least 10 teeth . . . . . **Phyla lanceolata**
1. Leaves linear to linear-oblanceolate, less than 1 cm wide, obtuse to broadly acute, toothed only near the apex, with fewer than 10 teeth . . . . . *Phyla cuneifolia*

PHYLLOSTACHYS

1. Proximal and older internodes becoming deeply imbued with black . . . . . *Phyllostachys nigra*
1. Internodes all yellow to green, without tinctures of black . . . . . *Phyllostachys aureosulcata*

PHYSALIS

1. Stems glabrous or glabrate.
2. Plants annual, without rhizomes, the subterranean portions easily extracted by pulling on the stem, and usually present on herbarium specimens; filaments slender throughout, much narrower than the anthers; leaves generally angulate.
Corolla yellow throughout; anthers less than 2.8 mm long; longer pedicels at anthesis more than 8 mm long . . . . . *Physalis angulata*
Corolla yellow with dark spots near the throat; anthers more than 2.8 mm long; pedicels never more than 8 mm long . . . . . *Physalis philadelphica*
2. Plants perennial by rhizomes, the rhizomes remaining in the ground following a simple pull on the stem and hence missing from many herbarium specimens; filaments often flattened and nearly as broad as the anthers, at least near the middle or toward the base; leaves entire to angulate.

Leaf blades broadly ovate, less than 1.7 times as long as wide, broadly rounded to truncate or cordate at the base . . *Physalis alkekengi*
Leaf blades ovate to lanceolate, mostly more than 1.7 times as long as wide, broadly cuneate to long-tapering into the petiole . . . . . **Physalis longifolia**

1. Stems decidedly villous, hispid, glandular, or of mixed pubescence.
   3. Pubescence of viscid or glandular hairs.
      4. Leaves tapering at the base, rarely more than 6 cm long . . . . . **Physalis virginiana**
      4. Leaves broadly rounded to cordate at the base, the larger commonly more than 6 cm long.
         5. Plants perennial by rhizomes, the rhizomes remaining in the ground following a simple pull on the stem and hence missing from many herbarium specimens; longer pedicels soon exceeding 1 cm long . . . . . **Physalis heterophylla**
         5. Plants annual, without rhizomes, the subterranean portions easily extracted by pulling on the stem and usually present on herbarium specimens; pedicels to 1 cm long.
            Corolla yellow throughout; leaves broadly cuneate at the base . . . . . *Physalis missouriensis*
            Corolla with a nigrescent center; leaves round to cordate at the base . . . . . *Physalis grisea*
   3. Pubescence eglandular, not viscid.
      6. Pedicels no more than 10 mm long, even in fruit . . . . . *Physalis pubescens*
      6. Pedicels soon more than 5 mm long in anthesis, and more than 10 mm long in fruit.
         7. Pubescence of simple hairs only . . . . . **Physalis virginiana**
         7. At least some of the hairs forked or branched.
            Many of the hairs simple, to 1 mm long . . . . . *Physalis hispida*
            Hairs prevailingly forked or branched, many more than 1 mm long . . . . . *Physalis pumila*

PHYSARIA *gracilis*

PHYSOCARPUS opulifolius

PHYSOSTEGIA

1. At least the distal leaves rounded, distinctly clasping at the base, the margins entire or with teeth less than 1 mm long; flowers to 15 mm long . . . . . *Physostegia parviflora*
1. Leaves gradually narrowed to a sessile base, not clasping, the margins commonly with teeth more than 1 mm long; flowers 8-35 mm long.
   2. Larger leaves more than 2.3 cm wide, the distal (short) side of the teeth often 2 mm or more long . . . . . **Physostegia speciosa**
   2. Leaves less than 2.3 cm wide, the distal side of the teeth usually less than 2 mm long.
      Flowers more than 2.4 cm long; lowest 3-several bracts of racemes usually without flowers . . . . . **Physostegia praemorsa**
      Flowers less than 2.4 cm long; empty bracts usually no more than 3 . . . . . **Physostegia virginiana**

PHYTOLACCA americana *the superior ovary; berry about 1 cm wide.* 20 JUN – 16 OCT. FACU. *C* = 0

PHYTOLACCACEAE: One genus in our area. . . . . PHYTOLACCA

PICEA

1. Branchlets pubescent . . . . . *Picea mariana*
1. Branchlets glabrous.
   2. Leaves dark-green and lustrous, to 2 cm long; cones 10-15 cm long . . . . . *Picea abies*
   2. Leaves dull-green to blue-green or glaucous; cones less than 10 cm long.
      Cones less than 6 cm long; leaves less than 2 cm long . . . . . *Picea glauca*
      Cones more than 6 cm long; longer leaves more than 2 cm long . . . . . *Picea pungens*

PICRIS *hieracioides*

PILEA

1. Achenes dark-olive to blackish throughout, pale-margined, the surfaces tuberculate, mostly more than 1.1 mm wide . . . . . **Pilea fontana**
1. Achenes pale-green, tan, or purple-spotted, the surfaces smooth or smoothish, never more than 1.1 mm wide . . . . . **Pilea pumila**

PINACEAE

A. Needles grouped into fascicles or clusters of 2 to several.
   Needles in fascicles of 2 to 5 . . . . . PINUS
   Needles clustered, numerous on short spurs . . . . . LARIX
A. Needles flat or depressed-quadrangular, solitary, appearing alternate along the twig.
   B. Needles depressed-quadrangular, mucronate, easily deciduous from older branchlets; remnant leaf-base projection more than 0.5 mm long . . . . . PICEA
   B. Needles flat or flattish, blunt, deciduous or persistent; remnant leaf-base projection less than 0.5 mm long.
      C. Terminal buds thickly resinous, often obscuring the scale margins; cones erect, the scales deciduous . . . . . ABIES
      C. Terminal buds not or scarcely resinous, the scale margins evident, entire or fimbriate; cones reflexed or pendulous, the scales persistent.
         Needles early deciduous, less than 19 mm long . . . . . TSUGA
         Needles persistent, the longer more than 19 mm long . . . . . PSEUDOTSUGA

PINUS

1. Needles mostly or entirely 5 per fascicle . . . . . **Pinus strobus**
1. Needles primarily 2 or 3 per fascicle.
   2. Longer needles more than 7 cm long.

3. Needles less than 1 mm wide . . . . . *Pinus echinata*
3. Needles more than 1 mm wide.
4. Needles prevailingly in 3's . . . . . *Pinus rigida*
4. Needles in 2's.
Fresh needles easily bent, but rarely breaking; bark dark . . . . . *Pinus nigra*
Fresh needles easily broken; bark light-gray to reddish-brown . . . . . **Pinus resinosa**
2. Needles to 7 cm long.
5. Scales of cone with a strong spine.
Spines stout-deltate, the longer more than 4 mm long . . . . . *Pinus pungens*
Spines slender, acicular, to 4 mm long . . . . . *Pinus virginiana*
5. Scales of cone spineless.
Longer needles more than 4 cm long . . . . . *Pinus sylvestris*
Needles less than 4 cm long . . . . . **Pinus banksiana**

PIPTATHERUM
1. Leaves setaceous-involute, less than 2 mm wide; spikelets less than 5 mm long . . . . . **Piptatherum pungens**
1. Leaves flat, mostly wider than 5 mm; spikelets more than 5 mm long . . . . . **Piptatherum racemosum**

PIPTOCHAETIUM avenaceum

PISTIA *stratiotes*

PISUM *sativum*

PLAGIOBOTHRYS *scouleri*

PLANODES *virginicum*

PLANTAGINACEAE: One genus in our area . . . . . PLANTAGO

PLANTAGO
1. Leaves linear to lanceolate, more than 5 times as long as wide.
2. Leaves more than 5 mm wide . . . . . *Plantago lanceolata*
2. Largest leaves very rarely exceeding 5 mm wide.
3. Leaves opposite or occasionally some appearing whorled, cauline; peduncles arising from the distal leaf axils . . . . . *Plantago arenaria*
3. Leaves all basal; inflorescence scapose.
Floral bracts much elongate, several times longer than the flowers . . . . . *Plantago aristata*
Floral bracts no more than 1.5 times as long as the flowers . . . . . *Plantago patagonica*
1. Leaves lanceolate-ovate to ovate, less than 5 times as long as wide.
4. Scape hollow; leaf blades glabrous throughout, the principal veins appearing to originate from the midrib . . . . . **Plantago cordata**
4. Scape solid; leaf blades glabrous or pubescent adaxially, the principal veins all originating in the petiole.
5. Petals more than 1.3 mm long; distinct petioles absent or less than 1.5 cm long; seeds 2-4.
Corolla lobes erect after anthesis, forming a beak atop the capsule; sepals and bracts coarsely pubescent . . . . . **Plantago virginica**
Corolla remaining reflexed or divaricate-spreading, not beak-forming; sepals and bracts glabrous . . . . . *Plantago media*
5. Petals less than 1.3 mm long; distinct petioles mostly more than 1.5 cm long; seeds mostly more than 4.
Capsules dehiscent near the middle, about at the level of the tips of the broadly obtuse sepals; leaves with petioles green throughout . . . . . *Plantago major*
Capsules with the line of dehiscence well below the level of the tips of the acute sepals; petioles typically with a tinge of red at the base . . . . . **Plantago rugelii**

PLATANACEAE: One genus in our area . . . . . PLATANUS

PLATANTHERA
1. Lip abundantly erose-lacerate to pectinately fringed; flowers often large and showy.
2. Flowers deep-yellow, orange, or purple.
Flowers yellow to orange . . . . . **Platanthera ciliaris**
Flowers pink to purple . . . . . **Platanthera psycodes**
2. Flowers white, yellowish, or greenish-white.
3. Lip simple, unlobed, deeply fringed.
Flowers yellowish . . . . . **Platanthera ×bicolor**
Flowers white . . . . . **Platanthera blephariglottis**
3. Lip divided into 3-5 major sections or lobes, each lobe deeply incised or fringed.
Flowering spikes up to 3 cm in diameter; lobes of lip often deeply incised to near the base into narrow filiform segments; spur shorter than to slightly longer than the ovary . . . . . **Platanthera lacera**
Flowering spikes more than 3 cm in diameter; lobes of lip fringed but not normally incised into linear-filiform segments; spur much longer than the ovary . . . . . **Platanthera leucophaea**
1. Lip entire, not fringed; flowers not large and showy.
4. Plants scapose; leaves 2, orbicular, both basal and appressed to the ground.

Scape bracteate; flowers white to greenish-white; lip linear-oblong, downwardly curved; ovary pedicellate . . . . . **Platanthera orbiculata**
Scape ebracteate; flowers yellowish-green; lip lance-deltate, attenuate to an acute or acuminate upwardly curved tip; ovary sessile . . . . . **Platanthera hookeri**

4. Plants caulescent; leaves one to several, lanceolate, oblong, to lance-ovate or ovate, spreading to ascending.
5. Cauline leaf solitary or with a few strongly reduced (less than 3 cm long) leaves distally . . . . . **Platanthera clavellata**
5. Cauline leaves 2 or more.
6. Lip broad, truncate-erose at the tip, typically with 2 basal lobes; proximal floral bracts much exceeding the flowers . . . . . **Platanthera flava herbiola**
6. Lip linear-oblong to lance-deltate, attenuate to an acute or acuminate tip, without basal lobes; proximal floral bracts not or only slightly exceeding the flowers.
Lip conspicuously dilated at the base; flowers white . . . . . **Platanthera dilatata**
Lip linear to lanceolate, not dilated at the base; flowers greenish . . . . . **Platanthera aquilonis**

PLATANUS occidentalis

PLUCHEA *odorata succulenta*

POA

1. Many florets with floral elements developing bulblets with subfoliaceous bracts narrowed abruptly into caudate tips up to 1.5 cm long . . . . . *Poa bulbosa*
1. Florets fertile, without bulblets.
2. Plants annual, rarely more than 25 cm high; panicles rarely more than 7 cm long; culms subterete; branches spreading.
Lemmas 3-nerved, the proximal one to 2.5 mm long, with cobwebby hairs at the base . . . . . *Poa chapmaniana*
Lemmas 5-nerved, the proximal one more than 2.5 mm long, with appressed hairs along the keel and margins, but without long cobwebby hairs at the base . . . . . *Poa annua*
2. Plants perennial, almost always higher than 25 cm; panicles very often more than 7 cm long; culms terete or conspicuously flattened; branches spreading or erect.
3. Marginal and lateral nerves of lemmas glabrous.
4. Longer ligules more than 4.2 mm long . . . . . *Poa trivialis*
4. Ligules all less than 4.2 mm long.
5. Lemmas with appressed silky hairs along the keel; proximal node of panicle with 4 branches . . . . . **Poa alsodes**
5. Lemmas completely glabrous except for the tuft of hairs at the base; proximal node of panicle with fewer than 4 branches.
Lemmas acute or acuminate, the scarious tip pliant, more than 0.25 mm long . . . . . **Poa saltuensis**
Lemmas obtuse, the scarious tip not pliant, scant to 0.25 mm long . . . . . **Poa languida**
3. Marginal nerves of lemmas pubescent, at least toward the base.
6. Larger lemmas 3.6 mm long or longer.
Panicle branches very short, floriferous near the base; elongate rhizomes present; intermediate nerves densely pubescent; longer ligules more than 2 mm, acute . . . . . *Poa arida*
Panicle branches elongate, floriferous mostly beyond the middle; elongate rhizomes absent; intermediate nerves not or only weakly pubescent; ligules to 2 mm long, rounded . . . . . **Poa wolfii**
6. Lemmas less than 3.6 mm long.
7. Lemmas distinctly 5-nerved, an intermediate nerve well developed between the keel and each of the marginal nerves; ligules to 2.6 mm long, rarely more than 2 mm long.
Intermediate nerves of lemma glabrous, the keel pubescent for about ½ its length; longer ligules more than 1.5 mm long; plants tufted or rhizomatous, often with elongate rhizomes . . . . . *Poa pratensis*
Intermediate nerves of lemma pubescent, the keel pubescent its entire length or nearly so; ligules less than 1.5 mm long; plants tufted, without elongate rhizomes . . . . . **Poa sylvestris**
7. Lemmas without distinct intermediate nerves, or, if incipient, then notably less developed than the marginal nerves; ligule length various.
8. Longer ligules more than 2.5 mm long . . . . . **Poa palustris**
8. Ligules to 2.5 mm long, usually much less.
9. Culms conspicuously flattened; panicle branches short, beset with spikelets nearly throughout their length; culms from elongate rhizomes . . . . . *Poa compressa*
9. Culms terete; panicle branches mostly floriferous only at or beyond the middle; plants tufted, without elongate rhizomes.
Panicle branches 1 or 2 per fascicle; sheaths scabrous; culms weak and filiform; ligules less than 2 mm long . . . . . **Poa paludigena**
Panicle branches 3-5 per fascicle; sheaths glabrous; culms wiry; ligules obsolete to 5 mm long . . . . *Poa nemoralis*

POACEAE

A. Culm wood-like, persistent; plant a bamboo.
Culms more than 0.6 cm in diameter, more than 1 m high . . . . . PHYLLOSTACHYS
Culms less than 0.6 cm in diameter, less than 1 m high . . . . . SASA
A. Culm neither wood-like nor persistent; plant not a bamboo.
B. Spikelets contained within a bony or spiny involucre, or the glumes spiny.
C. Involucre spineless . . . . . BUCHLOË
C. Involucre or glumes with strong spines.
Spikelets embedded in a spiny bur, the glumes without hooked spines . . . . . CENCHRUS
Spikelets 1-5 on short branchlets, the 2nd glume with hooked spines . . . . . TRAGUS

B. Spikelets exposed, neither within a bony involucre nor with spiny glumes.
D. The pistillate and staminate spikelets unalike, dimorphic or plants dioecious.
E. Plant a prostrate stoloniferous perennial; plants dioecious.
Spikelets all distinctly on one side of the rachis . . . . . BUCHLOË
Spikelets not distinctly on one side of the rachis . . . . . DISTICHLIS
E. Plant an erect annual; plants monoecious.
Pistillate and staminate spikelets in the same inflorescence, the pistillate ones distal on appressed-ascending branches, the staminate ones proximal on spreading branches, the leaves often less than 4 cm wide . . . . . ZIZANIA
Pistillate and staminate spikelets on separate inflorescences, the staminate ones solitary and terminal, the pistillate ones in the axils of the leaves, the leaves normally 4 cm or more wide . . . . . ZEA
D. Spikelets all essentially alike; plants not dioecious.
F. Spikelets in distinct rows along one or two sides of the spike rachis . . . . . Group 1
F. Spikelets not in distinct rows along the rachis.
Fully mature spikelets consistently with 2-several perfect florets . . . . . Group 2
Spikelets with only one perfect floret or occasionally with 1 or 2 sterile lemmas at the base of the perfect floret . . . . . Group 3

Group 1. (spikelets in 1 or 2 distinct rows)

A. Spikelets strongly flattened laterally, wafer-like, without glumes, the subindurated lemma and palea coarsely hispid along their keels . .LEERSIA
A. Spikelets not as above.
B. Spikelets in two rows oriented on either side of the rachis.
C. At least the pistillate spikelets situated within excavations on a thick, conspicuously jointed rachis, not overlapping the next one above on the opposite side of the rachis, the spikes 3-5 mm in diameter, evenly cylindrical.
Spikelets long-awned . . . . . AEGILOPS
Spikelets awnless . . . . . TRIPSACUM
C. Plants not as above.
D. Glumes absent or more often reduced to minute bristles or horns at the base of each spikelet . . . . . .HYSTRIX
D. At least one glume fully developed per spikelet or spikelet group.
E. Many or most spikelets paired or in 3's at each node along the rachis.
F. Distal spikelets mostly paired at each node; proximal spikelets mostly solitary at each node . . . . . ×ELYHORDEUM
F. All or essentially all of the spikelets paired or in 3's at each node.
G. Spikelets in 3's at each node, the lateral pair usually pedicellate and reduced to awns; rachis disarticulating at each node, easily broken up into numerous segments.
Glumes setaceous throughout . . . . . HORDEUM
Glumes of central spikelet slightly expanded near the base . . . . . ×ELYHORDEUM
G. Spikelets in 2's (occasionally in 3's or 4's in Elymus canadensis) at each node, both with perfect flowers; rachis continuous, not disarticulating into numerous segments.
Glumes more than 2.5 mm wide; lemmas essentially awnless . . . . . LEYMUS
Glumes less than 2.5 mm wide; lemmas usually at least short-awned . . . . . ELYMUS
E. Spikelets all solitary per node.
H. Spikelets oriented edgewise to the rachis.
Glumes and lemmas sharply acute to awned; first glume absent . . . . . LOLIUM
Glumes and lemmas broadly obtuse; both glumes present . . . . . SCLEROCHLOA
H. Spikelets oriented sideways, the broad side facing the rachis.
I. Plants annual, the entire plant easily extracted from the soil intact; spikelets mostly with awns much longer than 2 cm or if awnless, then glumes broadly ovate and several-nerved.
Glumes broadly ovate, nerves 3-several . . . . . TRITICUM
Glumes linear-subulate, nerves 1 or rarely 3 . . . . . SECALE
I. Plants perennial, cespitose or rhizomatous, the subterranean portions difficult to extract by a simple pull on the culm; spikelets awnless or with slender awns up to 2 cm long; glumes lance-linear to linear-subulate.
J. Glumes and lemmas very strongly thick-nerved and truncate to rounded at the tip . . . . . THINOPYRUM
J. Glumes and lemmas acute or acuminate, usually tapering into cusps or awns.
K. Internodes of inflorescence mostly 1-2 mm long. . . . . AGROPYRON
K. Internodes of inflorescence more than 2 mm long.
L. Florets easily disarticulated from each other and from the persistent glumes; anthers less than 2.5 mm long; plants cespitose . . . . . ROEGNERIA
L. Florets persistent, difficult to dislodge from the rachilla and glumes; anthers more than 2.5 mm long; plants strongly rhizomatous, not cespitose.
Leaf blades becoming involute, the adaxial surface more obviously stronger nerved than the abaxial surface; lemmas glabrous to scabrous or puberulent only proximally; cartilaginous node shorter than wide . . . . . PASCOPYRUM
Leaf blades flat, the nerves about equally conspicuous on both sides; lemmas either glabrous or densely pubescent; cartilaginous node of culm as long as or longer than wide . . . . . ELYTRIGIA
B. Spikelets secund, both rows of spikelets oriented on one side of the rachis.
M. Spikes less than 1.5 cm long.
N. Spikes divaricate-spreading or even reflexed along the inflorescence axis . . . . . BOUTELOUA
N. Spikes appressed or appressed-ascending to the inflorescence axis.
Spikelets broadly obovate, scarcely longer than broad . . . . . BECKMANNIA
Spikelets lance-ovate, about twice as long as broad . . . . . ERIOCHLOA
M. Spikes more than 1.5 cm long.

O. Spikes in digitate or subdigitate clusters at the ends of the stems and branches; spikelets never orbicular or suborbicular.
P. Spikelets awned . . . . . CHLORIS
P. Spikelets awnless.
Q. Larger spikes more than 3 mm broad . . . . . ELEUSINE
Q. Spikes less than 3 mm broad.
Spikes up to 5 cm long; culms flattened; sheaths strongly keeled; ligule a ring of pilose hairs; creeping perennial . . . . . CYNODON
Spikes usually more than 5 cm long; culms terete; sheaths not keeled; ligule membranaceous; annuals . . . DIGITARIA
O. Spikes solitary or racemose along the inflorescence axis or the spikelets orbicular to suborbicular.
R. Spikelets orbicular to suborbicular, about or nearly as long as broad.
Spikelets cuneate, broadest above the middle and abruptly aristate . . . . . BECKMANNIA
Spikelets orbicular or nearly so, broadest at the middle, never aristate . . . . . PASPALUM
R. Spikelets longer than broad.
S. Each spikelet subtended by a dense tuft of pilose hairs . . . . . ERIOCHLOA
S. Spikelets without a tuft of long-pilose hairs at base (rachis and pedicels sometimes long-ciliate, but hairs never in a dense tuft).
T. Plant a dwarf perennial; leaves glabrous, up to 2 mm wide . . . . . BOUTELOUA
T. Plants cespitose annuals or coarse rhizomatous perennials; leaves glabrous or scabrous, many of them more than 2 mm wide.
U. Plant a coarse rhizomatous perennial, the unbranched culms mostly 1 m or more in height; inflorescence long-exserted; leaves harshly scabrous along the margins . . . . . SPARTINA
U. Plants cespitose or matted with branching culms, generally less than 1 m in height; inflorescence often partly included within the subtending sheath; leaves not harshly scabrous along the margins.
V. Spikelets 1-flowered.
Spikelets hispid, eglandular, often awned, more than 1.6 mm long . . . . . ECHINOCHLOA
Spikelets minutely stipitate-glandular, awnless, less than 1.6 mm long . . . . . PASPALUM
V. Spikelets 2-several flowered.
Lemmas broadly obtuse, with parallel nerves; spike scarcely exserted from the spathiform sheaths, the blades no more than 2 cm long and 3 mm wide . . . . . SCLEROCHLOA
Lemmas sharply acute, tapering to awns, the nerves converging at the tip; inflorescence becoming fully exserted, the leaf blades longer and usually wider . . . . . LEPTOCHLOA

Group 2. (mature spikelets with 2 or more fertile florets)

A. At least the 2nd glume equaling to overtopping the lowest lemma.
B. Glumes 1 cm or more long.
Plant perennial with a basal tuft of curly leaves; leaves less than 4 mm wide; panicle spike-like . . . . . DANTHONIA
Plant annual without a basal tuft of curly leaves; leaves more than 4 mm wide; panicle open, diffuse . . . . . AVENA
B. Glumes less than 1 cm long.
C. Spikelets awnless.
D. Larger leaves more than 7 mm wide . . . . . SCOLOCHLOA
D. Leaves all less than 7 mm wide.
Glumes blunt, widest near the summit; inflorescence rachis glabrous or scabrous . . . . . SPHENOPHOLIS
Glumes acute, widest near the middle; inflorescence rachis distinctly pubescent . . . . . KOELERIA
C. Spikelets awned.
E. Awns geniculate or distinctly jointed near the middle.
Awns more than 1 cm long, strongly bent near the middle . . . . . ARRHENATHERUM
Awns much less than 1 cm long, jointed near the middle . . . . . CORYNEPHORUS
E. Awns straight or flexed near the base.
F. Larger leaf blades more than 4.5 mm wide; plant velvety white-pubescent . . . . . HOLCUS
F. Leaf blades no more than 4.5 mm wide; plant not velvety white-pubescent.
G. Plant annual, up to 2.5 dm high; spikelets at the ends of stiffly spreading branches and branchlets; leaves linear-setaceous . . . . . AIRA
G. Plant a cespitose perennial, mostly more than 2.5 dm high; spikelets in spiciform to open panicles, but branches never divaricately spreading; leaves flat or becoming folded.
Leaf blades filiform; awn geniculate below the middle; lemmas scabrous . . . . . AVENELLA
Leaf blades flat; awn essentially straight throughout; lemmas glabrous . . . . . DESCHAMPSIA
A. Both glumes shorter than the lowest lemma.
H. Lemmas bifid, 2-toothed or discretely lobed at the apex, often awned from the notch or just below it.
I. Spikelets purplish, less than 1 cm long, with the nerves of the lemmas conspicuously bearded.
Plant annual; panicle contracted or less than 1 dm broad . . . . . TRIPLASIS
Plant perennial; panicle open, more than 1 dm broad . . . . . TRIDENS
I. Spikelets green, stramineous, or purplish, mostly 1 cm or more long, glabrous, scabrous, to pilose, but never conspicuously bearded along the nerves.
J. Lemmas 1-3 nerved; panicle partially included within the subtending sheath, the branches stiffly spreading-ascending . . . . . LEPTOCHLOA
J. Lemmas 3-several nerved; panicle soon fully exserted, the branches spreading or ascending.
K. Callus bearded; glumes and often the lemmas strongly suffused with purple below the summit; sheaths open. .SCHIZACHNE
K. Callus not bearded; glumes and lemmas not usually suffused with purple; sheaths closed.
Lemmas all alike, fertile, usually at least short-awned . . . . . BROMUS
Lemmas dissimilar, the upper reduced and sterile, awnless or merely mucronate . . . . . MELICA

H. Lemmas entire to more or less erose at the tip; awned or awnless.
L. Spikelets sessile to subsessile, glomerulate, the glomerules appearing secund along the spreading or contracted panicle branches ..... DACTYLIS
L. Spikelets sessile to pedicellate, but not in discrete glomerules.
M. Spikelets strongly flattened, 5-15 mm wide, with sterile lemmas below the fertile ones; leaves 1 cm or more wide ..... CHASMANTHIUM
M. Spikelets rounded to compressed and keeled, but plants not as above.
N. Lemmas keeled or if obscurely so, then with cobwebby hairs at the base, without awns or subulate tips.
Lemmas green-herbaceous, with broad scarious margins, usually with cobwebby hairs proximally, 3-7 nerved ..... POA
Lemmas scarious throughout, chartaceous, never with cobwebby hairs, 1-3 nerved ..... ERAGROSTIS
N. Lemmas rounded or becoming keeled only near the tip, never cobwebby at the base, often awned or subulate-tipped.
O. Lemmas 3-nerved, often with at least some leaves wider than 1 cm.
P. Rachilla long-villous ..... PHRAGMITES
P. Rachilla glabrous.
Lemmas abruptly narrowed into a stout, pungent mucro; usually at least some of the leaves more than 1 cm wide ..... DIARRHENA
Lemmas merely acute or weakly mucronulate; leaves less than 5 mm wide ..... ERAGROSTIS
O. Lemmas 5-several nerved, rarely with leaves wider than 1 cm.
Q. Lateral nerves of lemmas parallel, not converging at the tip; lemmas obtuse (or acute in Glyceria canadensis), awnless.
R. Margins of the sheaths united nearly to the summit ..... GLYCERIA
R. Margins of sheaths free or partially free.
Larger leaves more than 4 mm wide; proximal panicle branches lax, spreading-ascending . TORREYOCHLOA
Leaves less than 4 mm wide; proximal panicle branches becoming stiffly deflexed .....PUCCINELLIA
Q. Lateral nerves of lemmas arching, converging toward the tip where the midrib is often excurrent into a slender awn.
S. Leaves flat, the larger more than 3 mm wide.
Lemmas to 5.2 mm long; leaves not auriculate; panicle branches ultimately spreading, the spikelets relatively remote ..... FESTUCA
Larger lemmas more than 5.2 mm long; leaves auriculate; panicle branches ascending to appressed, the spikelets close ..... SCHEDONORUS
S. Leaves filiform, less than 3 mm wide.
Plants annual; anthers usually one ..... VULPIA
Plants perennial; anthers usually 3 ..... FESTUCA

Group 3. (spikelets with only 1 fertile floret)

A. Spikelets falling entire or in groups, the glumes deciduous with the floret. (This feature can be tested in less-than-mature material by attempting to remove the floret without detaching the glumes from the pedicel or from the rachis in sessile spikelets--this is extremely difficult in plants that take this lead.)
B. Fertile spikelets sessile or subsessile (short-pedicellate in Alopecurus and Zoysia) in loose to dense spikes or racemes or if in pairs, then one of the spikelets sessile.
C. Inflorescence a solitary, terminal, densely compact spiciform panicle.
D. Spikelets subtended and much exceeded by slender bristles.
Bristle fascicle falling with the narrowly lanceolate spikelets ..... PENNISETUM
Bristles persistent on the rachis after the falling of the obovoid spikelets ..... SETARIA
D. Spikelets without subtending bristles.
First glume absent; ligule a series of hairs ..... ZOYSIA
First glume present, similar to the 2nd glume; ligule membranaceous ..... ALOPECURUS
C. Inflorescence of 1-several racemes, in axillary or terminal clusters.
E. Inflorescence rachis continuous, not disarticulating.
Inflorescence plumose, the spikelets concealed by silky pubescence ..... MISCANTHUS
Inflorescence not plumose, the spikelets without silky pubescence, though often coarsely hispid or muricate ECHINOCHLOA
E. Inflorescence rachis jointed, disarticulating, the spikelets 2-3 at each joint.
F. Plant annual; leaf blades less than 1 dm long ..... MICROSTEGIUM
F. Plant perennial; leaf blades more than 1 dm long.
G. Inflorescence a compact erect panicle more than 20 cm long; spikelets all perfect, similar, in pairs along the rachis ..... SACCHARUM
G. Inflorescence of relatively distinct or separated racemes, no unit as long as 20 cm; spikelets dissimilar, with one perfect and sessile, the other one mostly rudimentary or obsolete on the pedicel.
H. Flowering racemes solitary at the ends of peduncles ..... SCHIZACHYRIUM
H. Flowering racemes 2-several per peduncle.
Culms with a distinctive groove on one side; flowering culms unbranched, the inflorescence a terminal raceme ..... BOTHRIOCHLOA
Culms without a groove on one side; flowering culms branched, the inflorescence loosely digitateANDROPOGON
B. Spikelets not in spikes or racemes, all or nearly all at least appearing pedicellate.
I. At least some spikelets usually geniculate-awned or if not, then the spikelets 2 per node, with one perfect and sessile, the other reduced, staminate, and pedicellate.
Leaves up to 1 cm wide; spikelets lanceolate, the larger more than 5 mm long .....SORGHASTRUM
Leaves well over 1 cm wide; spikelets broadly elliptic to ovoid, plump, usually no more than 5 mm long .....SORGHUM
I. Spikelets never geniculate-awned (lemmas often with a short, recurved, hook-like awn in Holcus).
J. Spikelets spherical to ovoid or obovoid, terete or dorsally compressed.

K. Panicle open, diffuse, often with a reddish cast; fertile lemma cartilaginous, becoming dark-brown to blackish, the margins hyaline; spikelets elliptic, acuminate, 2.5-3 mm long on scabrous pedicels 1-8 cm long . . . . . LEPTOLOMA
K. Panicle usually green or greenish, diffuse or not; fertile lemma indurated, without a hyaline margin, not becoming dark; spikelets various.
L. Perennials without rhizomes, with a vernal and autumnal flowering phase, the vernal phase unbranched and the culms emerging from a winter rosette of mostly ovate leaves, the autumnal phase with smaller panicles borne among numerous secondary branches. . . . . DICHANTHELIUM
L. Annuals or perennials from rhizomes or stout caudices, the panicles emerging only once, after the middle of July.
Panicle branches secund, the spikelet pedicels nearly all less than 1 mm long . . . . . COLEATAENIA
Panicle branches not secund, many of the pedicels more than 1 mm long . . . . . PANICUM
J. Spikelets linear-lanceolate to lanceolate, oblong or ovate, strongly laterally compressed.
M. Leaves less than 5 mm wide; glumes dissimilar, the second dilated and enlarged distally, widest above the middle; lemmas awnless or rarely with a short straight awn just below the tip . . . . . SPHENOPHOLIS
M. Leaves more than 5 mm wide; glumes similar, the second not enlarged or dilated distally, widest below the middle; lemmas awned or awnless.
Foliage and stems velvety-pubescent throughout; spikelets ovate . . . . . HOLCUS
Foliage and stems glabrous or merely scabrous; spikelets narrowly lanceolate . . . . . CINNA

A. Spikelets disarticulating above the glumes, leaving usually 2 empty, often small, hulls at the ends of the pedicels. (In plants that are found under this lead, the florets normally can be easily teased apart from the glumes without detaching the glumes from the pedicel.)
N. Lemma awned or aristate from at or near the tip (awns soon deciduous in Oryzopsis and Piptatherum, the lemmas strongly cartilaginous-indurated).
O. Lemmas terminating in 3 aristate processes, at least one developing into a manifest awn . . . . . ARISTIDA
O. Lemmas with only a single awn.
P. Lemmas less than 9 mm long.
Q. Lemma strongly indurated; glumes wide, obtuse to acuminate, rounded dorsally.
Abaxial leaf surfaces minutely but densely and evenly cinereous-pubescent . . . . . ORYZOPSIS
Abaxial leaf surfaces either puberulent and pilose or few-nerved and papillose . . . . . PIPTATHERUM
Q. Lemma membranaceous to subindurate at maturity; glumes linear-attenuate to awned, compressed-keeled or rounded dorsally.
Awn at the tip of the lemma, the lemmas conspicuously 3-nerved; plants perennial . . . . . MUHLENBERGIA
Awn originating from the dorsal surface of the nerveless lemma, just below the tip; plant annual . . . . . APERA
P. Larger lemmas 9 mm or more long.
R. Awns straight; glumes less than 5 mm long . . . . . BRACHYELYTRUM
R. Awns with a strong spiral twist below the middle; larger glumes longer than 5 mm.
S. Glumes more than 1.5 cm long; awns commonly more than 8 cm long . . . . . HESPEROSTIPA
S. Glumes less than 1.5 cm long; awns less than 8 cm long.
Lemmas glabrous, usually with a tuft of hairs distally, the larger more than 7 mm long . . . . . PIPTOCHAETIUM
Lemmas appressed-pubescent throughout, less than 7 mm long . . . . . NASSELLA
N. Lemma awnless or awned from near or below the middle, rarely indurated.
T. Spikelets 1 cm or more long.
Panicles spike-like, the spikelets not plumose . . . . . AMMOPHILA
Panicles becoming open, the spikelets heavily plumose . . . . . PHRAGMITES
T. Spikelets less than 1 cm long.
U. Spikelets sessile or subsessile on pedicels no more than 1 mm long, appressed in dense, stiff, spike-like inflorescences; leaves up to 10 mm wide.
V. Plants prostrate, decumbent; spikes mostly less than 2.5 cm long, the base included in the subtending sheath . . . . . CRYPSIS
V. Plants erect; spikes generally more than 2.5 cm long, exserted.
Spikelets less than 5 mm long, strongly flattened; lemmas awnless; spikes green; inodorous . . . . . PHLEUM
Spikelets more than 5 mm long, subterete; lemmas awned; spikes becoming brownish; fragrant . . . . . ANTHOXANTHUM
U. Spikelets all or nearly all manifestly pedicellate in dense to more or less open inflorescences; leaf width various.
W. Lemmas bearded at the base, the callus with a tuft of appressed-ascending hairs.
X. Awn conspicuous, exserted more than 1 cm beyond the glumes . . . . . ARRHENATHERUM
X. Awns absent or only weakly exserted.
Y. Larger leaves more than 1 cm wide . . . . . PHALARIS
Y. Leaves less than 1 cm wide.
Z. Callus hairs much less than ½ the length of the spikelet . . . . . MUHLENBERGIA
Z. Callus hairs ½ or more as long as the spikelet.
At least the proximal sheaths closely soft-puberulent . . . . . CALAMOVILFA
Sheaths all glabrous or scabrous . . . . . CALAMAGROSTIS
W. Lemmas without a basal tuft of hairs.
aa. Larger leaves more than 1 cm wide.
Panicle open, diffuse; spikelets dorsally compressed; glumes obtuse to acute . . . . . MILIUM
Panicle open only during anthesis, otherwise with the branches ascending to appressed; spikelets laterally compressed, crowded; glumes acute, pungent-tipped . . . . . PHALARIS
aa. Leaves all less than 1 cm wide.
bb. Spikelets about 5 or 6 mm long and fully as broad, with sterile lemmas below the fertile lemmas; glumes subequal . . . . . HIEROCHLOË
bb. Spikelets less than 5 mm long or much longer than broad, without sterile lemmas below the fertile lemmas; glumes various.
cc. Lemmas nerveless or with only a midnerve . . . . . SPOROBOLUS
cc. Lemmas conspicuously 3-5 nerved.

