

# Key to Families of Vascular Plants

## *Key to Groups*

1. Plants never bearing seeds, but reproducing by spores (**FERNS AND FERN ALLIES; /MONILOPHYTA**). . . . . **KEY 1**—p. 543
- 1' Plants reproducing by seeds; spores produced but retained in ovules or shed as pollen grains.
  2. Ovules exposed to the external environment at the time of pollination; seeds produced in woody or fleshy cones or borne naked at the ends of stalks or on the edges of reduced modified leaves; carpels *never* produced (**GYMNOSPERMS; /ACROGYMNOSPERMAE**). . . . . **KEY 2**—p. 546
  - 2' Ovules enclosed in an ovary at the time of pollination; seeds borne in fleshy or dry fruits derived from ripened carpel tissue (**ANGIOSPERMAE**).
    3. Cotyledons 2 (very rarely 1 or more than 2); flower parts *usually* in whorls of 4 or 5, or indefinite in number; stems *usually* increasing in diameter through secondary growth; leaves *usually* pinnately or palmately veined; roots all secondary, a well-developed taproot often present (**TRADITIONAL DICOTYLEDONS**).
      4. Gynoecium apocarpous, composed of 2 or more distinct carpels (flower with 2 or more pistils). . . . . **KEY 3**—p. 547
      - 4' Gynoecium monocarpous (of 1 carpel) or syncarpous (of 2 or more connate carpels).
        5. Perianth absent or represented by a single whorl that is *usually* treated as sepals even when petaloid in appearance.
          6. Plants definitely woody. . . . . **KEY 4**—p. 550
          - 6' Plants herbaceous or only slightly woody at the base. . . . . **KEY 5**—p. 555
        - 5' Perianth represented by two or more whorls or complete spirals, the outer generally treated as sepals and the inner as petals.
          7. Petals distinct, at least at the base, falling individually or in pairs, never connate into a ring or a tube.
            8. Ovary superior; flowers hypogynous or perigynous.
              9. Number of stamens *more* than twice the number of petals, often numerous. . . . . **KEY 6**—p. 559
              - 9' Number of stamens twice the number of petals or fewer.
                10. Ovary 1-loculed. . . . . **KEY 7**—p. 562
                - 10' Ovary two- to many-loculed. . . . . **KEY 8**—p. 564
            - 8' Ovary inferior or half-inferior; flowers epigynous. . . . . **KEY 9**—p. 567

- 7' Petals connate into a ring or tube, sometimes only at the base; the entire corolla falling as a single unit.
  - 11. Ovary or ovaries superior.
    - 12. Stamens equal the number of corolla lobes or more; corolla usually radial.
      - .....**KEY 10**—p. 570
    - 12' Stamens less than the number of corolla lobes; corolla usually bilateral.
      - .....**KEY 11**—p. 574
  - 11' Ovary partially or wholly inferior. ....**KEY 12**—p. 576
- 3' Cotyledon 1; flower parts *usually* in whorls of 3; stems *usually* not showing increase in diameter through secondary growth; leaves *usually* parallel veined; roots *usually* all secondary (**MONOCOTYLEDONEAE**).
  - 12. Perianth present, well developed, often showy. ....**KEY 13**—p. 578
  - 12' Perianth absent or very reduced, sometimes bristlelike or scalelike. ....**KEY 14**—p. 581

## Key 1—Plants Reproducing by Spores (*/Monilophyta*; Ferns and Fern Allies)

1. Leaves one-veined, linear to oblong or scalelike or completely absent.
  2. Plants free-floating or stranded on mud, very small. . . . . **SALVINIACEAE**—p. 162
  - 2' Plants not floating, epiphytic or anchored in wet to dry soil.
    3. Leaves apparently absent or reduced to veinless scales; roots absent; stems elongate, slender, dichotomously branched with scattered 3-lobed sporangia. . . . . **/PSILOACEAE**—p. 158
    - 3' Leaves and roots present; sporangia not borne on naked dichotomous stems.
      4. Leaves all basal, linear.
        5. Plants with creeping rhizomes, often bearing swollen sporocarps; leaves with circinate veneration. . . . . **MARSILEACEAE**—p. 161
        - 5' Plants with cormlike bases, never rhizomatous; leaves never circinate.
      - 4' Leaves cauline, scalelike.
        6. Stems hollow, jointed, with connate whorled scale leaves; sporangia borne on the under-surface of peltate sporangiophores in terminal cones. . . . . **/EQUISETUM**—p. 160
        - 6' Stems solid, not jointed; leaves alternate or opposite; sporangia borne in axils of fertile leaves (sporophylls), often aggregated into conelike groups.
          7. Sporangia all similar, producing only one kind of spore; ligule absent. . . . . **/LYCOPODIACEAE**—p. 158
          - 7' Sporangia of two kinds, some producing 4 megaspores, others producing numerous microspores; ligule present in leaf axils but often extremely small and difficult to observe. . . . . **SELAGINELLACEAE**—p. 158
  - 1' Leaves with numerous veins, well developed, entire to several times compound.
    8. Plants aquatic, either rooting or free-floating.
      9. Leaves pinnately divided or 1×–4× pinnate. . . . . **PARKERIACEAE**—p. 163
      - 9' Leaves palmate with 4 leaflets. . . . . **MARSILEACEAE**—p. 161
    - 8' Plants terrestrial or epiphytic, always rooted.
      10. Leaves strongly dimorphic, the fertile fronds or fertile portions of the fronds sharply different from the sterile fronds or portions of the fronds.
        11. Sterile leaves linear, grasslike without expanded blades. . . . . **SCHIZAEACEAE**—p. 161
        - 11' Sterile leaves with expanded, often lobed or compound blades.
          12. Leaves indeterminate with twining rachises. . . . . **LYGODIACEAE**—p. 161
          - 12' Leaves determinate, never twining.
            13. Sporangia 0.5–1 mm diameter, spherical. or pear-shaped, sessile.
              14. Sporangia pear-shaped, ca. 0.5 mm diameter; annulus present, subapical, forming a complete ring around the sporangium; sporangia borne in long-stalked clusters, these either arising in pairs below the sterile portion of the frond or on slender fertile fronds completely separate from the sterile fronds. . . . . **ANEMIACEAE**—p. 161

- 14' Sporangia spherical, 0.5–1 mm diameter; annulus absent; sporangia borne variously—in stalked clusters arising singly from the bases of sterile portion of the fronds, on terminal fertile pinnae, on fertile pinnae placed between upper and lower sterile pinnae, or on stout fertile fronds completely separate from the sterile fronds.
15. Fronds mostly solitary, generally 1–40 cm long, arising from a short stem with a fascicle of fleshy roots; sporangia in a spikelike or paniclelike cluster on a specialized stalk arising from the petiole below the sterile portion of the frond. . . . . **/OPHIOGLOSSALES**—p. 160
- 15' Fronds densely clustered, mostly 0.5–1.5 m long, arising in a dense rosette from a stout rhizome with slender, fibrous roots; sporangia borne on terminal fertile pinnae, on fertile pinnae placed between upper and lower sterile pinnae, or on stout fertile fronds completely separate from the sterile fronds. . . . . **OSMUNDACEAE**—p. 161
- 13' Sporangia much smaller, generally stalked.
16. Sori marginal, borne beneath curled margin of frond. . . . . **PTERIDACEAE**—p. 164
- 16' Sori borne away from margin on undersurface of frond.
17. Sori narrowly linear. . . . . **BLECHNACEAE**—p. 164
- 17' Sori round. . . . . **DRYOPTERIDACEAE**—p. 164
- 10' Leaves not at all or only weakly dimorphic, the fertile fronds or fertile portions of the fronds more or less similar to the sterile fronds or portions of the fronds.
18. Plants with a definite trunk; trees with very large 2×–4× pinnate leaves; annulus oblique to the stalk, forming a complete ring around the sporangium.
19. Sori borne on the undersurface of the leaflets in forks of the veins. . . . . **CYATHEACEAE**—p. 162
- 19' Sori borne on the leaf margins at the ends of veins. . . . . **DICKSONIACEAE**—p. 162
- 18' Plants with short to elongated rhizomes, but not forming a trunk; epiphytic or terrestrial herbs with simple to variously compound leaves; annulus vertical or absent, not forming a complete ring around the sporangium.
20. Leaves very thin, typically only a single cell layer thick between the veins. . . . . **HYMENOPHYLLACEAE**—p. 161
- 20' Leaves thicker, generally several cells thick.
21. Sori borne along margins of leaf segments, the leaf margin generally revolute or with reflexed segments.
22. Stout ferns, 3–30 dm tall; petioles grooved, greenish or more or less straw-colored; rhizomes elongated, long-creeping; leaf bases with slender hairs but without scales. . . . . **DENNSTAEDTIACEAE**—p. 163
- 22' Slender ferns, mostly 1–5 dm tall, petioles terete, often dark brown or black; rhizomes short to moderately elongated, generally not long-creeping; leaf bases generally with scales, sometimes also hairy. . . . . **PTERIDACEAE**—p. 164
- 21' Sori borne away from margin on undersurface of frond (go to 23—next page).

- 23. Sori without indusia.
  - 24. Sporangia distributed across undersurface of frond.  
 ..... **.PTERIDACEAE**—p. 164
  - 24' Sporangia in discrete sod.
    - 25. Leaves simple, entire or pinnately lobed; without needlelike or stellate hairs. .... **.POLYPODIACEAE**—p. 163
    - 25' Leaves 1-2 times pinnate, with needlelike or stellate hairs.  
 ..... **.THELYPTERIDACEAE**—p. 163
- 23' Sori with indusia.
  - 26. Sori elongated; indusia attached laterally.
    - 27. Sori one on each side of midvein of leaf or leaf segments or in chainlike rows parallel to midvein.
      - 28. Leaves linear, entire. .... **.VITTARIACEAE**—p. 164
      - 28' Leaves pinnately lobed or compound.  
 ..... **.BLECHNACEAE**—p. 164
    - 27' Sori not in chainlike rows, angled away from midvein along lateral veinlets.
      - 29. Scales of stems and petiole bases with ladderlike cross partitions; sporangial stalks 1 cell thick.  
 ..... **.ASPLENIACEAE**—p. 163
      - 29' Scales of stems and petiole bases without ladderlike cross partitions; sporangial stalks 2–3-cells thick.  
 ..... **.DRYOPTERIDACEAE**—p. 164
  - 26' Sori more or less round to reniform; indusia variously attached.
    - 30. Leaves with needlelike or stellate hairs.  
 ..... **.THELYPTERIDACEAE**—p. 163
    - 30' Leaves without needlelike or stellate hairs, often scaly.  
 ..... **.DRYOPTERIDACEAE**—p. 164

