

KEY TO FAMILIES OF VASCULAR PLANTS OF FRANKLIN COUNTY, OHIO

I. KEY TO FAMILIES OF SEEDLESS VASCULAR PLANTS (PTERIDOPHYTES)

- a Plants aquatic, floating, small; leaves at most 1.5 cm long, papillose or hairy, actually or appearing 2-ranked. **SALVINIACEAE**, p. 51
- a' Plants aquatic or terrestrial, not floating.
 - b Aerial stems ridged and grooved, the main one with central cavity, leafless except for toothed sheaths at nodes; sporophylls in terminal cones. **EQUISETACEAE**, p. 41
 - b' Aerial stems absent or, if present, leafy, not ridged, not grooved, sometimes horizontal.
 - c Leaves 4-foliolate, petioles long, erect; stems horizontal; sporangia in sporocarps; growing in mud. **MARSILEACEAE**, p. 50
 - c' Leaves scalelike or small and linear, at most 1.5 cm long, in spirals or 4-ranked. (See c".)
 - d Sporophylls in terminal 4-angled cones; leaf with a ligule. **SELAGINELLACEAE**, p. 40
 - d' Sporophylls in terminal terete cones or in zones alternating with zones of foliage leaves; leaf without a ligule. **LYCOPODIACEAE**, p. 40
 - c" Leaves not 4-foliolate, not scalelike, not small and linear; usually large, usually compound, from rhizomes.
 - e Sporangia borne on leaves or portions of leaves that are without flat green blades.
 - f Sporangia coherent in 2 rows in a stalked unbranched spikelike cluster; leaf consisting of 2 segments on a common petiole, one an entire green blade, the other the cluster of sporangia. **OPHIOGLOSSACEAE**, p. 42
 - f' Sporangia not in an unbranched spikelike cluster.
 - g Sporangia in beadlike globular clusters, the clusters enfolded by modified pinnules, or in chainlike rows (*Onocleaceae* & *Blechnaceae*). **POLYPODIACEAE**, p. 43
 - g' Sporangia separate, opening with a terminal longitudinal cleft into 2 valves.
 - h Either leaves or leaflets dimorphic, some green and foliaceous, others bearing sporangia and not foliaceous; leaves large, lanceolate to oblong. **OSMUNDACEAE**, p. 43
 - h' Leaf consisting of 2 segments on a common petiole, one green and foliaceous, compound or divided, the other bearing a cluster of sporangia. **OPHIOGLOSSACEAE**, p. 42
 - e' Sporangia in sori at margin of or distributed on under surface of flat green leaf-blades; sori with or without indusia; indusia various; sporangia opening transversely (*Dennstaedtiaceae*, *Adiantaceae* & *Asplenaceae*). **POLYPODIACEAE**, p. 43

II. KEY TO FAMILIES OF SEED PLANTS (SPERMATOPHYTES)

GENERAL SECTION

- a Ovules and seeds naked, attached to open carpels, without stigmas, styles, and ovaries; plants woody. **GYMNOSPERMS (DIVISION PINOPHYTA)**, SECTION A, p. 25
- a' Ovules and seeds enclosed in an ovary formed from a closed carpel or group of united carpels; stigma or stigmas present, and often style or styles; plants herbaceous or woody. **ANGIOSPERMS (DIVISION MAGNOLIOPHYTA, FLOWERING PLANTS)**, SECTION B, p. 26

SECTION A. GYMNASPERMS (DIVISION PINOPHYTA)

- a Sporophylls on dwarf branches, not in cones; leaves with expanded blades, dichotomously veined. **GINKGOACEAE**, p. 51
- a' Sporophylls in cones (rarely solitary); leaves needlelike, flat and linear, or scalelike.
 - b Leaves flat and linear, yellow-green beneath; staminate cone of 5-8 peltate stamens; ovule solitary, surrounded by fleshy red aril. **TAXACEAE**, p. 51
 - b' Both kinds of sporophylls in cones; ovules more than 1.
 - c Leaves needlelike or flat and linear; leaves and sporophylls in spirals.
 - d Cones with a bract behind each cone-scale; the cone-scale longer or shorter than its bract; plants evergreen and leaves persistent, except in *Larix*. **PINACEAE**, p. 52

- d' Cones without bracts; leaves deciduous, some scattered on twigs, others spreading in 1 plane on deciduous featherlike branchlets. **TAXODIACEAE**, p. 54
- c' Leaves scalelike or awl-shaped; leaves and sporophylls opposite or whorled. **CUPRESSACEAE**, p. 54

SECTION B. ANGIOSPERMS (DIVISION MAGNOLIOPHYTA, FLOWERING PLANTS)

- a Usually flower parts 4 or 5 or a multiple of 4 or 5 and leaves not parallel-veined; vascular bundles open, usually in a circle around central pith; annual growth-rings forming from cambium when stems are perennial; cotyledons 2. **DICOTYLEDONS (CLASS MAGNOLIOPSIDA)**, SECTION I-B, p. 26
- a' Usually flower parts 3 or a multiple of 3 and leaves parallel-veined; vascular bundles closed, usually not in a circle but scattered through the pith; annual rings of growth not present in stems; cotyledon 1. (Included are small floating aquatics with thalluslike body, about 1 cm long or less, seldom observed in flower.) **MONOCOTYLEDONS (CLASS LILIOPSIDA)**, SECTION II-B, p. 38

SECTION I-B. DICOTYLEDONS (CLASS MAGNOLIOPSIDA)