Lemmas 3-nerved, awned, the glumes usually unequal, at least one usually shorter than the lemma . . . . . MUHLENBERGIA
Lemmas mostly 5-nerved, awnless, the glumes subequal and equaling or exceeding the lemma . . . AGROSTIS

PODOPHYLLUM peltatum

POGONIA ophioglossoides

POLANISIA
1. Petals less than 8 mm long; longest stamens less than 12 mm long . . . . . **Polanisia dodecandra**
1. Petals 8 mm or more long; longest stamens more than 12 mm long . . . . . *Polanisia dodecandra trachysperma*

POLEMONIACEAE
A. Leaves deeply divided or compound.
Leaves pinnatifid, the ultimate leaf divisions filiform; corollas deep-red externally . . . . . IPOMOPSIS
Leaves pinnately compound, the leaflets lanceolate or ovate; corollas blue . . . . . POLEMONIUM
A. Leaves simple, entire.
Leaves alternate; corollas less than 1 cm across; annual . . . . . COLLOMIA
Principal stem leaves opposite; corollas more than 1 cm across; perennial . . . . . PHLOX

POLEMONIUM reptans

POLYGALA
1. Many or all of the leaves whorled, 3 or more per node; annual.
2. Racemes more than 6 mm broad; larger leaves more than 3 mm wide . . . . . **Polygala cruciata aquilonia**
2. Racemes less than 6 mm broad; leaves no more than 3 mm wide.
Distal leaves mostly alternate or scattered, the proximal mostly in whorls of 2-4 . . . . . **Polygala verticillata ambigua**
Distal leaves mostly in whorls of 3-5 . . . . . **Polygala verticillata isocycla**
1. Leaves all alternate or the proximal sometimes opposite; annual or perennial.
3. Stems annual, solitary from a slender taproot; flowers tinged with pink or purple, densely spicate.
Leaves minute, linear-subulate, mostly deciduous by flowering time; petals fused into a slender tube . . . . . **Polygala incarnata**
Leaves linear, linear-oblong, or narrowly lanceolate, persistent during anthesis; petals not fused into a slender tube **Polygala sanguinea**
3. Stems several to numerous from a biennial or perennial root or caudex; flowers white and spicate or roseate and loosely racemose.
4. Flowers usually roseate, in loose racemes, at least the proximal pedicels 1 mm or more long . . . . . **Polygala polygama obtusata**
4. Flowers white, in dense spiciform racemes, sessile or subsessile on pedicels less than 1 mm long.
Leaves oblong to lance-ovate, more than 3 times as long as wide, obtuse to acute, less than 1.5 cm wide . . . . . **Polygala senega**
Middle and distal leaves ovate, less than 3 times as long as wide, quickly acuminate at both ends, more than 1.5 cm wide . . . . . **Polygala senega latifolia**

POLYGALACEAE
A. Flowering branches decumbent or ascending; leaves dimorphic, the proximal small and scale-like, the distal broad and foliaceous with ovate-rhombic to elliptic blades; flowers 11 mm or more long . . . . . POLYGALOIDES
A. Flowering branches erect; leaves all similar; flowers less than 11 mm long . . . . . POLYGALA

POLYGALOIDES paucifolia

POLYGONACEAE
A. Stamens 9; leaves linear-oblong and densely pannose-tomentose abaxially . . . . . ERIOGONUM
A. Stamens (except in Rheum) fewer than 9; leaves linear to ovate, but never pannose-tomentose.
B. Leaves filiform, soon deciduous; flowers racemose, the pedicels solitary from scale-like ocreolae; annual . . . . . POLYGONELLA
B. Leaves not filiform, usually persistent; flowers racemose or not, often not solitary; usually perennial.
C. Tepals 6, the inner three much enlarged and valve-like in fruit . . . . . RUMEX
C. Tepals usually fewer than 6, all in a single series, never much enlarged and valve-like.
D. Stems with stout, cartilaginous, broadly based, retrorse prickles.
Leaves tapered at the base; racemes more than 2 cm long . . . . . PERSICARIA
Leaves hastate or sagittate at the base; racemes mostly less than 2 cm long . . . . . TRACAULON
D. Stems smooth, variously pubescent, coarsely hispid or with retrorse bristles only.
E. All or nearly all of the leaves petiolate, broadly ovate to deltate, cordate to subtruncate at the base.
F. Shrubs or coarse perennials with stems more than 5 mm in diameter . . . . . REYNOUTRIA
F. Annuals or perennials with stems less than 5 mm in diameter.
Plants erect smooth annuals; flowers in small corymbulose racemes . . . . . FAGOPYRUM
Plants either suffruticose and thicket-forming or sprawling, trailing, or twining, variously pubescent or glabrous; flowers in continuous or interrupted elongate racemes or panicles . . . . . FALLOPIA
E. Leaves tapering to sessile or petiolate bases or if some cordate, then these usually confined to the proximal nodes or base of the plant.
G. Achenes 3-winged, becoming more than twice as long as the perianth; stamens 9; basal leaves very large and wide, with fleshy petioles . . . . . RHEUM

G. Achenes lenticular to trigonous, but not winged, less than twice as long as the perianth; stamens fewer than 9; basal leaves absent or not as above.
H. Flowers fasciculate, 1-4 in the axils of leaf-like bracts; leaves and bracts jointed at the base . . . . . POLYGONUM
H. Flowers in loose to dense terminal spikes, without foliaceous bracts subtending fascicles; leaves not jointed at the base.
Tepals 4, the flowers remote along the slender inflorescence axis; achenes beaked by the persistent, indurated, hooked style. . . . . ANTENORON
Tepals 5, the flowers remote or aggregated; achenes not beaked with an indurated and hooked style PERSICARIA

POLYGONATUM
1. Leaves puberulent abaxially . . . . . **Polygonatum pubescens**
1. Leaves glabrous abaxially . . . . . **Polygonatum biflorum**

POLYGONELLA articulata

POLYGONUM
1. Plants stiffly erect, with ascending branches, the leaves linear to narrowly elliptic, nearly all more than 4 times as long as wide.
2. Stems 4-angled; leaves subulate.
Leaf blades pleated, with a strong vein on either side of the midrib, the margins scabrous . . . . . .**Polygonum tenue**
Leaf blades not pleated, without notable lateral veins, the margins smooth . . . . . **Polygonum sawatchense**
2. Stems not 4-angled; leaves not subulate.
Principal leaves narrowly lanceolate to lance-elliptic, long-acute, the plant heterophyllous; mature pedicels mostly more than 2 mm long . . . . . **Polygonum ramosissimum**
Leaves linear-spatulate, obtuse, the plant homophyllous; mature pedicels to 2 mm long . . . . . *Polygonum prolificum*
1. Plants prostrate to decumbent, the principal leaves rarely 4 times as long as wide.
3. Outer sepals not or only scarcely cucullate, about equaling the inner 2.
Plants with leaves not or only gradually reduced on the flowering branchlets; perianth divided to about the middle . . . . . *Polygonum arenastrum*
Plants with much reduced leaves on the flowering branchlets; perianth divided to well below the middle . . . . . *Polygonum aviculare*
3. Outer sepals strongly keeled and cucullate, distinctly surpassing the inner ones.
4. Leaves broadly rounded at the tip, less than 3 times as long as wide; outer sepals separate for less than ½ their length; achenes papillose in a random pattern . . . . . **Polygonum achoreum**
4. Leaves attenuate to an acute or obtuse tip, many more than 3 times as long as wide; outer sepals separate for more than ½ their length; achenes with the papillae in lines.
Principal leaves distinctly larger than the bracts, the larger more than 2.5 cm long . . . . . **Polygonum erectum**
Leaves all more or less similar in size, the bracteal ones not notably smaller than the others, to about 2.5 cm long . . . . . **Polygonum buxiforme**

POLYMNIA canadensis

POLYPODIACEAE: One genus in our area . . . . . POLYPODIUM

POLYPODIUM virginianum

POLYSTICHUM acrostichoides

POLYTAENIA nuttallii

PONTEDERIA cordata

PONTEDERIACEAE
A. Plant floating on inflated float-like petioles . . . . . EICHHORNIA
A. Plants not floating on inflated petioles.
Leaves lanceolate to ovate, subcordate to cordate, much more than 1 cm wide; flowers blue-violet, clustered, irregular; stamens 6; fruit one-seeded . . . . . PONTEDERIA
Leaves linear, less than 1 cm wide; flowers yellow, solitary, regular; stamens 3; fruit many-seeded . . . . . HETERANTHERA

POPULUS
1. Leaves either coarsely 3-5 lobed or with fewer than 12 coarse teeth on a side, smooth to permanently white or whitish lanate-tomentose abaxially; terminal buds dull to whitish-pubescent.
2. Leaves of principal shoots deeply 3-5 lobed, permanently and densely tomentose abaxially . . . . . *Populus alba*
2. Leaves coarsely toothed to repand or sinuate-dentate, but not deeply lobed, glabrous to densely tomentose abaxially.
Leaves weakly lobed and/or sinuate-dentate with mostly fewer than 6 coarse teeth on a side, at least the terminal ones persistently white-tomentose abaxially . . . . . *Populus canescens*
Leaves all unlobed, with mostly 6-10 marginal teeth on a side, becoming glabrous or glabrescent . . . . . .**Populus grandidentata**
1. Leaves unlobed, most of them with more than 12 teeth on a side, the abaxial surfaces of mature leaves glabrous to sparingly tomentose; terminal buds usually glabrous or glabrate.
3. Petioles distinctly compressed, particularly beyond the middle; leaf blades less than 1.3 times as long as wide and not silvery or coppery abaxially.

4. Buds dull or shiny but not sticky-viscid, up to 10 mm long; leaves up to 8 cm long, green to the margin, the teeth not callus-tipped; bark of older trunks remaining smooth or smoothish.
   Leaf blades abruptly short-acuminate, many with more than 15 teeth on a side; buds shiny . . . . . **Populus tremuloides**
   Leaf blades acute, rarely with more than 15 teeth on a side; buds dull-tomentose . . . . . **Populus ×smithii**
4. Buds sticky-viscid, the terminal buds often more than 10 mm long; leaves frequently more than 8 cm long, with narrow but distinct hyaline margins (under 10× magnification), the teeth callus-tipped; bark of older trunks becoming deeply furrowed.
   Leaf blades often glandular at the summit of the petioles, normally about as wide as long, the bases various but often widely cordate, the margins typically densely ciliate; stigmas 3 or 4; stamens more than 40 . . . . . **Populus deltoides**
   Leaf blades never glandular at the summit of the petioles, typically wider than long, the bases widely cuneate to subtruncate, the margins glabrous; stigmas 2; stamens fewer than 40 . . . . . *Populus nigra* '*Italica*'

3. Petioles nearly or quite terete, the same shape throughout, often channeled adaxially; leaf blades either more than 1.3 times as long as wide or silvery or coppery-colored abaxially.
5. Leaves permanently tomentose abaxially, at least along the veins.
   Leaves acute . . . . . **Populus tremuloides**
   Leaves obtuse . . . . . **Populus heterophylla**
5. Leaves distinctly silvery or coppery-lustrous abaxially, glabrous or with a few stiff hairs along the major veins abaxially.
6. Petioles pubescent; abaxial leaf surfaces silvery and pubescent . . . . . *Populus ×gileadensis*
6. Petioles glabrous or minutely puberulent; abaxial leaf surfaces coppery, glabrous or puberulent along the principal veins.
   Leaves prevailingly cordate at the base, less than 1.3 times as long as wide . . . . . **Populus ×jackii**
   Leaves round-cuneate to weakly subcordate at the base, many of them more than 1.3 times as long as wide . . . . . **Populus balsamifera**

PORTULACA

1. Petals less than 5 mm long; leaf blades spatulate, flat . . . . . *Portulaca oleracea*
1. Petals more than 5 mm long; leaf blades linear, terete or nearly subterete.
   Petals less than 10 mm long; seeds less than 0.7 mm in diameter . . . . . *Portulaca pilosa*
   Petals more than 10 mm long; seeds more than 0.7 mm in diameter . . . . . *Portulaca grandiflora*

PORTULACACEAE

A. Plants scapose or subscapose; leaves all basal or nearly so . . . . . PHEMERANTHUS
A. Plants caulescent; leaves cauline, opposite.
   Leaves 2, more than 3 cm long; flowers white and pink; plant an ephemeral perennial . . . . . CLAYTONIA
   Leaves more than 2, less than 3 cm long; flowers variously hued; plant an annual . . . . . PORTULACA

POTAMOGETON

1. All leaves linear to linear-lanceolate, mostly 2-6 mm wide and more than 5 cm long, distinctly 2-ranked, with usually more than 20 fine lateral nerves.
   Leaves stiffly and strongly 2-ranked, more or less auriculate at the base, minutely spinulose-serrulate beyond the middle, attenuate at the tip; stems terete, straight, much narrower than the leaves; stipules with prominent white veins, adnate to the leaf base .**Potamogeton robbinsii**
   Leaves lax, loosely 2-ranked, straight to the base, entire throughout, abruptly acute; stems distinctly flattened, often nearly as wide as the leaves, often geniculate; stipules scarious, free . . . . . **Potamogeton zosteriformis**
1. Plants without the above combination of characters or, if similar, then leaves ribbon-like and with less than 20 lateral nerves.
2. Submersed leaves less than 4.5 mm wide.
3. Plants in fruit with dimorphic leaves, the submersed ones linear and eglandular, the floating leaves lance-ovate to ovate and up to 1 cm wide.
4. Stipules free; fruit compressed-flattened, usually sharply keeled on the back but not cristate-denticulate, without lateral keels; fruits in interrupted terminal spikes of floating leaves . . . . . **Potamogeton vaseyi**
4. Stipules of many leaves adnate to the leaf bases; fruit flat-concave on the side, with both marginal and lateral, often denticulate, crests; fruits often in globose spikes in the axils of submersed leaves, as well as in cylindrical spikes in the axils of floating leaves.
   Globose submersed spikes subsessile or on peduncles to 4 mm long; submersed leaves obtuse to acute, the floating leaves obtuse . . . . . **Potamogeton diversifolius**
   Globose submersed spikes on curving peduncles, often more than 4 mm long; submersed leaves narrowly acute to bristle-tipped, the floating leaves acute . . . . . **Potamogeton bicupulatus**
3. Plants in fruit with leaves all linear, submersed, with or without a pair of glands near the base.
5. Peduncles less than 1 cm long; leaves usually eglandular; spikes less than 5 mm long . . . . . **Potamogeton foliosus**
5. Longer peduncles more than 1 cm long; leaves often with a pair of glands at the base; spikes usually more than 5 mm long.
6. Stipules membranaceous, scarious or brownish, often deciduous.
   Midnerve of leaves simple, without a distinct border; leaves rarely more than 1.2 mm wide; stipules united below the middle . . . . . **Potamogeton pusillus**
   Midnerve of leaves flanked by rows of elongate cells, creating the appearance of an exaggerated midrib; leaves often more than 1.2 mm wide; stipules with margins free to the base . . . . . **Potamogeton berchtoldii**
6. Stipules firm, fibrous, soon disintegrating into white fibrillose shreds.
   Leaves flat, obtuse, cuspidate, with 5 to 7 nerves . . . . . **Potamogeton friesii**
   Leaves mostly with revolute margins, acute to attenuate, with 1 to 3 or rarely 5 nerves . . . . . **Potamogeton strictifolius**
2. Submersed leaves more than 4.5 mm wide.
7. Leaves all submersed, 0.5-4 cm wide, widest near the broadly rounded to clasping base; floating leaves absent; peduncles typically clavate.

8. Stipules scarious, not or only tardily disintegrating; leaves often more than 10 cm long and 2 cm wide, broadly rounded or but slightly clasping at the base, the tips broadly obtuse and often minutely split at the very tip when pressed; larger fruit bodies more than 3.5 mm long; stems often hidden on closely crowded terminal shoots by the stipules, which overlap the ones above . . . . . **Potamogeton praelongus**
8. Stipules absent or early disintegrating into coarse white fibers; leaves less than 10 cm long and 2 cm wide, cordate-clasping at the base, acute and entire at the tip; fruit bodies all less than 3.5 mm long; stems not at all hidden by any remnants of the stipules.
Leaves strongly cordate-clasping, tapering to a narrowly acute tip . . . . . **Potamogeton richardsonii**
Leaves broadly rounded to half-clasping, many of them short-acuminate . . . . . **Potamogeton ×hagstroemii**

7. Leaves submersed or floating, linear to broadly ovate, but never broadly rounded to clasping or if only slightly so, then floating leaves present.
9. Submersed leaves 2-ranked, narrowly linear with parallel margins, ribbon-like, up to 10 mm wide; midveins of submersed leaves paralleled by conspicuous bands often 1 mm or more wide, commonly ¼ or more the width of the blade **Potamogeton epihydrus**
9. Submersed leaves not 2-ranked, with curved margins, occasionally more than 10 mm wide; midveins of submersed leaves usually less than 1 mm wide and notably less than ¼ the width of the blade.
10. Stems, petioles, and peduncles conspicuously dark-spotted; floating leaves broadly ovate and cordate, mostly 3 cm or more wide . . . . . **Potamogeton pulcher**
10. Stems, petioles, and peduncles not dark-spotted; floating leaves various or absent.
11. Floating and upper submersed leaves large, often more than 5 cm wide, broadly elliptic to ovate, with 27 or more nerves, the submersed ones often conspicuously falcate-folded; fruits 4 mm or more long, including the beaks; stipules mostly more than 4 cm long. . . . . **Potamogeton amplifolius**
11. Floating and upper leaves mostly less than 3 cm wide, never more than 5 cm wide, elliptic to ovate, with fewer than 27 nerves, falcate-folded or not; fruits to 4 mm long; stipules more or less than 4 cm long.
12. Leaves all submersed, ribbon-like, parallel-sided, conspicuously serrulate-crisped, sessile, very broadly rounded at the tip; floating leaves absent . . . . . *Potamogeton crispus*
12. Submersed leaves entire to subrepand or undulate, but never serrulate-crisped, sessile or narrowed to petiolar bases, mostly tapering at the tip; floating leaves often present.
13. Submersed leaves absent at flowering time or narrowed to petioles 1.5 cm or more long.
14. Floating leaf blades auriculate-subcordate at the base . . . . . **Potamogeton natans**
14. Floating leaf blades tapered or rounded at the base.
Larger submersed leaves 5 mm or more wide . . . . . **Potamogeton nodosus**
Submersed leaves absent or much less than 5 mm wide . . . . . **Potamogeton oakesianus**
13. Submersed leaves sessile or occasionally the upper leaves tapering to petioles up to 4 cm long.
15. Many stipules more than 3.5 cm long; stems simple or occasionally once-branched; larger submersed leaves wider than 1.5 cm; fruits mostly 3-4 mm long . . . . . **Potamogeton illinoensis**
15. Stipules up to 3.5 cm long; stems commonly branched; submersed leaves less than 1.5 cm wide; fruits less than 3 mm long.
Stipules of submersed leaves present and well developed; submersed leaves acuminate to a subulate tip . . . . . **Potamogeton gramineus**
Stipules of submersed leaves absent or poorly developed; submersed leaves acute, without a subulate tip . . . . . **Potamogeton ×rectifolius**

POTENTILLA

1. Leaves all trifoliolate or the terminal lobe rarely 3-cleft.
Stems spreading-hirsute proximally; stamens 20; achenes strongly rugose . . . . . **Potentilla norvegica**
Stems softly pubescent proximally; stamens 5 or 10; achenes smooth . . . . . *Potentilla rivalis*
1. At least the proximal leaflets more than 3.
2. Cauline leaves pinnately compound . . . . . **Potentilla bipinnatifida**
2. Cauline leaves palmately compound (rarely the lowest leaves subpinnate in Potentilla rivalis).
3. Leaves bicolored, green adaxially, white or silvery abaxially.
Leaves revolute-margined, densely and closely white-pannose abaxially, dark-green adaxially; distal stems and peduncles tightly tomentose . . . . . *Potentilla argentea*
Leaves not revolute, densely silvery-sericeous with appressed hairs abaxially, yellowish-green adaxially; stems villous . . . . . **Potentilla simplex argyrisma**
3. Leaves not notably bicolored, green or greenish on both sides.
4. Flowers solitary on long peduncles from the leaf axils of trailing or ascending stems; leaflets 5.
5. Most leaflets entire below the middle, all along the straight-cuneate margin . . . . . **Potentilla canadensis**
5. Most leaflets with teeth along the margin well below the middle.
Leaflets less than 3 cm long, glabrous or with a few appressed hairs along the veins abaxially; stems glabrous or glabrate . . . . . *Potentilla reptans*
Larger leaflets mostly more than 3 cm long, manifestly pubescent; stems pubescent . . . . . **Potentilla simplex**
4. Flowers few to numerous in a terminal compound cyme or dichasium; plants erect; leaflets usually 7.
6. Leaflets less than 15 mm long . . . . . *Potentilla tabernaemontani*
6. Larger leaflets more than 15 mm long.
7. Leaves rarely with more than 5 leaflets, the proximal subpinnate . . . . . *Potentilla rivalis*
7. Leaves with 5 to 7 leaflets, all digitate.
Calyx lobes 3-5 mm long; petals up to 6 mm long; leaves thinly canescent-tomentose abaxially, as well as hirsute; achenes smooth . . . . . *Potentilla inclinata*
Calyx lobes 5 mm or more long; petals usually about 10 mm long; leaves thinly hirsute abaxially; achenes deeply rugose . . . . . *Potentilla recta*

POTERIUM *sanguisorba polygamum*

PRENANTHES

1. Involucres glabrous.
   - Heads more than 6-flowered; principal phyllaries 7 or more . . . . . **Prenanthes alba**
   - Heads mostly 5-flowered, rarely with as many as 6 flowers; principal phyllaries fewer than 7 . . . . . **Prenanthes altissima**
1. Involucres coarsely pubescent.
   2. Stem leaves petiolate; heads with more than 20 flowers, in paniculiform arrays . . . . . **Prenanthes crepidinea**
   2. Stem leaves sessile; heads with fewer than 20 flowers, in racemiform arrays.
      - Stems and leaves glabrous below the inflorescence; flowers pinkish to lavender . . . . . **Prenanthes racemosa**
      - Stems and leaves pubescent or scabrous nearly or quite throughout; flowers creamy . . . . . **Prenanthes aspera**

PRIMULACEAE

A. Leaves less than 2 cm long; whorls of bracts subtending umbels leaf-like; plants less than 10 cm tall; annual . . . . . ANDROSACE
A. Leaves much longer than 2 cm; whorls of bracts subtending umbels minute and not at all leaf-like; plants more than 10 cm tall; perennial . . . . . DODECATHEON

PROBOSCIDEA *louisiana*

PROSERPINACA palustris

PRUNELLA

1. Plants prostrate or decumbent, usually rooting at the nodes and often forming vegetative mats; leaves oval to broadly ovate or oblong-ovate, usually rounded at the base, nearly all less than twice as long as wide . . . . . *Prunella vulgaris*
1. Plants erect, never rooting at the nodes; middle and distal leaves oblong-lanceolate to lance-ovate, usually cuneate at the base, more than twice as long as wide . . . . . **Prunella vulgaris lanceolata**

PRUNUS

1. Flowers and fruits mostly more than 20, in elongate, ebracteate racemes; petioles slender, to 1 mm wide.
   2. Leaves lanceolate to oblanceolate or a few sometimes ovate, mostly twice as long as wide or longer, the teeth appressed or incurved, tipped by obtuse glands; calyx lobes narrow, acute, entire or ambiguously glandular, persistent on the black fruit; tree . . . . . **Prunus serotina**
   2. Leaves broadly ovate to obovate, less than twice as long as wide, the teeth sharp, eglandular, not incurved; calyx lobes broad, obtuse, conspicuously glandular, deciduous after flowering, not remaining with the dark-red or purple fruit; shrub or tree.
      - Petals less than 5 mm long; hypanthium glabrous within; stone smooth; shrub . . . . . **Prunus virginiana**
      - Petals more than 5 mm long; hypanthium pubescent within; stone sculptured; tree . . . . . *Prunus padus*
1. Flowers one to several or fewer than 20, sessile or in umbelliform or corymbiform clusters, or if racemose, then the flowers and fruits bracteate; petioles various.
   3. Flowers and fruits sessile or nearly so, or short-pedicellate and doubled; petals white to pink or rose-colored.
      4. Year-old twigs and abaxial leaf surfaces pubescent to tomentose . . . . . *Prunus tomentosa*
      4. Year-old twigs and abaxial leaf surfaces glabrous or glabrate.
         5. Flowers bright-pink or rose-colored; fruits densely tomentulose, more than 3 cm long . . . . . *Prunus persica*
         5. Flowers white or pink; fruit glabrous or if pubescent, then less than 3 cm long.
            - Petals many more than 5, doubled; fruits scarlet, less than 2 cm long . . . . . *Prunus triloba*
            - Petals five; fruits yellowish with a reddish cheek, more than 2 cm long . . . . . *Prunus armeniaca*
   3. Flowers and fruits distinctly pedicellate; flowers white or rarely pale-pink.
      6. Flowers and fruits in short, leafy-bracted corymbiform racemes; leaves subtruncate to subcordate, crenulate, roundish, and short-acuminate, about l to l.5 times as long as wide; young twigs minutely but densely white-puberulent . . . . . *Prunus mahaleb*
      6. Plants without the above combination of characters.
         7. Plants in flower.
            8. Sepals pubescent, at least on the adaxial surface near the base.
               9. Sepals entire, not glandular-serrate, or with a few slender teeth at the tip.
                  - Flowers up to 1.2 cm across; petals to 6 mm long; longer pedicels to l cm long . . . . . *Prunus angustifolia*
                  - Flowers more than 1.2 cm across; petals more than 6 mm long; longer pedicels usually more than 1 cm long . . . . . **Prunus americana**
               9. Sepals glandular or serrate their entire length.
                  10. Sepals up to 3 mm long; petals up to 7 mm long . . . . . *Prunus hortulana*
                  10. Sepals often more than 3 mm long; petals more than 7 mm long.
                     - Flowers in fascicles of 1-2. . . . . *Prunus domestica*
                     - Flowers nearly all in fascicles of 3-5 . . . . . **Prunus nigra**
            8. Sepals glabrous throughout or sparsely pilose along the margins.
               11. Fully open flowers more than 2 cm across.
                  12. Sepals entire or nearly so.
                     - Sepals acute to acuminate . . . . . *Prunus sargentii*
                     - Sepals obtuse . . . . . *Prunus avium*
                  12. Sepals decidedly serrate or spinulose-margined.
                     - Teeth of leaves low and gland-tipped, the gland nearly in the sinus . . . . . *Prunus cerasus*
                     - Teeth of leaves sharply and abruptly acuminate, the gland well removed from the sinus . . . . . *Prunus cerasifera*
               11. Flowers less than 2 cm across.
                  13. Pedicels mostly more than 1 cm long; leaves finely serrulate throughout, mostly widest at or below the middle . . . . .

. . . . . **Prunus pensylvanica**
13. Pedicels nearly all less than 1 cm long, rarely up to 1.2 cm long; leaves entire below the middle for about ⅓ their length, widest beyond the middle.
14. First-year twigs finely puberulent . . . . . **Prunus pumila susquehanae**
14. First-year twigs glabrous.
Plants of the dune and strand area near Lake Michigan . . . . . **Prunus pumila**
Plants remote from Lake Michigan . . . . . **Prunus pumila besseyi**
7. Plants in fruit and with mature leaves.
15. Leaves completely glabrous, the teeth much reduced or absent below the middle, narrowly oblanceolate to obovate, clearly widest beyond the middle.
16. First-year twigs finely puberulent . . . . . **Prunus pumila susquehanae**
16. First-year twigs glabrous.
Leaves narrowly oblanceolate, acuminate from near the middle, at least 3 times as long as wide . . . . . **Prunus pumila**
Leaves elliptic-ovate to obovate, less than 3 times as long as wide when mature . . . . . **Prunus pumila besseyi**
15. Plants not as above.
17. Leaves finely serrulate to crenulate, mostly widest below the middle, usually more than twice as long as wide, the teeth always much less than l mm long.
18. Mature leaves up to 2.5 cm wide, many of them conspicuously conduplicate; thicket-forming, often thorny shrub less than 5 m high . . . . . *Prunus angustifolia*
18. At least the larger leaves more than 2.5 cm wide, mostly flat; shrubs or trees often more than 5 m high.
Petiole glabrous throughout; middle portion of the leaf blades with more than 11 teeth per cm . . . . . **Prunus pensylvanica**
Petiole puberulent adaxially; middle portion of the leaf blades with fewer than 11 teeth per cm . *Prunus hortulana*
17. Leaves coarsely serrate, typically widest at or beyond the middle, mostly less than twice as long as wide, the margins usually coarsely cut with teeth 1 mm or more long.
19. Teeth abruptly acuminate into an eglandular, more or less spinulose tip.
Leaves glabrate abaxially, many of the teeth abruptly short-aristate . . . . . *Prunus sargentii*
Leaves pubescent abaxially, at least along the veins, the teeth sharply short-acuminate . . . . . **Prunus americana**
19. Teeth blunt or merely acute, sometimes bearing a gland at or near the tip.
20. Fruit a cherry, the stone subglobose; glands on the leaf teeth persistent.
Larger leaves more than 8.5 cm long; petioles often more than 2 cm long, with conspicuous glands near the summit . . . . . *Prunus avium*
Leaves less than 8.5 cm long; petioles up to 2 cm long, usually glandless . . . . . *Prunus cerasus*
20. Fruit a plum, the stone flattened; glands at the tips of the leaf teeth usually deciduous.
21. Petioles to 1.2 cm long . . . . . *Prunus cerasifera*
21. Longer petioles more than 1.2 cm long.
Leaves abruptly acuminate, the petioles very often glandular near the summit; fruits mostly 2-4 per cluster . . . . . **Prunus nigra**
Leaves obtuse to acute, the petioles often glandless; fruits usually solitary and pendent *Prunus domestica*

PSEUDOGNAPHALIUM
1. Stems appressed-floccose . . . . . **Pseudognaphalium obtusifolium**
1. Stems glandular-puberulent.
Leaves clearly decurrent at the base . . . . . **Pseudognaphalium macounii**
Leaves not decurrent . . . . . **Pseudognaphalium micradenium**

PSEUDOTSUGA *menziesii*

PSORALIDIUM tenuiflorum

PTELEA
1. Lower leaf surfaces and branches glabrous or glabrate . . . . . **Ptelea trifoliata**
1. Lower leaf surfaces and branches permanently and densely pubescent . . . . . **Ptelea trifoliata mollis**

PTERIDIUM
1. Longest entire leaf segment or part of a segment more than 6 times as long as wide, the terminal segments less than 5 mm wide . . . . . **Pteridium aquilinum pseudocaudatum**
1. Longest entire leaf segment or part of a segment less than 6 times as long as wide, the terminal segments more than 5 mm wide . . . . . **Pteridium aquilinum latiusculum**

PUCCINELLIA *distans*

PUERARIA *montana*

PULMONARIA
1. Cauline leaves auriculate-cordate; glands of stem absent or concealed by villous pubescence . . . . . *Pulmonaria officinalis*
1. Cauline leaves sessile to petiolate; glands of stem evident, thinly villous . . . . . *Pulmonaria saccharata*

PULSATILLA patens multifida

PUSCHKINIA *scilloides*

PYCNANTHEMUM

1. Stems glabrous or pubescent only on the angles.
   Stems glabrous or glabrate; leaves linear-lanceolate, less than 4 mm wide, rarely more than 3 mm wide; calyx lobes subulate, puberulent, 1 mm or more long . . . . . **Pycnanthemum tenuifolium**
   Stems pubescent on the angles; larger leaves more than 3 mm wide; calyx lobes acuminate, densely pilose, less than 1 mm long . . . . . **Pycnanthemum virginianum**
1. Stems puberulent to pilose on the angles and the faces.
   2. Principal leaves ovate, less than 3 times as long as wide . . . . . **Pycnanthemum muticum**
   2. Leaves all lanceolate, more than 3 times as long as wide.
      3. Leaves pubescent adaxially; stems densely pilose; involucral bracts acute . . . . . **Pycnanthemum pilosum**
      3. Leaves glabrous adaxially; stems puberulent; involucral bracts acuminate . . . . . **Pycnanthemum verticillatum**

PYRACANTHA *coccinea*

PYROLA

1. Calyx lobes blunt, to less than 1.8 mm long; leaves less than 3.5 cm long; petals greenish . . . . . **Pyrola chlorantha**
1. Calyx lobes acute, more than 1.8 mm long; larger leaves more than 3.5 cm long; petals white or pink to purple.
   2. Bracts below the raceme 0-3, narrowly lanceolate, to 1 mm wide, not at all clasping at the base; leaf blades mostly as long as or longer than their petioles, rather thin, dull adaxially; calyx lobes as wide as or wider than long; petals white . . . . . **Pyrola elliptica**
   2. Bracts below the raceme 1-5, lance-ovate, the larger more than 1 mm wide, more or less clasping at the base; leaf blades mostly as long as to shorter than their petioles, thick and coriaceous, lustrous adaxially; calyx lobes longer than wide; petals white to pink or purple.
      Flowers pink or purple; calyx lobes nearly or quite nerveless, overlapping at the base; leaves shorter than to about as long as wide, mostly subtruncate to cordate at the base . . . . . **Pyrola asarifolia purpurea**
      Flowers white or creamy; adaxial surface of the calyx lobes distinctly 3-5 nerved, not overlapping at the base; leaves mostly longer than wide, usually cuneate to broadly rounded at the base . . . . . **Pyrola americana**

PYROLACEAE

A. Leaves lanceolate to spatulate or oblanceolate, twice as long as wide or longer; inflorescence a corymb; filaments hairy . . . . . CHIMAPHILA
A. Leaf blades orbicular to broadly elliptic-ovate, less than twice as long as wide; inflorescence a raceme; filaments glabrous.
   Styles straight, arising from the center of the ring of stamens; flowers and fruits arranged along one side of the rachis . . . . . ORTHILIA
   Styles declined, arising from the side of the ring of stamens; flowers more or less spirally arranged on the rachis . . . . . PYROLA

PYRUS

1. Leaves abruptly short-acuminate, many of them widest at or beyond the middle.
   Leaves crenate or bluntly serrulate . . . . . *Pyrus communis*
   Leaves sharply serrate . . . . . *Pyrus pyrifolia*
1. Leaves long-acuminate, most of them widest below the middle.
   2. Petioles densely gray-tomentose; leaves serrate . . . . . *Pyrus betulifolia*
   2. Petioles glabrous or sparsely villous; leaves crenate.
      Stamens more than 20; styles 3-5; pedicels becoming more than 1 mm in diameter; fruit about 2 cm across . . . . . *Pyrus kumaoni*
      Stamens 20; styles usually 2; pedicels to 1 mm in diameter; fruit about 1 cm across . . . . . *Pyrus calleryana*

QUERCUS

1. Lobes blunt or rounded or callus-tipped, but never bristle-tipped. § LEPIDOBALANUS
   2. Leaves glabrous and usually glaucous abaxially, shallowly to deeply cut, but with very blunt lobe tips.
      Leaves with the larger petioles more than 10 mm long, the blades cuneate at the base . . . . . **Quercus alba**
      Leaves with the petioles to 10 mm long, the blades cordate-auriculate at the base . . . . . *Quercus robur*
   2. Lower leaf surfaces at least thinly stellate-pubescent or tomentose.
      3. Leaves with a tendency to be divided by a cut into two divisions, the distal division notably wider, sometimes longer, and often more lobed than the proximal division; terminal buds glabrous to densely gray-pubescent; acorn nut usually deeply seated in an abundantly fringed cap.
         4. Either the terminal buds glabrous or both the distal and proximal leaf divisions divided nearly all the way to the midrib, or both . . . . . **Quercus ×bebbiana**
         4. Buds always gray-pubescent; leaves rarely with both the distal and proximal leaf divisions deeply cut.
            Distal and proximal sections of the blade separated by a dissection, often with a truncate sinus, more than ½ the way to the midrib . . . . . **Quercus macrocarpa**
            Distal and proximal sections of the blades separated by a dissection less than to about ½ the way to the midrib . . . . . **Quercus ×schuettei**
      3. Leaves not notably divided into distinct distal and proximal halves; terminal buds glabrous or ciliate; acorn nut shallowly seated in a fringeless cap.
         5. All of the lateral veins ending in an antrorsely directed tooth.
            6. Teeth of leaf rounded, nearly or quite without a callus tip; hairs of abaxial midrib appearing clustered; acorn more than 2 cm long . . . . . *Quercus montana*
            6. Teeth of leaf acute, the tips generally with a callus tip; hairs of abaxial midrib tiny and stellate; acorn less than 2 cm long.