## Key 2—Plants Reproducing by Seeds Not Enclosed in Carpels—Gymnosperms

1. Leaves pinnately compound.
  2. Ovules borne on margins of leaflike sporophylls with pinnately lobed terminal segments.  
 .....**CYCADACEAE**—p. 188
  - 2' Ovules borne in conelike strobili. ....**ZAMIACEAE**—p. 188
- 1' Leaves simple.
  3. Leaves 2, large, strap-shaped, leathery, persisting throughout life of plant; plants taprooted perennials without aerial leafy stems. ....**WELWITSCHIACEAE**—p. 190
  - 3' Leaves many, small to large, variously shaped, mostly deciduous in age; mostly shrubs or trees with leafy stems.
    4. Ovules borne in woody cones.
      5. Cone scales free from subtending bracts or nearly so. ....**PINACEAE**—p. 188
      - 5' Cone scales adnate to subtending bracts, sometimes with apices free.
        6. Ovules 2—many per cone scale. ....**CUPRESSACEAE**—p. 189
        - 6' Ovule 1 per cone scale, free and winged or embedded in cone scale and wingless.  
 .....**ARAUCARIACEAE**—p. 189
    - 4' Ovules naked or enclosed in a fleshy cone or surrounded by a cluster of perianthlike scales.
      7. Stems jointed, green; leaves small, dry, opposite or whorled; ovules surrounded by a cluster of perianthlike scales. ....**EPHEDRACEAE**—p. 190
      - 7' Stems not jointed; leaves small to large.
        8. Leaves pinnately veined with netted veinlets. ....**GNETACEAE**—p. 190
        - 8' Leaves with parallel or dichotomous venation; veinlets not netted, often absent.
          9. Leaf venation dichotomous; leaf blades petiolate, fan-shaped.  
 .....**/GINKGO**—p. 188
          - 9' Leaf venation parallel or only one vein present.
    10. Leaves and branchlets opposite or whorled.
      11. Seeds 1–3, enclosed in fleshy berrylike cones.  
 .....**CUPRESSACEAE**—p. 189
      - 11' Seeds 1–3 on short stalks, subtended by a few scalelike bracts.  
 .....**CEPHALOTAXACEAE**—p. 189
  - 10' Leaves and branchlets alternate.
    12. Seeds surrounded by or completely enclosed by a fleshy, often brightly colored aril; not associated with any sterile cone scales.  
 .....**TAXACEAE**—p. 189
    - 12' Seeds without an aril; surrounded by a fleshy cone scale, often subtended by or basally enclosed in a swollen structure derived from sterile cone scales.  
 .....**PODOCARPACEAE**—p. 189

## Key 3—Dicots with an Apocarpous Gynoecium, Pistils 2 or More per Flower

1. Perianth absent or represented by only one whorl of parts, generally treated as sepals even when petaloid in color and texture.
  2. Sepals absent; plants herbaceous; flowers in dense spikes. . . . . **SAURURACEAE**—p. 245
  - 2' Sepals present though sometimes small.
    3. Hypanthium present. . . . . **ROSACEAE**—p. 276
    - 3' Hypanthium absent.
      4. Plants herbs or woody vines.
        5. Fruit a cluster of large berries up to 7 cm long; stems twining; leaves palmately compound. . . . . **LARDIZABALACEAE**—p. 245
        - 5' Fruit a cluster of achenes or follicles, mostly less than 4 cm long; stems not twining; leaves simple or variously compound. . . . . **RANUNCULACEAE**—p. 246
      - 4' Plants erect shrubs or trees.
        6. Flowers imperfect; inflorescence a dense spherical head. . . . **PLATANACEAE**—p. 246
        - 6' Flowers perfect or imperfect, borne in open clusters.
          7. Sepals connate; filaments connate into a tube. . . . . **STERCULIACEAE**—p. 334
          - 7' Sepals distinct; filaments distinct.
            8. Fruit an aggregate of follicles; flowers 2.5 cm in diameter or larger. . . . . **MAGNOLIACEAE**—p. 243
            - 8' Fruit a ring of berries; flowers smaller. . . . . **PHYTOLACCACEAE**—p. 365
  - 1' Perianth parts in two or more whorls or complete spirals, the outer series usually treated as sepals and the inner as petals.
    9. Plants aquatic; leaves large, peltate. . . . . **NELUMBONACEAE**—p. 246
    - 9' Plants terrestrial; leaves not peltate.
      10. Stamens twice as many as the number of petals or fewer.
        11. Petals connate, at least at the base.
          12. Carpels 4 or more; leaves succulent; sap clear. . . . . **CRASSULACEAE**—p. 270
          - 12' Carpels 2; sap usually milky.
            13. Styles distinct but stigmas connate and adnate to anthers forming a drum-shaped gynostegium. . . . . **ASCLEPIADACEAE**—p. 373
            - 13' Styles distinct or connate; stigmas connate but free from stamens; anthers sometimes connivent around the styles. . . . . **APOCYNACEAE**—p. 372
        - 11' Petals distinct.
          14. Leaves and often stems thick and fleshy. . . . . **CRASSULACEAE**—p. 270
          - 14' Leaves and stems not very thick and fleshy.
            15. Leaves punctate; herbage often aromatic. . . . . **RUTACEAE**—p. 282
            - 15' Leaves not punctate; herbage not aromatic (go to 16—next page).

- 16. Hypanthium present.
  - 17. Ovules mostly 1–2 per carpel; leaves simple or compound, usually stipulate, usually pinnately veined. . . . . **ROSACEAE**—p. 276
  - 17' Ovules several to many in each carpel; leaves simple, usually not stipulate, usually palmately veined. . . . . **SAXIFRAGACEAE**—p. 270
- 16' Hypanthium absent.
  - 18. Leaves simple.
    - 19. Branches essentially leafless, forming rigid green thorns. . . . . **SIMAROUBACEAE**—p. 282
    - 19' Branches leafy, not at all thorny.
      - 20. Leaves opposite. . . . . **MALPIGHIACEAE**—p. 273
      - 20' Leaves alternate. . . . . **MENISPERMACEAE**—p. 246
  - 18' Leaves compound.
    - 21. Plants herbaceous. . . . . **LIMNANTHACEAE**—p. 281
    - 21' Plants woody. . . . . **SIMAROUBACEAE**—p. 282
- 10' Stamens more than twice as many as petals or petaloid perianth elements or more than 15.
  - 22. Leaves and often stems thick and fleshy. . . . . **CRASSULACEAE**—p. 270
  - 22' Leaves and stems not thick and fleshy.
    - 23. Plants herbaceous or only slightly woody at base.
      - 24. Hypanthium present. . . . . **ROSACEAE**—p. 276
      - 24' Hypanthium absent.
        - 25. Sepals enlarging and persisting around the fruits; stamens maturing centrifugally. . . . . **PAEONIACEAE**—p. 271
        - 25' Sepals caducous or withering as fruits mature.
          - 26. Sepals 4–many, present at anthesis, often petaloid. . . . . **RANUNCULACEAE**—p. 246
          - 26' Sepals 2–3, falling as the flower opens, not petaloid. . . . . **PAPAVERACEAE**—p. 246
    - 23' Plants definitely woody, shrubs or trees.
      - 27. Crushed herbage strongly aromatic.
        - 28. Leaves opposite. . . . . **CALYCANTHACEAE**—p. 244
        - 28' Leaves alternate. . . . . **ILLICIACEAE**—p. 243
      - 27' Crushed herbage not aromatic.
        - 29. Hypanthium present.
          - 30. Stipules usually present; leaves mostly toothed, lobed or compound; seeds without an aril. . . . . **ROSACEAE**—p. 276
          - 30' Stipules present; leaves entire or tridentate at apex; seeds with an aril. . . . . **CROSSOSOMATAACEAE**—p. 278



29' Hypanthium absent.

31. Fruit a fleshy aggregate of berries. . . . . **ANNONACEAE**—p. 243

31' Fruit a dry aggregate of follicles, samaras or achenes.

32. Leaves compound. . . . . **PAEONIACEAE**—p. 271

32' Leaves simple.

33. Pistils spirally attached to an elongated receptacle.  
. . . . . **MAGNOLIACEAE**—p. 243

33' Pistils whorled; receptacle not elongated.  
. . . . . **DILLENIACEAE**—p. 270

## Key 4—Woody Dicots with Apetalous Flowers; Pistil 1 per Flower

1. Arrangement of flowers, at least the staminate, in catkins or catkinlike spikes.
  2. Trees with slender drooping jointed branchlets resembling pine needles; leaves reduced to minute whorled scales. . . . . **CASUARINACEAE**—p. 277
  - 2' Trees or shrubs with ordinary branches and leaves; leaves alternate or opposite.
    3. Plant a fleshy subshrub with succulent linear to oblanceolate or scalelike leaves; catkins erect.
      4. Leaves stipulate; ovary 4-locular. . . . . **BATAACEAE**—p. 281
      - 4' Leaves estipulate; ovary 1-locular. . . . . **CHENOPODIACEAE**—p. 365
    - 3' Plant an ordinary shrub or tree.
      5. Leaves opposite. . . . . **GARRYACEAE**—p. 372
      - 5' Leaves alternate.
        6. Leaves compound. . . . . **JUGLANDACEAE**—p. 278
        - 6' Leaves simple.
          7. Fruit a capsule with several to many comose seeds; flowers subtended by minute glands or fringed bractlets. . . . . **SALICACEAE**—p. 274
          - 7' Fruit one-seeded, dry or fleshy; seeds not comose; bractlets, if present, not fringed.
            8. Fruits fleshy.
              9. Sap milky.
                10. Pistillate inflorescence ripening as an ellipsoid to globose multiple fruit. . . . . **MORACEAE**—p. 276
                - 10' Pistillate flowers solitary; ovary ripening as a drupe. . . . . **EUPHORBIACEAE**—p. 273
              - 9' Sap clear; ripened pistillate inflorescence with small distinct drupes. . . . . **MYRICACEAE**—p. 278
            - 8' Fruits dry.
              11. Fruit *either* a nut subtended by a cuplike involucre of numerous small scaly bractlets or 1–3 nuts surrounded by a burlike involucre of long, stiff, hardened bractlets; staminate catkins stiff and spikelike, *or* short and headlike, *or* very slender and drooping; bractlets of catkins inconspicuous. . . . . **FAGACEAE**—p. 277
              - 11' Fruit a nut or nutlet subtended or surrounded by a leafy involucre or by an enlarged catkin scale *or* many small samaras in a conelike pistillate catkin; staminate catkins densely flowered, drooping at anthesis; bractlets of the catkins well developed, more or less concealing the flowers. . . . . **BETULACEAE**—p. 277
      - 1' Arrangement of flowers various, but not in catkins.
        12. Perianth entirely absent.
          13. Flowers in dense spikes or racemes, perfect or imperfect; stamens 1–10; ovary 1-loculed; sap clear. . . . . **PIPERACEAE**—p. 244