Abaxial pubescence wholly of appressed stellate hairs with more than 5 rays; acorns sessile or on pedicels less than 2 cm long, not usually paired . . . . . **Quercus muehlenbergii**
Abaxial pubescence with some hairs 1-4 rayed, usually intermixed with erect and/or spreading hairs; acorns on pedicels more than 2 cm long, usually paired . . . . . **Quercus bicolor**

5. Some of the lateral veins ending before reaching a lobe.
7. Lobes all much shorter than ½ of the distance to the midrib.
Many of the lobes longer than wide . . . . . *Quercus ×saulii*
Lobes all as wide as or wider than long . . . . . **Quercus bicolor**
7. Some of the lobes cut ½ or more of the distance to the midrib.
8. Young twigs pannose . . . . . **Quercus ×deamii**
8. Twigs glabrous to thinly puberulent.
Lobes all bluntly rounded . . . . . **Quercus ×jackiana**
At least the distal lobes acute . . . . . *Quercus lyrata*

1. Lobes sharp, bristle-tipped, or leaves entire. § ERYTHROBALANUS
9. Leaves entire or irregularly sinuate with 1-5 broad, entire, bristle-tipped lobes.
10. Leaves entire . . . . . **Quercus imbricaria**
10. Leaves irregularly sinuate with 1-5 bristle-tipped lobes.
11. Leaves at least thinly tomentose abaxially . . . . . **Quercus ×leana**
11. Leaves glabrous abaxially or with a tuft of hairs in the vein axils.
Leaves rounded to the base . . . . . **Quercus ×runcinata**
Leaves strongly and often broadly cuneate at the base . . . . . **Quercus ×exacta**
9. Leaves regularly sinuate-lobed, the principal lobes generally with 1 or more small bristle-tipped teeth.
12. Bud scales all glabrous, glabrate, or minutely canescent.
13. Leaf blades mostly with 4-5 pairs of lateral lobes cut scarcely ½ the distance to the midrib, with parallel or convergent margins, forming V-shaped sinuses . . . . . **Quercus rubra**
13. Leaf blades usually with fewer than 4 distinct pairs of lobes cut prevailingly more than ½ the distance to the midrib, the lobes often expanded distally, tending to form elliptic sinuses.
14. Larger winter buds gray or gray-brown, the larger more than 5 mm long; larger acorn caps more than 16 mm across.
Acorn cap shallowly cup-shaped, covering no more than ⅓ of the nut, inner surface glabrous or with a scant ring of hairs around the scar, the walls to 1.5 mm thick; twigs gray-brown . . . . . **Quercus shumardii**
Acorn cap deeply goblet-shaped, covering at least ⅓ of the nut, pubescent within, the walls thicker; twigs usually with tinctures of red . . . . . *Quercus texana*
14. Winter buds less than 5 mm long; acorn cap nearly always less than 16 mm across.
Principal vein axils on the abaxial leaf surfaces commonly with dense tufts of tangled hairs; acorn nut to 1.5 cm long . . . . . **Quercus palustris**
Leaves glabrous throughout abaxially or with minute tufts of hairs in the vein axils; acorn nut usually longer . . . . . **Quercus ×columnaris**
12. At least the distal bud scales notably appressed-pubescent.
15. Principal abaxial vein axils usually with strong tufts of tangled hairs; acorn cap scales appressed or loose near the margins; winter buds with the proximal scales pubescent.
16. Larger buds becoming more than 7 mm long by September, distinctly angular in cross section, the scales densely appressed-pubescent throughout or the proximal series somewhat less so; scales of acorn cap gray-hairy throughout, the marginal ones loose, their tips forming a fringe . . . . . **Quercus velutina**
16. Buds to 7 mm long, terete or only ambiguously angular, the scales not densely appressed-pubescent throughout; scales of acorn cap usually glabrous or glabrate, the marginal ones essentially appressed.
Winter buds to 6 mm long; leaves with dense tufts of tangled hairs in the abaxial vein axils . . . . . **Quercus ×vaga**
Winter buds becoming more than 6 mm long; leaves glabrescent or the abaxial vein axils with scant pubescence . . . . . **Quercus ×palaeolithicola**
15. Principal abaxial vein axils glabrous or with minute tufts of hairs; acorn cap scales tightly appressed; winter buds with the proximal scales usually glabrous.
17. Terminal buds up to 5 mm long, the scales glabrous or the distal ones ciliate-pubescent; larger acorn caps to 1.9 cm wide . . . . . **Quercus ellipsoidalis**
17. Terminal buds more than 5 mm long, at least the distal scales conspicuously pubescent; larger acorn caps often more than 1.9 cm wide.
Terminal winter buds more than 7 mm long, often somewhat angled; less than ⅓ of the nut covered by the cap . . . . . **Quercus ×hawkinsiae**
Terminal winter buds to 7 mm long, terete; at least ⅓ of the nut covered by the cap . . . . . **Quercus coccinea**

RANUNCULACEAE

A. Plants vines; leaves all opposite . . . . . CLEMATIS
A. Plants not vines; leaves not opposite (a distal involucral pair of leaves sometimes may be opposite).
B. Leaves simple, entire, linear to linear-oblong, up to 2 mm wide, undifferentiated from the petiole; scapes 1-flowered, with an elongate, spike-like receptacle . . . . . MYOSURUS
B. Leaves compound or simple, not linear, and more than 2 mm wide, petioles normally distinct; inflorescence various.
C. Flowers either spurred or strongly irregular.
D. Petal-like sepals unequal, the upper one the largest and helmet-shaped, prolonged forward into a short beak . . . . . ACONITUM
D. Petal-like sepals equal or unequal, at least the upper one with an elongate spur.
E. Flowers with (4)5 conspicuous spurs . . . . . AQUILEGIA
E. Flowers with only one conspicuous spur.
Perennials; pistils 3-5 . . . . . DELPHINIUM

Annuals; pistil 1 . . . . . CONSOLIDA
C. Flowers regular, not spurred.
F. Cauline or involucral leaves opposite or whorled.
G. Flowers yellow; fruit a follicle . . . . . ERANTHIS
G. Flowers not yellow; fruit an achene.
H. Leaves distinctly ternately compound; leaflets less than 3 cm long, as wide as long, shorter than their petiolules . . . . . ANEMONELLA
H. Leaves usually deeply cleft or incised, simple to scarcely compound, or if compound, then the leaflets usually more than 3 cm long and with petiolules essentially absent.
Petal-like sepals usually more than 2.5 cm long; styles more than 1 cm long; plant sericeous; ultimate leaf segments linear to linear-lanceolate, less than 5 mm wide . . . . . PULSATILLA
Sepals less than 2.5 cm long; styles less than 1 cm long; plants otherwise, not as above . . . . . ANEMONE
F. Cauline leaves alternate or all leaves basal.
I. Flowers yellow, or leaves simple and unlobed, or plant aquatic.
J. Leaves usually dimorphic, or all deeply cleft, divided and 3-several parted, or decompound, or if unlobed throughout, then lanceolate to linear.
Receptacle becoming an elongate cylinder, the achenes tomentose, with an elongate, more or less falcate-tapered, pungent beak 2-3 mm long; leaves pinnatisect and basal . . . . . CERATOCEPHALA
Receptacle globose to cylindric, the achenes neither tomentose nor pungently long-beaked; leaves various . . . . . RANUNCULUS
J. Leaves all essentially alike, unlobed, broadly cordate to ovate-rotund, entire to crenate.
K. Petals absent, the sepals petaloid and yellow; fruit a several-seeded follicle . . . . . CALTHA
K. Petals yellow or white, the sepals usually green or greenish, not petaloid; fruit an achene.
Petals 5, small, up to 8 mm long; sepals 5; plants up 12 cm high . . . . . HALERPESTES
Petals more than 5, showy, more than 8 mm long; sepals fewer than 5; plants normally more than 12 cm high . . . . . FICARIA
I. Flowers not yellow, the leaves compound or 3-lobed, and plant never aquatic.
L. Plants scapose, the leaves all basal; flowers solitary.
Leaves pubescent, shallowly to deeply 3-lobed but never trifoliolate; bracts green, conspicuous . . . . . HEPATICA
Leaves glabrous, trifoliolate; bracts absent . . . . . COPTIS
L. Plants with cauline leaves, basal leaves present or absent; flowers 1 to several.
M. Flowers several to many in terminal racemes or panicles.
N. Flowers usually greenish, in terminal, many-flowered panicles; fruit an achene . . . . . THALICTRUM
N. Flowers white or whitish, in terminal racemes; fruit not an achene.
Plants less than 1 m high; racemes usually not exceeding 1 dm in length; fruit berry-like . . . . . ACTAEA
Plants always becoming more than 1 m high; racemes very soon more than 1 dm in length; fruit a follicle . . . . . CIMICIFUGA
M. Flowers solitary or few, terminal or axillary, not in racemes or panicles.
O. Leaves simple, deeply palmately lobed; flower on a stout peduncle.
Leaf divisions entire . . . . . PAEONIA
Leaf divisions sharply and finely serrate . . . . . HYDRASTIS
O. Leaves compound or pinnatisect; flowers either on slender peduncles or sessile.
Leaves pinnatisect into narrowly linear segments; flowers sessile in an involucre of pinnatisect bracts; sepals blue or white; fruit of 5 to 10 connate follicles . . . . . NIGELLA
Leaves compound, the leaflets broadly ovate and coarsely lobed; flowers on elongate, slender peduncles; sepals white; fruit of mostly 4 separate follicles . . . . . ENEMION

RANUNCULUS

1. Plants aquatic, occasionally stranded; leaves submersed, divided into numerous filiform or attenuate segments or flabelliform in stranded forms.
2. Petals white; leaf segments filiform, mostly 0.1-0.2 mm wide, essentially the same width throughout their length . . **Ranunculus longirostris**
2. Petals yellow; larger leaf segments wider, often tapered or with attenuate tips.
Petals more than 7 mm long; fruiting heads more than 6 mm long; achene bodies soon exceeding 1.6 mm long, with a conspicuous, white, corky thickening along the margin and at the base . . . . . **Ranunculus flabellaris**
Petals less than 7 mm long; fruiting heads up to 6 mm long; achene bodies less than 1.6 mm long, without white corky thickenings . . . . . **Ranunculus gmelinii hookeri**
1. Plants terrestrial or subaquatic but with primary leaves emergent; leaves never filiform nor divided into attenuate segments.
3. Plants glabrous throughout or essentially so, rarely somewhat ciliate along the distal petioles.
4. All leaves unlobed, entire to remotely serrate.
Basal leaves ovate or oblong; cauline leaves less than 6 cm long; annual . . . . . **Ranunculus pusillus**
Basal leaves narrowly lanceolate to linear; larger cauline leaves more than 6 cm long; perennial . . . . . **Ranunculus ambigens**
4. At least the distal leaves and bracts deeply lobed or divided, the margins various.
5. Petals more than 5 mm long; achenes strongly flattened and rim-margined; stems sarmentose . . . . . **Ranunculus septentrionalis**
5. Petals less than 5 mm long; achenes turgid, not rim-margined; stems not becoming sarmentose.
Basal and proximal leaves normally deeply lobed or cleft, the divisions entire to irregularly and shallowly incised . . . . . **Ranunculus sceleratus**
Basal leaves evenly crenulate, undivided (though rarely with one divided or lobed), quite different from the deeply cleft or divided distal cauline and bracteal leaves . . . . . **Ranunculus abortivus**
3. At least the distal portion of plant pubescent, strigose, or pilose to hispid, the leaves usually pubescent, at least along the veins abaxially.
6. Basal leaves crenulate, ovate, usually unlobed, unlike the deeply divided distal cauline and bracteal leaves . . **Ranunculus rhomboideus**
6. All leaves deeply cleft or divided.

7. Primary leaves simple, very deeply divided or cleft, but with the terminal lobe without a narrow petiolule or stalk; receptacle glabrous or villous.
   Petals less than 6 mm long, about equaling the sepals; beak of achene strongly recurved; major leaf divisions crenate-denticulate to cleft less than ½ their length; receptacle villous . . . . . **Ranunculus recurvatus**
   Petals more than 6 mm long, much longer than the sepals; beak of achene straight or only slightly bent; leaf divisions dentate, normally cleft much more than ½ their length; receptacle glabrous or rarely with villous hairs only at the tip . *Ranunculus acris*
7. Primary leaves compound, at least the terminal lobe (major division) petiolulate, with a slender stalk or stipe; receptacle always villous.
   8. Petals less than 5 mm long, shorter than to subequal to the sepals; mature fruiting heads short-cylindric, obviously longer than broad. . . . . **Ranunculus pensylvanicus**
   8. Petals 5 mm or more long, exceeding the sepals; mature fruiting head subglobose.
      9. Style and beak inconspicuous, broad-based, and very short, up to 1(1.4) mm long; outline of the blade portion of the leaf seldom exceeding 5 cm in length.
         10. Base of stem bulbous; sepals soon sharply reflexed . . . . . *Ranunculus bulbosus*
         10. Base of stem not bulbous; sepals reflexed or not.
            11. Stems erect; sepals reflexed; achenes usually papillose . . . . . *Ranunculus sardous*
            11. Some of the stems usually arching and sarmentose; sepals spreading; achenes smooth.
               Petals 5-9. . . . . *Ranunculus repens*
               Petals more than 9 . . . . . *Ranunculus repens pleniflorus*
      9. Style and beak slender, soon exceeding 1 mm in length; blade length various.
         12. Stems glabrate to appressed-pubescent or canescent with antrorse hairs.
            Many of the roots tuberous-thickened; plants less than 3 dm high, the stems densely silky pubescent . . . . . **Ranunculus fascicularis**
            Roots without tuberous thickening; plants soon more than 3 dm high, the stems glabrate or finely appressed-pubescent . . . . . **Ranunculus septentrionalis**
         12. Stems spreading or retrorsely villous or hispid.
            Aerial shoots to 5.5 dm at fruiting time, all erect, without a tendency to produce sarmentose branches . . . . . **Ranunculus hispidus**
            Longer aerial shoots at fruiting time more than 5.5 dm long, some of them becoming sarmentose . . . . . **Ranunculus caricetorum**

RAPHANUS
1. Petals pale-yellow, often fading to white, with dark veins; fruit up to 6 mm broad; stems usually thinly hispid; root not fleshy . . . . . *Raphanus raphanistrum*
1. Petals pale-pink to purple; fruit more than 6 mm broad; stems glabrous; root usually fleshy . . . . . *Raphanus sativus*

RAPISTRUM *rugosum*

RATIBIDA
1. Disc subglobose to ovoid, up to 1.5 times as long as broad; ligules more than 3 cm long . . . . . **Ratibida pinnata**
1. Disc columnar, more than twice as long as broad; ligules less than 3 cm long . . . . . *Ratibida columnifera*

RESEDA
1. Leaves entire or the distal ones shallowly 3-cleft.
   Sepals linear-oblong, 5 or 6; some of the distal leaves 3-lobed . . . . . *Reseda odorata*
   Sepals deltate, 4; leaves all entire . . . . . *Reseda luteola*
1. Leaves pinnately divided.
   Leaves divided throughout their length; flowers greenish-white . . . . . *Reseda alba*
   Leaves entire proximally, divided from near the middle; flowers yellowish . . . . . *Reseda lutea*

RESEDACEAE: One genus in our area . . . . . RESEDA

REYNOUTRIA
1. Veins of abaxial leaf surfaces with scattered, elongate, multicellular hairs . . . . . *Reynoutria sachalinensis*
1. Veins of abaxial leaf surfaces glabrous or beset with short, narrowly to broadly deltate hairs.
   Leaves to 1.8 dm long; abaxial veins glabrous or scaberulous with swollen or knob-like cells . . . . . *Reynoutria japonica*
   Larger leaves more than 1.8 dm long; abaxial veins with short, stout-based hairs . . . . . *Reynoutria ×bohemica*

RHAMNACEAE
A. Inflorescence usually long-pedunculate in terminal and axillary paniculiform clusters; flowers white; fruit a capsule . . . . . CEANOTHUS
A. Inflorescence sessile, solitary or in few-flowered fascicles; flowers greenish; fruit a fleshy drupe.
   Leaves nearly or quite entire . . . . . FRANGULA
   Leaves serrulate to crenulate . . . . . RHAMNUS

RHAMNUS
1. Leaves sharply serrate with subulate teeth . . . . . *Rhamnus arguta velutina*
1. Leaves bluntly serrulate to crenulate.
   2. Leaves with 5 or more pairs of lateral veins, the petioles rarely more than 15 mm long.

3. Leaves subopposite . . . . . *Rhamnus utilis*
3. Leaves unambiguously alternate.
. Full-grown leaves lance-ovate, mostly long-acuminate, with more than 8 fine teeth per cm near the middle, less than 3.5 cm wide . . . . . **Rhamnus lanceolata**
Larger leaves ovate, acute to short-acuminate, with fewer than 8 crenulate teeth per cm, commonly more than 3.5 cm wide . . . . . **Rhamnus alnifolia**
2. Leaves with fewer than 5 distinct pairs of lateral veins, the petioles mostly more than 15 mm long.
4. Leaves of long shoots long-cuneate or attenuate at the base, the petiole pubescent, at least along the adaxial grove . *Rhamnus japonica*
4. Leaves rounded to broadly cuneate at the base, the petiole glabrous or pubescent.
Larger leaves more than 7.5 cm long; petiole glabrous or nearly so . . . . . *Rhamnus davurica*
Larger leaves to 7.5 cm long; petiole glabrous or pubescent . . . . . *Rhamnus cathartica*

RHEUM *rhabarbarum*

RHEXIA
1. Leaves ovate, sessile, the larger more than 11 mm wide; petals cool to warm magenta; stems notably 4-angled . . . . . **Rhexia virginica**
1. Leaves linear to lanceolate, short-petiolate, to 11 mm wide; petals white to pale-pink; stems not angled . . . . . **Rhexia mariana**

RHODODENDRON *periclymenoides*

RHODOTYPOS *scandens*

RHUS
1. Leaves 3-foliolate, with only one pair of lateral leaflets.
Terminal leaflet acute, elliptic to rhombic-ovate, mostly more than 4 cm long; flowers opening before the emergence of the leaves . . . . . **Rhus aromatica**
Terminal leaflet obtuse, flabelliform-obovate, up to 4 cm long; flowers opening with the emergence of the leaves **Rhus aromatica arenaria**
1. Leaves pinnately compound, with 3 or more pairs of lateral leaflets.
2. Leaflets entire or with a few remote shallow teeth . . . . . **Rhus copallinum**
2. Leaflets serrate to dentate.
3. Branchlets glabrous throughout; drupes with hairs all less than 0.5 mm long and prevailingly papillose-clavate . . . . . **Rhus glabra**
3. Branchlets puberulent to villous; drupes with many or all of the hairs more than 0.5 mm long, many of them acicular.
4. Second-year branches glabrous; drupes with many of the hairs clavate and less than 1.5 mm long . . . . . **Rhus ×pulvinata**
4. Second-year branches villous; drupes prevailing with acicular hairs, many of them more than 1.5 mm long.
Leaflets serrate . . . . . **Rhus typhina**
Leaflets pinnately divided . . . . . *Rhus typhina 'Laciniata'*

RHYNCHOSPORA
1. Leaves 5 mm or more wide; achenes flattened; tubercle large, more than 10 mm long . . . . . **Rhynchospora macrostachya**
1. Leaves rarely up to 5 mm wide; achenes plump or lenticular; tubercle minute, less than 3 mm long.
2. Achene surface rugulose-ridged or longitudinally cancellate; bristles much shorter than the achene or absent.
3. Flowers fewer than 5 per spikelet . . . . . **Rhynchospora recognita**
3. Flowers 5-numerous per spikelet.
Tubercle depressed, much broader than long . . . . . **Rhynchospora nitens**
Tubercle as long as broad or longer, tapering into a beak . . . . . **Rhynchospora scirpoides**
2. Achene surface smooth or only slightly rugulose, never longitudinally cancellate; bristles longer than the achene.
4. Spikelets whitish to pale-brown; bristles more than 6 . . . . . **Rhynchospora alba**
4. Spikelets brown to dark chestnut-colored or nigrescent; bristles 6 or fewer.
5. Perianth bristles antrorsely barbed, the longer ones usually exceeding the tubercle; scales dark-olivaceous to nigrescent; leaves setaceous-filiform . . . . . **Rhynchospora fusca**
5. Perianth bristles smooth or variously barbed, subequaling or shorter than the tubercle; scales brown to chestnut-colored; leaves setaceous to flat.
Culms filiform; leaves capillary, up to 0.5 mm wide; achene body less than ½ as broad as long, with inconspicuous margins . . . . . **Rhynchospora capillacea**
Culms stout; leaves more than 0.5 mm wide; achene body more than ½ as broad as long, with conspicuous hyaline margins . . . . . **Rhynchospora capitellata**

RIBES
1. Leaves yellow-dotted abaxially with resinous glands.
2. Leaves broadly cuneate at the base; flowers more than 13 mm long . . . . . *Ribes odoratum*
2. Leaves subtruncate to cordate; flowers less than 13 mm long.
3. Floral bracts shorter than the pedicels; flowers less than 7 mm long . . . . . *Ribes nigrum*
3. Floral bracts longer than the pedicels; flowers more than 7 mm long.
Sepals clavate, to about twice as long as wide, the larger more than 2 mm wide beyond the middle; terminal lobes of the leaves nearly all to about twice as long as wide; median teeth of terminal lobes nearly all less the 5 mm long . . . . . **Ribes americanum**
Sepals narrowly oblong, more than twice as long as wide, less than 2 mm wide; many of the terminal lobes of the leaves more than twice as long as wide; many of the teeth of the terminal lobes 5 mm or more long . . . . . **Ribes americanum mesochorum**
1. Leaves not glandular-dotted abaxially.
4. Stems unarmed; flowers usually 5 or more in racemes.

5. Flowers bright-yellow, clove-scented; hypanthium tubular, much longer than broad; leaves cuneate-rounded to subtruncate at the base . . . . . *Ribes odoratum*
5. Flowers greenish-yellow, not clove-scented; hypanthium saucer-shaped, about as long as broad; leaves cordate.
Pedicels glandular; upper ⅔ of the terminal lobes of the leaves essentially straight-sided to a broadly acute tip . . . . . **Ribes triste**
Pedicels glabrous; terminal lobes of the leaves with each side producing a subtle curve to the obtuse tip . . . . . *Ribes rubrum*

4. Stems armed with nodal spines (rarely sometimes unarmed in Ribes hirtellum); flowers 1 to 4 in axillary clusters.
6. Ovary and fruit tomentose or bristly-pubescent; petioles with stipitate glands longer than the pubescence.
Calyx lobes as long as or longer than the tube, tomentose; pedicels and peduncles subequaling or shorter than the flower . . . . . *Ribes uva-crispa*
Calyx lobes much shorter than the tube, bristly; pedicels and peduncles longer than the flowers . . . . . **Ribes cynosbati**
6. Ovary and fruit glabrous; petioles without stipitate glands or with a few weak glands no longer than the pubescence.
7. Flowers whitish; stamens long-exserted; floral bracts with marginal stipitate glands; nodal spines stout . . . . . **Ribes missouriense**
7. Flowers greenish or purplish; stamens included; floral bracts merely ciliate; nodal spines absent or if present, then weak and slender.
Leaves glabrous or with scattered hairs abaxially . . . . . **Ribes hirtellum**
Leaves softly pubescent abaxially, appressed-pubescent adaxially . . . . . **Ribes hirtellum calcicola**

RICINUS *communis*

ROBINIA

1. Peduncles and young branchlets eglandular, glabrate to thinly puberulent; flowers white; pods smooth . . . . . *Robinia pseudoacacia*
1. Peduncles and often the young branchlets stipitate-glandular, glandular-viscid, or abundantly hispid; flowers pink or rose-purple; pods hispid or glandular.
2. Peduncles densely and strongly hispid as well as stipitate-glandular; leaflets 7-15; plants up to 1.5 m high.
Leaflets broadly oblong to rotund, almost always less than twice as long as wide, obtuse . . . . . *Robinia hispida*
Leaflets oblong to elliptic, more than twice as long as wide, acute . . . . . *Robinia hispida fertilis*
2. Peduncles viscid to stipitate-glandular, but not hispid; leaflets of larger leaves more than 15; plants more than 1.5 m high.
Leaf rachides pubescent and eglandular; young branchlets, pedicels, and calyces stipitate-glandular . . . . . *Robinia luxurians*
Leaf rachides, branchlets, and sometimes the pedicels and calyces viscid with large sessile or subsessile glands . . . . . *Robinia viscosa*

ROEGNERIA

1. Florets with awns longer than the lemmas . . . . . **Roegneria subsecunda**
1. Awns absent or shorter than the lemmas . . . . . **Roegneria trachycaula**

RORIPPA

1. Plant wholly aquatic; proximal submersed leaves decompound into filiform segments, the emersed leaves pinnatifid or shallowly serrulate to subentire . . . . . **Rorippa aquatica**
1. Plant terrestrial or paludal; leaves all variously entire to decompound, but the segments not filiform.
2. Petals more than 3 mm long; leaves pinnately lobed or divided throughout.
Basal rosettes present in young plants, the cauline leaves deeply pinnatifid, the larger more than 2 cm wide, glabrous or sparingly hirsute; siliques rarely maturing seed, the style never more than 1 mm long . . . . . *Rorippa sylvestris*
Basal rosettes absent even in young plants, the cauline leaves deeply sinuate-lobed, less than 2 cm wide, usually with scattered, plump, vesicular trichomes on the abaxial midveins; siliques soon becoming tumid with seed and usually falcate-curved, the longer styles more than 1 mm long . . . . . *Rorippa sinuata*
2. Petals absent or less than 3 mm long; many of the leaves with large portions undivided.
3. Fruits subsessile to short-pedicellate on pedicels up to 2 mm long; style minute or absent; stamens usually 4; petals 0-2 . . . . . **Rorippa sessiliflora**
3. Fruits pedicellate on pedicels more than 2 mm long; style well developed; stamens typically 6; petals 4.
4. Pedicels 3 times or more the length of the subglobose fruits . . . . . *Rorippa austriaca*
4. Pedicels less than to subequaling the length of the fruit.
Plants glabrous or glabrate or hispid proximally; fruits conspicuously longer than broad, soon more than 4 mm long . . . . . **Rorippa palustris fernaldiana**
Plants usually copiously hispidulous throughout; fruits scarcely longer than broad, up to 4(6) mm long . . . . . **Rorippa palustris hispida**

ROSA

1. Three of the sepals pinnately divided into 2 or more pairs of linear-oblong lobes, the lobes usually further divided or strongly dentate.
2. Leaflets abundantly stipitate-glandular over the abaxial surface . . . . . *Rosa rubiginosa*
2. Leaflets without stipitate glands or with a few along the midrib.
3. Hypanthium glabrous or nearly so . . . . . *Rosa canina*
3. Hypanthium abundantly stipitate-glandular.
Some of the leaves with the rachis at least sparsely prickly; teeth of leaflets acute, the shorter side less than 0.8 mm long . . . . . *Rosa gallica*
Leaf rachis without prickles; teeth of leaflets acuminate, the longer ones with the shorter side more than 0.8 mm long . . . . . *Rosa centifolia*

1. None of the sepals pinnately divided or three of them with 1-4 narrow, usually entire, lobes.
4. Leaflets primarily 3, with an occasional leaf 5-parted; plant more than 1 m high; styles united into a column.
Leaflets glabrous abaxially or with sparse pubescence only along the veins . . . . . **Rosa setigera**
Leaflets velvety-pubescent abaxially, the hairs well distributed on the laminae . . . . . **Rosa setigera tomentosa**
4. Leaflets primarily 5-11, rarely with an occasional leaf 3-parted; plant height various; styles free (united in Rosa multiflora).

5. Stipules conspicuously pectinate; flowers in many-flowered corymbiform or pyramidal racemes; styles united into a column that protrudes from the hypanthium . . . . . *Rosa multiflora*
5. Stipules entire, toothed or irregularly laciniate, but not pectinate; flowers solitary or few in cymes; styles distinct, usually only the stigmas evident above the hypanthium.
   6. Twigs and thorns densely tomentose; fruit more than 2 cm in diameter . . . . . *Rosa rugosa*
   6. Twigs and thorns not tomentose; fruit less than 2 cm in diameter.
      7. Infrastipular prickles absent.
         8. Many of the leaves with 9 leaflets.
            9. Stipules at least sparsely glandular along the margin . . . . . **Rosa ×mediоccidentis**
            9. Stipules essentially glandless.
               Leaves glabrous or sparsely pubescent abaxially, the leaflets prevailingly elliptic and acute . . . . . **Rosa arkansana**
               Leaves softly pubescent abaxially, the leaflets prevailingly obovate and obtuse . . . . . **Rosa arkansana suffulta**
         8. Leaflets 5-7.
            10. Prickles extending throughout the flowering branches.
               Abaxial leaf surfaces viscid, the atomiferous glands well disposed on the laminae among the hairs . **Rosa acicularis**
               Abaxial leaf surfaces eglandular . . . . . **Rosa ×mediоccidentis**
            10. Prickles absent or confined to the principal cane.
               Leaflets more or less obtuse, with fewer than 15 teeth per side . . . . . **Rosa blanda**
               Leaflets acute, with more than 15 teeth per side . . . . . **Rosa ×palustriformis**
      7. Infrastipular prickles present, paired at the nodes.
         11. Infrastipular prickles acicular, straight.
            12. At least some of the leaves with 9 leaflets . . . . . **Rosa ×mediоccidentis**
            12. Leaflets 5-7.
               Internodal prickles nearly or quite absent . . . . . **Rosa carolina**
               Internodal prickles well developed . . . . . **Rosa carolina subserrulata**
         11. Infrastipular prickles stout, broad-based, straight or decurved.
            13. Pedicels and hypanthia glabrous.
               Infrastipular prickles prevailingly but slightly curved; flowers often double; stipules often convolute . *Rosa majalis*
               Infrastipular prickles straight, divaricate at 90 degrees to the stem; petals 5; stipules flat . . . . . *Rosa woodsii*
            13. Pedicels and hypanthia prickly or stipitate-glandular.
               Pedicels and hypanthia with stout prickles . . . . . *Rosa ×harisonii*
               Pedicels and hypanthia without prickles . . . . . **Rosa palustris**

ROSACEAE

A. Leaves opposite; petals 4; sepals 4; fruit a blackish drupe . . . . . RHODOTYPOS
A. Leaves alternate or basal; sepals and petals not 4 (sepals 4, petals absent in Poterium and Sanguisorba); fruit various.
   B. Leaves simple.
      C. Ovary superior; fruit dry or dryish, or if fleshy, then 1-seeded.
         D. Many or all of the principal leaves 3-5 lobed; fruit dry; bark exfoliating in long strips in Physocarpus.
            Flowers rose-purple in open widely branched cymes; sepals more than 5 mm long, abruptly contracted into long-caudate tips; fruit a cluster of drupelets . . . . . RUBUS
            Flowers white in dense corymbiform racemes; sepals less than 5 mm long, obtuse or acute; fruit folliculiform, dehiscing along both the ventral and dorsal sutures . . . . . PHYSOCARPUS
         D. None of the leaves lobed; fruit dry or fleshy; bark various, but not exfoliating in long strips.
            E. Pistil 1; fruit a fleshy drupe . . . . . PRUNUS
            E. Pistils 3-8; fruit a follicle or dry achene.
               Flowers less than 1 cm across in axillary clusters or terminal densely flowered panicles; fruit a follicle . . . . . SPIRAEA
               Flowers more than 1 cm across, solitary at the ends of short leafy branches; fruit a dry achene . . . . . KERRIA
      C. Ovary inferior; fruit fleshy, 2-several seeded.
         F. Inflorescence racemose; petals white, lanceolate, normally twice as long as wide or longer; branches never thorny AMELANCHIER
         F. Inflorescence not racemose; petals white to pink or rose, mostly less than twice as long as wide; branches thorny or not.
            G. Leaves entire . . . . . COTONEASTER
            G. Leaves serrulate or serrate.
               H. Flowers and fruits in corymbose inflorescences.
                  I. Twigs unarmed, the leaves always with dark, oblong, appressed glands along the adaxial midrib . . . . . ARONIA
                  I. Twigs usually with stout spines, the adaxial midnerves eglandular.
                     Leaves evergreen, crenate, never lobed; styles 5 . . . . . PYRACANTHA
                     Leaves deciduous, serrate, often lobed; styles 5 or fewer . . . . . CRATAEGUS
               H. Flowers and fruits in umbelliform or fasciculate inflorescences.
                  J. Much branched shrubs, the flowers 1-4 per fascicle; adaxial leaf surface glossy . . . . . CHAENOMELES
                  J. Small trees, the flowers commonly more than 4 per fascicle; adaxial leaf surface not glossy.
                     Styles free, but closely constricted at the base by the mouth of the hypanthium; petals white; fruit with abundant grit cells . . . . . PYRUS
                     Styles united at the base, the mouth of the hypanthium open; petals white to pink or rose; fruit nearly or quite without grit cells . . . . . MALUS
   B. Leaves compound.
      K. Plants woody brambles, shrubs, or small trees.
         L. Leaves with more than 5 pairs of leaflets; branches unarmed.
            Teeth with 2-4 fine teeth on one side, 0-2 on the other; carpels 5, the fruit a follicle; shrub . . . . . SORBARIA
            Teeth serrate to doubly serrate; carpels 4, the fruit an indehiscent pome; tree . . . . . SORBUS

L. Leaves with no more than 5 pairs of leaflets; branches armed or unarmed.
M. Leaves usually pinnately compound; fruit a hip or consisting of 5 follicles . . . . . ROSA
M. Leaves usually palmately compound; fruit an achene or drupelet.
Flowers yellow; plant without bristles or prickles; an erect shrub . . . . . DASIPHORA
Flowers not yellow; plants almost always with bristles or prickles, at least below; plants often arching or trailing . . . .RUBUS
K. Plants herbaceous or suffruticose in Gillenia and Sibbaldiopsis.
N. Leaves twice to thrice pinnately compound . . . . . ARUNCUS
N. Leaves trifoliolate to once-pinnate or palmate.
O. Plants scapose, the leaves all basal, trifoliolate . . . . . FRAGARIA
O. Plants with cauline leaves, the inflorescence terminal or axillary.
P. Leaves all trifoliolate, the leaflets all alike.
Q. Flowers white; calyx not subtended by sepal-like bracts.
Plants prickly or bristly; fruit an aggregation of drupelets . . . . . RUBUS
Plants unarmed; fruit consisting of follicles . . . . . GILLENIA
Q. Flowers yellow or very rarely white; calyx subtended by 5 sepal-like bracts.
R. Sepal-like bracts large, foliaceous, 3-toothed at the apex; plant running by leafy stolons . . . . . DUCHESNEA
R. Sepal-like bracts scarcely longer than to mostly subequaling or shorter than the sepals, entire at the apex; plants usually erect.
Plants suffruticose; petals white; leaflets entire, 3-toothed at the apex; leaves coriaceous, glossy . . . . . SIBBALDIOPSIS
Plants herbaceous; petals yellow; leaflets coarsely dentate; leaves neither coriaceous nor glossy POTENTILLA
P. Leaves not all trifoliolate, or if so, then the leaflets dissimilar.
S. Inflorescence densely cymose-paniculate, with white or pink flowers up to 8 mm across; pistils more than 5; fruit a cluster of achene-like, indehiscent, one-seeded follicles; stems glabrous; leaves pinnate, the terminal leaflet much expanded and deeply incised into 3-9 lobes . . . . . FILIPENDULA
S. Plants not as above.
T. Flowers yellow, in open spike-like racemes, the calyces densely beset with hooked bristles . . . . . AGRIMONIA
T. Flower color various, the racemes never open and spike-like, the calyces without hooked bristles.
U. Leaves all digitately divided . . . . . POTENTILLA
U. At least the proximal or basal leaves pinnately compound.
V. Flowers in cylindrical heads or dense spikes; sepals 4, the petals absent.
Leaflets ovate to suborbicular, up to 2 cm long; stamens numerous; pistils 2 . . . . . POTERIUM
Leaflets oblong, much more than 2 cm long; stamens 4; pistil 1 . . . . . SANGUISORBA
V. Flowers neither in cylindrical heads nor dense spikes; sepals 5, the petals usually present.
W. Styles persistent, jointed near the middle or densely villous, plumose, and greatly elongating; distal lobes of proximal leaves notably larger that the proximal ones . . . . . GEUM
W. Styles short, neither jointed nor plumose or elongating; principal leaflets of proximal leaves all similar or only gradually different in size from base to apex.
X. Leaves densely silvery-sericeous abaxially . . . . . ARGENTINA
X. Leaves not silvery-sericeous abaxially.
Petals purple; leaflets mostly 5, oblong, well over twice as long as wide; stems glabrous proximally . . . . . COMARUM
Petals whitish to light-yellow; leaflets mostly more than 5, ovate, scarcely twice as long as wide to often shorter; stems with spreading pubescence throughout . . . . . DRYMOCALLIS

ROTALA ramosior

RUBIACEAE

A. Shrubs; flowers in spherical heads . . . . . CEPHALANTHUS
A. Herbs; flowers not in spherical heads.
B. Leaves whorled.
C. Flowers sessile and clustered in an involucre of leaf-like bracts; fruits with a persistent crown of sepals . . . . . SHERARDIA
C. Flowers sessile or pedicellate, solitary or clustered, but not in involucres; fruits without a calyx.
Plant villous; ovaries and fruits glabrous . . . . . CRUCIATA
Plant not villous or if so, then the ovaries and fruits hispid . . . . . GALIUM
B. Leaves opposite.
D. Leaves evergreen, deltate-ovate, truncate or subtruncate at the base, petiolate; corolla lobes villous; fruit a berry . . . . . MITCHELLA
D. Leaves deciduous, linear to elliptic or rhombic-ovate, sessile or the proximal more or less petiolate; corolla lobes not villous; fruit not a berry.
Flowers sessile; stipules with long setaceous bristles; stems spreading . . . . . DIODIA
Flowers pedicellate; stipules entire or subentire; stems usually erect . . . . . HOUSTONIA

RUBUS

1. Stems nearly or quite without either acicular or broad-based prickles.
Leaves simple; petals rose-purple. § ANAPLOBATUS . . . . . *Rubus odoratus*
Leaves compound; petals white or pale-pink. § CYLACTIS . . . . . **Rubus pubescens**
1. Stems armed with stiff bristles or prickles.
2. Leaflets of mature leaves strongly bicolored, green adaxially, densely white-pannose or tightly tomentose abaxially; fruit separating from the receptacle at maturity. § IDAEOBATUS
3. Calyx lobes, pedicels, petioles, and younger herbage stipitate-glandular. § Idaeanthi

4. Inflorescence paniculate; sepals connivent, 1 cm or more long, enclosing the maturing fruit in a bur, spreading only at maturity; plant densely stipitate-glandular, some of the gland-tipped hairs 3 mm or more long . . . . . *Rubus phoenicolasius*
4. Inflorescence a simple or complex leafy cyme; sepals soon spreading or reflexed, up to 1 cm long; plant with glandular hairs all less than 3 mm long.
   Some portions of the canes with more than 20 stiff bristles per cm, without stouter, broadly based prickles intermixed . . . . . **Rubus strigosus**
   Canes with no more than 20 stiff bristles per cm, commonly with stouter prickles intermixed . . . . . **Rubus ×neglectus**

3. Plants without stipitate glands.
5. Central leaflets obovate to broadly rhombic, cuneate, obtuse to subacute at the tip . . . . . *Rubus parvifolius*
5. Central leaflets elliptic to ovate, cordate to rounded at the base, acuminate at the tip.
   Pedicels with strongly curved thorns; stems arching or sprawling, often rooting at the tips, heavily glaucous; leaves of primocane mostly ternate or if quinate, then the leaflets digitate; flowers mostly more than 1 cm across; fruit dark-purple or nigrescent (rarely pale or yellowish), the drupelets invested with white tomentum below the middle . . . . . **Rubus occidentalis**
   Pedicels without curved thorns; stems neither sprawling and rooting at the nodes nor glaucous; leaves of primocane ternate or if quinate, then the leaflets pinnate; flowers usually no more than 1 cm across; fruit red (rarely yellowish), not tomentose between the drupelets. . . . . *Rubus idaeus*

2. Leaflets of mature leaves green on both sides or the abaxial surfaces loosely grayish-tomentose; fruit adherent to the receptacle at maturity. § EUBATUS
6. Primocanes at least thinly beset with coarse hispid hairs, setose bristles, or acicular prickles that have scarcely any flare at the base.
7. At least the distal portion of the primocane with stiff hispid hairs admixed with long-stipitate glandular hairs, soon lopping over, trailing, and rooting at the tip. § Hispidi
   Primocanes beset with stiff bristle-like prickles; primocane leaves 3-5 foliolate, the leaflets herbaceous, acute to short-acuminate . . . . . **Rubus fulleri**
   Primocanes without stiff bristle-like prickles; primocane leaves 3-foliolate, the leaflets subevergreen, obtuse to broadly acute . . . . . **Rubus hispidus**
7. Primocanes essentially eglandular, notably beset with acicular bristles, erect, high-arching or lopping over and only rarely rooting at their tip.
8. Calyx lobes of all but the terminal flowers mostly 5-6 mm long; floricanes prostrate, often rooting at their tip. § Hispidi . . . . . **Rubus plus**
8. Larger calyx lobes more than 6 mm long; floricanes ascending or arching, not rooting at their tip. § Setosi
9. Abaxial leaf surfaces glabrate or pubescent prevailingly on the veins, not soft to the touch.
   Pedicels notably stipitate-glandular; terminal primocane leaflet abruptly short-acuminate . . . . . **Rubus wheeleri**
   Pedicels eglandular; terminal primocane leaflet abruptly acuminate-caudate . . . . . **Rubus wisconsinensis**
9. Abaxial leaf surfaces velvety-pubescent on the veins and laminae, soft to the touch.
10. Primocane prickles firm, usually a little flared at the base, capable of tearing the skin; pedicels and calyces eglandular . . . . . **Rubus missouricus**
10. Primocane prickles weakly setose, not capable of tearing the skin; pedicels and calyces glandular or not.
   Pedicels and calyces sparsely to densely short-stipitate glandular; central primocane leaflet tapering from at or beyond the middle. . . . . **Rubus semisetosus**
   Pedicels and calyces eglandular or beset with an occasional gland; central primocane leaflet tapering from below the middle . . . . . **Rubus schneideri**

6. Primocanes at least thinly beset with flared, commonly recurved prickles that can cause notable discomfort if stroked against their declination.
11. Floricanes erect to high-arching, not reclining at the tip to trail or root; primocanes subterete to ridged and 4-angled, the leaflets strongly acuminate, velutinous abaxially; terminal primocane leaflets decidedly cordate.
12. Inflorescence and usually the young primocane tissues thinly to densely disposed with prominent long-stalked, usually reddish-tipped, glands that are held well above the level of the pubescence. § Alleghenienses
13. Flowers, including the lowest leafy bracted ones, in racemes that are usually twice as long as broad and extend well beyond the leafy-bracted portion; sepals not usually more than 3 mm wide and commonly less than 7 mm long; flowers less than 2.5 cm across. . . . . **Rubus allegheniensis**
13. Flowers in racemes or clusters notably less than twice as long as broad, the inflorescence usually leafy-bracted to near the middle or beyond; sepals nearly always more than 3 mm wide and 7 mm long; flowers more than 2.5 cm across.
   Terminal primocane leaflet about ¾ as wide as long and broadly cordate at the base; inflorescence racemose, with a strong central axis, narrowed distally . . . . . **Rubus rosa**
   Terminal primocane leaflet notably less than ¾ as wide as long and rounded to subcordate at the base; inflorescence more or less cymose, broadened distally. . . . . **Rubus alumnus**
12. Plant glandless or the inflorescence with a rare singleton or scattering of short-stalked dark-tipped hairs that are commonly declined and often obscured by or much shorter than the pubescence and usually admixed with sessile glutinous glands, particularly on young primocane tissues. § Arguti
14. Larger flowers 3 cm or more across; larger fruits more than 1.5 cm long . . . . . **Rubus bellobatus**
14. Flowers all less than 3 cm across; fruits less than 1.5 cm long.
15. Abaxial leaf surfaces loosely but distinctly grayish-tomentose . . . . . *Rubus bifrons*
15. Abaxial leaf surfaces softly pubescent, but without tangled, interwoven hairs.
16. Flowers mostly more than 11, the inflorescence axis floriferous to the base or the lowest flower or pedicel originating from either the bud or the lowest bract, the proximal pedicels usually elongate and leafy bracted . . . . . **Rubus avipes**
16. Flowers fewer than 11, the inflorescence axis appearing to be borne on a leafy peduncle, with at least the proximal foliar leaf without a flower or pedicel.
17. Prickles of primocane setose, straight to scarcely deflexed, slightly flared at the base (§ Setosi, see also couplet 10) . . . . . **Rubus missouricus**
17. Prickles of primocane acicular, often falcate, distinctly flared at the base.

18. Prickles of primocane 2 or more per cm, at least along some portions of the cane.
    Prickles more than 5 per cm . . . . . **Rubus cauliflorus**
    Prickles fewer than 5 per cm . . . . . **Rubus recurvans**
18. Prickles of primocane fewer than 2 per cm.
    Terminal primocane leaflet elliptic, tapered to scarcely rounded at the base . . . . **Rubus pensilvanicus**
    Terminal primocane leaflet ovate, rounded to cordate at the base . . . . . **Rubus frondosus**

11. At least most of the floricanes mounding, low-arching, or reclining, with a strong tendency to trail and/or set roots at the tip; primocanes subterete, the leaflets acute to acuminate, variously pubescent abaxially; terminal primocane leaflets only rarely decidedly cordate.
19. Leaflets of larger leaves pinnately cleft or divided. § Sylvatici . . . . . *Rubus laciniatus*
19. Leaflets undivided. § Flagellares
20. Plant with at least a few gland-tipped hairs in the inflorescence or on the calyx lobes.
21. Flowers several in cymiform, paniculiform, or racemiform inflorescences.
    Inflorescences paniculiform or cymiform, canescent; canes glaucous . . . . . *Rubus caesius*
    Inflorescences racemiform, not canescent; canes not glaucous . . . . . **Rubus ithacanus**
21. Flowers few on ascendate, elongate pedicels.
22. Leaves glabrous or glabrate abaxially . . . . . **Rubus profusiflorus**
22. Leaves with the abaxial veins and usually the laminae notably pubescent.
    Primocane lightly armed, generally with fewer than 4 prickles per cm . . . . . **Rubus meracus**
    Primocane coarsely prickly, with more than 4 prickles per cm . . . . . **Rubus deamii**
20. Plant eglandular.
23. Leaflets glabrate or the hairs confined to the major abaxial veins.
24. Prickles rarely exceeding 2.5 mm in length; inflorescences ascendate, 1 or few-flowered; leaves all 3-foliolate.
    At least some inflorescences more than 1-flowered . . . . . **Rubus steelei**
    Inflorescence 1-flowered . . . . . **Rubus baileyanus**
24. Many of the prickles more than 2.5 mm in length; inflorescences ascendate to cymose, often more than 3-flowered; well developed primocane leaves 3-5 foliolate.
25. Terminal primocane leaflets nearly or quite as long as wide, nearly circular in outline, acute or with a short-acuminate tip less than 1 cm long . . . . . **Rubus fecundus**
25. Terminal primocane leaflets notably longer than wide, the larger with an acuminate tip more than 1 cm long.
    Terminal primocane leaflets obovate and shouldered, usually long-acuminate, the base cuneate to narrowly truncate; inflorescences prevailingly ascendate . . . . . **Rubus flagellaris**
    Terminal primocane leaflets ovate, widest at or below the middle, gradually acuminate, the base rounded to subcordate; inflorescences cymose . . . . . **Rubus plicatifolius**
23. Leaflets velutinous abaxially, with soft hairs disposed on the veins and at least thinly so on the laminae.
26. Inflorescence ascendate, the flowers on strongly ascending, elongate, separate pedicels, the cluster without a clear central axis.
    Pedicels much longer than the bracteal leaves . . . . . **Rubus roribaccus**
    Pedicels not or only scarcely exceeding the bracteal leaves . . . . . **Rubus meracus**
26. Inflorescences mostly cymiform or racemiform, generally with 2 or more flowers on divaricate or spreading pedicels along a more or less discernable axis.
27. Inflorescence racemose; prickles stout, straight, mostly more than 2.5 mm long . . . . . **Rubus ithacanus**
27. Inflorescence cymose; prickles weak, often curved, mostly less than 2.5 mm long.
    Plant low-arching, much of the floricane soon reclining and procumbent, some of the flowers extended beyond the bracteal leaves. . . . . **Rubus michiganensis**
    Plant high-arching, only reclining in the distal ⅓ of the floricane, the flowers surpassed or equaled by the bracteal leaves . . . . . **Rubus recurvans**

RUDBECKIA

1. Principal leaves deeply 3-7 lobed.
2. Stems glabrous and glaucous; disc greenish-yellow; principal leaves 5-7 lobed.
    Disc florets ligulate, the flower heads doubled . . . . . *Rudbeckia laciniata* '*Hortensia*'
    Disc florets not ligulate, the ligules restricted to the ray florets . . . . . **Rudbeckia laciniata**
2. Stems glabrous or pubescent; disc deep purplish-brown; larger leaves 3-lobed.
    Receptacular bracts densely pubescent toward the obtuse or merely acute tips; leaves downy-pubescent abaxially . . . . . **Rudbeckia subtomentosa**
    Receptacular bracts glabrous, the tips abruptly contracted into a subulate cusp; leaves often rough abaxially, but rarely downy . . . . . **Rudbeckia triloba**

1. None of the leaves lobed.
3. Receptacular bracts glabrous, abruptly contracted into a subulate cusp; ligules no more than 12 . . . . . **Rudbeckia triloba**
3. Receptacular bracts glabrous, pubescent, or setose-ciliate, obtuse to acute, but never abruptly contracted into a subulate cusp; ligules often more than 12.
4. Receptacular bracts glabrous or glabrate, more or less ciliolate on the distal margins; pappus a very short crown.
5. Proximal leaf blades broadly rounded to subcordate at the base, sharply dentate; cauline leaves reduced progressively distally . . . . . **Rudbeckia sullivantii**
5. Proximal leaf blades attenuate at the base, shallowly crenate-serrate to subentire; distal leaves not notably reduced.
    Proximal leaves elliptic, about 3 times as long as wide; ligules rarely more than 2 cm long . . . . . *Rudbeckia fulgida*
    Proximal leaves ovate, mostly 2 times as long as wide; ligules prevailingly more than 2 cm long . . . . . **Rudbeckia speciosa**
4. Receptacular bracts canescent or ciliate-setose above the middle; pappus none or an irregular crown.

6. Receptacular bracts canescent; stem leaves on distinct slender petioles, the lateral nerves mostly 4, conspicuous; pappus an irregular crown. . . . . *Rudbeckia grandiflora*
6. Receptacular bracts setose-ciliate; stem leaves sessile or the proximal ones subpetiolate on winged petioles, the lateral nerves usually inconspicuous; pappus none.
7. Disc more than 1.9 cm across; ligules more than 4 cm long . . . . . *Rudbeckia hirta 'Gloriosa Daisy'*
7. Disc less than 1.9 cm across; ligules less than 4 cm long.
Larger cauline leaves 3 cm or more wide . . . . . **Rudbeckia hirta**
Cauline leaves less than 3 cm wide . . . . . **Rudbeckia hirta pulcherrima**

RUELLIA L. {named for French herbalist Jean de la Ruelle (1474-1537), physician to François I, after which he became a priest and published a Latin translation of Dioscorides' *De Materia Medica*, then botany's own *De Natura Stirpium* in 1536, in which he described about 600 plants, based on the works of Theophrastus and Pliny, as well as some of his own work} **Acanthaceae**

~ Minute yellowish to nigrescent blisters on the leaves may be caused by Puccinia lateripes, an autoecious rust.

~ *Inflorescences axillary, the flowers 1-few in loose or dense clusters; calyx 5-parted; corolla regular or nearly so, funnelform, the lobes spreading; stamens 4; fruit a narrow capsule.*

1. Leaves sessile; stems villous; lobes linear-setaceous, the margins with long ciliate hairs . . . . . **Ruellia humilis**
1. Leaves distinctly petiolate; stems short-pubescent to glabrescent; calyx calyx lobes lanceolate, the surfaces with long hairs intermixed with stipitate glands . . . . . **Ruellia strepens**

RUMEX

1. Leaves, at least the proximal ones, hastate at the base; plants dioecious, the flowers reddish or yellowish.
Cauline leaf blades less than 1.5 cm wide, linear-elliptic or hastate-subtruncate with widely spreading, linear proximal lobes . . . . . *Rumex acetosella*
Larger cauline leaf blades more than 1.5 cm wide, ovate-oblong, narrowly to broadly cordate by deltate-oblong basal lobes . . . . . *Rumex thyrsiflorus*
1. None of the leaves hastate at the base; plants monoecious, the flowers usually perfect, greenish or brownish.
2. Margins of valves sharply toothed, deeply angular-lobed or with acicular bristles or spines.
3. Marginal teeth less than 1 mm long, deltate, shorter than to about as long as broad . . . . . *Rumex ×acutus*
3. Longer marginal teeth more than 1 mm long, acicular, much longer than wide.
Leaves ovate, obtuse, the larger more than 5 cm wide and deeply cordate; valves 3.3-5 mm long, the teeth shorter than the breadth of the valve . . . . . *Rumex obtusifolius*
Leaves lanceolate, acute, less than 5 cm wide, attenuate to subcordate; valves less than 3.3 mm long, the bristles longer than the breadth of the valve . . . . . **Rumex fueginus**
2. Margins of valves entire to very shallowly denticulate, never sharply toothed, lobed, or bristled.
4. Larger leaves more than 7 cm wide; larger valves more than 6 mm long.
Well developed tubercles 2 or 3, their bases situated distinctly above the base of the valve; pedicel without a distinct joint at the stipe . . . . . **Rumex orbiculatus**
Tubercles 0-1, the bases about even with the base of the valve; pedicel with a swollen joint at the stipe . . . . . *Rumex patientia*
4. Leaves all less than 7 cm wide; valves not more than 6 mm long.
5. Leaves distinctly crenulate, crisped, or undulate; valves broadly ovate to nearly circular in outline, usually all three with swollen tubercles . . . . . *Rumex crispus*
5. Leaves entire or subentire, never distinctly crisped or undulate; valves deltate, 1-3 developing tubercles.
6. Fruiting pedicels clavate, at least twice the length of the valves . . . . . **Rumex verticillatus**
6. Fruiting pedicels filiform, rarely, if ever, twice the length of the valves.
Valves subacute, each developing tubercles when mature; plant spreading-ascending; leaves less than 3.5 cm wide . . . . . **Rumex triangulivalvis**
Valves obtuse, only 1 or 2 of them developing tubercles when mature; plant erect; larger leaves often more than 3.5 cm wide . . . . . **Rumex altissimus**

RUPPIA cirrhosa

RUPPIACEAE: One genus in our area . . . . . RUPPIA

RUTA *graveolens*

RUTACEAE

A. Leaves opposite . . . . . PHELLODENDRON
A. Leaves alternate.
B. Leaflets 3 . . . . . PTELEA
B. Leaflets or leaf divisions more than 3.
C. Plant with deltate axillary prickles, shrub or small tree . . . . . ZANTHOXYLUM
C. Plant unarmed, suffruticose subshrub.
Leaves pinnately compound, the leaflets sessile but distinct . . . . . DICTAMNUS
Leaves 2-3 pinnatifid, the ultimate leaf divisions indistinct . . . . . RUTA

SABATIA

1. Perennial, the leaves broadly sessile, but not clasping . . . . . **Sabatia campanulata**

1. Annual or biennial, the leaves clasping.
   Nerves of the calyx tube strongly wing-angled and auriculate to the sinuses . . . . . **Sabatia campestris**
   Nerves of the calyx tube flush or scarcely carinate to the sinuses . . . . . **Sabatia angularis**

SACCHARUM *ravennae*

SAGINA *procumbens*

SAGITTARIA
1. Emersed leaves all, or nearly all, linear to lance-ovate, some rarely with 1 or 2 basal lobes; pistillate heads occasionally sessile or subsessile; filaments roughened with minute scales.
   Pistillate heads with slender pedicels mostly 1 cm or more long; achenes about 2 mm long, the beaks less than 0.8 mm long . . . . . **Sagittaria graminea**
   Pistillate heads sessile, or subsessile on stout pedicels less than 1 cm long; achenes about 3 mm long, the longer beaks more than 0.8 mm long . . . . . **Sagittaria rigida**
1. Emersed leaves all, or nearly all, sagittate to sagittate-hastate; pistillate heads almost always pedicellate; filaments smooth, without scales.
   2. Bracts obtuse to acute, rarely subacuminate, up to 1 cm long; stamens mostly more than 25; faces of the achene plane . . **Sagittaria latifolia**
   2. Bracts long-acuminate, often more than 1 cm long; stamens not more than 25; faces of the achene ridged or winged.
      Lower bracts up to 1.5 cm long and 4 mm wide at the base; stamens mostly fewer than 15(20); beaks of achenes minute, less than 0.3 mm long; dorsal crest of achene entire; emersed leaves rarely more than 13 cm long from leaf tip to lobe tip, never more than 18 cm long. . . . . **Sagittaria cuneata**
      Lower bracts often more than 1.5 cm long and 4 mm wide; stamens usually more than 15; beaks of achenes more than 0.3 mm long; dorsal crest of achene crenulate or denticulate; emersed leaves more than 13 cm long and often more than 18 cm **Sagittaria brevirostra**

SALICACEAE
A. Leaves mostly less than 1.8 times as long as wide, the petioles usually more than 2 cm long; stamens usually more than 7 per flower; floral scales erose or lacerate; buds with several imbricated scales . . . . . POPULUS
A. Leaves mostly more than 1.8 times as long as wide, the petioles nearly always less than 2 cm long; stamens usually fewer than 8 per flower; floral scales entire or subentire; buds with one scale . . . . . SALIX

SALICORNIA *rubra*

SALIX
1. Many of the leaves opposite or subopposite . . . . . *Salix purpurea*
1. Leaves all regularly alternate.
   2. Twigs undulate-contorted . . . . . *Salix matsudana*
   2. Twigs stiff to limber, but not undulate-contorted.
      3. Plants with mature well developed leaves . . . . . **Group 1.**
      3. Plants with aments that have either dehiscing anthers or fairly well developed capsules, the leaves commonly absent or merely emergent and immature.
         Plants staminate . . . . . **Group 2.**
         Plants pistillate. . . . . **Group 3**.

Group 1. (Plants with well developed leaves)

1. Leaves entire, crenate, or with fewer than 3 blunt teeth per cm at or beyond the middle.
   2. Leaf margins essentially flat, the adaxial surface not visible along the margins abaxially.
      3. Leaf blades rarely more than 2.8 times as long as wide, the pubescence of purely white hairs only; stipules absent or deciduous and less than 2 mm long . . . . . **Salix bebbiana**
      3. Many of the leaf blades more than 2.8 times as long as wide, the pubescence usually with some reddish or tawny hairs intermixed with the white ones; stipules deciduous or persistent, more than 2 mm long.
         4. Leaf blades rarely more than 4 times as long as wide . . . . . **Salix discolor**
         4. Most of the blades more than 4 times as long as wide.
            5. Leaves green and smooth adaxially, acuminate, the hairs abaxially straight and appressed . . . . . **Salix petiolaris**
            5. Leaves grayish-green and usually rugose adaxially, broadly acute, the hairs abaxially tangled or tomentose.
               Leaves less than 10 cm long, rugose adaxially, the petioles less than 6 mm long . . . . . **Salix humilis**
               Many of the leaves more than 10 cm long, smooth adaxially, the petioles usually more than 6 mm long . . . *Salix viminalis*
   2. Leaf margins distinctly revolute, a portion of the adaxial surface curled under and usually easily visible from the side or even abaxially along the margin.
      6. Leaves completely glabrous and entire, strongly reticulate-veined and green adaxially, glaucous abaxially . . . . . **Salix pedicellaris**
      6. Leaves permanently pubescent, at least abaxially, usually rugose, otherwise various.
         7. Most of the leaf blades more than 4 times as long as wide; plants mostly less than 2 m high.
            Leaves densely white-tomentose or floccose abaxially, mostly more than 6.5 times as long as wide . . . . . **Salix candida**
            Leaves thinly to densely villous, some of the hairs usually reddish, the blades less than 6.5 times as long as wide . . **Salix humilis**
         7. Leaf blades all less than 4 times as long as wide; plants very often more than 2 m high.
            Year-old branches glabrous or glabrate . . . . . *Salix caprea*
            Year-old branches densely pubescent. . . . . *Salix cinerea*
1. Leaves distinctly serrate or serrulate, with more than 3 sharp or glandular teeth per cm at or beyond the middle.

8. Leaf margins irregularly serrate, the distinctly glandular teeth variously disposed along each side, the blades mostly more than 10 times as long as wide . . . . . **Salix interior**
8. Leaf margins regularly serrate or serrulate, the teeth, glandular or not, either closely and evenly serrate or progressively distant toward the base, the blades if more than 10 times as long as wide, then with finely serrate margins.
    9. Leaves green abaxially, glabrous or pubescent.
        10. Petioles eglandular at the summit; leaves glabrous to densely pubescent.
            Leaf blades less than 3 times as long as wide, the margins strongly glandular-serrate, broadly rounded to cordate at the base, glabrate to densely pubescent . . . . . **Salix syrticola**
            Leaf blades more than 3 times as long as wide, the margins not strongly glandular, broadly cuneate to rounded at the base, glabrous or glabrate . . . . . **Salix eriocephala**
        10. Many of the petioles with flattish to conic or clavate glands, often near the summit; leaves glabrous or with a few persistent reddish hairs.
            11. Leaf blades linear-lanceolate to lance-ovate, often falcate, more than 5 times as long as wide; buds sharply pointed.
                Nearly all of the leaf blades more than 7 times as long as wide . . . . . **Salix nigra**
                Principal blades less than 7 times as long as wide . . . . . **Salix ×glatfelteri**
            11. Leaf blades narrowly lanceolate to ovate, not particularly falcate, less than 7 times as long as wide and not usually more than 5 times as long as wide; buds blunt, not sharply pointed.
                12. At least the distal leaves of the branch with the blades long-attenuate into caudate tips, mostly more than 3.6 times as long as wide, glabrous or with deciduous reddish hairs; stipules tardily deciduous and glandular . . . . . **Salix lucida**
                12. Distal leaves acute to acuminate, not caudate, the blades mostly less than 3.6 times as long as wide, glabrous; stipules absent, or if present, then not notably glandular.
                    Leaf blades rarely more than 3 times as long as wide, firm but not particularly coriaceous, not at all pale abaxially . . . . . *Salix pentandra*
                    Many of the blades more than 3 times as long as wide, strongly coriaceous and often pale abaxially . . . **Salix serissima**
    9. Leaves distinctly pale, glaucous or sericeous abaxially.
        13. Buds sharp-pointed; leaf blades ovate-lanceolate, long-attenuate and caudate at the tip, the areolae on the abaxial surface distinct, mostly less than 0.3 mm across; stipules minute and deciduous, conspicuous only on sprout shoots.
            Petioles to 10 mm long . . . . . **Salix ×glatfelteri**
            Longer petioles more than 10 mm long . . . . . **Salix amygdaloides**
        13. Buds tongue-shaped, the tip obtuse; leaf blades linear to lanceolate or ovate, acute to long-acuminate, the areolae incomplete or indistinct and often more than 0.3 mm across; stipules absent or conspicuous.
            14. Fully mature leaves broadly cuneate to rounded or even subcordate at the base; petioles eglandular at the summit; stipules often prominent and persistent; immature leaves commonly reddish, even after drying.
                15. Leaf blades mostly more than 4 times as long as wide, less than 2.2 cm wide . . . . . **Salix eriocephala**
                15. Leaf blades rarely more than 4 times as long as wide, more than 2.2 cm wide.
                    Stipules absent or less than 2.5 mm long . . . . . **Salix pyrifolia**
                    Stipules usually present, more than 2.5 mm long . . . . . **Salix myricoides**
            14. Leaves usually tapered at the base; petioles glandular or eglandular at the summit; stipules absent or inconspicuous; immature leaves usually green throughout or sometimes blackening in drying.
                16. Leaf blades thick and coriaceous, lance-ovate, acuminate, rarely more than 5 times as long as wide . . . . . **Salix serissima**
                16. Leaf blades not coriaceous, linear to lanceolate, acute or acuminate, more than 5 times as long as wide.
                    17. Leaves glabrous, the petioles mostly more than 7 mm long.
                        Leaf blades linear, more than 7 times as long as wide, the margins serrulate; petioles pubescent on the adaxial side; branches pendulous. . . . . *Salix babylonica*
                        Leaf blades lanceolate, less than 7 times as long as wide, the margins coarsely serrate; petioles glabrous; branches not usually pendulous . . . . . *Salix fragilis*
                    17. At least some of the leaves appressed-pubescent, at least thinly so along the veins abaxially and/or the petioles less than 7 mm long.
                        18. Branchlets and abaxial leaf surfaces silky appressed-pubescent with long white hairs.
                            Herbage not blackening with drying . . . . . *Salix alba*
                            Herbage blackening with drying . . . . . **Salix sericea**
                        18. Branchlets and abaxial leaf surfaces nearly or quite glabrous or with some of the hairs a cinnamon or coppery color.
                            Leaves glabrous or appressed-pubescent with cinnamon or coppery colored hairs admixed . . . **Salix petiolaris**
                            Leaves pubescent abaxially with white hairs, at least thinly so along the midvein . . . . . *Salix ×rubens*

Group 2. (Plants with staminate aments)

1. Stamens 3 or more behind each scale, pubescent, at least below the middle.
    2. Aments slender, loosely flowered, the broadest portions less than 1 cm.
        3. Leaves lanceolate to ovate-lanceolate, glaucous abaxially . . . . . **Salix amygdaloides**
        3. Leaves linear-lanceolate, green abaxially.
            At least some of the leaves with the tendency to become asymmetrically curved or falcate . . . . . **Salix nigra**
            Leaves with the margins essentially equal on both sides . . . . . **Salix ×glatfelteri**
    2. Aments stout, densely flowered, very often more than 1 cm broad.
        4. Young leaves with deciduous reddish hairs, the stipules evident and distinctly glandular . . . . . **Salix lucida**
        4. Young leaves glabrous, the stipules absent or inconspicuous.
            Young leaves glaucous or pale abaxially; aments less than 3.5 cm long . . . . . **Salix serissima**
            Young leaves green abaxially; aments often exceeding 3.5 cm long . . . . . *Salix pentandra*
1. Stamens mostly 2, pubescent or glabrous.
    5. Peduncles of fully developed aments bractless or with 1-3 much reduced bracts.