- 13' Flowers in cyathia, imperfect, with a solitary naked pistillate flower surrounded by several staminate flowers, each consisting of only one stamen on a jointed pedicel, the whole cluster surrounded by an involucre bearing one or more nectaries; ovary usually 3-loculed; sap milky. . . . . **EUPHORBACEAE**—p. 273
- 12' Perianth present, consisting of a greenish or petaloid calyx.
  - 14. Inflorescence (at least of the pistillate flowers) a dense spherical head or a dense spike, or flowers on the inside of a hollow receptacle.
    - 15. Fruits or fruit-clusters dry.
      - 16. Stipules conspicuous, sheathing; fruit a dense spherical cluster of achenes. . . . . **PLATANACEAE**—p. 246
      - 16' Stipules inconspicuous distinct; fruits distinct.
        - 17. Leaves palmately lobed; fruits capsular, in dense spherical clusters. . . . . **HAMAMELIDACEAE**—p. 271
        - 17' Leaves bipinnate or reduced to entire simple phyllodes (flattened petioles without leaflets); fruit a legume. . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
    - 15' Fruit clusters fleshy; fruits coalescent into a multiple fruit. . . . . **MORACEAE**—p. 276
  - 14' Inflorescence not a spherical head.
    - 18. Plants parasitic on the branches of trees and shrubs and not connected to the ground. . . . . **VISCACEAE**—p. 362
    - 18' Plants not parasitic, normally rooted in the ground.
      - 19. Ovary wholly or partly inferior (or appearing so).
        - 20. Foliage and young branches scurfy with peltate or stellate scales.
          - 21. Carpel and ovule 1; flowers solitary or in axillary clusters. . . . . **ELAEAGNACEAE**—p. 276
          - 21' Carpels and ovules 2-several; flowers in umbels. . . . . **ARALIACEAE**—p. 379
        - 20' Foliage and branches never scurfy.
          - 22. Plants climbing, vines.
            - 23. Flowers surrounded by showy bracts. . . . . **NYCTAGINACEAE**—p. 365
            - 23' Flowers bractless or subtended by inconspicuous greenish bracts. . . . . **ARISTOLOCHIACEAE**—p. 245
          - 22' Plants erect, shrubs or trees.
            - 24. Style 1; trees or shrubs with entire leaves.
              - 25. Stamens 5-10; fruit fleshy.
                - 26. Stamens 10; fruit a drupe. . . . . **COMBRETACEAE**—p. 279
                - 26' Stamens 5; fruit a berry. . . . . **CAPRIFOLIACEAE**—p. 379
                - 25' Stamens many; fruit a woody capsule. . . . . **MYRTACEAE**—p. 279
                - 24' Styles 2 or style 2-lobed; deciduous shrubs with lobed or dentate leaves; fruit a berry. . . . . **HYDRANGEACEAE**—p. 368
    - 19' Ovary superior (go to 27—next page).

- 27. Leaves opposite or whorled.
  - 28. Leaves whorled. . . . . **PROTEACEAE**—p. 246
  - 28' Leaves opposite.
    - 29. Fruit a samara; leaves usually lobed or compound.
      - 30. Samara 1-loculed; wing single; leaves pinnately compound or rarely simple. . . . . **OLEACEAE**—p. 373
      - 30' Samara 2-loculed; wing double; leaves palmately lobed or occasionally compound. . . . . **SAPINDACEAE**—p. 282
    - 29' Fruit not winged; leaves simple and entire.
      - 31. Locules of ovary 3.
        - 32. Ovules 2 per locule. . . . . **BUXACEAE**—p. 247
        - 32' Ovule 1 per locule. . . . . **SIMMONDSIACEAE**—p. 366
      - 31' Locules of ovary 1-2, with 1 ovule per locule.
        - 33. Leaf strongly 3-veined from base. . . . . **LAURACEAE**—p. 244
        - 33' Leaf with one main vein.
          - 34. Flowers minute, inconspicuous. . . . . **OLEACEAE**—p. 373
          - 34' Flowers large, showy.
            - 35. Ovules several to many. . . . . **LYTHRACEAE**—p. 279
            - 35' Ovules 1 or 2.
              - 36. Plant a mesophytic shrub with broad thin leaves. . . . . **THYMELAEACEAE**—p. 282
              - 36' Plant an intricately branched desert shrub with narrow fascicled leaves. . . . . **ROSACEAE**—p. 276
  - 27' Leaves alternate.
    - 37. Leaves compound.
      - 38. Leaf even-pinnate; leaflets 4–8.
        - 39. Fruit a leathery indehiscent legume; leaflets obtuse. . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
        - 39' Fruit fleshy; leaflets acute. . . . . **SAPINDACEAE**—p. 282
      - 38' Leaf odd-pinnate; leaflets 3–11.
        - 40. Leaflets 3; flowers white-tomentose; stamens 10. . . . . **EUPHORBIACEAE**—p. 273
        - 40' Leaflets 3–11; flowers brownish-green; stamens 5. . . . . **ANACARDIACEAE**—p. 282
    - 37' Leaves simple, sometimes lobed.
      - 41. Anthers opening by pores; herbage usually aromatic. . . . . **LAURACEAE**—p. 244
      - 41' Anthers opening by slits (go to 42—next page).

- 42. Ovules several per locule.
  - 43. Locule of ovary 1.
    - 44. Stamens numerous; trees or shrubs.
      - .....**FLACOURTIACEAE**—p. 302
    - 44' Stamens 4–5; woody vines.
      - .....**AMARANTHACEAE**—p. 365
    - 43' Locules of ovary 2–8; stamens monadelphous.
      - .....**STERCULIACEAE**—p. 334
  - 42' Ovules 1–2 per locule.
    - 45. Locules of ovary 2–9.
      - 46. Stamens as many as and alternate with the sepals.
        - .....**RHAMNACEAE**—p. 276
      - 46' Stamens opposite the sepals or more numerous.
        - 47. Locules of ovary 6–9; fruit a berry; plants small, prostrate.
          - .....**EMPETRACEAE**—p. 371
        - 47' Locules of ovary 2–4.
          - 48. Ovules bent upward and inward with the raphe toward the axis of the ovary; sap often milky; fruit a capsule or a berry. ....**EUPHORBIACEAE**—p. 273
          - 48' Ovules bent downward with the raphe away from the axis of the ovary; sap clear; fruit a drupe or a capsule. ....**BUXACEAE**—p. 247
    - 45' Locule of ovary 1.
      - 49. Style or stigmas 2–4.
        - 50. Flowers perfect.
          - 51. Fruit an orbicular to ovate disclike samara; trees.
            - .....**ULMACEAE**—p. 276
          - 51' Fruit an achene or a utricle; low shrubs or woody vines.
            - 52. Flowers several to many in a calyxlike involucre.
              - .....**POLYGONACEAE**—p. 367
            - 52' Flowers bractless or subtended by solitary bracts.
              - .....**CHENOPODIACEAE**—p. 365
          - 50' Flowers imperfect.
            - 53. Fruit a drupe, nut or samara, not enclosed by bracts.
              - .....**ULMACEAE**—p. 276
            - 53' Fruit an achene, enclosed by 2 persistent bracts.
              - .....**CHENOPODIACEAE**—p. 365
      - 49' Style or stigma 1.
        - 54. Calyx with long cylindrical tube, often swollen at base.
          - 55. Flowers bilateral. ....**PROTEACEAE**—p. 246

- 55' Flowers radial. . . . .**NYCTAGINACEAE**—p. 365
- 54' Calyx not tubular or if so, the tube quite short.
  - 56. Style in fruit plumose; ovary often surrounded by a tubular hypanthium. . . . .**ROSACEAE**—p. 276
  - 56' Style not plumose; ovary not surrounded by a hypanthium.
    - 57. Stamens 4. . . . .**PROTEACEAE**—p. 246
    - 57' Stamens 8 or 10. . .**THYMELAEACEAE**—p. 282

## Key 5—Herbaceous Dicots with Perianth Absent or Represented by a Single Whorl

1. Locules of ovary 2 or more.
  2. Fruit breaking apart into mericarps or nutlets.
    3. Plants aquatic, submersed or stranded on mud.
      4. Flowers in simple or compound umbels. . . . . **APIACEAE**—p. 379
      - 4' Flowers axillary or in spikes.
        5. Leaves pinnately dissected. . . . . **HALORAGACEAE**—p. 271
        - 5' Leaves entire. . . . . **CALLITRICHACEAE**—p. 376
    - 3' Plants terrestrial.
      6. Mericarps dehiscent; sap often milky. . . . . **EUPHORBIACEAE**—p. 273
      - 6' Mericarps indehiscent; sap never milky.
        7. Perianth parts 5, distinct; flowers in compound umbels. . . . . **APIACEAE**—p. 379
        - 7' Perianth parts 4, connate. . . . . **RUBIACEAE**—p. 372
  - 2' Fruit a berry or a capsule.
    8. Flowers in erect catkinlike spikes. . . . . **BATAACEAE**—p. 281
    - 8' Flowers solitary or variously clustered but not in catkinlike spikes.
      9. Ovary inferior.
        10. Plants aquatic. . . . . **ONAGRACEAE**—p. 279
        - 10' Plants terrestrial.
          11. Flowers imperfect.
            12. Tendrils usually present; perianth parts fused. . . **CUCURBITACEAE**—p. 277
            - 12' Tendrils absent; perianth parts distinct. . . . . **BEGONIACEAE**—p. 277
          - 11' Flowers perfect.
            13. Leaves deeply cordate, glabrous or soft pubescent.  
. . . . . **ARISTOLOCHIACEAE**—p. 245
            - 13' Leaves truncate, covered with water-filled vesicles. . . **AIZOACEAE**—p. 365
        - 9' Ovary superior.
          14. Plant red and white striped; green pigment absent. . . . . **ERICACEAE**—p. 369
          - 14' Plant green and photosynthetic.
            15. Flowers perfect; ovary 3- to many-loculed.
              16. Leaves deeply dissected into linear segments. . . **RANUNCULACEAE**—p. 246
              - 16' Leaves entire.
                17. Fruit a flattened berry; flowers in elongated terminal racemes.  
. . . . . **PHYTOLACCACEAE**—p. 365
                - 17' Fruit a capsule; flowers axillary or in short, dense clusters; plants low-growing, frequently prostrate (go to 18—next page).