6. Scales subtending stamens yellowish-brown to pinkish . . . . . **Salix bebbiana**
6. Scales brown to nigrescent, at least above the middle.
7. Ments to 2 cm long; plants less than 2(3) m high.
8. Peduncles without leafy bracts; young leaves essentially entire . . . . . **Salix humilis**
8. Peduncles notably bracteate; young leaves toothed.
Year-old branches glabrous . . . . . **Salix petiolaris**
Year-old branches pubescent, at least in patches . . . . . **Salix sericea**
7. Ments in anthesis longer than 2 cm; plants usually more than 2 m high.
9. Filaments glabrous throughout . . . . . *Salix viminalis*
9. Filaments pilose at the base.
10. Young leaves sparsely pubescent, many of the hairs reddish . . . . . **Salix discolor**
10. Young leaves densely white-villous.
Year-old branches glabrous or glabrate . . . . . *Salix caprea*
Year-old branches densely pubescent . . . . . *Salix cinerea*
5. Ments borne on short leafy peduncles.
11. Branchlets thickly and densely white-floccose . . . . . **Salix candida**
11. Branchlets glabrous to densely pubescent, sericeous, or tomentose, but not floccose.
12. Filaments glabrous throughout.
13. Ments relatively few-flowered, not more than 2 cm long; bracts yellowish; young leaves entire . . . . . **Salix pedicellaris**
13. Ments many-flowered, becoming more than 2 cm long; bracts tawny to brown or black; young leaves serrate or crenate.
14. Young leaves gray-tomentose, the teeth strongly glandular . . . . . **Salix syrticola**
14. Young leaves often reddish, glabrous to sparsely pubescent, the teeth blunt or sharply acute, but not strongly glandular.
15. Anthers more than 0.6 mm long . . . . . **Salix eriocephala**
15. Anthers rarely more than 0.6 mm long.
Branchlets red and shiny . . . . . **Salix pyrifolia**
Branchlets yellowish to brown or greenish, not red and shiny . . . . . **Salix myricoides**
12. Filaments loosely pubescent, at least below the middle.
16. Bracts dark-brown or black . . . . . **Salix petiolaris**
16. Bracts yellowish or greenish.
17. Petioles eglandular at the summit; shrubs.
Amentiferous peduncles more than 0.7 cm long; young leaves linear, with irregular teeth . . . . . **Salix interior**
Amentiferous peduncles less than 0.7 cm long; young leaves ovate, obovate, or oblong, essentially entire **Salix bebbiana**
17. Petioles prevailingly glandular at the summit; trees.
18. Amentiferous peduncles less than 0.4 cm long; branches pendulous . . . . . *Salix babylonica*
18. Amentiferous peduncles more than 0.4 cm long; branches pendulous or not.
19. Ments less than 4 cm long; young leaves densely sericeous with long hairs . . . . . *Salix alba*
19. Ments usually more than 4 cm long; young leaves glabrous to thinly short-sericeous.
Leaves nearly or quite glabrous . . . . . *Salix fragilis*
Leaves pubescent . . . . . *Salix ×rubens*

Group 3. (Plants with pistillate ments)

1. Ovaries and capsules pubescent.
2. Floral bracts variously light-colored, yellowish or tawny to pinkish; amentiferous peduncles leafy at the base.
3. Ovaries and capsules densely white-floccose . . . . . **Salix candida**
3. Ovaries and capsules gray-hairy to glabrescent.
Leafy amentiferous peduncles more than 2 cm long; floral bracts caducous after anthesis, mostly more than 2 mm long . . . . . **Salix interior**
Amentiferous peduncles less than 2 cm long; floral bracts persistent, to about 2 mm long . . . . . **Salix bebbiana**
2. Floral bracts brown to brownish-green to nigrescent, at least at the tip; amentiferous peduncles bractless or leafy.
4. Longer pedicels more than 2 mm long, the ments becoming more than 3.5 cm long.
5. Young leaves sparsely pubescent, many of the hairs often reddish or coppery-tinged . . . . . **Salix discolor**
5. Young leaves densely white-villous.
Year-old branches glabrous or glabrate . . . . . *Salix caprea*
Year-old branches densely pubescent . . . . . *Salix cinerea*
4. Pedicels rarely more than 2 mm long, the ments usually no more than 3.5 cm long.
6. Stigmas on stalks more than 0.5 mm long . . . . . *Salix viminalis*
6. Stigmas on stalks less than 0.5 mm long.
7. Year-old branches glabrous . . . . . **Salix petiolaris**
7. Year-old branches permanently pubescent.
Hairs of abaxial leaf surfaces straight and appressed . . . . . **Salix sericea**
Hairs of abaxial leaf surfaces tangled and tomentose . . . . . **Salix humilis**
1. Ovaries and capsules nearly or quite glabrous.
8. Floral bracts, at least many of them, persistent, yellowish to brown, black or red.
9. Leaf margins entire; bracts sparsely pubescent to glabrous . . . . . **Salix pedicellaris**
9. Leaf margins serrate or crenate; bracts pubescent to villous.
10. Young leaves densely pubescent, the margins strongly glandular-serrate, ovate, obovate, or oblong, grayish-green; capsules more than 5 mm long . . . . . **Salix syrticola**
10. Young leaves glabrous to pubescent, the margins crenate to serrate but not strongly glandular, narrowly lanceolate to ovate or oblong, typically reddish-tinged; capsules to 5 mm long.
11. Pedicels less than 0.5 mm long.

Capsules more than 4 mm long, on slender pedicels . . . . . **Salix pyrifolia**
Capsules less than 4 mm long, sessile . . . . . *Salix babylonica*
11. Pedicels more than 0.5 mm long.
Young leaves glabrous and thickly glaucous abaxially . . . . . **Salix myricoides**
Young leaves more or less pubescent, green or pale abaxially . . . . . **Salix eriocephala**
8. Floral bracts caducous in fruit, yellowish.
12. Leaves linear to lanceolate; pedicels of capsules not usually exceeding 0.8 mm long.
13. Leaves densely sericeous, the margins serrulate; aments no more than 6 cm long; stigmas on stalks less than 0.3 mm long *Salix alba*
13. Leaves sparsely pubescent to glabrous, the margins serrate; aments often becoming more than 6 cm long; stigmas on stalks more than 0.3 mm long.
14. Leaves green abaxially.
Capsules less than 5.3 mm long; leaves evenly serrulate, many of them falcate . . . . . **Salix nigra**
Capsules more than 5.3 mm long; leaves irregularly serrate, never falcate . . . . . **Salix interior**
14. Leaves glaucous abaxially.
Leaves pubescent; pedicels less than twice the length of the nectaries . . . . . *Salix ×rubens*
Leaves glabrous; pedicels mostly more than twice the length of the nectaries . . . . . *Salix fragilis*
12. Leaves narrowly to broadly ovate, usually abruptly acuminate; longer pedicels of capsules usually at least 0.8 mm long.
15. Petioles eglandular at the summit; capsules rarely more than 6 mm long; leaves glaucous abaxially, dull adaxially; stipules absent or minute.
Leaves glaucous abaxially, abruptly long-acuminate . . . . . **Salix amygdaloides**
Leaves green or scarcely pale abaxially, gradually acuminate . . . . . **Salix ×glatfelteri**
15. Petioles strongly glandular at the summit; capsules often more than 6 mm long; leaves green or glaucous abaxially, glossy adaxially; stipules present or absent.
16. Capsules not more than 7 mm long; leaves green abaxially; stipules tardily deciduous and glandular . . . . . **Salix lucida**
16. Capsules soon exceeding 7 mm long; leaves green or glaucous abaxially; stipules absent.
Abaxial surface of floral bracts glabrous or glabrate beyond the middle . . . . . *Salix pentandra*
Floral bracts pilose throughout . . . . . **Salix serissima**

SALSOLA
1. Flowers mostly overlapping in dense spikes, the bracts appressed-ascending; leaves tipped by a bristle less than 0.1 mm wide at the base and less than 0.5 mm long . . . . . *Salsola collina*
1. Flowers scarcely overlapping in loose spikes, the bracts widely spreading; leaves tipped by a strong spine more than 0.1 mm wide at the base, the larger more than 0.5 mm long . . . . . *Salsola tragus*

SALVIA
1. Leaves linear to oblong-lanceolate, narrowly cuneate, less than 2 cm wide, subsessile or on petioles up to 2 cm long.
Calyx tube pubescent only along the ribs; corolla less than 1.5 cm long; annual . . . . . *Salvia reflexa*
Calyx tube pubescent throughout; corolla more than 1.5 cm long; perennial . . . . . *Salvia azurea grandiflora*
1. Leaves lanceolate to ovate, mostly truncate to subcordate at the base, often more than 2 cm wide, at least the proximal petioles more than 2 cm long.
2. Leaves elliptic-oblong, obscurely crenulate . . . . . *Saliva officinalis*
2. Leaves narrowly to broadly ovate, distinctly crenate or crenate-dentate.
3. Stems without glandular hairs; corollas less than 1.5 cm long . . . . . *Salvia ×sylvestris*
3. Stems with glandular hairs, at least distally; corollas more than 1.5 cm long.
Calyx tube more than 7 mm long; bracts lanceolate to ovate; leaves mostly cauline, commonly with more than 3 pairs *Salvia sclarea*
Calyx tube less than 7 mm long; bracts narrowly lance-deltate; leaves basally disposed, with up to 3 pairs of cauline leaves . . . . . *Salvia pratensis*

SALVINIACEAE: One genus in our area . . . . . AZOLLA

SAMBUCUS
1. Pith brown; inflorescence ovoid, paniculiform, about as long as broad; blooming period ended by the first of June; fruits bright-red . . . . . **Sambucus racemosa pubens**
1. Pith white; inflorescence flat or flattish, umbelliform, much broader than long; blooming period beginning after the first of June; fruits usually purplish-black (red, yellow, orange, or green in rare forms).
2. Leaflets nearly always 5, rarely 7, acute to short-acuminate; petals creamy-white when fresh; carpels usually 3; fresh drupe more than 5 mm across. . . . . *Sambucus nigra*
2. Leaflets nearly always 7 or more, rarely 5, long-acuminate; petals white when fresh; carpels usually 4; fresh drupe to 5 mm across.
Leaflets undivided, serrate . . . . . **Sambucus canadensis**
Leaflets pinnately divided into irregularly dentate or lobed segments . . . . . *Sambucus canadensis 'Acutiloba'*

SAMOLACEAE: One genus in our area . . . . . SAMOLUS

SAMOLUS parviflorus

SANGUINARIA canadensis

SANGUISORBA canadensis

SANICULA

1. Styles conspicuous, recurving and surpassing the hooked bristles.
   - Calyx lobes no more than 1 mm long, those of the staminate flowers deltate, acute . . . . . **Sanicula odorata**
   - Calyx lobes more than 1 mm long, those of the staminate flowers narrowly subulate . . . . . **Sanicula marilandica**

1. Styles inconspicuous, shorter than the hooked bristles.
   2. Staminate flowers on pedicels 3 times as long as the calyx or longer; beak of pistillate sepals typically prolonged beyond the bristles; fruit more than 5 mm long, the body elliptic-oblong, obviously longer than broad . . . . . **Sanicula trifoliata**
   2. Staminate flowers on pedicels up to 3 times the length of the calyx; beak of pistillate sepals shorter than and mostly hidden by the bristles; fruit up to 5 mm long, the body subglobose.
      - Umbellets of 3 pistillate flowers rarely more than 10 mm across, with 1-3 staminate flowers borne on pedicels to 2 mm long . . . . . **Sanicula canadensis**
      - Umbellets of 3 pistillate flowers commonly more than 10 mm across, with more than 3 staminate flowers, some borne on pedicels more than 2 mm long . . . . . **Sanicula canadensis grandis**

SANTALACEAE: One genus in our area . . . . . COMANDRA

SANVITALIA *procumbens*

SAPINDACEAE

A. Leaves alternate, pinnatifid to bipinnate . . . . . KOELREUTERIA
A. Leaves opposite, simple to quinate . . . . . ACER

SAPONARIA *officinalis*

SARRACENIA purpurea

SARRACENIACEAE: One genus in our area . . . . . SARRACENIA

SASA *veitchii*

SASSAFRAS albidum

SATUREJA *hortensis*

SAURURACEAE: One genus in our area . . . . . SAURURUS

SAURURUScernuus

SAXIFRAGACEAE

A. Leaves all cauline, more than 2 per stem . . . . . CHRYSOSPLENIUM
A. Leaves all basal or sometimes the stems with 1 or 2 cauline leaves.
   B. Leaves entire or remotely and scarcely repand-denticulate . . . . . MICRANTHES
   B. Leaves manifestly crenate or dentate.
      C. Petioles glabrous; inflorescence paniculate; stamens 5 . . . . . SULLIVANTIA
      C. Petioles white strigose-hispid to puberulent or minutely stipitate-glandular; inflorescence spicate or racemose; stamens 5 or 10.
         D. Petioles densely spreading-pilose, the flowers irregular and asymmetrical in paniculate inflorescences; stamens 5 . . . . . HEUCHERA
         D. Plants not as above; stamens 10.
            - Petals pectinate-fringed or fimbriate-pinnatifid; flowers and fruits on short stout pedicels usually less than 5 mm long; stems with a single pair of cauline leaves (usually completely scapose in the rare Mitella nuda) . . . . . MITELLA
            - Petals entire; flowers and fruits on slender pedicels mostly 5 mm or more long; plant completely scapose . . . . . TIARELLA

SCEPTRIDIUM

1. Sterile blades with the ultimate divisions decidedly acute.
   - Leaf divisions flat, not rugose-channeled, the ultimate lobes with prevailingly 1 vein . . . . . **Sceptridium dissectum**
   - Leaf divisions concave adaxially, rugose-channeled, the ultimate lobes mostly with 2 or more veinlets . . . . . **Sceptridium rugulosum**

1. Sterile blades with the ultimate divisions blunt.
   - Terminal principal segments of terminal and lateral pinnae not notably more elongate that the lateral ones . . . . . **Sceptridium multifidum**
   - Terminal segments with a notable tendency to be more elongate and only weakly cleft . . . . . **Sceptridium oneidense**

SCHEDONORUS

1. Leaf blades often more than 5 mm wide, strongly cartilaginous-nerved, the auricles ciliate; segments of the rachilla pubescent or scabrous with antrorse hairs . . . . . *Schedonorus arundinaceus*
1. Leaf blades rarely more than 5 mm wide, never more than 7 mm, not strongly cartilaginous-nerved, the auricles smooth; segments of the rachilla appearing smooth under 10× magnification . . . . . *Schedonorus pratensis*

SCHEUCHZERIA palustris americana

SCHIZACHNE purpurascens

SCHIZACHYRIUM

1. Plants rooting and branching at the proximal nodes . . . . . **Schizachyrium littorale**
1. Plants cespitose, none of the aerial culms bearing roots . . . . . **Schizachyrium scoparium**

SCHOENOPLECTIELLA

1. Achenes conspicuously transversely rugulose; perianth bristles absent; scales notably mucronate, the midrib excurrent as a dark mucro about 0.2 mm long; culms with at least one cauline blade . . . . . **Schoenoplectiella hallii**
1. Achenes smooth or bluntly pitted; perianth bristles present or absent; scales obtuse or with an apiculus less than 0.1 mm long; culms without well developed cauline blades.
   Longer culms rarely more than 0.75 times the length of the whole shoot, the bracts appearing as a straight continuation of the culm . . . . . **Schoenoplectiella smithii**
   Longer culms almost always more than 0.75 times the length of the whole shoot, the bract very often bent away or deflected from the base of the spikes, causing the culm and bract together to appear as though kinked at the inflorescence . . . . . **Schoenoplectiella purshiana**

SCHOENOPLECTUS

1. Bract subtending the inflorescence absent or very short, very rarely longer than the solitary spikelet; culms filiform . . . . . **Schoenoplectus subterminalis**
1. Bract or bracts subtending the inflorescence conspicuous; culms not filiform; spikelets usually more than 1.
   2. Culms sharply triangular.
      Stigmas prevailingly 2; perianth bristles mostly less than the length of the achene, the apiculus less than 0.5 mm long; leaves not exceeding the middle of the culm . . . . . **Schoenoplectus pungens**
      Stigmas 3; perianth bristles mostly longer than the length of the achene, the larger apiculi 0.5 mm or more long; leaves much surpassing the middle of the culm . . . . . **Schoenoplectus torreyi**
   2. Culms terete or obscurely triangular.
      3. Stigmas 3; achenes trigonous; perianth bristles 2-4; panicle branches flexuous; scales pale-brown and glabrous . . . . . **Schoenoplectus heterochaetus**
      3. Stigmas 2; achenes plano-convex; perianth bristles 4-6; panicle branches stiff; scales darker, usually reddish-brown, either viscid or scabrous or both.
         Spikelets ovoid, mostly less than twice as long as broad, usually less than 10 mm long; culms easily compressed; achenes rarely more than 2.1 mm long . . . . . **Schoenoplectus tabernaemontani**
         Spikelets oblong to more or less cylindric, mostly more than twice as long as broad, and usually becoming more than 10 mm long; culms firm; most achenes 2.1 mm or more long . . . . . **Schoenoplectus acutus**

SCILLA *siberica*

SCIRPUS

1. Lower sheaths conspicuously tinged with red.
   Stigmas 2; perianth bristles typically 4; achenes lenticular . . . . . **Scirpus microcarpus**
   Stigmas 3; perianth bristles 3 or 6; achenes trigonous . . . . . **Scirpus expansus**
1. All sheaths brownish or green.
   2. Perianth bristles kinked and curled, at least beyond the middle; spikelets one to few in open or contracted cymes.
      3. Leaves more than 11 per culm . . . . . **Scirpus polyphyllus**
      3. Leaves fewer than 11 per culm.
         4. Scales with prominent, usually green, midribs, nearly or quite concealing the perianth bristles . . . . . **Scirpus pendulus**
         4. Scales without prominent midribs, much exceeded by the perianth bristles.
            Spikelets in each cymule prevailingly sessile, with at least the central spikelet of each cymule always sessile . . . . **Scirpus cyperinus**
            Spikelets nearly all pedicellate, with only the central spikelet of the ultimate cymule typically sessile . . . . . **Scirpus pedicellatus**
   2. Perianth bristles neither curled nor kinked, or bristles obsolete; spikelets numerous, crowded into dense, mostly subglobose heads.
      5. Perianth bristles absent or occasionally as many as 3 and shorter than the achenes, the bristles smooth or with a few barbs near the tips . . . . . **Scirpus georgianus**
      5. Perianth bristles more than 3, shorter than to exceeding the shoulders of the achenes, barbed nearly or quite throughout.
         6. Scales with mucros more than 0.4 mm long . . . . . *Scirpus pallidus*
         6. Scales with mucros to 0.4 mm long.
            Scales soon deciduous; longer perianth bristles usually shorter than the achenes . . . . . **Scirpus hattorianus**
            Scales persistent; perianth bristles frequently subequaling or exceeding the achenes . . . . . **Scirpus atrovirens**

SCLERANTHUS *annuus*

SCLERIA

1. Achenes smooth; larger leaves more than 4 mm wide . . . . . **Scleria triglomerata**
1. Achenes sculptured, wrinkled, warty, or tuberculate; leaves less than 4 mm wide (up to 5 mm wide in the rare Scleria muehlenbergii).
   2. Achenes minutely pubescent; spikelets in axillary and terminal panicles, the proximal panicles drooping on slender peduncles; leaves glabrous, the larger ones more than 2 mm wide . . . . . **Scleria muehlenbergii**
   2. Achenes glabrous; panicles, if present, erect or ascending; leaves glabrous to pubescent, less than 2(4) mm wide.
      3. Flowers one to few in sessile glomerules along an interrupted spike, the involucral bracts setaceous and scarcely exceeding the glomerule; achene about 1.5 mm in diameter; hypogynium absent or inconspicuous; leaves glabrous or pilose; plant annual . . . . . **Scleria verticillata**
      3. Flowers in terminal or axillary fascicles, each fascicle subtended by an involucre of foliaceous bracts; plants otherwise without the above combination of characters.
         Plant annual, the herbage essentially glabrous except for the pubescent ventral sheaths; hypogynium etuberculate . **Scleria reticularis**
         Plant a rhizomatous perennial, the herbage copiously pubescent; hypogynium conspicuously tuberculate . . . . . **Scleria pauciflora**

SCLEROCHLOA *dura*

SCOLOCHLOA *festucacea*

SCROPHULARIA

1. Principal leaves with blades coarsely serrate or serrate-incised, the teeth mostly long-acuminate; leaf bases cuneate, rounded, or subtruncate, usually decurrent along the petioles for most of their length; staminode greenish-yellow; stem face flat or even somewhat convex . . . . . **Scrophularia lanceolata**
1. Principal leaves with blades mostly evenly serrate or serrate-dentate, the teeth mostly rounded or broadly tapering to an abruptly apiculate tip; leaf bases broadly rounded to mostly subcordate or cordate, not decurrent along the petioles; staminode brown or purplish; stem faces mostly grooved . . . . . **Scrophularia marilandica**

SCROPHULARIACEAE

A. Leaves mostly in whorls of 3 to 7 . . . . . VERONICASTRUM
A. Leaves alternate, opposite, or occasionally in whorls of 3.
  B. Calyx with fewer than 5 distinct lobes or sepals (rarely 5 in Melampyrum).
    C. Leaves strongly dimorphic, the basal ones well developed, cordate and long-petiolate, the cauline much reduced, mostly alternate and sessile; inflorescence a dense terminal spike-like raceme . . . . . BESSEYA
    C. Leaves not dimorphic as above; inflorescence various.
      Corollas strongly bilabiate, partly yellow; capsules pointed, asymmetrical; inflorescence leaves frequently laciniate-dentate at the base . . . . . MELAMPYRUM
      Corollas mostly regular or nearly so, scarcely or not at all bilabiate, never partly yellow; capsules emarginate, symmetrical; none of the leaves laciniate-dentate at the base . . . . . VERONICA
  B. Calyx lobes or sepals 5 (some lobes obsolete in Mimulus glabratus jamesii).
    D. Leaves all essentially alternate (the proximal sometimes opposite in Kickxia and Nuttallanthus).
      E. Flowers in terminal spikes or racemes.
        F. Corollas distinctly spurred at the base; calyx and stem eglandular.
          Corollas blue or white; capsules less than 4 mm long; leaves linear, less than 1.5 mm wide . . . . . NUTTALLANTHUS
          Corollas yellow; capsules more than 4 mm long; leaves linear to ovate, the larger more than 1.5 mm wide . . . . . LINARIA
        F. Corollas not spurred; calyx, and often the stems, glandular-pubescent or tomentose.
          G. Corollas nearly or quite regular; stamens 5; calyx glandular or tomentose . . . . . VERBASCUM
          G. Corollas strongly bilabiate; stamens 4; calyx glandular-pubescent.
            Leaves serrulate . . . . . DIGITALIS
            Leaves entire . . . . . ANTIRRHINUM
      E. Flowers axillary.
        H. Plant glabrous throughout; leaves reniform to suborbicular, palmately lobed; plant trailing, rooting at the nodes . CYMBALARIA
        H. Plants villous or pilose, at least beyond the middle; leaves linear to triangular-ovate, unlobed or merely hastate at the base; plant prostrate to erect.
          I. Leaves broadly elliptic-oblong to triangular-ovate, the larger often hastate at the base; plant prostrate . . . . . KICKXIA
          I. Leaves linear to narrowly lanceolate; plants erect.
            Flowers and fruits sessile or subsessile on pedicels shorter than the sepals; sepals more than 5 mm long; corolla merely saccate, more than 8 mm long . . . . . ANTIRRHINUM
            Flowers and fruits on slender pedicels longer than the sepals; sepals less than 5 mm long; corolla conspicuously spurred at the base, less than 8 mm long . . . . . CHAENORHINUM
    D. Leaves opposite or a few sometimes in whorls of 3 (the inflorescence leaves or bracts sometimes alternate).
      J. Inflorescence a terminal raceme, panicle, or spike, the bracts subtending the pedicels very strongly reduced, not at all resembling the stem leaves.
        K. Inflorescence spicate, the flowers sessile or subsessile on pedicels mostly less than 1 mm long . . . . . CHELONE
        K. Inflorescence racemiform or paniculiform, the flowers on distinct pedicels more than 1 mm long.
          L. Leaves distinctly petiolate.
            Plants creeping to suberect, less than 2 dm high; leaves less than 4(5) cm long, tapered into the petioles . . . . . MAZUS
            Plants erect, more than 2 dm high; leaves more than 4 cm long, abruptly contracted into the petioles . SCROPHULARIA
          L. Leaves sessile or rarely the proximal ones petiolate.
            Flowers 2-several in whorls from the distal leaf axils; corollas cleft nearly to the base; staminode rudimentary; blooming period ending in late May; annual . . . . . COLLINSIA
            Flowers in terminal racemiform or paniculiform inflorescences; corollas lobed only above the middle; staminode manifest, conspicuously bearded; blooming period beginning in late May; perennial . . . . . PENSTEMON
      J. Inflorescence not terminal, the flowers usually solitary in the axils of well developed leaves.
        M. Principal leaves lobed, dissected, or compound . . . . . LEUCOSPORA
        M. Leaves all unlobed.
          N. Sepals united, at least partially, into a distinct tube.
            Corollas strongly bicolored white and blue; calyx lobes longer than the tube . . . . . COLLINSIA
            Corollas not bicolored, blue-violet or yellow; calyx lobes shorter than the tube or nearly absent . . . . . MIMULUS
          N. Sepals free to the base.
            O. Sepals dimorphic, the upper one broadly elliptic and two times or more as wide as the other four, the next two about twice as wide as the smallest pair; corollas nearly regular; leaves suborbicular, about as long as wide . . . . . BACOPA
            O. Sepals all about the same width; corollas bilabiate; leaves clearly longer than wide.
              Calyx ebracteate . . . . . LINDERNIA
              Calyx subtended by a pair of sepaloid bracts . . . . . GRATIOLA

SCUTELLARIA
1. Leaves up to 1.5(2) cm long, entire or subentire; flowers axillary, the bracts resembling the leaves in size and shape.
   Plant glandular-pubescent; leaves flat . . . . . **Scutellaria parvula**
   Plant pubescent, but eglandular; leaves typically revolute-margined . . . . . **Scutellaria leonardii**
1. Leaves more than 1.5 cm long, serrate, dentate, crenate, or occasionally some of them subentire; inflorescence various.
   2. Stems and leaves glabrous or glabrate; flowers numerous in one-sided, mostly axillary, racemes, the bracts much reduced, not at all resembling the foliage leaves . . . . . **Scutellaria lateriflora**
   2. Stems, at least along the angles, and abaxial leaf surfaces pubescent; inflorescence various.
      3. Flowers solitary in the axils of the leaves or leaf-like bracts, or occasionally in interrupted, axillary, racemiform inflorescences with the bracts more or less reduced in size, but still resembling the foliage leaves.
         Leaves broadly ovate, less than twice as long as wide, sessile or subsessile . . . . . **Scutellaria nervosa**
         Leaves, or most of them, lanceolate to narrowly ovate, more than twice as long as wide, distinctly petiolate . **Scutellaria galericulata**
      3. Flowers in terminal racemes, the floral bracts strongly reduced, not at all resembling the foliage leaves.
         Leaves mostly cordate, not noticeably (under 10× magnification) puncticulate abaxially, the larger ones usually more than 6 cm long and 4 cm wide . . . . . **Scutellaria ovata**
         Leaves broadly cuneate to truncate or the proximal ones rarely subcordate, conspicuously glandular-puncticulate abaxially, less than 6 cm long and 4 cm wide . . . . . **Scutellaria elliptica hirsuta**

SECALE *cereale*

SECURIGERA *varia*

SEDUM
1. At least some of the leaves broad, flat, with parallel adaxial and abaxial surfaces.
   Leaves more than 6.5 mm wide; petals white . . . . . **Sedum ternatum**
   Leaves less than 6.5 mm wide; petals yellow . . . . . *Sedum sarmentosum*
1. Leave subterete or the adaxial and abaxial surfaces convex and non-parallel.
   2. Leaves minute, very crowded, less than 6 mm long.
      Leaves ovoid, widest near the base, not definitely ranked; petals mostly more than 5 mm long . . . . . *Sedum acre*
      Leaves linear-oblong, appearing 6-ranked on sterile shoots; petals no more than 5 mm long . . . . . *Sedum sexangulare*
   2. Leaves larger, closely to loosely arranged, the longer ones more than 6 mm long.
      Flowers white or pale-pink; leaves blunt . . . . . *Sedum album*
      Flowers yellow; leaves subulate at the tip . . . . . *Sedum rupestre*

SELAGINELLA
1. Leaves firm, appressed, linear-lanceolate, minutely ciliate along the margins, bristle-tipped . . . . . **Selaginella rupestris**
1. Leaves delicate, the larger ones spreading, narrowly ovate, eciliate, not bristle-tipped . . . . . **Selaginella eclipes**

SELAGINELLACEAE: One genus in our area . . . . . SELAGINELLA

SENECIO
1. Plant copiously glandular-pubescent; ligules present, but minute . . . . . *Senecio viscosus*
1. Plant glabrous to tomentose, but never densely glandular-pubescent; ligules absent . . . . . *Senecio vulgaris*

SENNA
1. Leaves with 1-3 pairs of broadly obovate, blunt-tipped leaflets; petiolar gland located between or just above the lowest pair of leaflets *Senna tora*
1. Leaves with mostly 4 or more pairs of lanceolate to ovate, obtuse, acute, or acuminate leaflets; petiolar gland located well below the lowest pair of leaflets.
   2. Leaflets long-acuminate, no more than 12 per leaf . . . . . *Senna occidentalis*
   2. Leaflets obtuse to acute, mostly more than 12 per leaf.
      Gland at base of petiole cylindrical or more or less conical, not widest beyond the middle; hairs of ovary and fruits less than 1.3 mm long, appressed . . . . . **Senna marilandica**
      Petiolar gland strongly clavate or stipitate, widest beyond the middle; longer hairs of ovary and fruit more than 1.3 mm long, commonly ascending or spreading . . . . . **Senna hebecarpa**

SESBANIA *herbacea*

SETARIA
1. Spikes with harshly scabrous, retrorsely barbed bristles causing the spikes to tangle inseparably with other spikes, leaves, and stem parts . . . . . *Setaria verticillata*
1. Spikelets with antrorsely barbed bristles, not tangling.
   2. Each pedicel subtended by 5 to 20, usually yellowish, bristles; fertile lemmas conspicuously transversely rugose, the second glume much exceeded by the fertile lemma; spikes nearly always less than 8.5 cm long; sheath margins neither ciliate nor pilose.
      Plant perennial; spikelets usually less than 2.5 mm long; second glume up to 1.5 mm long . . . . . **Setaria parviflora**
      Plant annual; spikelets more than 2.5 mm long; second glume more than 1.5 mm long . . . . . *Setaria pumila*
   2. Each pedicel subtended by fewer than 5(6) greenish, purplish, or yellowish bristles; fertile lemmas finely rugulose to smooth, hidden by the second glume; spikes often more than 8.5 cm long; sheath margins ciliate or pilose for most of their length.
      3. Adaxial leaf surfaces ascending-villous . . . . . *Setaria faberi*

3. Leaves glabrous or scabrous, but without villous hairs.
   4. Larger spikelets more than 2.5 mm long, disarticulating above the glumes . . . . . *Setaria italica*
   4. Larger spikelets no more than 2.5 mm long, disarticulating below the glumes.
      Leaves less than 13 mm wide; panicles to 10 cm long and, not including the bristles, less than 9 mm broad, not usually lobulate . . . . . *Setaria viridis*
      Larger leaves 13 mm or more wide; panicles more than 10 cm long and, not including the bristles, 9 mm broad, usually appearing lobulate, with short lateral branches . . . . . *Setaria viridis major*

SHEPHERDIA
1. Adaxial leaf surfaces densely clothed with silvery scales; flowers appearing with the leaves . . . . . *Shepherdia argentea*
1. Adaxial leaf surfaces green, nearly or quite without silvery scales; flowers appearing before the leaves . . . . . **Shepherdia canadensis**

SHERARDIA *arvensis*

SIBBALDIOPSIS tridentata

SICYOS angulatus

SIDA *spinosa*

SILENE
1. Principal leaves whorled; petals fringed . . . . . **Silene stellata**
1. Leaves all opposite; petals not fringed.
   2. Calyx glabrous.
      3. Calyx clavate, dilated distally, tapered to the base; corolla pink; leaves lance-ovate, clasping . . . . . *Silene armeria*
      3. Calyx not clavate; corolla white, pink, rose, or absent; leaves various.
         4. Plant with glutinous patches along the distal internodes and peduncles; calyx tightly investing the capsule . . . . . **Silene antirrhina**
         4. Plants without glutinous patches along the internodes; calyx at least partially inflated around the capsule.
            5. Flowers 1-5, solitary in the axils of full-sized leaves . . . . . **Silene nivea**
            5. Flowers more than 5, in minutely bracted extended cymes or panicles.
               6. Nerves of calyx dark-green or purple, with thickened midribs . . . . . *Silene flos-cuculi*
               6. Nerves of calyx pale, nearly concolorous with the tube, scarcely expressed.
                  Calyx very inflated, subspherical to ovoid, umbilicate, dimpled beneath at its junction with the pedicel, the longitudinal nerves connected by conspicuous, anastomosing intermediate nerves; distal floral bracts never ciliolate; perennial . . . . . *Silene vulgaris*
                  Calyx scarcely inflated, narrowly ovoid-oblong to broadly ellipsoid, cuneate or rounded to the pedicel, the intermediate nerves absent or inconspicuous; distal floral bracts typically ciliolate; biennial . . . . . *Silene cserei*
   2. Calyx puberulent, villous, or glandular.
      7. Plants densely white-tomentulose; calyx lobes geniculate-twisted . . . . . *Silene coronaria*
      7. Plants green, villous or viscid, never white-tomentulose; calyx lobes not geniculate-twisted.
         8. Inflorescence densely hemispherical; calyx not inflated . . . . . *Silene chalcedonica*
         8. Inflorescence a loose, often dichotomous, cyme or raceme; calyx inflated.
            9. Flowers white or creamy-white (rarely pink-tinged).
               10. Styles 5 or 6 or flowers imperfect . . . . . *Silene latifolia*
               10. Styles fewer than 5; flowers perfect.
                  11. Flowers in long dichotomous racemes, ascending, usually secund . . . . . *Silene dichotoma*
                  11. Flowers in an open cyme, often nodding, never secund.
                     Calyx tube glandular-villous; annual . . . . . *Silene noctiflora*
                     Calyx tube short-pubescent, eglandular; perennial . . . . . **Silene nivea**
            9. Flowers scarlet or roseate, rarely white.
               12. Leaves linear or linear-lanceolate, less than 1 cm wide . . . . . *Silene conica*
               12. Leaves ovate to oblanceolate or spatulate, many or all more than 1 cm wide.
                  13. Styles 5; corollas roseate . . . . . *Silene dioica*
                  13. Styles fewer than 5; corollas scarlet.
                     Plant with more than 10 pairs of broadly ovate leaves below the compact inflorescence; corolla lobes entire . . . . . **Silene regia**
                     Plant with fewer than 10 pairs of oblanceolate or spatulate leaves below the loose cymose inflorescence; corolla lobes usually 2-cleft . . . . . **Silene virginica**

SILPHIUM
1. Leaves all basal or if cauline, then reduced and pinnately lobed.
   2. Leaves all basal, cordate, denticulate; stems glabrous . . . . . **Silphium terebinthinaceum**
   2. Leaves prevailingly basal, usually tapered into the petiole, pinnately lobed or divided, the lobes or divisions with entire margins, the cauline ones few, reduced; stems pubescent, at least distally.
      Basal leaves simply lobed or pinnately divided; stems glabrous proximally . . . . . **Silphium pinnatifidum**
      Basal leaves bipinnatifid, the ultimate divisions acutely few-lobed; stems hispid proximally . . . . . **Silphium laciniatum**
1. Leaves cauline, neither reduced nor pinnately lobed.
   3. Leaves connate-perfoliate; stems quadrangular . . . . . **Silphium perfoliatum**
   3. Leaves merely sessile; stems terete or subterete.
      4. Phyllaries glabrous; abaxial leaf surfaces and peduncles glabrous or glabrate . . . . . *Silphium speciosum*

4. Phyllaries scabrous or pubescent; abaxial leaf surfaces scabrous, the peduncles usually pubescent.
5. Phyllaries scabrous or pubescent, eglandular . . . . . **Silphium integrifolium**
5. Phyllaries glandular-pubescent.
Abaxial leaf surfaces uniformly velutinous with soft hairs . . . . . **Silphium integrifolium deamii**
Abaxial leaf surfaces glabrate or thinly short-pubescent on the veins with pustular-based hairs . . . . . **Silphium integrifolium neglectum**

SIMAROUBACEAE: One genus in our area . . . . . AILANTHUS

SINAPIS
1. Ovaries and fruits densely white-hispid with elongate-deltate hairs . . . . . *Sinapis alba*
1. Ovaries and fruits glabrous or sparsely pubescent . . . . . **Sinapis arvensis**

SISYMBRIUM
1. Middle and distal leaves pinnatifid into linear segments . . . . . *Sisymbrium altissimum*
1. Leaves coarsely pinnatifid into lanceolate or ovate, serrate lobes.
Siliques widely spreading-ascending on filiform pedicels more than 4 mm long . . . . . *Sisymbrium loeselii*
Siliques tightly appressed to the rachis on stout, clavate, erect pedicels less than 4 mm long . . . . . *Sisymbrium officinale*

SISYRINCHIUM
1. Spathes all on peduncles originating from the axil of a foliaceous involucral bract, the peduncles all notably longer than the outer bract of the spathes.
2. Inner bract of spathes less than 1.4 cm long . . . . . **Sisyrinchium atlanticum**
2. Inner bract of spathes more than 1.4 cm long.
Stems conspicuously winged, usually more than 2.5 mm wide near the middle, where the wing is at least as wide as the central portion; bracts of spathes subequal or the outer one notably longer . . . . . **Sisyrinchium angustifolium**
Stems narrowly winged, at most 2.5 mm wide well beyond the middle, the wings not as wide as the central portion; bracts of spathes subequal . . . . . **Sisyrinchium strictum**
1. Spathe(s) sessile in the axil of the involucral bract or one of them short-stalked on a peduncle not much longer than the outer bract of the spathe.
3. Involucral bract united for 2 mm or more along the proximal margins; capsules more than 4.5 mm long; spathe 1 **Sisyrinchium montanum**
3. Involucral bract free to the base or united for less than 2 mm; capsules less than 4.5 mm long; spathe 1 or 2.
Spathes 2 . . . . . **Sisyrinchium albidum**
Spathe 1 . . . . . **Sisyrinchium campestre**

SIUM suave

SMALLANTHUS uvedalia

SMILACACEAE: One genus in our area . . . . . SMILAX

SMILACINA
1. Leaves 1 to 4 . . . . . **Smilacina trifolia**
1. Leaves more than 4.
Perianth segments less than 3 mm long, shorter than the stamens; inflorescence paniculate; flowers and fruits on very short pedicels; fruit typically dotted, never striped . . . . . **Smilacina racemosa**
Perianth segments more than 3 mm long, longer than the stamens; inflorescence racemose; flowers and fruits with long pedicels; fruit striped . . . . . **Smilacina stellata**

SMILAX
1. Stems firm, seemingly woody, prickly, at least below.
2. Prickles all stout, with flared bases, green or with dark tips; younger stems and branches distinctly quadrangular; peduncles less than 1.5 cm long, shorter than to subequaling the subtending petiole . . . . . **Smilax rotundifolia**
2. Prickles weak, bristle-form to acicular, mostly dark-colored; younger stems and branches terete or variously angled, but not quadrangular; peduncles more than 1.5 cm long, usually exceeding the subtending petiole . . . . . **Smilax hispida**
1. Stems herbaceous, never with prickles.
3. Plant a vine, climbing by tendrils, well over 1 m high when in flower, normally branching freely; peduncles borne in the leaf axils with fully developed blades.
Leaves completely glabrous . . . . . **Smilax herbacea**
Leaves prevailingly pubescent abaxially . . . . . **Smilax lasioneura**
3. Plants seemingly erect or ascending herbs, less than l m high, neither climbing nor branching, without tendrils or occasionally with tendrils among the distal nodes; peduncles borne in the axils of bladeless bracts or in the axils of the lowest leaves.
Petioles mostly as long as or longer than the blades; plant often more than 0.5 m high, with tendrils among the distal nodes; umbels with more than 25 flowers. . . . . **Smilax illinoensis**
Petioles shorter than to about as long as the blades; plant usually less than 0.5 m high, rarely with a few tendrils distally; umbels with fewer than 25 flowers . . . . . **Smilax ecirrhata**

SOLANACEAE
A. Principal leaves sessile, auriculate-clasping; fruit a dehiscent circumscissile capsule; flowers bicolored with a purplish tube and yellow lobes, in one-sided leafy spikes . . . . . HYOSCYAMUS
A. Leaves not auriculate-clasping; fruit not a dehiscent circumscissile capsule; flowers various.

B. Plants woody, at least near the base, sprawling or climbing vines.
Leaves all unlobed; plant often remotely spiny; stems mostly woody ..... LYCIUM
Principal leaves 3-4 lobed; plant unarmed; much of the stem herbaceous ..... SOLANUM
B. Plants herbaceous, erect or ascending.
C. Plants in flower.
D. Calyx more than 3 cm long ..... DATURA
D. Calyx less than 3 cm long.
E. Flowers more than 2.5 cm long.
Leaves linear-spatulate; corollas less than 1 cm long ..... CALIBRÁCHOA
Leaves oblong-ovate; corollas much more than 1 cm long ..... PETUNIA
E. Flowers up to 2.5 cm long.
F. Flowers greenish-yellow, tubular, the tube cylindrical, much longer than the flaring lobes ..... NICOTIANA
F. Flowers not as above.
G. Corolla rotate, the lobes much longer than the united portion.
Corolla yellow, the plant never spiny ..... LYCOPERSICON
Corolla not yellow or if yellow, then the plant spiny ..... SOLANUM
G. Corolla campanulate, the lobes united for all or nearly all of their length.
Corolla blue ..... NICANDRA
Corolla yellow or white ..... PHYSALIS
C. Plants in fruit.
H. Calyx or capsule pungently spiny or prickly.
Plants unarmed except for the large prickly or spiny capsule ..... DATURA
Stems and leaves spiny, the fruit a smooth berry enclosed by an adherent spiny calyx ..... SOLANUM
H. Neither the calyx nor the fruit spiny or prickly.
I. Fruit a capsule (not to be confused with an inflated or enveloping calyx).
J. Capsules in terminal panicles ..... NICOTIANA
J. Capsules solitary in the axils.
Leaves linear-spatulate, less than 1.7 cm long ..... CALIBRACHOA
Leaves oblong-ovate, the larger more than 1.7 mm long ..... PETUNIA
I. Fruit a berry, sometimes enveloped by a well developed, often inflated, calyx at maturity.
K. Calyx inflated and concealing the berry.
Calyx tube divided to the base, the lobes auriculate at the base with slender appendages; berry dry ..... NICANDRA
Calyx tube lobed only near the summit, the base without auricles or appendages; berry fleshy ..... PHYSALIS
K. Calyx not inflated, the berry exposed.
L. Leaves simple ..... SOLANUM
L. Leaves pinnately compound.
Berries more than 2.5 cm in diameter ..... LYCOPERSICON
Berries less than 2.5 cm in diameter ..... SOLANUM

SOLANUM

1. Stems silvery-gray canescent, the hairs densely matted and appressed; flowers violet ..... *Solanum elaeagnifolium*
1. Stems not as above; flowers variously colored.
2. Plants with spines or prickles.
3. Leaves pinnatifid or bipinnatifid; corolla yellow; calyx densely spiny ..... *Solanum rostratum*
3. Leaves entire to sinuate-toothed or lobed; corolla not yellow; calyx without spines.
Stellate hairs of abaxial leaf surfaces sessile; calyx to 7 mm long; berry less than 2 cm in diameter ..... *Solanum carolinense*
At least some of the stellate hairs stipitate or elevated above the leaf surface, giving the indument a more tomentose appearance; calyx mostly 8 mm or more long; berry more than 2 cm in diameter ..... *Solanum dimidiatum*
2. Plants without spines or prickles.
4. Plant a sprawling climbing vine, usually woody at the base ..... *Solanum dulcamara*
4. Plants erect or ascending herbs.
5. Leaves entire to irregularly repand-dentate.
Plant viscid-pubescent with spreading glandular hairs; calyx enlarging in fruit to cover half of the berry . *Solanum physalifolium*
Plant glabrous to more or less pubescent with appressed eglandular hairs; calyx not much enlarging in fruit, covering only the basal portion of the berry ..... **Solanum ptychanthum**
5. At least the principal leaves deeply sinuate-lobed to pinnately lobed or compound.
6. Many of the leaves 3-5 lobed, the terminal lobe much larger than the lowest lobes; flowers purple; fruits red when ripe ..... *Solanum dulcamara*
6. Leaves with lobes mostly 7 or more, the terminal lobe similar in size to the lateral lobes; flowers not purple; fruits not becoming red.
Leaves pinnately compound, the larger leaflets ovate and usually distinctly petiolulate; plant tuberiferous *Solanum tuberosum*
Leaves merely pinnately lobed or dissected, the lobes deltate-lanceolate to oblong; plant without tubers . *Solanum triflorum*

SOLIDAGO

1. Heads in short axillary racemes or clusters, all but occasionally the distal ones exceeded by their subtending leaves; stems and leaves smooth or smoothish.
Stems glaucous with a waxy bloom that can be rubbed off; leaves lanceolate, tapered to a sessile base, less than 3 cm wide . . **Solidago caesia**
Stems green, not glaucous; leaves broadly ovate, abruptly contracted to a winged petiole, the larger ones more than 3 cm wide ..... **Solidago flexicaulis**
1. Heads in terminal, paniculiform, thyrsiform, or racemiform arrays (rarely the proximal ones in axillary clusters or racemes), the subtending leaves not exceeding the arrays; stems and leaves smooth to pubescent or scabrous.

2. Cauline leaves very gradually reduced in size from the base to the summit, abruptly reduced and bracteate in the inflorescence.
   3. Stems manifestly pubescent, at least beyond the middle.
      Involucres less than 3 mm long . . . . . **Solidago canadensis**
      Involucres more than 3 mm long . . . . . **Solidago altissima**
   3. Stems nearly or quite glabrous below the inflorescence.
      Leaves pinnately veined, usually conspicuously reticulate, the primary lateral veins not parallel to the midvein . . . **Solidago ulmifolia**
      Leaves triple-veined from at or near the base, scarcely reticulate, the lateral veins essentially 2, prolonged and parallel to the midvein . . . . . **Solidago gigantea**
2. Cauline leaves progressively reduced in size from near the base of the stem to the summit and into the inflorescence.
   4. Stems either pubescent nearly or quite throughout or the leaves harshly scabrous adaxially, or both.
      5. Heads not secund, spirally arranged in terminal and axillary racemes . . . . . **Solidago hispida**
      5. Heads secund along the upper sides of the terminal panicle branches.
         6. Cauline leaves rugose and usually harshly scabrous adaxially with short, stout, pustular-based hairs, the blades ovate, less than 4.5 times as long as wide, strongly serrate or dentate.
            Middle and proximal leaf blades more than 3.5 cm wide, the proximal ones conspicuously decurrent along the petiole; stems glabrous, often appearing more or less quadrangular distally . . . . . **Solidago patula**
            Middle and proximal leaf blades rarely more than 3.5 cm wide, never more than 4 cm, none of the leaves decurrent at the base; stems glabrous or pubescent, terete . . . . . **Solidago rugosa**
         6. Cauline leaves not rugose, scaberulous with a close indument of fine hairs adaxially, the blades of the proximal ones more than 4.5 times as long as wide, usually long-tapered into the petiole, subentire or serrate-crenate with low teeth.
            7. Involucres more than 4.3 mm long; cauline leaves rarely crenate . . . . . **Solidago decemflora**
            7. Involucres less than 4.3 mm long; cauline leaves often crenate.
               Heads subsessile or on pedicels to 3 mm long, densely disposed, the inflorescence branches with heads throughout their length . . . . . **Solidago nemoralis**
               Heads on pedicels 3 mm or more long, generally absent from the proximal portions of the slender, recurved inflorescence branches. . . . . **Solidago nemoralis haleana**
   4. Stems glabrous to glabrate below the inflorescence or rarely remotely hirtellous, the leaves smooth or weakly scaberulous adaxially.
      8. Middle cauline leaves less than 4.5 times as long as wide and sharply and regularly serrate their entire length.
         Leaves strongly rugose, the veins impressed adaxially; long creeping rhizomes regularly developed . . . . . **Solidago rugosa**
         Leaves not rugose, the veins flush with the surface adaxially; creeping rhizomes absent, the stems from a stout caudex . . . . . **Solidago ulmifolia**
      8. Middle cauline leaves either more than 4.5 times as long as wide or subentire to irregularly serrate, or both.
         9. Involucres mostly more than 5 mm long and cauline leaves fewer than 19.
            Heads notably stalked, the longer ebracteate pedicels more than 5 mm long . . . . . **Solidago simplex**
            Heads sessile or on pedicels less than 5 mm long or if longer, then the pedicels bracteate . . . . . **Solidago deamii**
         9. Either the involucres less than 5 mm long or if more than 5 mm long, then with more than 19 cauline leaves.
            10. Leaves thick and fleshy, completely entire and glabrous, the margins smooth or scaberulous, only the midvein conspicuous; heads mostly more than 20-flowered; ligules 8-10; pappus 3.5 mm or more long; disc florets more than 12, mostly 4 mm or more long; achenes 2.2 mm or more long . . . . . *Solidago sempervirens*
            10. Leaves various, but never thick and fleshy; heads, pappus, flowers, and achenes various.
               11. Pedicels and branchlets of inflorescence usually abundantly hirtellous, the inflorescence a thyrse, the heads not secund on the branches or, if occasionally so in Solidago uliginosa, then the proximal leaf petioles strongly half-sheathing the stem; heads up to 15-flowered, the ligules no more than 8.
                  Lower leaves less than 7 times as long as wide, not sheathing the stem; cauline leaves rarely fewer than 25; ligules rarely fewer than 6. . . . . **Solidago speciosa**
                  Lower leaves more than 7 times as long as wide, the petioles distinctly half-sheathing the stem; cauline leaves rarely more than 25; ligules rarely more than 6 . . . . . **Solidago uliginosa**
               11. Inflorescence branches and pedicels glabrous or very sparsely hirtellous, the heads strongly secund on spreading or arching branches; leaves never clasping at the base; heads usually more than 15-flowered, with more than 8 ligules.
                  Basal and proximal leaves almost always less than 1.5 cm wide and absent at flowering time, distinctly 3-nerved; achenes glabrous to sparsely strigose or pilose . . . . . **Solidago missouriensis**
                  Larger leaves more than 1.5 cm wide, often present or scarcely withered at flowering time, 1-nerved to faintly 3-nerved; achenes typically short-hairy . . . . . **Solidago juncea**

SONCHUS

1. Heads, including the bright-yellow ligules, more than 2.5 cm across; fruiting involucres more than 13 mm long; rhizomatous perennials.
   Involucres with slender gland-tipped hairs . . . . . *Sonchus arvensis*
   Involucres glabrous or nearly so . . . . . *Sonchus uliginosus*
1. Heads, including the pale-yellow ligules, up to 2.5 cm across; fruiting involucres not more than 13 mm long; annuals.
   Achenes smooth except for the few longitudinal ribs; leaf bases with rounded auricles; plant usually pungently prickly . . . . . *Sonchus asper*
   Achenes tuberculate-rugulose; leaf bases sagittate, the auricles tapered to an acute or acuminate tip; plant weakly prickly . *Sonchus oleraceus*

SORBARIA *sorbifolia*

SORBUS

1. Leaflets abruptly short-acuminate, the terminal tooth distinctly prolonged and much longer than wide, the leaflet margins mostly singly serrate, with sharply acuminate teeth; herbage glabrous or with a thin scattering of hairs, particularly along the veins abaxially . . . . . **Sorbus decora**
1. Leaflets obtuse or acute, the terminal tooth scarcely prolonged, nearly as wide as long, the leaflet margins often doubly serrate, with acute teeth; herbage thinly to densely pubescent. . . . . *Sorbus aucuparia*

SORGHASTRUM nutans

SORGHUM

1. Pedicels of sterile (staminate) spikelets mostly more than 2 mm long.
   - Perennial; leaves nearly always less than 2.5 cm wide . . . . . *Sorghum halepense*
   - Annual; larger leaves more than 2.5 cm wide . . . . . *Sorghum arundinaceum*
1. Pedicels of sterile (staminate) spikelets less than 2 mm long.
   - Sessile spikelet obovoid to broadly ovoid; caryopsis exposed at maturity . . . . . *Sorghum bicolor*
   - Sessile spikelet lanceoloid to ellipsoid; caryopsis enclosed at maturity . . . . . *Sorghum ×drummondii*

SPARGANIACEAE: One genus in our area . . . . . SPARGANIUM

SPARGANIUM

1. Stigmas 2; individual fruits of the bur becoming more than 3.5 mm thick, obpyramidal, the beak from the center of the flattened summit . . . . . **Sparganium eurycarpum**
1. Stigma 1; individual fruits of the bur less than 3.5 mm thick, tapering into the beak.
   2. Beak of the achene, including the stigma, nearly all less than 1.5 mm long; mature head less than 1.2 cm in diameter; staminate head 1 . . . . . **Sparganium natans**
   2. Beak of the achene more than 1.5 mm long; mature head more than 1.2 cm in diameter; staminate heads usually 2 or more.
      3. Flowering plant usually floating; staminate heads all approximate, their portion of the inflorescence less than 3 cm long . . . . . **Sparganium angustifolium**
      3. Flowering plant usually emersed, erect; staminate heads rather well separated, their portion of the inflorescence usually more than 3 cm long.
         4. Stigmatic surfaces more than 1.8 mm long . . . . . **Sparganium androcladum**
         4. Stigmatic surfaces nearly all less than 1.8 mm long.
            - Leaves to 7 mm wide, stiffly erect; proximal bract rarely more than 3 dm from the base of the plant; inflorescence unbranched, the pistillate heads 1-4, at least the proximal one or its peduncle usually borne without an immediate subtending bract . . . . . **Sparganium emersum**
            - Larger leaves more than 7 mm wide, lax; proximal bract commonly more than 3 dm from the base of the plant; inflorescence axis simple or branched, often with more than 4 pistillate heads, all of them or their peduncles from the axils of subtending bracts . . . . . **Sparganium americanum**

SPARTINA

1. Panicle branches more than 10; glumes and lemmas awned . . . . . **Spartina pectinata**
1. Panicle branches fewer than 10; glumes and lemmas awnless . . . . . *Spartina gracilis*

SPERGULA *arvensis*

SPERGULARIA

1. Sepals never less than 4 mm long, rarely less than 4.3 mm; seeds nearly always with a broad membranaceous wing . . . . . *Spergularia media*
1. Sepals always less than 4.3 mm long, usually less than 4 mm; seeds wingless, papillose along the margin.
   - Stamens more than 6, usually 10; most leaves spinulose at the tip with a filiform subulus 0.2 mm or more long . . . . . *Spergularia rubra*
   - Stamens fewer than 6, usually 1-3; leaves all blunt to stoutly mucronate . . . . . *Spergularia marina*

SPERMOLEPIS *inermis*

SPHENOPHOLIS

1. 1st glume 0.3 mm wide or more on one side; distal lemmas coarsely scaberulous-papillose; mature anthers more than 0.9 mm long . . . . . **Sphenopholis nitida**
1. 1st glume less than 0.3 mm wide; lemmas all glabrous or minutely papillose, or only the midnerves scabrous; anthers less than 0.9 mm long.
   - 2nd glume broadly obovate, subtruncate, obviously and coarsely 3-5 nerved, nearly as wide as long; panicle more or less spike-like with appressed branches. . . . . **Sphenopholis obtusata**
   - 2nd glume narrowly obovate, mostly acute at the apex, finely 3-nerved, obviously longer than wide; panicle open or at least not spike-like . . . . . **Sphenopholis intermedia**

SPIRAEA

1. Flowers in simple fascicles with 0-few subtending leaves or umbelliform racemes on leafy shoots; flowers white.
   2. Flowers in long-pedunculate umbelliform racemes . . . . . *Spiraea ×vanhouttei*
   2. Flower clusters sessile.
      3. Leaves ovate to flabelliform, the larger more than 8 mm wide; flowers doubled, the petals numerous . . . . . *Spiraea prunifolia*
      3. Leaves narrowly lanceolate, rarely more than 8 mm wide; petals 5.
         - Leaves entire or rarely with a few teeth near the tip . . . . . *Spiraea hypericifolia*
         - Leaves serrate . . . . . *Spiraea thunbergii*
1. Flowers in compound, corymbiform, or paniculate inflorescences; flowers white or roseate.
   4. Leaves densely tomentose abaxially.
      - Tomentum white . . . . . *Spiraea douglassii*
      - Tomentum with tinctures of yellow or brown . . . . . **Spiraea tomentosa**
   4. Leaves glabrous or glabrate abaxially.
      5. Inflorescence much longer that broad . . . . . **Spiraea alba**
      5. Inflorescence as broad as long or broader.

Leaves less than 4.5 cm long; plants less than 0.5 m high . . . . . *Spiraea ×bumalda*
Larger leaves more than 4.5 cm long; plants more than 0.5 m high . . . . . *Spiraea japonica*

SPIRANTHES
1. Lip of corolla more than 5.5 mm long.
   2. Lip fiddle-shaped and recurved, the other flowering parts strongly ascending . . . . . **Spiranthes romanzoffiana**
   2. Lip oblong or tongue-shaped, not constricted in the middle, recurved or not, but the other flowering parts not all strongly ascending.
      3. Distal sheath tips overlapping the base of the next; lateral sepals widely spreading, typically with the tips arching above the petals; flowers always with a vanilla-like odor; leaf blades absent at flowering time . . . . . **Spiranthes magnicamporum**
      3. Distal sheath tips not or scarcely reaching the base of the next; lateral sepals appressed, mostly following the line of the body of the flower; flowers with or without a fragrance; proximal leaf blades sometimes present at flowering time.
         Flowers muted white to more often distinctly cream-colored, the lip very often more deeply so; long axis of the middle and distal flowers with a tendency to diverge at notably less than a right angle off the inflorescence axis, this feature particularly expressed by the lateral sepals . . . . . **Spiranthes ochroleuca**
         Flowers crystalline-white, the lip nearly or quite concolorous; long axis of the flowers mostly at right angles or greater off the inflorescence axis . . . . . **Spiranthes cernua**
1. Lip of corolla less than 5.5 mm long.
   4. Lip with a bright-yellow center; plant finished blooming before July 15 . . . . . **Spiranthes lucida**
   4. Lip pale throughout or with a green center; plant not in bloom before July 15.
      5. Lip with a distinctly green center.
         Proximal flowers rather well separated, notably more so than the middle and distal ones . . . . . **Spiranthes lacera**
         Proximal flowers borne nearly as tightly together as the distal ones . . . . . **Spiranthes lacera gracilis**
      5. Lip pale, white or yellowish, but never green.
         Plant glabrous throughout; cauline leaves absent at flowering time . . . . . **Spiranthes tuberosa**
         At least the inflorescence pubescent; one or more expanded cauline leaves present at flowering time . . *Spiranthes ovalis erostellata*

SPIRODELA polyrhiza

SPOROBOLUS
1. Plants annual; leaves up to 2 mm wide; inflorescence strict, usually partly included at the base within an inflated sheath, the exposed portion up to 6 cm long.
   Spikelets more than 3.1 mm long; sides of lemmas appressed-villous (this feature sometimes obscure in the wrong light) . . . . . **Sporobolus vaginiflorus**
   Spikelets less than 3.1 mm long; sides of lemmas glabrous . . . . . **Sporobolus neglectus**
1. Plants perennial, without the above combination of characters.
   2. Most sheaths densely pilose-bearded in a ring at the summit; spikelets less than 3 mm long; panicle (when exserted) with spreading branches . . . . . **Sporobolus cryptandrus**
   2. Sheaths not bearded at the summit (occasionally ciliate at the summit in Sporobolus compositus); spikelets more than 3 mm long; panicle strict or spreading.
      3. Spikelets remote; panicles long-exserted, open, the branches spreading; culms very slender, rising out from dense tussocks; plant fragrant in anthesis. . . . . **Sporobolus heterolepis**
      3. Spikelets crowded; panicles strict, spike-like, partly included at the base within subtending sheaths (occasionally becoming exserted in Sporobolus clandestinus); culms usually more or less tufted or cespitose, but never forming dense tussocks; plant inodorous.
         Sides of lemmas glabrous . . . . . *Sporobolus compositus*
         Sides of lemmas appressed-hairy, at least toward the base . . . . . **Sporobolus clandestinus**

STACHYS
1. Leaves densely and thickly covered by a velvety tomentum . . . . . *Stachys byzantina*
1. Leaves glabrous to hispid or densely pubescent, but never tomentose.
   2. Leaves entire or subentire, sessile or subsessile, linear to narrowly oblanceolate, less than 1 cm wide; stems glabrous . . . **Stachys hyssopifolia**
   2. Leaves serrate, sessile to petiolate, narrowly lanceolate to ovate, the larger ones usually more than 1 cm wide; stems pubescent or hispid, at least on the proximal angles.
      3. At least the distal portions of the stems pubescent throughout, both on the faces as well as the angles . . . . . **Stachys pilosa**
      3. Stems hispid only along the angles.
         4. Calyx typically hispid on the angles, the lobes coarsely ciliate or ciliate-hispid . . . . . **Stachys hispida**
         4. Calyx glabrous or rarely sparsely hispid, the lobes glabrous and entire.
            Leaves sessile or subsessile, no more than 17 mm wide . . . . . **Stachys aspera**
            Leaves on distinct petioles more than 5 mm long, the larger more than 17 mm wide . . . . . **Stachys tenuifolia**

STAPHYLEA trifolia

STAPHYLEACEAE: One genus in our area . . . . . STAPHYLEA

STELLARIA
1. Plants glabrous; leaves linear.
   2. Flowers 1-few in leafy cymes; leaves to 1.8 cm long, the midrib obscure . . . . . **Stellaria crassifolia**
   2. Flowers 2-several in branched cymes, the bracts minute, not foliaceous; larger leaves more than 1.8 cm long, the midrib distinct.
      Inflorescence terminal; sepals conspicuously nerved, very often more than 4 mm long; leaves lance-ovate, widest at the base or at least below the middle; seeds wavy-rugulose . . . . . *Stellaria graminea*

Inflorescence axillary, the stem continuing beyond the leaf that subtends the inflorescence; sepals nerveless or only weakly nerved, to 4 mm long; leaves linear, scarcely tapered at either end; seeds essentially smooth . . . . . **Stellaria longifolia**
1. Stems pubescent, the pubescence usually in lines; leaves elliptic to elliptic-ovate to suborbicular.
   3. Plant perennial; stems and branches 4-angled; leaves sessile . . . . . **Stellaria pubera**
   3. Plant annual; stems and branches essentially terete; proximal and middle leaves petiolate.
      Flowering sepals about 3 mm long, sometimes enlarging to 5 mm in fruit, often with a purplish stain at the base; petals usually absent; stamens rarely more than 3; seeds yellowish-brown, to 0.8 mm long, acutely papillate . . . . . *Stellaria pallida*
      Calyx as large or even larger, green throughout; petals present; stamens 3 or more; seeds dark-brown, at least 0.9 mm long, bluntly papillate . . . . . *Stellaria media*

STENANTHIUM gramineum

STENOSIPHON *linifolius*

STREPTOPUS lanceolatus longipes

STROPHOSTYLES
1. Leaflets linear to lance-ovate, unlobed; calyx pubescent or hirsute . . . . . **Strophostyles leiosperma**
1. Leaflets roundly deltate-ovate, often more or less 1-3 lobed; calyx glabrous or only the lobes more or less pubescent . . . . **Strophostyles helvola**

STUCKENIA
1. Most stipular sheaths inflated to 2-3 times the width of the stem; leaves obtuse to broadly acute or even slightly retuse . . . . . *Stuckenia filiformis occidentalis*
1. Stipular sheaths not inflated; leaves tapered to distinctly sharp tips . . . . . **Stuckenia pectinata**

STYLOPHORUM diphyllum

STYRACACEAE: One genus in our area . . . . . STYRAX

STYRAX americanus

SUAEDA *calceoliformis*

SULLIVANTIA renifolia

SYMPHORICARPOS
1. Branchlets glabrous . . . . . *Symphoricarpos albus laevigatus*
1. Branchlets puberulent to pubescent, at least on the younger growth.
   2. Corollas to 4 mm long; fruits red, in subglobose clusters; leaves downy abaxially . . . . . *Symphoricarpos orbiculatus*
   2. Corollas more than 4 mm long; fruits white or whitish, in congested to racemose inflorescences; leaves glabrous or sparsely pubescent abaxially.
      Style more than 3 mm long, exserted; fruits less than 1 cm wide; shoots of the year more than 1.9 mm in diameter . . . . . **Symphoricarpos occidentalis**
      Style to 3 mm long, included; larger fruits more than 1 cm wide; shoots of the year less than 1.9 mm in diameter .**Symphoricarpos albus**

SYMPHYOTRICHUM
1. At least the proximal leaves both petiolate and cordate or subcordate.
   2. Leaf blades entire or some subentire with an occasional serration.
      Leaves harshly scabrous adaxially or sometimes merely scaberulous . . . . . **Symphyotrichum oolentangiense**
      Leaves usually glabrous adaxially . . . . . **Symphyotrichum shortii**
   2. Leaf blades, or many of them, serrate or dentate.
      3. Stems uniformly cinereous-puberulent, at least distally . . . . . **Symphyotrichum drummondii**
      3. Stems glabrous, glabrate, or puberulent in the array and in lines along the distal portion of the stem.
         4. Petioles not or only scarcely winged; proximal leaves with sharp, sometimes slightly spreading teeth; phyllaries sharply acute, with the median band at least slightly dilated toward the tip, many with tinctures of purple distally; ligules lavender or blue . . . . . **Symphyotrichum cordifolium**
         4. Many of the cauline petioles notably winged; proximal leaves with flat bluntish teeth; phyllaries long-attenuate, with a slender, scarcely dilated median green band; ligules white to lavender.
            Heads mostly on naked peduncles, many of them 4 mm or more long; larger phyllaries more than 0.6 mm wide; larger ray florets 10 mm or more long, the ligules mostly 5.5 mm or more long . . . . . .**Symphyotrichum ciliolatum**
            Heads mostly sessile or on bracteate peduncles, the naked portion rarely reaching 4 mm long; phyllaries less than 0.6 mm wide; ray florets less than 10 mm long, the ligules less than 5.5 mm long . . . . . **Symphyotrichum urophyllum**
1. Leaves narrowed to sessile or clasping bases or if somewhat petiolate, then never cordate or subcordate.
   5. Stem leaves with strongly auriculate-clasping bases.
      6. Phyllaries and peduncles glandular-pubescent.
         Leaves less than 2 cm long; involucre scarcely glandular . . . . . **Symphyotrichum ×amethystinum**
         Larger leaves more than 2 cm long; involucre strongly glandular . . . . . **Symphyotrichum novae-angliae**