- 18. Leaves alternate or opposite; capsule circumscissile.  
 ..... **AIZOACEAE**—p. 365
- 18' Leaves apparently whorled; capsule splitting lengthwise, loculicidal.  
 ..... **MOLLUGINACEAE**—p. 366
- 15' Flowers imperfect; ovary 2–3-loculed.
  - 19. Fruit a schizocarpic capsule; sap often milky; flowers sometimes very reduced and clustered into cyathia. .... **EUPHORBIACEAE**—p. 273
  - 19' Fruit a drupe; sap clear; flowers never in cyathia. .... **BUXACEAE**—p. 247
- 1' Locule of ovary 1.
  - 20. Ovules several to many.
    - 21. Plants tiny internal parasites on stems of leguminous shrubs. ... **RAFFLESACEAE**—p. 273
    - 21' Plants free-living or root-parasites.
      - 22. Ovary inferior.
        - 23. Inflorescence subtended by conspicuous petaloid bracts. ... **SAURURACEAE**—p. 245
        - 23' Inflorescence without petaloid bracts.
          - 24. Leaves entire, linear to oblong. .... **SANTALACEAE**—p. 362
          - 24' Leaves pinnately dissected. .... **DATISACEAE**—p. 277
      - 22' Ovary superior.
        - 25. Leaves estipulate.
          - 26. Placentation parietal. .... **SAXIFRAGACEAE**—p. 270
          - 26' Placentation free-central.
            - 27. Leaves opposite.
              - 28. Flowers sessile; sepals petaloid. .... **PRIMULACEAE**—p. 370
              - 28' Flowers pedicelled, minute; sepals green.  
 ..... **CARYOPHYLLACEAE**—p. 364
              - 27' Leaves alternate. .... **AMARANTHACEAE**—p. 365
          - 25' Leaves stipulate.
            - 29. Capsule dehiscent by terminal teeth or valves. . . **CARYOPHYLLACEAE**—p. 364
            - 29' Capsule circumscissile. .... **AIZOACEAE**—p. 365
  - 20' Ovule 1.
    - 30. Leaves enormous, more than 50 cm wide. .... **GUNNERACEAE**—p. 246
    - 30' Leaves much smaller.
      - 31. Style 1, undivided or stigma I and sessile.
        - 32. Plants submersed aquatics.
          - 33. Leaves repeatedly forked. .... **CERATOPHYLLACEAE**—p. 245
          - 33' Leaves entire. .... **HALORAGACEAE**—p. 271
        - 32' Plants terrestrial (go to 34—next page).



- 34. Stigma sessile.
  - 35. Calyx present. . . . . **URTICACEAE**—p. 277
  - 35' Calyx absent.
    - 36. Leaves palmately compound; fruit dry, 3–5 mm long.
      - . . . . . **BERBERIDACEAE**—p. 246
    - 36' Leaves simple; fruit fleshy, smaller. . . . . **PIPERACEAE**—p. 244
- 34' Stigma terminating a slender style.
  - 37. Leaves deeply lobed or compound.
    - 38. Tendrils present. . . . . **CUCURBITACEAE**—p. 277
    - 38' Tendrils absent. . . . . **ROSACEAE**—p. 276
  - 37' Leaves simple, unlobed, entire or variously toothed.
    - 39. Calyx petaloid, the basal portion tightly enwrapping the ovary.
      - . . . . . **NYCTAGINACEAE**—p. 365
    - 39' Calyx, if present, not at all petaloid; stinging hairs often present.
      - 40. Plants densely stellate-pubescent; stems prostrate.
        - . . . . . **EUPHORBIACEAE**—p. 273
      - 40' Plants glabrous or pubescent but not stellate; stems often erect.
        - . . . . . **URTICACEAE**—p. 276
- 31' Styles, style-branches or stigmas 2 or more.
  - 41. Flowers subtended by a well-developed involucre.
    - 42. Flowers tubular with 5 (rarely 4) showy perianth parts; ray flowers sometimes present; ovary inferior. . . . . **ASTERACEAE (COMPOSITAE)**—p. 378
    - 42' Flowers often not tubular; perianth parts 6; ray flowers never present; ovary superior. . . . . **POLYGONACEAE**—p. 367
  - 41' Flowers not subtended by an involucre.
    - 43. Leaves deeply palmately lobed or palmately compound.
      - . . . . . **CANNABACEAE**—p. 277
    - 43' Leaves simple, entire to dentate or shallowly hastate.
      - 44. Fruit a triangular achene; sepals 6 in two often dissimilar whorls or 5 and uniseriate, frequently more or less brightly colored and showy; leaves often with sheathing stipules (ocreae) and swollen nodes.
        - . . . . . **POLYGONACEAE**—p. 367
      - 44' Fruit a biconvex achene, a circumscissile capsule or a utricle; sepals 3–5, often greenish or calyx absent.
        - 45. Leaves stipulate.
          - 46. Stipules united forming an ocrea; leaves alternate or all basal.
            - . . . . . **POLYGONACEAE**—p. 367
          - 46' Stipules distinct; leaves opposite, but one of each pair of leaves often larger than the other. . . . . **CARYOPHYLLACEAE**—p. 364
        - 45' Leaves estipulate (go to 47—next page).

47. Plants often farinose or fleshy; plants often of saline or alkaline habitats; bracts subtending flowers herbaceous or fleshy.  
..... **CHENOPODIACEAE**—p. 365
- 47' Plants not mealy or fleshy; plants mostly not of saline habitats; bracts subtending flowers dry and scarious. . **AMARANTHACEAE**—p. 365

## Key 6—Dicots with Distinct Petals, Many Stamens, and a Superior Ovary

1. Ovary 1-loculed.
  2. Ovule 1 or 2 per ovary, fruit a drupe, berry, one-seeded follicle or achene.
    3. Flowers 3-merous.
      4. Fruit a triangular achene. . . . . **POLYGONACEAE**—p. 367
      - 4' Fruit a berry or a drupe. . . . . **LAURACEAE**—p. 244
    - 3' Flowers 5-merous. . . . . **ROSACEAE**—p. 276
  - 2' Ovules 2-many per ovary; fruit a capsule, follicle or legume.
    5. Foliage densely stipitate-glandular.
      6. Plant a low herb with simple leaves; hairs often insect-trapping; flowers small, 5-merous. . . . . **DROSERACEAE**—p. 367
      - 6' Plant an erect herb with palmately compound leaves; hairs not insect-trapping; flowers showy, 4-merous. . . . . **CAPPARACEAE**—p. 280
    - 5' Foliage glabrous to densely pubescent but not densely glandular.
      7. Flowers in racemes, spikes or heads.
        8. Plants herbaceous, 1–2.5 m tall; leaves ternately decompose; fruit a follicle. . . . . **RANUNCULACEAE**—p. 246
        - 8' Plants woody, or if herbaceous, smaller; leaves simple to bipinnate; fruit a capsule or a legume.
          9. Stamens all attached on one side of flower; fruit an ovoid, apically dehiscent capsule. . . . . **RESEDACEAE**—p. 281
          - 9' Stamens uniformly attached around the flower; fruit a legume. . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
      - 7' Flowers solitary or in cymose or paniculiform clusters.
        10. Fruit a follicle; flowers with a hypanthium. . . . . **ROSACEAE**—p. 276
        - 10' Fruit a capsule; flowers usually without a hypanthium.
          11. Sepals caducous, usually 2 or 3, sometimes united to the tip into a conical cap and deciduous as a unit; sap (at least in the roots) usually milky or colored. . . . . **PAPAVERACEAE**—p. 246
          - 11' Sepals persistent, 2–6, never united to the tip; sap clear.
            12. Stamens basally united into 5 bunches. . . . . **CLUSIACEAE (GUTTIFERAE)**—p. 274
            - 12' Stamens distinct to the base.
              13. Styles 3–8, united only at the base; plants often somewhat succulent. . . . . **PORTULACACEAE**—p. 365
              - 13' Style 1, sometimes divided at the tip; plants not at all succulent. . . . . **CISTACEAE**—p. 281
    - 1' Ovary 2-many-loculed.
      14. Leaves hollow, tubular, often water-filled. . . . . **SARRACENIACEAE**—p. 370

- 14' Leaves with ordinary flat blades.
  - 15. Plants aquatic; leaves large, ovate to orbicular, floating or emersed.
    - .....**NYMPHAEACEAE**—p. 242
  - 15' Plants terrestrial.
    - 16. Flowers imperfect; ovary (2–) 3- (–4) lobed. ....**EUPHORBIACEAE**—p. 273
    - 16' Flowers perfect.
      - 17. Stamens monadelphous.
        - 18. Petals 8–12 in 2 series. ....**TILIACEAE**—p. 334
        - 18' Petals 5 (or sometimes more in “double” flowers).
          - 19. Anthers 1-loculed with a single crescent-shaped pollen sac.
            - .....**MALVACEAE**—p. 281
          - 19' Anthers 2-loculed. ....**STERCULIACEAE**—p. 334
      - 17' Stamens distinct or united basally in groups.
        - 20. Hypanthium present.
          - 21. Style 1.
            - 22. Ovules several to many per locule. ....**LYTHRACEAE**—p. 279
            - 22' Ovules 2 per locule. ....**RHIZOPHORACEAE**—p. 274
            - 21' Styles 2 or more. ....**ROSACEAE**—p. 276
        - 20' Hypanthium absent.
          - 23. Fruit fleshy.
            - 24. Ovary maturing as a ring of 3–10 black drupes surrounding a bright red receptacle; flowers yellow. ....**OCHNACEAE**—p. 274
            - 24' Ovary maturing as a berry.
              - 25. Style 1, unbranched; exocarp leathery, fruit a hesperidium.
                - .....**RUTACEAE**—p. 282
              - 25' Styles or style-branches 3-many; exocarp thin, sometimes coarsely hairy.
                - .....**ACTINIDIACEAE**—p. 371
    - 23' Fruit dry at maturity.
      - 26. Leaves opposite. ....**CLUSIACEAE (GUTTIFERAE)**—p. 274
      - 26' Leaves alternate.
        - 27. Stipules present though sometimes small and deciduous.
          - 28. Anthers opening by terminal pores.
            - .....**ELAEOCARPACEAE**—p. 275
          - 28' Anthers opening by lateral slits. ....**TILIACEAE**—p. 334
        - 27' Stipules absent.
          - 29. Sepals deciduous as flower opens. ...**PAPAVERACEAE**—p. 246
          - 29' Sepals present in open flowers.
            - 30. Plants herbaceous. ....**RANUNCULACEAE**—p. 246

30' Plants woody.

31. Anthers inverted, deeply sagittate, dehiscing by terminal  
(actually basal) pores. . . . . **ACTINIDIACEAE**—p. 371

31' Anthers erect, dehiscing by longitudinal slits.

32. Stipules present. . . . **DIPTEROCARPACEAE**—p. 282

32' Stipules absent. . . . . **THEACEAE**—p. 368

## Key 7—Dicots with Two or More Whorls of Distinct Perianth Parts and a Superior One-Loculed Ovary

1. Ovule 1.
  2. Filaments of all 10 stamens connate into a tube around the ovary or 9 connate and 1 distinct; fruit a one-seeded legume. . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
  - 2' Filaments of all stamens distinct.
    3. Hypanthium present, well developed. . . . . **ROSACEAE**—p. 276
    - 3' Hypanthium absent or scarcely developed.
      4. Sepals 3–4.
        5. Perianth 3-merous. . . . . **POLYGONACEAE**—p. 367
        - 5' Perianth 4-merous. . . . . **BRASSICACEAE (CRUCIFERAE)**—p. 280
      - 4' Sepals or calyx lobes 5 or more.
        6. Calyx tubular, more or less glandular pubescent, often scarious. . . . . **PLUMBAGINACEAE**—p. 367
        - 6' Calyx shallow and dislike to campanulate.
          7. Herbage densely stellate canescent; plants herbaceous. . . . . **EUPHORBIACEAE**—p. 273
          - 7' Herbage glabrous to pilose but never stellate; plants woody. . . . . **ANACARDIACEAE**—p. 282
- 1' Ovules 2-many.
  8. Fruit breaking transversely into one-seeded joints.
    9. Corolla strongly bilateral; petals 5; stamens monadelphous or diadelphous. . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
    - 9' Corolla radial; petals 4; stamens distinct, tetradynamous. . . . . **BRASSICACEAE (CRUCIFERAE)**—p. 280
  - 8' Fruit fleshy and indehiscent or dry and regularly dehiscent.
    10. Placentation free central or basal.
      11. Corolla of 2 or more series of petals; anthers often poricidal by uplifted valves . . . . . **BERBERIDACEAE**—p. 246
      - 11' Corolla of a single series of petals; anthers longitudinally dehiscent.
        12. Leaves reduced to tiny scales. . . . . **TAMARICACEAE**—p. 366
        - 12' Leaves with well-developed blades.
          13. Sepals 2 (rarely more); leaves often succulent. . . . . **PORTULACACEAE**—p. 365
          - 13' Sepals 5, distinct or united; leaves seldom succulent.
            14. Styles or style branches 2–5. . . . . **CARYOPHYLLACEAE**—p. 364
            - 14' Style 1, undivided.
              15. Hypanthium absent. . . . . **PRIMULACEAE**—p. 370

- 15' Hypanthium present. . . . . **LYTHRACEAE**—p. 279
- 10' Placentation marginal or parietal.
  - 16. Style 1, unbranched, or stigma solitary and sessile.
    - 17. Placentation marginal; the ovary simple.
      - 18. Sepals 12–15; petals 6. . . . . **BERBERIDACEAE**—p. 246
      - 18' Sepals 4–5; petals 4–5.
        - 19. Petals 4. . . . . **RUTACEAE**—p. 282
        - 19' Petals 5.
          - 20. Fruit a drupe. . . . . **ROSACEAE**—p. 276
          - 20' Fruit dry at maturity.
            - 21. Stamens 4; fruit a spiny pod; leaves always simple.
              - . . . . . **KRAMERIACEAE**—p. 272
              - 21' Stamens (5–) 10; fruit a legume, usually not spiny; leaves compound.
                - . . . . . **FABACEAE (LEGUMINOSAE)**—p. 275
    - 17' Placentation parietal, the ovary compound.
      - 22. Corolla with one or more spurred or saccate petals.
        - 23. Petals 5, sepals 5. . . . . **VIOLACEAE**—p. 274
        - 23' Petals 4, sepals 2. . . . . **PAPAVERACEAE**—p. 246
      - 22' Corolla without spurred petals.
        - 24. Capsule hard, woody; trees or shrubs with simple leaves.
          - . . . . . **PITTOSPORACEAE**—p. 379
        - 24' Capsule not woody; herbs or shrubs with simple or palmately compound leaves.
          - 25. Flowers solitary on long slender peduncles. . . . **PAPAVERACEAE**—p. 246
          - 25' Flowers in elongated racemes. . . . . **CAPPARACEAE**—p. 280
- 16' Styles or style branches 2–several or stigmas several and sessile.
  - 26. Plants climbing by means of tendrils; flowers with a fringed corona.
    - . . . . . **PASSIFLORACEAE**—p. 274
  - 26' Plants without tendrils.
    - 27. Foliage bearing long, slender, gland-tipped insect-trapping hairs.
      - . . . . . **DROSERACEAE**—p. 367
    - 27' Foliage not glandular.
      - 28. Leaves opposite or appearing to be whorled. . . . **FRANKENIACEAE**—p. 366
      - 28' Leaves alternate (or rarely opposite and basal).
        - 29. Stamens hypogynous; flowers bilateral; leaves narrowly linear to lanceolate and pinnately parted. . . . . **RESEDACEAE**—p. 281
        - 29' Stamens perigynous; flowers usually radial; leaves mostly broader, often shallowly palmately lobed. . . . . **SAXIFRAGACEAE**—p. 270

## Key 8—Dicots with Distinct Petals, Few Stamens, and a Superior Two- to Many-Loculed Ovary

1. Ovules 1 or 2 per locule.
  2. Styles 3–5 or style 3–5 branched from below the middle.
    3. Fruit a drupe with 1 or 2 seeds. . . . .**ANACARDIACEAE**—p. 282
    - 3' Fruit dry, dehiscent.
      4. Petals shorter than sepals, very inconspicuous; ovary 3-lobed; styles 3.  
 . . . . .**EUPHORBIACEAE**—p. 273
      - 4' Petals usually longer than sepals, showy; ovary not much lobed; styles 5.
        5. Leaves palmately compound. . . . .**OXALIDACEAE**—p. 275
        - 5' Leaves simple, entire. . . . .**LINACEAE**—p. 274
  - 2' Style 1, entire or divided above the middle, or ovary with a sessile stigma.
    6. Fruit a samara with a well-developed wing.
      7. Samara wing round. . . . .**RUTACEAE**—p. 282
        - 7' Samara wing elongate.
          8. Petals 2; samara simple. . . . .**OLEACEAE**—p. 373
          - 8' Petals 4–6; samara double, 2-winged, 2-seeded. . . . .**SAPINDACEAE**—p. 282
      - 6' Fruit not winged.
        9. Plants definitely woody; well-developed trees, shrubs or woody vines.
          10. Stamens equal in number to the petals and opposite them.
            11. Plants climbing by means of tendrils; leaves mostly palmately lobed or compound.  
 . . . . .**VITACEAE**—p. 272
            - 11' Plants erect or decumbent shrubs without tendrils; leaves pinnately veined or some-  
 times 3-veined from the base, never compound. . . . .**RHAMNACEAE**—p. 276
          - 10' Stamens alternate with petals or more numerous.
            12. Herbage usually strongly scented, usually dotted with translucent oil glands.  
 . . . . .**RUTACEAE**—p. 282
            - 12' Herbage not strongly scented, not gland-dotted.
              13. Leaves compound. . . . .
              14. Leaves palmate. . . . .**SAPINDACEAE**—p. 282
              - 14' Leaves pinnate or bipinnate.
                15. Stamens monadelphous; fruits drupaceous, persistent in large clusters  
 on the branches. . . . .**MELIACEAE**—p. 282
                - 15' Stamens distinct; fruits capsular, deciduous at maturity.  
 . . . . .**SAPINDACEAE**—p. 282



- 13' Leaves simple.
  - 16. Flowers with a well-developed disc around the ovary.
    - .....**CELASTRACEAE**—p. 272
  - 16' Flowers without a disc. ....**AQUIFOLIACEAE**—p. 380
- 9' Plants herbaceous or suffrutescent.
  - 17. Herbage dotted with translucent oil glands. ....**RUTACEAE**—p. 282
  - 17' Herbage not gland-dotted.
    - 18. Ovary locules 2.
      - 19. Sepals 5; petals 3–5; flowers strongly bilateral. . . .**POLYGALACEAE**—p. 275
      - 19' Sepals 4; petals 4; flowers radial or nearly so.
        - 20. Fruit a pair of 1-seeded nutlets. ....**CAPPARACEAE**—p. 280
        - 20' Fruit a silicle or a silique. . .**BRASSICACEAE (CRUCIFERAE)**—p. 280
    - 18' Ovary locules 3–5:
      - 21. Calyx spurred; leaves peltate. ....**TROPAEOLACEAE**—p. 280
      - 21' Calyx not spurred; leaves rarely peltate.
        - 22. Stamens monadelphous. ....**STERCULIACEAE**—p. 334
        - 22' Stamens distinct or connate only at base.
          - 23. Stipules absent. ....**LIMNANTHACEAE**—p. 281
          - 23' Stipules present.
            - 24. Styles elongate, persistent as coiled beaks on the ripened carpels.
              - .....**GERANIACEAE**—p. 279
            - 24' Styles short, not forming coiled beaks when carpels separate.
              - .....**ZYGOPHYLLACEAE**—p. 272
  - 1' Ovules 3-many per locule.
    - 25. Petals inserted on a well-developed hypanthium.
      - 26. Styles 2–3. ....**SAXIFRAGACEAE**—p. 270
      - 26' Style 1.
        - 27. Anthers elongate, one-loculed, opening by a terminal pore.
          - .....**MELASTOMATAACEAE**—p. 280
        - 27' Anthers short, 2-loculed, opening by longitudinal slits. ....**LYTHRACEAE**—p. 279
    - 25' Petals attached to the receptacle.
      - 28. Calyx spurred or saccate.
        - 29. Leaves large, pinnately compound; flowers in elongated racemes.
          - .....**MELIANTHACEAE**—p. 279
        - 29' Leaves smaller, simple; flowers solitary or in small clusters. .**BALSAMINACEAE**—p. 369

- 28' Calyx not spurred or saccate.
30. Plants definitely woody, trees or shrubs.
31. Leaves compound.
32. Stamens monadelphous; leaves alternate. . . . . **BOMBACOIDEAE**—p. 335
- 32' Stamens distinct; leaves opposite. . . . . **STAPHYLEACEAE**—p. 279
- 31' Leaves simple.
33. Leaves deeply bilobed, covered with a resinous exudate; xerophytic shrub.  
. . . . . **ZYGOPHYLLACEAE**—p. 272
- 33' Leaves toothed or entire, not resinous; mesophytic shrubs or trees.
34. Leaf-blades palmately veined; flowers in racemes. . . . **GREYIACEAE**—p. 279
- 34' Leaf-blades pinnately veined.
35. Flowers solitary or in rounded clusters. . . . **PITTOSPORACEAE**—p. 379
- 35' Flowers in racemes. . . . . **CLETHRACEAE**—p. 371
- 30' Plants herbaceous or only slightly woody subshrubs.
36. Ovary locules 2; fruit a silicle or silique.  
. . . . . **BRASSICACEAE (CRUCIFERAE)**—p. 280
- 36' Ovary locules 3–5; fruit a capsule.
37. Leaves opposite or whorled.
38. Herbs of aquatic or semiaquatic situations, often growing on mud-flats; capsules septicidal. . . . . **ELATINACEAE**—p. 275
- 38' Herbs of terrestrial situations; capsules opening by terminal valves.  
. . . . . **CARYOPHYLLACEAE**—p. 364
- 37' Leaves alternate or all basal.
39. Leaves palmately compound; plants always green and photosynthetic.  
. . . . . **OXALIDACEAE**—p. 275
- 39' Leaves simple; plants markedly mycotrophic, sometimes achlorophyllous and non-photosynthetic. . . . . **ERICACEAE**—p. 369