6. Phyllaries and peduncles pubescent or glabrous, but never glandular.
   7. Leaves coarsely serrate, contracted below the middle into a winged base, ultimately dilated into clasping auricles . . . . . **Symphyotrichum prenanthoides**
   7. Leaves entire to subentire, clasping at the base, but not as above.
      8. Stems glaucous; leaves firm and coriaceous; phyllaries firm, cartilaginous, with green diamond-shaped tips; achenes glabrous . . . . . **Symphyotrichum laeve**
      8. Stems not glaucous; leaves not firm and coriaceous; phyllaries thin with a pale-green, scarcely dilated central band; achenes pubescent.
         9. Phyllaries pubescent on the outer face; leaves less than 5 cm long . . . . . **Symphyotrichum ×amethystinum**
         9. Phyllaries glabrous on the outer face; longer leaves more than 5 cm long.
            Stems with at least the middle and distal internodes coarsely hispid with broad-based hairs, from a coarse crown or short rhizome; abaxial midribs hispid . . . . . **Symphyotrichum puniceum**
            Stems glabrous throughout or merely sparsely hispid in lines, colonial from elongate horizontal rhizomes; abaxial midribs glabrous. . . . . **Symphyotrichum firmum**

5. Stem leaves scarcely or not at all clasping at the base, never auriculate (occasionally somewhat sheath-like at the base).
   10. Plants annual, glabrous or glabrate; ligules absent, rudimentary, or few and longer than the phyllaries.
      Ligules not or only scarcely exceeding the phyllaries; involucres narrowly cylindric . . . . . *Symphyotrichum subulatum*
      Ligules much surpassing the phyllaries; involucres campanulate . . . . . *Symphyotrichum divaricatum*
   10. Plants perennial, pubescent or glabrous; ligules present and conspicuous.
      11. Leaves firm, silvery silky-pubescent throughout, sessile, entire, up to 4 cm long . . . . . **Symphyotrichum sericeum**
      11. Leaves not as above, never silvery-silky.
         12. Most phyllaries strongly mucronate or subulate with hyaline tips.
            13. Outer face of phyllaries hispid-strigose; achenes notably 5-9 ribbed.
               Ray florets no more than 20; involucres to 5 mm long, the phyllaries imbricate; heads mostly secund along the branches . . . . . **Symphyotrichum ericoides**
               Ray florets mostly more than 20; larger involucres more than 5 mm long, the phyllaries not much imbricated as they pass into the bracteal leaves; heads diffusely disposed along the branches . . . . . *Symphyotrichum falcatum commutatum*
            13. Phyllaries glabrous or glabrate on the outer face; achenes obscurely 2-4 ribbed.
               14. Ligules fewer than 15, to 5 mm long. . . . . **Symphyotrichum parviceps**
               14. Ligules more than 15 and usually more than 5 mm long.
                  Stems and often the leaves hirsute or villous . . . . . **Symphyotrichum pilosum**
                  Stems and leaves glabrous or glabrate, except for ciliate petioles . . . . . **Symphyotrichum pilosum pringlei**
         12. Phyllaries obtuse, acute, acuminate, but never strongly mucronate or with subulate hyaline tips.
            15. Phyllaries glandular or hispidulous on the outer face.
               Phyllaries glandular. . . . . **Symphyotrichum oblongifolium**
               Phyllaries eglandular. . . . . **Symphyotrichum ericoides**
            15. Phyllaries glabrous on the outer face.
               16. Involucres less than 4 mm high; heads numerous, mostly secund or subsecund in more or less 1-sided racemes; fresh disc floret lobes erect.
                  Array branches with leaves less than 1.5 cm long . . . . . **Symphyotrichum racemosum**
                  Array branches with many of the leaves longer than 1.5 cm . . . . . **Symphyotrichum lanceolatum interior**
               16. Larger involucres 4 mm or more high; heads few to numerous, the racemes with heads scattered, solitary to several, sometimes more or less secund; disc floret lobes spreading or erect.
                  17. Heads 1-several, solitary at the tips of stiffly ascending, bracted peduncles; phyllaries strongly dilated-rhombic and green beyond the middle.
                     18. Proximal leaves with a distinct petiole and dilated blade . . . . . **Symphyotrichum oolentangiense**
                     18. None of the leaves dilated and petiolate.
                        Cauline leaves coarsely long-ciliate . . . . . *Symphyotrichum ascendens*
                        Cauline leaves scabrous-margined, but without long cilia . . . . . **Symphyotrichum dumosum**
                  17. Heads mostly numerous, on short peduncles, often in diffuse or secund racemes; phyllaries with the median green band linear-rhombic, scarcely dilated.
                     19. Leaves pubescent abaxially, at least along the midrib.
                        Leaves evenly short-pubescent abaxially . . . . . **Symphyotrichum ontarionis**
                        Leaves pubescent only along midrib abaxially . . . . . **Symphyotrichum lateriflorum**
                     19. Leaves glabrous abaxially.
                        20. Lobes of the disc florets up to ¼ the length of the swollen portion of the tube; leaves usually harshly pustular-scabrous adaxially with mostly revolute margins; anastomosing veinlets abaxially forming mostly quadrate or isodiametric areolae . . . . . **Symphyotrichum praealtum**
                        20. Lobes of the disc florets mostly longer (except in Symphyotrichum boreale); leaves glabrous or scabrous; veinlets forming elongate-rectangular areolae, not isodiametric.
                           21. Ligules usually 30 or more, about 10 mm long; leaves narrowly linear, scabrous, mostly less than 6 mm wide, never more than 9 mm wide; heads few in subcorymbiform arrays; larger involucres more than 5.5 mm high . . . . . **Symphyotrichum boreale**
                           21. Ligules usually fewer than 30 and less than 10 mm long; leaves smooth or smoothish, the larger frequently more than 6 mm wide; heads several to numerous in paniculiform arrays; involucres not more than 5.5 mm high.
                              Heads secund, the racemes mostly 1-sided; ligules fewer than 17, to 5 mm long; phyllaries obtuse or acute with a conspicuous, dilated, green or purplish central band . . **Symphyotrichum lateriflorum**
                              Heads not noticeably secund; ligules mostly more than 17, usually more than 5 mm long; phyllaries attenuate, with a slender, green central band . . . . . **Symphyotrichum lanceolatum**

SYMPHYTUM
1. Stems and inflorescence densely bristly-hispid and intermixed with spinulose, broad-based hairs; leaves not conspicuously decurrent along the stem . . . . . *Symphytum asperum*
1. Stems and inflorescence merely pilose-hispid, without spinulose, broad-based hairs; at least the distal leaves conspicuously decurrent along the stem . . . . . *Symphytum officinale*

SYMPLOCARPUS foetidus

SYRINGA
1. Corolla tube scarcely longer than the calyx.
   Leaves mostly broadly rounded at the base, usually pubescent abaxially, rarely more than 1.9 times as long as wide; capsules obtuse . . . . . *Syringa reticulata*
   Leaves prevailingly narrowly rounded at the base, completely glabrous, some usually more than 1.9 times as long as wide; capsules acute to acuminate . . . . . *Syringa pekinensis*
1. Corolla tube much longer than the calyx.
   2. Leaves truncate-rounded to subcordate . . . . . *Syringa vulgaris*
   2. Leaves rounded-cuneate.
      3. Leaves pubescent abaxially, at least along the veins . . . . . *Syringa pubescens patula*
      3. Leaves glabrous abaxially.
         Larger petioles more than 12 mm long; larger leaves more than 4 cm long . . . . . *Syringa ×chinensis*
         Petioles to 12 mm long; leaves to 4 cm long . . . . . *Syringa ×persica*

TAENIDIA integerrima

TAGETES *erecta*

TAMARICACEAE: One genus in our area . . . . . TAMARIX

TAMARIX *parviflora*

TANACETUM
1. Leaves simple, merely crenate; crushed plant pleasantly fragrant . . . . . *Tanacetum balsamita*
1. Leaves pinnately compound; plant inodorous or fragrant.
   Ligules evident, white; leaf divisions about as long as wide, bluntly lobed . . . . . *Tanacetum parthenium*
   Ligules absent or yellow; leaf divisions much longer than wide, the elongate lobes sharply toothed . . . . . *Tanacetum vulgare*

TARAXACUM
1. Leaves with a strong tendency to be generally wider toward the tip, the terminal lobe the largest and often not much divided or divided only part of the way to the midvein; inner phyllaries nearly flat at the tip or with a slight to distinct callus thickening; seeds straw-hued to brown . . . . . *Taraxacum officinale*
1. Leaves without a strong tendency to be wider toward the tip, the terminal lobe not noticeably larger than the median ones, all of the lobes divided completely to the midvein; inner phyllaries callus-thickened at the summit or often possessing a strongly corniculate process; seeds becoming deep reddish-brown at maturity . . . . . *Taraxacum erythrospermum*

TARENAYA *hassleriana*

TAXACEAE: One genus in our area . . . . . TAXUS

TAXODIACEAE: One genus in our area . . . . . TAXODIUM

TAXODIUM *distichum*

TAXUS
1. Median and distal bud scales blunt, scarcely keeled, merely convex dorsally; leaves gradually tapered distally . . . . . *Taxus baccata*
1. Median and distal bud scales sharply acute, distinctly keeled, sharply folded dorsally; leaves rather abruptly short-acuminate.
   Leaves to 2.2 cm long and 2.4 mm wide; seeds to 5 mm long, oblate; aril globose; plant monoecious . . . . . **Taxus canadensis**
   Larger leaves often more than 2.2 cm long and 2.4 mm wide; larger seeds 6-8 mm long, ellipsoid; aril ellipsoid; plant dioecious . . . . . *Taxus cuspidata*

TEESDALIA *nudicaulis*

TEPHROSIA virginiana

TETRANEURIS herbacea

TEUCRIUM
1. Calyces and stems with retrorsely incurved or appressed hairs . . . . . **Teucrium canadense**
1. Calyces and stems with divaricate or retrorsely spreading villous hairs . . . . . **Teucrium canadense occidentale**

THALICTRUM
1. Leaves all long-petiolate; leaflets membranaceous, the teeth or lobes typically 4 or more; blooming period ending by the first of June; plant less than 1 m high. . . . . **Thalictrum dioicum**
1. Leaves sessile; leaflets subcoriaceous to coriaceous, the lobes fewer than 4; blooming period beginning after the first of June; plants more than 1 m high.
   2. Leaflets eglandular and completely glabrous abaxially . . . . . **Thalictrum dasycarpum hypoglaucum**
   2. Leaflets puberulent or glandular abaxially.
      Leaves fetid when crushed, the abaxial surfaces of the leaflets with short, glandular-capitate hairs or waxy, atomiferous, sessile glands . . . . . **Thalictrum revolutum**
      Leaves not fetid, the abaxial surfaces of the leaflets eglandular and puberulent with fine or slightly viscid hairs . . . . . **Thalictrum dasycarpum**

THASPIUM
1. Nodes and leaf bases distinctly and densely hispidulous; lobes of leaves with coarse teeth, the larger ones regularly more than 2.5 mm long, the margins scaberulous . . . . . **Thaspium chapmanii**
1. Nodes and leaf bases glabrous to minutely papillose-hispid; lobes of leaves with teeth all less than 2.5 mm long, the margins completely smooth . . . . . **Thaspium trifoliatum**

THELESPERMA *megapotamicum*

THELYPTERIDACEAE
A. Blades deltate, nearly as wide as long or even wider . . . . . PHEGOPTERIS
A. Blades obviously longer than wide . . . . . THELYPTERIS

THELYPTERIS
1. Proximal pinnae strongly reduced, less than 1.3 cm long . . . . . **Thelypteris noveboracensis**
1. Proximal pinnae slightly reduced to nearly as long as the median ones, more than 1.3 cm long . . . . . **Thelypteris palustris**

THINOPYRUM *ponticum*

THISMIA americana

THISMIACEAE: One genus in our area . . . . . THISMIA

THLADIANTHA *dubia*

THLASPI
1. Silicles less than 8 mm long, the distal notch wider than deep . . . . . *Thlaspi perfoliatum*
1. Silicles more than 8 mm long, the distal notch deeper than wide . . . . . *Thlaspi arvense*

THUJA occidentalis

THYMELAEA *passerina*

THYMELAEACEAE
A. Plant woody . . . . . DIRCA
A. Plant annual . . . . . THYMELAEA

THYMUS *pulegioides*

TIARELLA cordifolia

TIDESTROMIA *lanuginosa*

TILIA
1. Abaxial leaf surfaces with a fine, close tomentum of stellate hairs or with densely disposed 8-pronged hairs.
   2. Petioles and branchlets tomentose . . . . . *Tilia tomentosa*
   2. Petioles and branchlets glabrous.
      Abaxial leaf surface with appressed-stellate hairs and usually with notable tufts of hairs in the vein axils . . . . . *Tilia ×stellata*
      Abaxial leaf surface concealed by a dense weft of tomentum, the vein axils lacking strong tufts of hairs . . *Tilia caroliniana heterophylla*
1. Abaxial leaf surfaces glabrous or with sparsely disposed simple or 4-8 pronged hairs.
   3. Leaves prevailingly more than 8 cm long.
      Abaxial surface glabrous or with simple hairs . . . . . **Tilia americana**
      Abaxial surface thinly but evenly pubescent with branched hairs . . . . . **Tilia americana neglecta**

3. Leaves nearly all less than 8 cm long.
   4. Abaxial leaf surface either glabrous or with small tufts of white hairs in the vein axils; flowers more than 7 per cyme ..... *Tilia japonica*
   4. Abaxial leaf surface pubescent or glabrous and with rufous hairs regularly disposed in the vein axils; flowers rarely more than 7 per cyme.
      Leaves pubescent abaxially on the veins and usually on the surface ..... *Tilia platyphyllos*
      Leaves glabrous abaxially, but with notable tufts of rufous or sordid hairs in the vein axils ..... *Tilia cordata*

TILIACEAE: One genus in our area ..... TILIA

TIPULARIA discolor

TOFIELDIACEAE: One genus in our area ..... TRIANTHA

TORILIS
1. Principal umbel ebracteate at the base or with a single elongate bract ..... *Torilis arvensis*
1. Principal umbel with a distinct involucre of 2 or more elongate bracts ..... *Torilis japonica*

TORREYOCHLOA pallida

TOXICODENDRON
1. Leaflets more than three ..... **Toxicodendron vernix**
1. Leaflets three.
   Erect to suberect, often colonial shrub without aerial roots; petioles glabrous or nearly so ..... **Toxicodendron rydbergii**
   Straggling or climbing vine with aerial roots; petioles pubescent ..... **Toxicodendron radicans**

TRACAULON
1. Leaves flared at the base, the blades hastate; achenes lenticular ..... **Tracaulon arifolium pubescens**
1. Leaves not flared at the base, the blades sagittate; achenes trigonous ..... **Tracaulon sagittatum**

TRADESCANTIA
1. Mid-cauline leaves lanceolate, abruptly tapered at the base, more than 2 cm wide, much wider than the sheaths ..... **Tradescantia subaspera**
1. Mid-cauline leaves less than 2 cm wide, long-tapered at the base, not much wider than the sheaths.
   2. Sepals and pedicels glabrous or the sepals with a few hairs near the tip ..... **Tradescantia ohiensis**
   2. Sepals and pedicels abundantly villous throughout.
      Lower surface of bracteal leaves pubescent; pedicels villous with filiform hairs only ..... **Tradescantia virginiana**
      Lower surface of bracteal leaves glabrous; pedicels villous with filiform hairs admixed with shorter, blunt-tipped, multicellular-viscid hairs ..... *Tradescantia bracteata*

TRAGOPOGON
1. Flowering involucre to 2.5 cm long, shorter than to subequaling the yellow ligules, expanding in fruit to 4.5 cm long, the phyllaries purple-tinged along the margin, at least proximally; peduncles scarcely or not at all dilated-enlarged nor fistulose at the summit; achenes, including the beaks, to 2.5 cm long; leaves tending to recurve at their tip ..... *Tragopogon pratensis*
1. Flowering involucre more than 2.5 cm long, exceeding the yellow or purple ligules, expanding to longer than 4.5 cm long, the margins not purple-tinged; peduncles strongly dilated-enlarged and fistulose at the summit; achenes, including the beaks, usually more than 2.5 cm long; leaf tips straight.
   Ligules purple; achene bodies broadly fusiform, mostly more than 2 mm broad ..... *Tragopogon porrifolius*
   Ligules yellow; achene bodies narrowly fusiform, less than 2 mm broad ..... *Tragopogon dubius*

TRAGUS *racemosus*

TRIADENUM
1. Sepals 5 mm or more long, acute or acuminate; styles more than 1.5 mm long ..... **Triadenum virginicum**
1. Sepals up to 5 mm long, obtuse; styles less than 1.5 mm long ..... **Triadenum fraseri**

TRIANTHA glutinosa

TRIBULUS *terrestris*

TRICHOPHORUM
1. Plant less than 25 cm high; culms triangular, scabrous on the angles ..... **Trichophorum clintonii**
1. Plant often more than 25 cm high; culms nearly terete, smooth ..... **Trichophorum cespitosum**

TRICHOSTEMA dichotomum

TRIDENS flavus

TRIENTALIS borealis

TRIFOLIUM

1. Petals pale to deep-yellow.
   2. Heads up to 8 mm thick, the flowers less than 3.5 mm long, fewer than 15, the standards scarcely or not at all striate .... *Trifolium dubium*
   2. Heads often more than 8 mm thick, the flowers more than 3.5 mm long, 15 or more in number, the standards conspicuously fluted with striate grooves.
      All 3 leaflets subsessile, the petiolules all about the same length, less than 1 mm long; stipules oblong-lanceolate, about equaling the petiole in length; seeds globose ..... *Trifolium aureum*
      The 2 lateral leaflets subsessile, the petiolule of the terminal leaflet 1 mm or more long; stipules ovate, usually about ½ as long as the petiole; seeds ovoid ..... *Trifolium campestre*
1. Petals not yellow.
   3. Flowers on distinct pedicels, the pedicels reflexed in age, soon becoming 1.5 mm or more long; stems glabrous or nearly so.
      4. Stems creeping, rooting at the nodes, only the peduncles and leaves erect; petals usually white; calyx lobes abruptly widened below the middle by scarious margins, both about as wide as the green midrib, the sinus between the lobes very often purple-blotched.
         Leaflets less than 3 cm long; flowering heads less than 3 cm across ..... *Trifolium repens*
         Leaflets more than 3 cm long; flowering heads more than 3 cm across ..... *Trifolium repens giganteum*
      4. Stems erect or ascending, not rooting at the nodes; petals infused with pink or rose; calyx lobes not or only narrowly scarious margined, the sinus not purple-blotched.
         Calyx less than 6 mm long, the teeth up to twice as long as the tube; flowers less than 1 cm long; stipules caudate ..... *Trifolium hybridum*
         Calyx more than 6 mm long, the teeth 3 or 4 times as long as the tube; flowers 1 cm or more long; stipules acuminate ..... **Trifolium reflexum glabrum**
   3. Flowers all sessile; stems glabrous or pubescent.
      5. Heads sessile or short-pedunculate, more than 1.5 cm broad, subtended by a pair of opposite leaves ..... *Trifolium pratense*
      5. Heads long-pedunculate from the axils of alternate leaves, usually less than 1.5 cm broad.
         6. Stems pubescent; calyx with linear-setaceous lobes 3 mm or more long, the tube not gibbous.
            Corollas white or pinkish, mostly hidden by the calyx; leaflets elliptic, much longer than wide; stipule lobes abruptly tapered into long setaceous tips ..... *Trifolium arvense*
            Corollas scarlet, equaling or surpassing the calyx; leaflets broadly obovate, about as wide as long; stipule lobes broadly acute ..... *Trifolium incarnatum*
         6. Stems glabrous or essentially so; calyx lobes less than 3 mm long, the tube distinctly gibbous on one side.
            Plant annual; corolla purple, oriented upside down, with the standard toward the lower side of the flower cluster ..... *Trifolium resupinatum*
            Plant a creeping perennial; corolla roseate, oriented normally ..... *Trifolium fragiferum*

TRIGLOCHIN

1. Stigmas 6; fruits ovoid-oblong, mostly more than 2 mm thick, rounded at the base, with 3 to 6 erect to recurved beaks; plant not stoloniferous ..... **Triglochin maritima**
1. Stigmas 3; fruits linear-clavate, usually less than 2 mm thick, attenuate at the base, essentially beakless; plant stoloniferous, the stolons often bearing bulbs ..... **Triglochin palustris**

TRILLIACEAE

A. Leaves in whorls of 4 or more, in 2 whorls below the inflorescence; flowers in umbels ..... MEDEOLA
A. Leaves in whorls of 3, in one whorl below the inflorescence; flowers solitary ..... TRILLIUM

TRILLIUM

1. Flowers sessile.
   2. Leaves petiolate; sepals deflexed; petals narrowed to an abrupt stipe-like claw ..... **Trillium recurvatum**
   2. Leaves sessile; sepals horizontally spreading, on a plane with the leaves; petals subcuneate at the base but not narrowed and stipe-like.
      3. Anther connection prolonged for 1 mm or more beyond the anther sacs; petals to 4 cm long ..... **Trillium sessile**
      3. Anther connection a mere stub or prolonged less than 1 mm beyond the anther sacs; petals more than 4 cm long.
         Flowers distinctly lemon-scented, the petals yellow ..... *Trillium luteum*
         Flowers not lemon-scented, the petals usually maroon or with tinctures of maroon ..... *Trillium cuneatum*
1. Flowers pedunculate.
   4. Leaves mostly more than twice as long as wide, up to 4.5 cm long, rounded at the base to a distinct petiole, obtuse to subacute; plant less than 15 cm high ..... **Trillium nivale**
   4. Leaves at most twice as long as wide, 5 cm or more long, broadly cuneate to a sessile or subsessile base (rarely petiolate), acute to short-acuminate; plants usually more than 15 cm high.
      5. Leaves distinctly petiolate; ovary 3-lobed; petals infused with red or purple at the base ..... **Trillium undulatum**
      5. Leaves sessile or subsessile; ovary 6-angled or lobed; petals white or pink (rarely maroon) but not infused with red or purple at the base.
         6. Petals notably longer than the sepals, rarely less than 3.5 cm long, white to roseate but never maroon; stigmas essentially erect, of uniform diameter, nearly straight; pedicels erect or ascending, holding the flowers above the leaves ..... **Trillium grandiflorum**
         6. Petals shorter than to subequaling the sepals, rarely exceeding 3.5 cm long, white to rose or maroon; stigmas spreading, tapering from the base to the recurved tip; pedicels erect to horizontal or deflexed.
            7. Filaments very short, less than ¼ as long as the anthers, rarely to 2.5 mm long, never more than 4 mm ..... **Trillium flexipes**
            7. Filaments usually at least ¼ as long as the anthers, commonly more than 2.5 mm long.
               Pedicels bent and deflexed from the base; petals rarely more than 2.5 cm long, never more than 4 cm, white to roseate; anthers less than 7 mm long, more than ½ as long as the filament ..... **Trillium cernuum**
               Pedicels erect; petals commonly more than 2.5 cm long, usually 3 cm or more, white or maroon; anthers generally 7 mm or more long, the filament no more than ½ as long ..... **Trillium erectum**

TRIODANIS
1. Leaves and leaf-like bracts ovate or rotund, strongly clasping the stem; capsule less than 1 cm long, straight . . . . . **Triodanis perfoliata**
1. Leaves and leaf-like bracts linear to narrowly lance-oblong or elliptic, not clasping; capsule becoming more than 1 cm long, often curved . . . . . *Triodanis leptocarpa*

TRIOSTEUM
1. Middle leaves pandurate, narrowed below the middle, dilated and clasping-connate at the base . . . . . **Triosteum perfoliatum**
1. Leaves all narrowly to broadly tapered below the middle, connected only by a narrow ridge, or 1 or 2 pairs connate with tissue less than 2 cm wide.
   Stems with hairs up to 1.5 mm long . . . . . **Triosteum aurantiacum**
   Stems with hairs more than 1.5 mm long . . . . . **Triosteum aurantiacum illinoense**

TRIPHORA trianthophora

TRIPLASIS purpurea

TRIPLEUROSPERMUM *inodorum*

TRIPSACUM *dactyloides*

TRITICUM *aestivum*

TSUGA canadensis

TULIPA
1. Anthers pubescent at the base; leaves linear, less than 2.5 cm wide . . . . . *Tulipa sylvestris*
1. Anthers glabrous at the base; leaves ovate, more than 2.5 cm wide . . . . . *Tulipa fosteriana*

TURRITIS glabra

TUSSILAGO *farfara*

TYPHA
1. Pistillate bracteoles (not to be confused with the stigmas) absent; larger fresh leaves 10 mm or more wide, the distal one subequaling the inflorescence; pistillate and staminate spikes prevailingly contiguous; compound pedicels in pistillate fruiting spike acicular . . . . . **Typha latifolia**
1. Pistillate bracteoles present, either setose with enlarged brown tips or pale and as wide as or wider than the stigmas; leaves often less than 10 mm wide, the distal one commonly much exceeding the inflorescence; pistillate and staminate spikes always with a notable separation; compound pedicels in pistillate fruiting spike peg-like, never acicular.
   2. Leaves with orangish-brown mucilage glands on the adaxial surface near the base and on the inner surface of the sheaths; pistillate spike whitish-brown to pale cinnamon-colored; distal leaf subequaling the inflorescence . . . . . *Typha domingensis*
   2. Leaves without mucilage glands on the adaxial surface; pistillate spike dark-red or chocolate-brown; distal leaf commonly surpassing the inflorescence.
      Pistillate bracteoles as wide as or wider than the stigmas at the apex, often apically globose and dark-brown; fresh leaves thickly convex below the middle, 4-12 mm wide when fresh, 3-8 mm wide when dry; fruiting pistillate spike to 1.5 cm thick and 15 cm long, separated from the staminate spike by at least 2 cm, commonly 3 cm or more . . . . . *Typha angustifolia*
      Pistillate bracteoles narrower than the stigmas and apically pale-brown to nearly colorless; leaves regularly more than 6 mm wide, even when dry, flattish to convex; fruiting pistillate spike usually more than 1.5 cm thick and 16 cm long, often not much separated from the staminate spike. . . . . *Typha ×glauca*

TYPHACEAE: One genus in our area . . . . . TYPHA

ULMACEAE

A. Leaves doubly serrate . . . . . ULMUS
A. Leaves 1-serrate to subentire.
   B. Leaves strongly asymmetrical at the base, subentire to irregularly serrate . . . . . CELTIS
   B. Leaves nearly or quite symmetrical at the base, evenly serrate.
      Teeth of leaves abruptly acuminate-subulate . . . . . ZELKOVA
      Teeth of leaves bluntly callous-tipped . . . . . ULMUS

ULMUS
1. Leaves to 3 cm wide, the marginal teeth singly serrate or a few weakly doubly serrate.
   Buds without rufous hairs on the distal scales; mature leaves glabrous or glabrate adaxially, the blades acute to slightly acuminate, almost never more than 7 cm long, essentially once-serrate . . . . . *Ulmus pumila*
   Buds with the distal scales rufous-ciliate or pubescent; mature leaves usually scabrous adaxially, the blades commonly acuminate, frequently more than 7 cm long, very often doubly serrate . . . . . *Ulmus ×intermedia*
1. Larger leaves more than 3 cm wide, the marginal teeth doubly serrate.

2. Most of the leaves with the lateral veins not forking or a few forking just before the margins; flowers and fruits distinctly stalked on slender pedicels more than 5 mm long, the wings ciliate; mature buds soon longer than wide and distinctly pointed; petioles glabrous to variously pubescent or pilose, but almost never coarsely hispid.
    Inflorescence racemose; fruits more than 1.5 cm long, pubescent on the flat surface; leaves symmetrical at the base, most of them minutely but distinctly auriculate-clasping, the lobes often slightly overlapping; at least some branchlets corky-ridged . . **Ulmus thomasii**
    Inflorescence fasciculate; fruits less than 1.5 cm long, glabrous on the flat surface; leaves symmetrical to asymmetrical at the base, not auriculate-clasping; typically none of the branchlets corky-ridged . . . . . **Ulmus americana**
2. Most of the leaves with 2 or more lateral veins forking well before the margins; flowers and fruits sessile or subsessile on stout pedicels up to 5 mm long, the wings eciliate; mature buds blunt, usually not much longer than wide; petioles glabrous or mostly dominated by coarse, pustular-based, hispid hairs.
    Buds rufous-pubescent throughout; stamens normally more than 5; fruits pubescent only at the center; petioles abundantly pustular-hispid; mature leaf blades distinctly doubly serrate, strongly pustular-hispid adaxially, strongly acuminate at the tip and asymmetrical at the base, the larger ones usually more than 11 cm long . . . . . **Ulmus rubra**
    Buds white-ciliate on the margins of the median scales, the distal scales rufous-ciliate or pubescent; stamens not usually more than 5; fruits glabrous or glabrate nearly throughout; petioles glabrous to hispid; mature leaves not or only obscurely doubly serrate, glabrous to hispid adaxially, acute or acuminate, often symmetrical at the base, the larger ones commonly less than 11 cm long . . . . . *Ulmus ×intermedia*

URTICA gracilis

URTICACEAE

A. Leaves alternate.
    Plant delicate, without stinging hairs; leaves entire, less than 7 cm long . . . . . PARIETARIA
    Plant coarse, copiously beset with stinging hairs; leaves serrate, more than 7 cm long . . . . . LAPORTEA
A. Leaves opposite.
    B. Leaves lanceolate, usually 3 or more times as long as wide (less than 3 times as long as wide in the extremely rare *Urtica dioica*); plants with stinging trichomes . . . . . URTICA
    B. Leaves ovate, less than 3 times as long as wide; plants without stinging trichomes.
        Teeth blunt; stems fleshy, translucent; flowers in panicles or glomerules; calyx of 3 to 4 separate sepals, exceeded by the achenes . . . . . PILEA
        Teeth acute; stems firm, not translucent; flowers in spikes; calyx tubular, enclosing the achenes . . . . . BOEHMERIA

UTRICULARIA

1. Plants without an array of basal leaves, aquatic or not.
    2. Chasmogamous corollas purple, the plants perennial from elongate stolons . . . . . **Utricularia resupinata**
    2. Chasmogamous corollas yellow or absent, the plants annual.
        Chasmogamous flowers common, regularly 2-few on slender stems, the spur of the corolla 7 mm or more long; cleistogamous flowers absent; bracts basally attached . . . . . **Utricularia cornuta**
        Chasmogamous flowers rare, with the spur less than 7 mm long; cleistogamous flowers typically solitary on a filiform scape; bracts peltate, attached at or near their centers . . . . . **Utricularia subulata**
1. Plants with an evident array of bladder-bearing, usually floating leaves at the base.
    3. Scape with a whorl of aerial leaves near the middle, the petioles strongly inflated . . . . . **Utricularia radiata**
    3. Scape leafless.
        4. Leaf divisions flat.
            Ultimate leaf divisions spinulose-serrulate (under 10× magnification); corolla with a spur about as long as the lower lip; bladders typically borne on separate branches . . . . . **Utricularia intermedia**
            Ultimate leaf divisions entire; corolla saccate or with a spur much shorter than the lower lip; bladders borne on the leaves . . . . . **Utricularia minor**
        4. Leaf divisions terete or filiform.
            5. Flowers purple or deep-pink . . . . . **Utricularia purpurea**
            5. Flowers yellow or yellowish.
                6. Plant coarse, the emergent scape 1 mm or more in diameter; flowers more than 4 per inflorescence, more than 12 mm long; leaves floating, the larger bladders more than 2 mm across . . . . . **Utricularia macrorhiza**
                6. Plant delicate, the emergent scape filiform, less than 1 mm in diameter; flowers fewer than 4 per inflorescence, up to 12 mm long, or chasmogamous flowers absent; leaves creeping or floating, the larger bladders rarely as much as 2 mm across.
                    Emergent scapes with at least 1 chasmogamous flower, from a thickly tangled mat of leaves creeping either on the bottom in shallow water, on receding shores, or on floating muck mats; cleistogamous flowers evidently absent . . . . **Utricularia gibba**
                    Emersed stems rarely with chasmogamous flowers, from a delicate mass of floating leaves; submersed stems regularly producing cleistogamous flowers on pedicels mostly 4-8 mm long . . . . . **Utricularia geminiscapa**

UVULARIA

1. Leaves glabrous abaxially, sessile; tepals pale-yellow or straw-colored, to 2.5 cm long, not much longer than the style; stamens distinctly surpassed by the stigmas; capsules becoming more than 15 mm long . . . . . **Uvularia sessilifolia**
1. Leaves finely puberulent abaxially, perfoliate with the stem; tepals deep-yellow, mostly more than 2.5 cm long, much exceeding the style; stamens equaling or exceeding the stigmas; capsules less than 15 mm long, rarely more than 10 mm . . . . . **Uvularia grandiflora**

VACCARIA *hispanica*

VACCINIUM

1. Plant erect, more than 5 dm high; larger mature leaves rarely less than 4.5 cm long and commonly more than 5 cm . . . . **Vaccinium corymbosum**
1. Plant low and spreading, normally less than 5 dm high; leaves rarely more than 4.5 cm long and never more than 5 cm.
   2. Twigs and abaxial leaf surfaces densely pubescent; leaves lanceolate, essentially entire, less than 3.5 cm long and 1.5 cm wide . . . . . **Vaccinium myrtilloides**
   2. Twigs and abaxial leaf surfaces glabrous, glabrate, or sparsely pubescent along the veins or on the stems in lines; leaves various, but if lanceolate and less than 1.5 cm wide, then evenly serrulate.
      Leaves lanceolate to lance-ovate, green on both sides, less than 1.5 cm wide, at least twice as long as wide but rarely more than 3.2 cm long, minutely but regularly and distinctly spinulose-serrulate . . . . . **Vaccinium angustifolium**
      Leaves lance-ovate to broadly obovate, pale-green or glaucous abaxially, the larger ones 1.5 cm or more wide, to twice as long as wide and often more than 3.2 cm long, entire to irregularly or regularly serrulate . . . . . **Vaccinium pallidum**

VALERIANA

1. The basal and numerous cauline leaves deeply pinnately divided with more than 5 pairs of segments, the rachis hirsute . . . . . *Valeriana officinalis*
1. The basal and few cauline leaves entire or with fewer than 5 pairs of segments or lobes, the rachis glabrous or ciliate.
   Leaf blades or their segments densely ciliate, essentially parallel-veined; panicle soon becoming much longer than broad . . . . . **Valeriana edulis ciliata**
   Leaf blades or their segments sparsely ciliate to glabrous, reticulate-veined; panicle broader than to about as long as broad . . . . . **Valeriana uliginosa**

VALERIANACEAE

A. Annuals; leaves entire or some occasionally dentate below the middle; achenes without a pappus . . . . . VALERIANELLA
A. Perennials; at least some of the leaves pinnately divided or compound; achenes with a pappus . . . . . VALERIANA

VALERIANELLA

1. Bracts all ciliate; cauline leaves dentate at the base; corollas less than 2.5 mm long, the lobes blue-tinged . . . . . *Valerianella locusta*
1. Bracts eciliate; cauline leaves entire at the base; corollas more than 2.5 mm long, white.
   Corollas no more than 4 mm long; fruits bluntly triangular in cross section, the larger nearly all more than 2.5 mm long . . . . . **Valerianella chenopodiifolia**
   Larger corollas more than 4 mm long; fruits variously shaped but not distinctly triangular in cross section, rarely more than 2.5 mm long . . . . . **Valerianella umbilicata**

VALLISNERIA americana

VERBASCUM

1. Stems glabrous or sparsely glandular-pubescent distally; flowers white or yellow . . . . . *Verbascum blattaria*
1. Stems densely woolly-pubescent throughout; flowers yellow.
   2. Cauline leaves with their bases conspicuously decurrent down the stem, commonly from one leaf base to the next; inflorescence densely spicate.
      Leaves decurrent but not reaching the leaf bases below; style clavate, the stigma tapered-decurrent . . . . . *Verbascum ×kerneri*
      Leaves decurrent to the leaf bases below; style abruptly terminated in a flared stigma . . . . . *Verbascum thapsus*
   2. Cauline leaves petiolate to merely clasping, the bases not or only slightly decurrent; inflorescence more or less loosely spicate to copiously branched.
      Inflorescence copiously paniculate-branched; leaves entire, principally lanceolate, mostly long-tapering at the bases . . . . . *Verbascum speciosum*
      Inflorescence spicate, usually loosely so below, unbranched or with an occasional branch below; leaves often crenulate-serrulate to crenate, mostly ovate and broadly clasping at the bases . . . . . *Verbascum phlomoides*

VERBENA

1. Bracts prevailingly longer than the flowers.
   Bracts more than 6 mm long, often falcate . . . . . **Verbena bracteata**
   Bracts less than 6 mm long, not falcate . . . . . **Verbena ×perriana**
1. Bracts all shorter than the flowers.
   2. Spikes congested, short, scarcely elongating in fruit, in paniculiform cymes . . . . . *Verbena bonariensis*
   2. Spikes slender to narrowly cylindric, elongating in age, solitary, or in simple, branched inflorescences.
      3. Leaves no more than 2 cm wide.
         4. Leaves elliptic to ovate; at least the distal stem hairs spreading . . . . . **Verbena ×moechina**
         4. Leaves linear to lanceolate; distal stem hairs appressed or ascending.
            Leaves to 10 mm wide . . . . . **Verbena simplex**
            Larger leaves more than 10 mm wide . . . . . **Verbena ×blanchardii**
      3. Larger leaves more than 2 cm wide.
         5. Spikes mostly 1-3, densely and coarsely hirsute; stems and leaves densely downy-pubescent; leaves ovate, cuneate, sessile, or the larger subsessile on petioles less than 5 mm long; calyx more than 3.5 mm long; petals pink to blue . . . . . **Verbena stricta**
         5. Spikes mostly more than 3, glabrate to pubescent; stems variously pubescent with appressed or spreading hairs; at least the larger leaves on petioles more than 5 mm long; calyx more or less than 3.5 mm long; petals blue or white.
            6. Flowers close, overlapping along the inflorescence axis; leaves lanceolate to narrowly ovate, sometimes with a pair of lobes at the base; calyx mostly more than 2.4 mm long; corollas bluish-purple.