## Key 9—Dicots with Distinct Petals and an Inferior Ovary

1. Stamens numerous, more than twice as many as the petals or more than 15.
  2. Styles more than 1, sometimes partly united.
    3. Plants aquatic with floating or emergent leaves and flowers. . . . .**NYMPHAEACEAE**—p. 242
    - 3' Plants terrestrial.
      4. Flowers imperfect; petals 2 in staminate flowers, 0 in pistillate flowers.  
.....**BEGONIACEAE**—p. 277
      - 4' Flowers perfect; petals 4 or 5 to many.
        5. Petals many; herbs or subshrubs, often succulent. . . . .**AIZOACEAE**—p. 365
        - 5' Petals normally 4 or 5 (except in horticulturally “doubled” flowers); well-developed shrubs or trees.
          6. Leaves alternate; petals 5; fruit a pome. . . . .**ROSACEAE**—p. 276
          - 6' Leaves opposite; petals usually 4; fruit a capsule. . . .**HYDRANGEACEAE**—p. 368
    - 2' Style 1.
      7. Sepals and petals indefinite in number and not sharply differentiated from each other; plants spiny, usually succulent. . . . .**CACTACEAE**—p. 365
      - 7' Sepals and petals 3–7 in distinct series.
        8. Species of herbs or low shrubs with rough, barbed or stinging hairs.  
.....**LOASACEAE**—p. 368
        - 8' Species of trees or shrubs lacking such hairs.
          9. Fruits fleshy.
            10. Seeds individually surrounded by sacs of juicy pulp, packed into superposed ovary locules (one above the other). . . . .**PUNICACEAE**—p. 279
            - 10' Seeds dry (any pulpy tissue derived from ovary wall); locules not superposed.
              11. Leaves punctate, often strongly scented. . . . .**MYRTACEAE**—p. 279
              - 11' Leaves not punctate, not scented. . . . .**RHIZOPHORACEAE**—p. 274
          - 9' Fruit dry.
            12. Leaves punctate. . . . .**MYRTACEAE**—p. 279
            - 12' Leaves not punctate. . . . .**ESCALLONIACEAE**—p. 278
    - 1' Stamens not more than twice as many as petals.
      13. Styles more than 1, separate to base.
        14. Plant a submersed aquatic with dimorphic leaves. . . . .**HALORAGACEAE**—p. 271
        - 14' Plant terrestrial, or if aquatic, the leaves all similar.
          15. Sepals 2; plants fleshy; seeds numerous. . . . .**PORTULACACEAE**—p. 365
          - 15' Sepals more than 2 or obscure.
            16. Seeds many in each locule of ovary.
              17. Plants herbaceous. . . . .**SAXIFRAGACEAE**—p. 270

- 17' Plants woody.
  - 18. Leaves opposite. . . . .**HYDRANGEACEAE**—p. 368
  - 18' Leaves alternate.
    - 19. Locule 1; placentation parietal; fruit often a berry.
      - . . . . .**GROSSULARIACEAE**—p. 271
    - 19' Locules 2; placentation axile; fruit a woody capsule.
      - . . . . .**HAMAMELIDACEAE**—p. 271
  - 16' Seeds 1 or 2 in each locule.
    - 20. Fruit splitting into 2 indehiscent mericarps; styles 2; herbage usually aromatic; inflorescence a head or compound umbel.
      - . . . . .**APIACEAE (UMBELLIFERAE)**—p. 379
    - 20' Fruit not splitting into mericarps; plants mostly woody.
      - 21. Pubescence stellate; fruit a woody capsule; styles 2.
        - . . . . .**HAMAMELIDACEAE**—p. 271
      - 21' Pubescence not stellate, or if so the plant a vine or shrub with a fleshy fruit; styles 2–10.
        - 22. Stamens 4–5, equal in number to the petals. . . . .**ARALIACEAE**—p. 379
        - 22' Stamens usually 10, more numerous than the petals (if fewer, plants with well-developed thorns).
          - 23. Leaves opposite; fruit a capsule. . . . .**HYDRANGEACEAE**—p. 368
          - 23' Leaves alternate; fruit a pome. . . . .**ROSACEAE**—p. 276
  - 13' Style 1, sometimes branched above the middle, or stigma(s) sessile.
    - 24. Stamens equal in number to petals and opposite them.
      - 25. Plant terrestrial, free-living; hypanthium usually present; ovary locules 2 or more.
        - . . . . .**RHAMNACEAE**—p. 276
      - 25' Plant parasitic on the branches of woody hosts; hypanthium absent; ovary one-loculed.
        - . . . . .**LORANTHACEAE**—p. 362
    - 24' Stamens alternate with the petals or sometimes of different number.
      - 26. Plant a tendril-bearing vine, monoecious. . . . .**CUCURBITACEAE**—p. 277
      - 26' Plants never tendril-bearing; flowers usually perfect.
        - 27. Ovules more than 1 in each locule of ovary.
          - 28. Leaves with 3–9 longitudinal veins and peculiar cross-venation, so as to be broken into many squarish areolae. . . . .**MELASTOMATAACEAE**—p. 280
          - 28' Leaves not so veined.
            - 29. Locule of ovary 1; placentation apical or parietal.
              - 30. Stamens twice as many as petals; placentation apical; ovules 2–6.
                - . . . . .**COMBRETACEAE**—p. 279
              - 30' Stamens as many as petals; placentation parietal; ovules several to many.
                - 31. Plants woody. . . . .**GROSSULARIACEAE**—p. 270

- 31' Plants herbaceous. . . . . **SAXIFRAGACEAE**—p. 272
- 29' Locules of ovary 2 or more; placentation axile.
  - 32. Trees or shrubs with opposite (less commonly alternate) entire leaves; stipules present, well developed, attached to stem (but often deciduous); ovules seldom more than 2 per locule. . . . . **RHIZOPHORACEAE**—p. 272
  - 32' Herbs or shrubs with alternate or opposite, often toothed or lobed leaves; stipules usually absent; ovules usually several to many per locule.
    - 33. Locules 4. . . . . **ONAGRACEAE**—p. 279
    - 33' Locules 2. . . . . **ESCALLONIACEAE**—p. 278
- 27' Ovule 1 in each locule of ovary or reduced to 1 in each ovary.
  - 34. Sepals and petals 5. . . . . **ARALIACEAE**—p. 379
  - 34' Sepals and petals 4 or 2.
    - 35. Fruit dry, nut-like; plants herbaceous. . . . . **ONAGRACEAE**—p. 279
    - 35' Fruit a drupe; plants mostly woody. . . . . **CORNACEAE**—p. 367

## Key 10—Dicots with Petals United into a Ring or Tube, a Superior Ovary, and a Radially Symmetric Corolla

1. Plants lacking green pigmentation, mycotrophic symbionts or root-parasites.
  2. Slender twining leafless vines. . . . .**CONVOLVULACEAE**—p. 377
  - 2' Erect fleshy herbs with scalelike leaves.
    3. Filaments adnate to corolla tube. . . . .**LENNOACEAE**—p. 373
    3. Filaments free from corolla or nearly so. . . . .**ERICACEAE**—p. 369
- 1' Plants green and photosynthetic
  4. Stamens more numerous than corolla lobes.
    5. Locule of ovary 1.
      6. Style generally off-center; placentation marginal; fruit a legume. . . . .**FABACEAE (LEGUMINOSAE)**—p. 275
      - 6' Style arising from center of ovary; placentation parietal or basal.
        7. Fruit an achene; flower 3-merous. . . . .**POLYGONACEAE**—p. 367
        - 7' Fruit a capsule; flowers 4–5 merous. . . . .**RUTACEAE**—p. 282
    - 5' Locules of ovary 2 to many.
      8. Filaments connate, at least at base, sometimes forming a long tube.
        9. Stamens numerous; leaves usually palmately veined. . . . .**MALVACEAE**—p. 281
        - 9' Stamens 10 or fewer; leaves various.
          10. Leaves compound, usually trifoliolate. . . . .**OXALIDACEAE**—p. 275
          - 10' Leaves simple.
            11. Flowers bilateral; plants herbs or subshrubs. . . . .**POLYGALACEAE**—p. 275
            - 11' Flowers radial; plants definitely woody, well developed trees or shrubs.
              12. Styles 2–5. . . . .**THEACEAE**—p. 369
              - 12' Style 1. . . . .**STYRACACEAE**—p. 370
    - 8' Filaments distinct.
      13. Plants herbaceous or only slightly woody. . . . .**PAPAVERACEAE**—p. 246
      - 13' Plants definitely woody, well-developed trees or shrubs.
        14. Stems covered with large stiff petiolar spines. . . . .**FOUQUIERIACEAE**—p. 369
        - 14' Stems unarmed.
          15. Anthers dehiscent by longitudinal slits. . . . .**EBENACEAE**—p. 370
          - 15' Anther dehiscent by terminal pores.
            16. Petals generally connate most of their length. . . . .**ERICACEAE**—p. 369
            - 16' Petals connate only at base. . . . .**CLETHRACEAE**—p. 371

- 4' Stamens as many as corolla lobes or fewer.
17. Locule of ovary 1.
18. Ovule 1, basal.
19. Style 1, undivided. . . . . **NYCTAGINACEAE**—p. 365
- 19' Styles 3–5 or style 1 and 3–5 lobed.
20. Styles or style branches 3; fleshy vines. . . . . **BASELLACEAE**—p. 366
- 20' Styles or style branches 5; herbs or shrubs. . . . . **PLUMBAGINACEAE**—p. 367
- 18' Ovules 2—many, parietal or free-central.
21. Placentae free-central.
22. Sepals 2. . . . . **PORTULACACEAE**—p. 365
- 22' Sepals 4–5.
23. Plants herbaceous. . . . . **PRIMULACEAE**—p. 370
- 23' Plants woody. . . . . **MYRSINACEAE**—p. 370
- 21' Placentae parietal.
24. Styles or style branches 2. . . . . **HYDROPHYLLACEAE**—p. 373
- 24' Style 1, undivided.
25. Leaves usually opposite or whorled; fruit mostly capsular.  
. . . . . **GENTIANACEAE**—p. 372
- 25' Leaves alternate; fruit a berry. . . . . **SOLANACEAE**—p. 377
- 17' Locules of ovary 2 or more or ovaries 2.
26. Ovary breaking apart into nutlets or one-carpellate pieces.
27. Stems sharply quadrangular. . . . . **LAMIACEAE (LABIATAE)**—p. 373
- 27' Stems terete.
28. Flowers in scorpioid cymes. . . . . **BORAGINACEAE**—p. 373
- 28' Flowers solitary.
29. Leaves reniform, thin. . . . . **CONVOLVULACEAE**—p. 377
- 29' Leaves narrow to broad, fleshy. . . . . **NOLANACEAE**—p. 377
- 26' Ovary ripening as a dehiscent capsule or as a berry or drupe or ovaries 2, ripening as follicles.
30. Filaments attached to receptacle or slightly adherent to base of corolla.
31. Anthers dehiscent by terminal pores, often bearing appendages.  
. . . . . **ERICACEAE**—p. 369
- 31' Anthers dehiscent by lateral slits, not appendaged. . . **AQUIFOLIACEAE**—p. 380
- 30' Filaments adnate to corolla throat or corolla tube.
32. Tendrils present. . . . . **VITACEAE**—p. 272

- 32' Tendrils absent.
33. Leaves alternate or of unusual arrangement.
34. Ovaries 2, distinct; stigmas connate and adnate to anthers.  
 .....**ASCLEPIADACEAE**—p. 269
- 34' Ovary 1; stigmas free from anthers.
35. Locules of ovary 3-many.
36. Stamens opposite the petals; ovule 1 per locule.  
 .....**SAPOTACEAE**—p. 370
- 36' Stamens alternate with the petals; ovules 2-many per locule.
37. Stems twining. ....**CONVOLVULACEAE**—p. 377
- 37' Stems erect to spreading.
38. Fruit a capsule or berry 1 cm or more in diameter; style undivided.  
 .....**SOLANACEAE**—p. 377
- 38' Fruit a much smaller capsule; style usually 3-lobed.  
 .....**POLEMONIACEAE**—p. 369
- 35' Locules of ovary 2.
39. Stems twining. ....**CONVOLVULACEAE**—p. 377
- 39' Stems prostrate to erect but not twining.
40. Sepals usually connate; style 1, undivided.
41. Some or all the stamens bearing dense tufts of hair; corolla lobes imbricate in bud; flowers in spikes or racemes.  
 .....**SCROPHULARIACEAE**—p. 377
- 41' Stamens glabrous or hairy only at base; corolla plicate or valvate in bud; flowers solitary or variously cymose.  
 .....**SOLANACEAE**—p. 377
- 40' Sepals distinct or nearly so; styles 2 or style 1 and 2-lobed.
42. Flowers solitary; plants usually twining or trailing; pedicels with a pair of bractlets; sap often milky.  
 .....**CONVOLVULACEAE**—p. 377
- 42' Flowers usually in scorpioid cymes; stems never twining; pedicels not bracteolate; sap clear.  
 .....**HYDROPHYLLACEAE**—p. 373
- 33' Leaves opposite or all basal.
43. Corolla dry, scarious. ....**PLANTAGINACEAE**—p. 376
- 43' Corolla of normal texture.
44. Stipules present, sometimes reduced to a line joining the leaf bases.  
 .....**LOGANIACEAE**—p. 372
- 44' Stipules absent (or very reduced).
45. Sap usually milky; ovaries often 2, joined by a common stigma.



- 46. Stamens and stigma adnate forming a cylindrical gynostegium.  
 .....**ASCLEPIADACEAE**—p. 373
- 46' Stamens free from stigma or merely adherent.  
 .....**APOCYNACEAE**—p. 372
- 45. Sap clear.
  - 47. Style 1, 3-branched. ....**POLEMONIACEAE**—p. 369
  - 47' Style 1, entire or 2-lobed or styles 2.
    - 48. Leaves mostly toothed, lobed or compound; styles or style-  
 branches 2.  
 .....**HYDROPHYLLACEAE**—p. 373
    - 48' Leaves entire; style unbranched.
      - 49. Petals with several veins from the base.  
 .....**SOLANACEAE**—p. 377
      - 49' Petal with 1 main vein. . . .**GENTIANACEAE**—p. 372

## Key 11—Dicots with Petals United into a Ring or Tube, a Superior Ovary, and a Bilaterally Symmetric Corolla

1. Plants lacking green pigmentation, mycotrophic symbionts or root-parasites.  
.....**OROBANCHACEAE**—p. 375
- 1' Plants green and photosynthetic.
  2. Locule of ovary 1.
    3. Ovule 1, apical. ....**GLOBULARIACEAE**—p. 376
    - 3' Ovules 2-many, parietal or free central.
      4. Placentation free central; plants aquatic with finely divided leaves or terrestrial and leaves all entire and basal. ....**LENTIBULARIACEAE**—p. 375
      - 4' Placentation parietal; plants terrestrial.
        5. Fruit with a hooked beak several cm long. ....**MARTYNIACEAE**—p. 375
        - 5' Fruit beakless.
          6. Plants herbaceous. ....**GESNERIACEAE**—p. 374
          - 6' Plants woody, sometimes climbing; leaves often compound.
            7. Leaves sticky-glandular, simple. ....**SCROPHULARIACEAE**—p. 377
            - 7' Leaves not sticky-glandular, sometimes compound.  
.....**BIGNONIACEAE**—p. 375
    - 2' Locules of ovary 2 or more.
      8. Fruit of 2–4 nutlets or drupelets, or a drupe with a bony, more or less lobed endocarp.
        9. Ovary entire or shallowly lobed; style terminal.
          10. Leaves usually opposite or whorled. ....**VERBENACEAE**—p. 377
          - 10' Leaves usually alternate. ....**MYOPORACEAE**—p. 375
        - 9' Ovary deeply 4-lobed. ....**LAMIACEAE (LABIATAE)**—p. 373
      - 8' Fruit a capsule or a berry.
        11. Fruit tipped with a hooked beak several cm long. ....**MARTYNIACEAE**—p. 375
        - 11' Fruit beakless or beak much shorter and straight.
          12. Leaves alternate.
            13. Lobes of corolla imbricate in bud; crushed herbage usually lacking rank odor.  
.....**SCROPHULARIACEAE**—p. 377
            - 13' Lobes of corolla valvate or plicate in bud; crushed herbage usually ill-scented with very rank odor. ....**SOLANACEAE**—p. 377
          - 12' Leaves opposite, whorled or all basal.
            14. Corolla radial; stamens 2. ....**OLEACEAE**—p. 373
            - 14' Corolla strongly to weakly bilateral; stamens 2 or 4.
              15. Plant a tree. ....**BIGNONIACEAE**—p. 375
              - 15' Plant a shrub, herb or woody vine.

- 16. Leaves compound. . . . . **BIGNONLACEAE**—p. 375
- 16' Leaves simple.
  - 17. Flowers individually subtended by a pair of bractlets.  
..... **ACANTHACEAE**—p. 373
  - 17' Flowers bractless or subtended by only one bract.  
..... **SCROPHULARIACEAE**—p. 377

## Key 12—Dicots with Petals United into a Ring or Tube and an Inferior Ovary

1. Anthers connate into a tube.
  2. Ovule solitary, basal; flowers in involucrate heads. . . . .**ASTERACEAE (COMPOSITAE)**—p. 378
  - 2' Ovules 1 to many; inflorescences various.
    3. Flowers perfect; corolla often strongly bilateral; tendrils absent.  
.....**CAMPANULACEAE**—p. 378
    - 3' Flowers imperfect; corolla usually radial; tendrils usually present.  
.....**CUCURBITACEAE**—p. 277
- 1' Anthers distinct.
  4. Filaments free from the corolla or only slightly adherent to base of corolla.
    5. Stamens as many as corolla lobes; herbs; fruit a capsule. . . . .**CAMPANULACEAE**—p. 378
    - 5' Stamens twice as many as corolla lobes; shrubs or trees; fruits fleshy.
      6. Fruit a berry; anthers dehiscent by terminal pores. . . . .**ERICACEAE**—p. 369
      - 6' Fruit a winged drupe; anthers dehiscent by lateral slits. . . . .**STYRACACEAE**—p. 370
  - 4' Filaments adnate to corolla tube or throat.
    7. Stamens 15 or more. . . . .**SYMPLOCACEAE**—p. 371
    - 7' Stamens 9 or fewer.
      8. Plant a parasitic shrub, growing on the branches of woody hosts; stamens opposite the corolla lobes. . . . .**LORANTHACEAE**—p. 362
      - 8' Plant terrestrial or epiphytic, never parasitic; stamens alternate with the corolla lobes.
        9. Stamens fewer than corolla lobes.
          10. Ovules several to many.
            11. Plants herbaceous. . . . .**GESNERIACEAE**—p. 374
            - 11' Plants woody. . . . .**CAPRIFOLIACEAE**—p. 379
          - 10' Ovule 1.
            12. Involucre present; inflorescence a dense bracteate head or spike.  
.....**DIPSACACEAE**—p. 379
            - 12' Involucre absent; inflorescence variously cymose, sometimes flowers solitary or clustered in heads.
              13. Plants woody. . . . .**CAPRIFOLIACEAE**—p. 379
              - 13' Plants herbaceous. . . . .**VALERIANACEAE**—p. 379
      - 9' Stamens as many as corolla lobes.
        14. Flowers imperfect, clustered in involucrate heads.  
.....**ASTERACEAE (COMPOSITAE)** —p. 378
        - 14' Flowers perfect, inflorescences various.
          15. Flowers 4-merous.
            16. Ovary 1-loculed, 1-ovuled. . . . .**DIPSACACEAE**—p. 379

- 16' Ovary 2-loculed with 1—many ovules in each locule or 1-loculed with several to many ovules. . . . . **RUBIACEAE**—p. 372
- 15' Flowers 5-merous.
  - 17. Stipules absent, or if present, small and attached to the petioles (rarely larger in plants with conspicuously bilabiate flowers and connate-perfoliate upper leaves); carpels 2–5. . . . . **CAPRIFOLIACEAE**—p. 379
  - 17' Stipules present, often well developed, generally attached to the stem between the bases of the leaves; carpels seldom more than 2. . . . . **RUBIACEAE**—p. 372