Calyx to 4 mm long, thinly appressed-pubescent; leaves sparsely pubescent with the veins below strigose or with scarcely divergent hairs . . . . . **Verbena hastata**
Calyx more than 4 mm long, more or less canescent; leaves densely spreading-pubescent throughout abaxially . . . . . **Verbena ×rydbergii**

6. Flowers well separated along the inflorescence axis, the middle and proximal ones not overlapping the ones above and sometimes even distant from them; leaves ovate, rarely lobed; calyx more or less than 2.4 mm long; corollas white, blue, or pink.
   7. Most of the flowers barely reaching the ones just above them on the spike; petals white or pink.
      Flowers pink (turning blue upon drying) . . . . . **Verbena ×engelmannii**
      Flowers white . . . . . **Verbena ×illicita**
   7. Most of the middle and proximal flowers quite distant from each other along the spike; petals white.
      Lower leaf surfaces thinly to densely hirsute with hairs 0.3 mm or more long; nutlets mostly 1.7 mm or more long, bluntly but distinctly expressed-veiny on the back . . . . . **Verbena urticifolia**
      Lower leaf surfaces and stems densely velutinous with hairs scarcely 0.25 mm long and never more than 0.3 mm long; nutlets to 1.6 mm long, smooth on the back . . . . . **Verbena urticifolia leiocarpa**

VERBENACEAE

A. Flowers in dense, ovoid or cylindrical heads or short spikes, the heads terminating long solitary peduncles from the leaf axils; calyx lobes 2-4; corollas 2-lipped; stigmas capitate; fruit separating into two nutlets; plants creeping . . . . . PHYLA
A. Flowers in short or elongate, racemose heads or spikes, the inflorescence terminal or from the distal axils; calyx lobes 5; corollas more or less regular; stigmas mostly 2-lobed; fruit separating into four nutlets; plants prostrate to erect.
   Styles more than 3 times as long as the ovary; open corollas more than 10 mm across; schizocarps black, less than half the length of the calyx . . . . . GLANDULARIA
   Styles less than 3 times as long as the ovary; open corollas less than 10 mm across; schizocarps rufous, more than half the length of the calyx . . . . . VERBENA

VERBESINA alternifolia

VERNONIA

1. Stems glabrous or glabrate distally, the abaxial leaf surfaces glabrous . . . . . **Vernonia fasciculata**
1. Stems and abaxial leaf surfaces puberulent to hirtellous or tomentulose.
   2. Inner phyllaries abruptly acuminate at their tip, usually copiously beset with resinous atoms along both sides of the strongly carinate midrib . . . . . *Vernonia baldwinii*
   2. Inner phyllaries blunt or apiculate to abruptly short-acuminate, not or only seldom resinous, the midrib flat or subcarinate toward the obtuse to mucronate tip.
      Florets fewer than 31 in well developed heads . . . . . **Vernonia gigantea**
      Florets more than 31 in well developed heads . . . . . **Vernonia missurica**

VERONICA

1. Flowers in axillary racemes or leaves more than 4 cm long or both; plant perennial.
   2. Stems glabrous, glabrate, or rarely minutely glandular; leaves serrate or entire.
      3. Leaf bases rounded to distinct petioles . . . . . **Veronica americana**
      3. Leaves sessile or tapered to indistinct petioles.
         4. Leaves remotely glandular-denticulate, merely narrowed to sessile bases, linear to linear-elliptic or narrowly lanceolate; racemes flexuous, typically zigzag, slender; capsules strongly flattened . . . . . **Veronica scutellata**
         4. Leaves serrate or entire, the distal ones with broad-cuneate to clasping bases, lanceolate to lance-oblong; racemes stiff, the axes straight and stout; capsules turgid.
            Cauline leaves lance-ovate, to 3 times as long as wide; pedicels eglandular; sepals acuminate . . . . . *Veronica anagallis-aquatica*
            Cauline leaves lanceolate to linear-oblong, more than 3 times as long as wide; pedicels finely stipitate-glandular; sepals obtuse to acute . . . . . **Veronica catenata glandulosa**
   2. At least the distal portions of the stem canescent, pubescent, or pilose; leaves serrate or dentate.
      5. Flowers sessile or on pedicels shorter than the bracts.
         Leaves more than 5 cm long, widest near the base, on petioles 1 cm or more long; spikes terminal, densely flowered; bracts linear-filiform; style becoming 2-3 times as long as the capsule, persistent . . . . . *Veronica longifolia*
         Leaves less than 5 cm long, broadly oval, widest near the middle, subsessile or indistinctly petiolate; spikes axillary, loosely flowered; bracts narrowly oblong, obtuse; style not much longer than the capsule, deciduous . . . . . *Veronica officinalis*
      5. Flowers long-pedicellate, the pedicels longer than the bracts.
         Calyx lobes all about equal; leaves less than twice as long as wide; racemes with a fine, spreading, glandular pubescence . . . . . *Veronica chamaedrys*
         One pair of the calyx lobes scarcely ½ as long as the other pair; leaves more than twice as long as wide; racemes with short, incurved, eglandular hairs . . . . . *Veronica austriaca teucrium*
1. Flowers solitary in the axils of leaf-like bracts or in terminal spikes with the bracts much reduced, the leaves all less than 4 cm long and only rarely more than 2.5 cm; plant annual or perennial.
   6. Flowers and fruits distinctly stalked on pedicels more than 4 mm long.
      7. Principal leaves notably longer than wide; calyx lobes acuminate, bract-like, concealing the corolla and the fruit; capsules notched well over ½ their length, the lobes much longer than the style . . . . . *Veronica biloba*
      7. Principal leaves about as wide as or even wider than long; calyx lobes acute to obtuse, neither bract-like nor particularly concealing the corolla or the fruit; capsules notched no more than ½ their length, the lobes not longer than the style.
         8. Leaves palmately 3-5 lobed, the central lobe obviously the larger . . . . . *Veronica hederaefolia*
         8. Leaves not palmately lobed, with 7 or more teeth, the central tooth not or only scarcely the larger.

Corollas much surpassing the sepals; fruiting pedicels more than 1.2 cm long; capsules more than 5.5 mm wide; seeds often more than 1.6 mm long . . . . . *Veronica persica*
Corollas not or only slightly longer than the sepals; fruiting pedicels up to 1.2 cm long; capsules less than 5.5 mm wide; seeds less than 1.6 mm long . . . . . *Veronica polita*

6. Flowers and fruits sessile or on pedicels up to 4 mm long.
   9. At least the middle cauline leaves pinnately divided.
      Style less than 0.7 mm long, ultimately exceeded by the shoulders of the capsule . . . . . *Veronica verna*
      Style more than 0.7 mm long, exceeding the shoulders of the capsule . . . . . *Veronica dillenii*
   9. None of the leaves pinnately divided, entire to crenate or dentate.
      10. Stems puberulent throughout with minute, fine, incurved hairs, the leaves glabrous or nearly so (hairy when young); longer pedicels often more than 2 mm long; matted perennial . . . . . *Veronica serpyllifolia*
      10. Stems and leaves glabrous throughout or pubescent with mostly spreading hairs or spreading hairs mixed with appressed ones; pedicels up to 2 mm long; erect annuals.
         11. Stem leaves subentire to crenulate or crenate, less than 1.5 times as long as wide; plant pubescent, not fleshy; corollas blue; capsules deeply notched, the style about equaling the lobes, mostly more than 0.3 mm long . . . . . *Veronica arvensis*
         11. Stem leaves entire or nearly so, mostly more than 2 times as long as wide; plant glabrous throughout (rarely thinly glandular-pubescent), the stems more or less fleshy; corollas white; capsules very shallowly notched, the stigma sessile or on a style less than 0.3 mm long.
            Stem and capsules glabrous . . . . . **Veronica peregrina**
            Stem and capsules glandular-pubescent . . . . . **Veronica peregrina xalapensis**

VERONICASTRUM virginicum

VIBURNUM

1. All or most of the leaves palmately 3-lobed.
   2. Leaves densely beset with atomiferous glands and stellate-pubescence abaxially; petioles eglandular; flowers all similar and fertile; fruits black or blackish . . . . . **Viburnum acerifolium**
   2. Leaves glabrous or pubescent with simple hairs abaxially, never dotted with glands; petioles glandular at the summit; inflorescence with the marginal flowers sterile and with greatly enlarged, flattened corollas; fruits red.
      Adaxial leaf surfaces glabrous; petiolar glands depressed, saucer-shaped, concave or depressed distally . . . . . *Viburnum opulus*
      Adaxial leaf surfaces thinly but distinctly strigose; petiolar glands clavate or columnar, not concave or depressed distally . . . . . **Viburnum trilobum**
1. Leaves essentially unlobed.
   3. Leaf blades thick, densely stellate-pubescent on both surfaces; winter buds naked.
      Leaves rugose adaxially; corolla campanulate, the tube not surpassing the calyx lobes . . . . . *Viburnum lantana*
      Leaves not rugose; corolla funnelform, the tube well exserted beyond the calyx lobes . . . . . *Viburnum carlesii*
   3. Leaf blades glabrous or glabrate adaxially to more or less pubescent abaxially with simple or fascicled hairs; winter buds with 1 or 2 pairs of outer scales.
      4. Leaf blades with the lateral veins often obscure or their integrity lost among the anastomosing veinlets long before reaching the entire to serrulate or crenulate margins; winter buds with only one pair of outer scales.
         5. Inflorescence definitely pedunculate, the primary rays of the cyme originating from a common locus at least 5 mm above the axils of the bracteal leaves, the leaves crenulate . . . . . **Viburnum cassinoides**
         5. Inflorescence sessile or subsessile, the primary rays of the cyme all originating from a common locus from the axils of the bracteal leaves, the leaves sharply serrate.
            Petioles with the margins manifestly undulate or repand-winged, often more or less revolute; leaf blades prevailingly abruptly acuminate . . . . . **Viburnum lentago**
            Petioles with the margins not undulate or repand-winged; leaf blades obtuse, acute, or some of them abruptly short-acuminate . . . . . **Viburnum prunifolium**
      4. Leaf blades with the lateral veins prominent, forked once or twice, ending in coarse teeth; winter buds with 2 pairs of outer scales.
         6. Leaves cuneate, prevailingly widest beyond the middle; inflorescence a hemispheric or subglobose cyme with opposite branches . . . . . *Viburnum sieboldii*
         6. Leaves broadly cuneate to subcordate at the base, widest near or below the middle; inflorescence a flattish umbel, the branches commonly 3 or more at a node.
            7. Young branchlets abundantly stellate-pubescent.
               Hypanthium glabrous or glandular . . . . . *Viburnum dentatum*
               Hypanthium densely setose or hirsute . . . . . *Viburnum dentatum scabrellum*
            7. Young branchlets glabrous or glabrate.
               8. Petioles up to 1.2 cm long, those of the leaves subtending the inflorescence subsessile to 5(8) mm long . . . . . **Viburnum rafinesquianum**
               8. Petioles more than 1.2 cm long, those subtending the inflorescence more than 5 mm long and usually more than 8 mm.
                  Leaves downy stellate-pubescent throughout abaxially . . . . . *Viburnum molle*
                  Leaves glabrous except for hairs in the main vein axils . . . . . *Viburnum recognitum*

VICIA

1. Flowers sessile or subsessile on short pedicels in the leaf axils.
   2. Calyx less than 12 mm long; corollas less than 18 mm long.
      Flowers less than 9 mm long; leaves with simple tendrils . . . . . *Vicia lathyroides*
      Flowers more than 9 mm long; leaves with mostly branched tendrils . . . . . *Vicia angustifolia*
   2. Calyx more than 12 mm long; corollas more than 18 mm long.

Calyx tube obviously longer than the lobes; flowers yellow or yellow suffused with purple . . . . . *Vicia grandiflora*
Calyx tube subequaling the lobes; flowers purple with violet wings . . . . . *Vicia sativa*

1. Flowers 1-several in long-pedunculate axillary racemes.
   3. Stipules sharply dentate-lobed with 2 or more lanceolate teeth; leaflets with more than 7 distinct pairs of lateral veins; stems glabrous or glabrate; inflorescence, including the peduncle, shorter than the subtending leaf; flowers fewer than 10 per raceme . . . . . **Vicia americana**
   3. Stipules entire or with a single basal lobe; leaflets with fewer than 7 pairs of lateral veins; stems glabrous to strigose or villous; inflorescence often becoming longer than the subtending leaf; flowers more or less than 10 per raceme.
      4. Calyx to 3 mm long, the lobes lanceolate to ovate-deltate; corollas white or white with blue tinges; fruits glabrous.
         Flowers 1-2 or rarely as many as 4 per peduncle; calyx lobes very unequal; leaflets almost never more than 10; fruits 4-seeded . . . . . *Vicia tetrasperma*
         Flowers more than 2, usually 7 or more per peduncle; calyx lobes subequal; leaflets commonly more than 10; fruits with more than 4 seeds . . . . . **Vicia caroliniana**
      4. Calyx usually more than 3 mm long, some of the lobes with linear-setaceous tips; corollas blue or violet except in rare white forms; fruits glabrous or pubescent.
         5. Stems with spreading hairs, the longer hairs more than 1 mm . . . . . *Vicia villosa*
         5. Stems glabrate, strigose, or with spreading hairs to 1 mm long.
            Upper two calyx teeth deltate, acute to abruptly acuminate, the lower 3 lance-attenuate; fruits to 7 mm wide; hilum large, more than ¼ the circumference of the seed; perennial . . . . . *Vicia cracca*
            Upper two calyx teeth with the midvein exiting as an acicular projection, the lower 3 teeth acicular-subulate; fruits more than 7 mm wide; hilum small, much less than ¼ the circumference of the seed; annual or biennial . . . . . *Vicia dasycarpa*

VIGNA *unguiculata*

VINCA

1. Leaves ciliate, deltate-ovate; larger corollas more than 3.2 cm across . . . . . *Vinca major*
1. Leaves eciliate, lance-elliptic; corollas less than 3.2 cm across . . . . . *Vinca minor*

VINCETOXICUM

1. Corolla lobes deltate, not much longer than wide, with short white pubescence on the adaxial face; peduncles to 2 cm long, rarely more in fruit . . . . . *Vincetoxicum nigrum*
1. Corolla lobes lanceolate, longer than wide, glabrous; longer peduncles more than 2 cm . . . . . *Vincetoxicum rossicum*

VIOLA

1. Plants with leafy stems.
   2. Plants annual; stipules foliaceous, pectinate to pinnatifid at the base.
      3. Enlarged middle lobe of stipules entire or with a single pair of distinct teeth toward the tip; peduncles almost never more than 4 cm long . . . . . *Viola rafinesquii*
      3. Enlarged middle lobe of most of the stipules distinctly crenate, with 3 or more pairs of low teeth; peduncles commonly more than 4 cm long.
         4. Corollas subequal to or not much longer than the sepals, less than 1.5 cm across, yellow . . . . . *Viola arvensis*
         4. Corollas much longer than the sepals, usually 1.5 cm or more across, variously colored.
            Flowers more than 2.5 cm across, purple or otherwise . . . . . *Viola ×wittrockiana*
            Flowers less than 2.5 cm across, deeply hued with violet or purple . . . . . *Viola tricolor*
   2. Plants perennial; stipules often ample and herbaceous, but not at all leaf-like.
      5. Stipules entire or merely weakly serrulate; petals yellow or white tinged with blue.
         6. Petals white or violaceous; stipules primarily scarious.
            Leaves glabrous or glabrate, if glabrate then with short-pubescence of divaricate hairs on the abaxial midrib less than 0.5 mm long; basal leaves as wide as long; rhizome stout, usually short . . . . . **Viola canadensis**
            Leaves pubescent, with many of the divaricate hairs on the abaxial midrib more than 0.5 mm long; basal leaves notably wider than long; rhizome slender, elongate . . . . . **Viola canadensis rugulosa**
         6. Petals yellow; stipules herbaceous, green.
            Larger bracteal leaves more than 5.5 cm long; basal leaves 0-1 . . . . . **Viola pubescens**
            Larger bracteal leaves all less than 5.5 cm long; basal leaves usually 2 or more . . . . . **Viola pubescens scabriuscula**
      5. Stipules pectinately fringed or incised; petals blue, violet, or whitish to creamy.
         7. Sepals eciliate; corollas pale-blue to lavender.
            Spur much longer than 6 mm; most auricles of sepals less than 1.2 mm long . . . . . **Viola rostrata**
            Spur shorter than 6 mm; most auricles of sepals more than 1.2 mm long . . . . . **Viola labradorica**
         7. Sepals all ciliate or at least weakly ciliolate; corollas white or with various tinctures of blue.
            8. Sepals ciliate nearly throughout; corollas white, usually with dark lines or markings in the throat . . . . . **Viola striata**
            8. Sepals weakly ciliolate; corollas with tinctures of blue, sometimes with darker marking proximally.
               Corolla with a creamy center, the spur to 5 mm long . . . . . **Viola ×eclipes**
               Corolla with a dark ring in the throat, the spurs often more than 5 mm long . . . . . **Viola ×brauniae**

1. Plants with the leaves all basal.
   9. At least some of the leaves divided or lobed for nearly half to more than half of their width.
      10. Only the mid-seasonal leaves trilobate to deeply palmately divided, the central lobe frequently longer or wider than the laterals, the early spring leaves undivided . . . . . **Viola palmata**
      10. All leaves deeply ternately divided.
         11. Stamens protruding from the throat; lateral petals beardless . . . . . **Viola pedata lineariloba**
         11. Stamens included; lateral petals bearded.

Leaves deeply divided into 5-9 mostly linear or spatulate segments . . . . . **Viola pedatifida**
Leaves cleft or deeply divided into 5-16 lobes, the lobes various, ranging from triangular, falcate, lanceolate to narrowly elliptic . . . . . **Viola subsinuata**

9. Leaves serrulate or subentire to merely coarsely dentate or shallowly lobed at the base.
   12. Many of the leaf blades 1.5 times as long as wide or longer, attenuate to broadly cuneate or subtruncate to subcordate at the base, the leaves sometimes with exaggerated teeth or distinct short lobes at the base.
      13. Flowers blue; petioles well developed and distinct; blades commonly deeply cordate and usually lobed proximally . . . **Viola sagittata**
      13. Flowers white; blades abruptly or gradually tapering into the petioles, rarely cordate, without proximal lobes.
         Leaf blades ovate-subcordate to broadly elliptic, almost never more than 2.5 times as long as wide . . . . . **Viola primulifolia**
         Leaf blades elliptic to linear, nearly always more than 2.5 times as long as wide . . . . . **Viola lanceolata**
   12. Blades of leaves all reniform to deltate, less than 1.5 times as long as wide, manifestly cordate (rarely subtruncate at the base), never lobed or coarsely toothed at the base.
      14. Stems and petioles pubescent throughout. . . . . **Viola sororia**
      14. Plant glabrous or glabrate.
         15. Principal leaves deltate, decidedly longer than wide.
            Sepals ciliolate; spurred petals glabrous . . . . . **Viola missouriensis**
            Sepals without cilia; spurred petals bearded . . . . . **Viola affinis**
         15. Leaves reniform to broadly deltate, shorter than to scarcely longer than wide.
            16. Plants stoloniferous, the corolla sweet-scented, the style conspicuously hooked at the tip . . . . . *Viola odorata*
            16. Plants neither stoloniferous nor discernibly scented, the style not conspicuously hooked.
               17. Flowers less than 14 mm long, white; rhizomes slender, to 2.5 mm thick.
                  Leaves absolutely glabrous or the petioles sparsely villous, the margins with low, flat crenations; lateral petals nearly glabrous to sparsely bearded . . . . . **Viola pallens**
                  At least some of the leaves sparsely pubescent with pale attenuate trichomes on the adaxial surface, these often aggregated near the base or along the margin, the margins of fresh leaves with slightly but distinctly elevated teeth tips, giving them a low serrate appearance; lateral petals thinly to densely bearded . . . . **Viola blanda palustriformis**
               17. Flowers 14 mm or more long, light to deep-blue or violet, or white; rhizomes coarse, stout, more than 2.5 mm thick.
                  18. Hairs of lateral petals rarely more than 0.5 mm long and conspicuously expanded and blunt at their tip, many of them 0.1-0.15 mm wide; flowers on peduncles usually much overtopping the leaves . . . . . **Viola cucullata**
                  18. Hairs of lateral petals elongate, many of them more than 0.5 mm long, tapered or gradually clavate at the tip, less than 0.1 mm wide; flowers overtopping the leaves or not.
                     19. Flowers white or white with bluish to violaceous streaks. . . . . **Viola priceana**
                     19. Flowers fully suffused with some shade of blue or violet.
                        Sepals obtuse, eciliate; leaf blades reniform, rounded, blunt-tipped, as wide as or wider than long; flowers mostly overtopping the leaves . . . . . **Viola nephrophylla**
                        Sepals acute, often ciliate; leaf blades cordate, prevailingly acute, about as long as wide; flowers variously disposed . . . . . **Viola sororia**

VIOLACEAE

A. Leaves all cauline, more than 10, lance-obovate, acuminate, usually entire; corollas green or greenish-white; petals about equal in length; stamens united into a sheath, the anthers not spurred; sepals not auriculate . . . . . HYBANTHUS
A. Leaves all basal or if cauline, then fewer than 10 and not as above; corollas never green or greenish-white; petals usually unequal in length; stamens distinct, the anthers spurred; sepals auriculate proximally . . . . . VIOLA

VITACEAE

A. Branches with brown pith, the bark shredding in strips, with or without lenticels; petals united at the summit, falling as a unit . . . . . VITIS
A. Branches with white pith, the bark tight, adherent, the lenticels usually conspicuous; petals free throughout.
   Leaves digitately compound or if simple, then the tendrils with adhesive discs . . . . . PARTHENOCISSUS
   Leaves simple or palmately lobed, the tendrils free, twining . . . . . AMPELOPSIS

VITIS

1. Lower leaf surfaces green or pubescent with straight untangled hairs (rarely with some patches of tomentum on young leaves), often more or less pale but never glaucous or rusty abaxially.
   2. Leaves all unlobed or a few weakly 3-lobed; nodal diaphragm 1 mm or more thick; berries black, shiny . . . . . **Vitis vulpina**
   2. Leaves mostly with at least one pair of sharp lateral lobes; nodal diaphragm less than 0.8 mm thick; berries typically with a heavy waxy bloom.
      Abaxial leaf surfaces glabrous or with pubescent veins or tufts of hairs in the vein axils . . . . . **Vitis riparia**
      Abaxial leaf surfaces decidedly pubescent on the laminae . . . . . **Vitis riparia syrticola**
1. Lower leaf surfaces strongly whitened, rusty, glaucous, or with matted and tangled hairs remaining at least along the veins at maturity.
   3. Abaxial leaf surfaces glaucous, the pubescence thinning at maturity, concentrating along the veins abaxially or becoming absent altogether and exposing the glaucous leaf surface. . . . . **Vitis aestivalis**
   3. Abaxial leaf surfaces with the tomentose pubescence fully investing the green abaxial leaf surface at maturity.
      Felt of abaxial leaf surfaces distinctly rufous, at least when young; berries more than 1 cm in diameter . . . . . **Vitis labrusca**
      Felt of abaxial leaf surfaces gray; berries less than 1 cm in diameter . . . . . **Vitis cinerea**

VULPIA

1. First glume nearly obsolete, to 2.6 mm long, less than ½ as long as the 2nd glume; longer awns more than 7 mm . . . . . *Vulpia myuros*
1. First glume commonly more than 2.6 mm long, more than ½ as long as the 2nd glume; awns usually less than 7 mm long . . . . . **Vulpia octoflora**

WISTERIA

1. Pedicels and calyx glandular; ovary and fruit glabrous; petioles to 6 cm long . . . . . *Wisteria frutescens*
1. Pedicels and calyx eglandular; ovary and fruit densely pubescent; longer petioles more than 6 cm long.
   Leaflets fewer than 14; flowers opening simultaneously, the standard more than 1.9 cm long and 1.8 cm wide . . . . . *Wisteria sinensis*
   Leaflets often more than 14; flowers opening progressively from the base to apex, the standard to 1.9 cm long and 1.8 cm wide . . . . . *Wisteria floribunda*

WOLFFIA

1. Fronds ovoid to globose, without pigmented cells . . . . . **Wolffia columbiana**
1. Fronds boat-shaped, low-conic or flat dorsally, with scattered pigmented cells visible under 10× magnification.
   Fronds rounded at the tip, with a prominent papule in the center of the dorsal surface . . . . . **Wolffia brasiliensis**
   Fronds with an upwardly turned, pointed tip and without a dorsal papule . . . . . **Wolffia borealis**

WOLFFIELLA gladiata

WOODSIA obtusa

A. Sori obviously longer than wide, situated only along the midveins of the pinnae, the indusium attached along the length of the sorus.
   B. Fronds once-pinnate, the ultimate divisions minutely crenulate-serrulate to subentire . . . . . HOMALOSORUS
   B. Fronds pinnate-pinnatifid to tripinnate, the ultimate divisions entire to serrate.
      Fronds pinnate-pinnatifid, the ultimate segments obtuse, entire or subentire . . . . . DEPARIA
      Fronds pinnate-pinnatifid to subtripinnate, the ultimate segments acute, entire, to more often irregularly serrate . . . . . ATHYRIUM
A. Sori not or only scarcely longer than wide, the indusia absent or attached at a single point.
   C. Indusium lacerate, of 4-6 wide segments that originate from beneath the sorus . . . . . WOODSIA
   C. Indusium variously attached, but never deeply lacerate into segments.
      Indusium hood-like or arched, attached by a broad base at the midrib side of the sorus; fronds with or without bulblets . . . . . CYSTOPTERIS
      Indusium either absent or attached at its middle, circular to kidney-shaped and more or less concealing the sporangia beneath; fronds never with bulblets . . . . . GYMNOCARPIUM

WOODWARDIA

1. Frond once-pinnate, the pinnae minutely serrate, only the proximal pairs cut completely to the rachis . . . . . **Woodwardia areolata**
1. Frond twice-pinnate, the ultimate divisions revolute-margined and minutely crenulate, the primary pinnae completely distinct . . . . . **Woodwardia virginica**

XANTHIUM

1. Leaves lanceolate, tapered at the base, less than 3 cm wide; plants with 3-pronged axillary spines . . . . . *Xanthium spinosum*
1. Leaves deltate-ovate to subreniform or suborbicular, more than 3 cm wide; axillary spines absent.
   Body of fruit and prickles glandular and well beset with coarse multicellular hairs . . . . . **Xanthium strumarium canadense**
   Body of fruit merely glandular or with a few short white hairs admixed . . . . . **Xanthium strumarium glabratum**

XYRIDACEAE: One genus in our area . . . . . XYRIS

XYRIS L. {Gr. = razor; from the sharp 2-edged leaves} **Xyridaceae**
~ *Petals yellow; styles 3; fruit a many-seeded capsule.*

1. Leaves and stem twisted, arising from a hardened bulbous base; lateral sepals minutely ciliate on the keel . . . . . **Xyris torta**
1. Leaves and stem not twisted, the base neither bulbous nor particularly hardened; lateral sepals erose-jagged on the keel . . . . . **Xyris difformis**

YUCCA *flaccida* Haw. ADAM'S NEEDLE {L. = flaccid; from the relatively weak leaf blades} Introduced from farther south.

Our earliest collection is one made in 1930 near Lakeville in St. Joseph County (Nieuwland *s.n.*, ND). This species is frequent in our sandy districts as an escape from cultivation along sandy roads, railroads, and in barrens with Conyza canadensis, *Croton glandulosus septentrionalis,* Cycloloma atriplicifolium, Leptoloma cognata, *Mollugo verticillata, Rumex acetosella*, and *Solanum carolinense.* In our western sector it occurs primarily along roads and railroads; frequent associates include Asclepias syriaca, Asclepias verticillata, *Linaria vulgaris, Poa compressa, Poa pratensis,* and *Verbascum thapsus.*

~ (U,V; Yucca smalliana, F,M,S; Y. filamentosa, C,D,J, in part) *Basal leaves 2-4 cm wide, the margins disintegrating into flexuous, often curled threads; cauline leaves much reduced, appressed; inflorescence paniculate, elevated well above the leaves, 1.5 m or more long, the axis densely cinereous-pubescent; flowers whitish, 3.5-5 cm long, the petals acuminate, to 2 cm wide; capsule cylindric-oblong, 3.5-5 cm long.* 25 JUN – 25 JUL. UPL

ZANNICHELLIA palustris

ZANTHOXYLUM americanum

ZEA *mays*

ZELKOVA *serrata*

ZIZANIA

1. Larger leaves more than 1.8 cm wide; sterile pistillate spikelets all less than 0.9 mm wide, notably beset with stiffly ascending hairs only on the ridges in the median portions . . . . . **Zizania aquatica**
1. Leaves usually less than 1.8 cm wide; larger sterile pistillate spikelets more than 0.9 mm wide, glabrous throughout the median portion or with hairs scattered between the ridges in the median portion . . . . . **Zizania palustris**

ZIZIA

1. Basal leaves all or nearly all simple . . . . . **Zizia aptera**
1. Basal leaves mostly ternately compound . . . . . **Zizia aurea**

ZOSTERACEAE

A. Fruits much longer than broad, slender-beaked, in sessile or subsessile clusters in the axils of opposite or whorled filiform leaves; stipules inconspicuous; flowers unisexual; stamen 1 . . . . . ZANNICHELLIA
A. Fruits about as long as to a little longer than broad, beakless or stoutly beaked, clustered on peduncles, the peduncles elongate (rarely nearly absent), terminal or axillary in the axils of alternate (the distalmost rarely opposite) linear-filiform to ovate leaves; stipules usually conspicuous; flowers perfect; stamens 4.
    Stipules adnate to the blade for more than 5 mm; leaves 1-nerved, sulcate . . . . . STUCKENIA
    Stipules free or adnate less than 5 mm; leaves 1-several nerved, not sulcate . . . . . POTAMOGETON

ZOYSIA *japonica*

ZYGOPHYLLACEAE

A. Larger leaves with 6 or more pairs of leaflets; carpels fewer than 6, the fruits with pungent spines; peduncles up to 1 cm long . . . . . TRIBULUS
A. Leaves all with fewer than 6 pairs of leaflets; carpels more than 6, unarmed; peduncles becoming more than 1 cm long . . . . . KALLSTROEMIA