## Key 13—Monocots with Showy Flowers

1. Gynoecium apocarpous; carpels more than 1, distinct to the base.
  2. Plant a shrub or tree with large compound or deeply lobed leaves.  
.....**ARECACEAE (PALMAE)**—p. 462
  - 2' Plant an aquatic or semiaquatic herb; leaves entire.
    3. Parts of perianth usually 2, rarely 1 or 3, petaloid. ....**APONOGETONACEAE**—p. 460
    - 3' Parts of perianth 6, in 2 series, at least the inner whorl petaloid.
      4. Sepals green; petals white to purple; fruits usually 1–2 seeded, mostly indehiscent.  
.....**ALISMATACEAE**—p. 459
      - 4' Sepals and petals both pink; fruits several seeded, dehiscent. ...**BUTOMACEAE**—p. 459
- 1' Gynoecium monocarpous or syncarpous; ovary 1, simple or compound, sometimes deeply lobed but if so, carpels always connate, at least toward the base.
  5. Ovary superior.
    6. Inflorescence subtended by a well-developed spathe.
      7. Plant a shrub or tree; leaves large, compound or deeply lobed.  
.....**ARECACEAE (PALMAE)**—p. 462
      - 7' Plant an herb; leaves entire.
        8. Plants aquatic or subaquatic, floating or rooted in shallow water.  
.....**PONTEDERIACEAE**—p. 464
        - 8' Plants terrestrial. ....**COMMELINACEAE**—p. 464
    - 6' Inflorescence without a well-developed spathe; leaves never compound or deeply lobed; plants not floating or submerged.
      9. Outer perianth segments distinctly different from the different from the inner, often green and sepaloid.
        10. Leaves few, not overlapping or sheathing. ....**LILIACEAE**—p. 462
        - 10' Leaves many, overlapping or sheathing.
          11. Ovules many in each locule; plants terrestrial or epiphytic; leaves often spiny-toothed, often succulent; sap not viscid. ....**BROMELIACEAE**—p. 463
          - 11' Ovules 1 or few in each locule; plants terrestrial; leaves never spiny-toothed, seldom succulent.
            12. Flowers sessile in a spike or head; fertile stamens usually 3.  
.....**XYRIDACEAE**—p. 463
            - 12' Flowers peduncled in a cyme or umbel; fertile stamens usually 6.  
.....**COMMELINACEAE**—p. 464
    - 9' Outer and inner perianth segments essentially alike, both whorls petaloid.
      13. Plants xerophytic and/or woody; leaves mostly fibrous, sword-like, in dense basal or apical tufts; style simple; flowers commonly in large racemes or panicles.
        14. Leaves very succulent but not strongly fibrous; sap often very slimy.  
.....**XANTHORRHOACEAE**—p. 462

- 14' Leaves thickish but more leathery than fleshy, very tough and fibrous; sap not slimy.  
.....**ASPARAGACEAE**—p. 462
- 13' Plants not or only slightly xerophytic; leaves not strongly fibrous; style 1, often lobed or divided, or styles 3.
  - 15. Plant a vine with net-veined leaves. ....**SMILACACEAE**—p. 461
  - 15' Plant an herb with parallel-veined leaves. ....**LILIACEAE**—p. 462
- 5' Ovary inferior.
  - 16. Fertile stamen 1 (or 2); petaloid staminodes sometimes present.
    - 17. Stamen or stamens adnate to stigma and style forming a gynandrium or column; ovary usually twisted. ....**ORCHIDACEAE**—p. 462
    - 17' Stamen free from stigma and style; ovary not twisted.
      - 18. Anther 2-loculed; sepals connate into a sometimes spathe-like tube.  
.....**ZINGIBERACEAE**. 465
      - 18' Anther 1-loculed; sepals distinct or at most connivent.
        - 19. Ovules many in each locule; flowers large, mostly more than 5 cm long.  
.....**CANNACEAE**—p. 465
        - 19' Ovules 1 in each locule; flowers small, less than 2.5 cm long.  
.....**MARANTACEAE**—p. 465
  - 16' Fertile stamens 3 or more, none modified into petaloid staminodes.
    - 20. Plants aquatic, submerged or floating; ovules spread all over the inner surface of ovary; flowers mostly imperfect. ....**HYDROCHARITACEAE**—p. 459
    - 20' Plants terrestrial or epiphytic; ovules confined to placentae; flowers usually perfect.
      - 21. Segments of perianth in 2 obviously different series, the outer differing from the inner in size, shape or color.
        - 22. Petals dissimilar, or only 1; plants mostly large, sometimes tree-like herbs.
          - 23. Leaves 2-ranked; fruit a capsule; flowers all perfect.  
.....**STRELITZIACEAE**—p. 465
          - 23' Leaves spirally arranged; fruit a berry; flowers functionally imperfect.  
.....**MUSACEAE**—p. 464
        - 22' Petals essentially alike, 3 in number; plants usually not very large.
          - 24. Stamens 3; bracts usually green or membranous.
            - 25. Leaves equitant (vertically folded and fused with only “lower” surface exposed).  
.....**IRIDACEAE**—p. 462
            - 25' Leaves dorsiventral (with a top and bottom side). . . **LILIACEAE**—p. 462
          - 24' Stamens 6.
            - 26. Leaves many, overlapping, usually more or less leathery and often spiny-toothed; flowers more than 1, usually with brightly colored bracts.  
.....**BROMELIACEAE**—p. 463

- 26' Leaves 2-3, not leathery or toothed; flower 1, with a single membranous bract. . . . . **LILIACEAE**—p. 462
- 21' Segments of perianth all similar in size, shape and color.
  - 27. Plant a vine with small inconspicuous flowers; leaves petiolate, net-veined. . . . . **DIOSCOREACEAE**—p. 461
  - 27' Plant not a vine; flowers small to large and showy.
    - 28. Stamens 3; leaves equitant (vertically folded and fused with only “lower surface” exposed). . . . . **IRIDACEAE**—p. 462
    - 28' Stamens 6 (rarely 3); leaves dorsiventral (with a top and bottom surface).
      - 29. Ovary only partially inferior; small scapose herbs with linear leaves. . . . . **LILIACEAE**—p. 462
      - 29' Ovary wholly inferior.
        - 30. Flowers several (1) in a scapose umbel subtended by 1 or more spathe-like bracts; leaves thin, neither leathery nor fibrous. . . . . **LILIACEAE**—p. 462
        - 30' Flowers many in large panicles, spikes or racemes; leaves thick, leathery, very fibrous. . . . . **AGAVACEAE**—p. 462



## Key 14—Monocots with Small, Non-Showy Flowers

1. Blades of leaves conspicuously expanded, pinnately or palmately veined, often lobed or compound.
  2. Leaves or leaflets very stiff, plicately folded; inflorescence a panicle subtended by a spathe.  
 ..... **ARECACEAE (PALMAE)**—p. 462
  - 2' Leaves not plicately folded; inflorescence a spadix (fleshy spike) subtended by a spathe.  
 ..... **ARACEAE**—p. 459
- 1' Blades of leaves linear or narrowly lanceolate, or sometimes lacking, parallel veined, never lobed or compound.
  3. Plants aquatic, either submersed or floating, or barely raised above the water surface.
    4. Plant body minute, less than 1 cm long, free-floating or stranded on mud, not differentiated into stem and leaves; roots, if present, unbranched. .... **ARACEAE**—p. 459
    - 4' Plant body much larger, differentiated into stems and leaves, usually rooted; roots branching.
      5. Plants of marine habitats; flowers on one side of a flattened axis.  
 ..... **ZOSTERACEAE**—p. 460
      - 5' Plants of fresh or brackish waters; flowers solitary or in spikes.
        6. Leaves opposite or whorled.
          7. Leaves with free membranous stipules, entire; gynoeceium apocarpous; fruits beaked. .... **ZANNICHELLIACEAE**—p. 467
          - 7' Leaves estipulate (although base somewhat auriculate); gynoeceium a single pistil with 3–4 stigmas; fruit beakless. .... **NAJADACEAE**—p. 467
        - 6' Leaves alternate or basal.
          8. Flowers imperfect, clustered in heads. .... **SPARGANIACEAE**—p. 462
          - 8' Flowers all perfect.
            9. Fruits sessile on axis of spike; peduncles straight.  
 ..... **POTAMOGETONACEAE**—p. 460
            - 9' Fruits stalked in umbelliform clusters; peduncles becoming spirally coiled in age. .... **RUPPIACEAE**—p. 460
  - 3' Plants of land or shallow water; if semiaquatic, leaves and flowers well-emersed from water.
    10. Flowers all imperfect in dense spikes or spherical heads 1–4 cm in diameter.
      11. Flowers in terminal spikes 10–30 cm long; pistillate flowers subtended by fine bristles.  
 ..... **TYPHACEAE**—p. 463
      - 11' Flowers in spherical heads; pistillate flowers subtended by tiny chaffy scales.  
 ..... **SPARGANIACEAE**—p. 462
    - 10' Flowers perfect, or if imperfect, inflorescence less than 1 cm in diameter.
      12. Gynoeceium apocarpous; ovaries 3–6, separating at maturity.
        13. Racemes bracteate; seeds 2 per ovary. .... **SCHEUCHZERIACEAE**—p. 460
        - 13' Racemes bractless; seed 1. .... **JUNCAGINACEAE**—p. 460
      - 12' Gynoeceium monocarpous or syncarpous.

14. Inflorescence a grayish-colored flat-topped, buttonlike scapose head of tiny imperfect flowers. . . . . **ERIOCAULACEAE**—p. 463
- 14' Inflorescence of solitary flowers, panicles, spikes or spikelets; flowers perfect or imperfect.
15. Fruit a capsule with 3 or more seeds; sepals 3, petals 3, both sets of perianth well developed and sepaloid. . . . . **JUNCACEAE**—p. 463
- 15' Fruit one-seeded, an achene or a caryopsis; perianth segments absent or reduced to bristles or minute scales.
16. Long-styled naked pistillate flowers borne in leaf axils; perfect flowers borne in scapose spikes; leaves all basal, terete. . . . . **JUNCAGINACEAE**—p. 460
- 16' Long-styled naked pistillate flowers absent or borne in a dense spike; perfect flowers present) borne in spikelets; leaves often cauline, flattened to terete or reduced to bladeless scales.
17. Leaves 3-ranked, sometimes reduced to bladeless sheaths; stem often 3-angled or sometimes terete, solid; nodes not swollen; inflorescence of spikes or spikelets without specialized sterile basal bractlets; flowers subtended by a solitary bract or sometimes enclosed by a hollow saclike bract (perigynium); perianth (if present) of bristles; fruit a biconvex or triangular achene. . . . . **CYPERACEAE**—p. 463
- 17' Leaves 2-ranked, at least some with well-developed blades; stem terete, often hollow; nodes swollen, knotlike; inflorescence of spikelets subtended by a pair of basal bracts (glumes); flowers enclosed by a pair of bractlets (lemma and palea); perianth reduced to an inconspicuous pair of scales (lodicules); fruit a caryopsis. . . . . **POACEAE (GRAMINEAE)**—p. 464