A FEW FAMILIES IN WHICH FLOWER PARTS ARE DIFFICULT TO INTERPRET

- a Perianth parts many, intergrading, sometimes intergrading with stamens.
 - b Shrubs; flowers perigynous; perianth parts similar, maroon, lanceolate, on concave hypanthium; stamens several to many; carpels several to many, separate. **CALYCANTHACEAE**, p. 57
 - b' Aquatic herbs; blades 1-7 dm wide, floating or emersed, ovate to circular; perianth parts, stamens, and carpels many; flowers hypogynous or epigynous.
 - c Blades peltate; petals numerous, outer ones green and sepaloid; carpels individually embedded in the enlarged, obconic receptacle. **NELUMBONACEAE**, p. 60
 - c' Blades with a sinus; petals 8-many; sepals 4-5, sometimes petaloid; carpels not embedded in the receptacle. **NYMPHAEACEAE**, p. 60
- a' Perianth parts about 15 or fewer; flowers hypogynous.
 - d Trees and shrubs; perianth parts similar, 9-15; stamens many; carpels many, separate or somewhat united; receptacle elongate. **MAGNOLIACEAE**, p. 56
 - d' Herbs; perianth zygomorphic, of 6 or 8 parts, largest and most conspicuous part cornucopia-shaped or saccate, spurred at base; stamens 5; ovary 5-loculed. **BALSAMINACEAE**, p. 238

KEY TO SECTIONS

- a Plants woody; flowers monosporangiate, the two kinds in separate clusters, one or both kinds in aments or heads; perianth absent or calyx present. SECTION I-B-1, p. 26
- a' Plants herbaceous or woody; if plants woody, then flowers bisporangiate, or clusters not as above, or both calyx and corolla present.
 - b Perianth none. SECTION I-B-2, p. 27
 - ✓ b' Perianth present (rarely absent in carpellate flowers but present in staminate flowers).
 - ✓ c Flowers hypogynous or perigynous.
 - d Either calyx or corolla present (usually calyx) but not both. SECTION I-B-3, p. 27
 - ✓ d' Both calyx and corolla present.
 - e Petals separate, at least below. SECTION I-B-4, p. 29
 - ✓ e' Petals more or less united. SECTION I-B-5, p. 34
 - c' Flowers epigynous (ovary wholly or partly inferior). SECTION I-B-6, p. 36

SECTION I-B-1. PLANTS WOODY; FLOWERS MONOSPORANGIATE, ONE OR BOTH KINDS IN AMENTS OR HEADS; COROLLA ABSENT

- a Both carpellate and staminate flowers in cylindric aments.
 - b Sepals 4, enlarged in fruit; stamens 4, opposite sepals; bracts small or absent; stigmas 2; fruit multiple; dioecious or sometimes monoecious. **MORACEAE**, p. 82
 - b' Perianth minute or absent or a small cuplike disk or 1-2 glands; bracts obvious.

- c Monoecious; carpellate bract subtending 2-3 flowers; styles or linear stigmas 2; fruit a nut or a samara; bracts often closed sacs. **BETULACEAE**, p. 92
- c' Dioecious; carpellate bract subtending 1 flower; style 1 or the 2-4, often bifid, stigmas sessile; fruit a capsule; seeds many, comate. **SALICACEAE**, p. 128
- a' Carpellate flowers not in cylindric aments.
- d Carpellate flowers in dense heads.
 - e Staminate flowers in cylindric aments and stem thornless, or in loose globular aments and stem usually thorny; style and stigma 1; fruit multiple. **MORACEAE**, p. 82
 - e' Staminate flowers in heads; carpellate heads peduncled and drooping; stem thornless.
 - f Staminate heads in erect racemes; stipule-rings absent. **HAMAMELIDACEAE**, p. 79
 - f' Staminate heads solitary, drooping; stipule-rings present. **PLATANACEAE**, p. 79
- d' Carpellate flowers not in dense heads, but solitary or few together or in budlike clusters or in few-flowered heads.
 - g Style and stigma 1; carpellate flowers solitary or in few-flowered heads, the staminate in umbels or short racemes; fruit a drupe. *Nyssa* in **CORNACEAE**, p. 213
 - g' Styles or stigmas or both 2 or more; fruit a nut; monoecious.
 - h Flowers appearing before leaves, the carpellate in small budlike clusters, 2 flowers under each bract, the staminate in cylindric aments. **BETULACEAE**, p. 92
 - h' Flowers appearing with or after leaves; carpellate flowers in an involucre or bur.
 - i Leaves pinnately compound; carpellate flowers solitary or in short spikes terminal on branches of current season; staminate aments elongate. **JUGLANDACEAE**, p. 86
 - i' Leaves simple; carpellate flowers axillary, solitary or few together, each in a cuplike involucre or 2-3 together in an involucre or bur; staminate flowers in erect spikes or in drooping slender or globular aments. **FAGACEAE**, p. 88

SECTION I-B-2. PERIANTH NONE

- a Trees; leaves opposite; flowers monosporangiate or bisporangiate, in panicles. **OLEACEAE**, p. 293
- a' Herbs.
 - b Sap milky; flowers monosporangiate, several staminate flowers and 1 carpellate flower within a calyxlike structure (cyathium); staminate flower of 1 stamen, carpellate of 3 united carpels. **EUPHORBIACEAE**, p. 218
 - b' Sap not milky; flowers not in a cyathium.
 - c Erect marsh herbs with ovate alternate leaves; flowers small, perfect, in nodding spikes. **SAURURACEAE**, p. 58
 - c' Aquatic herbs with tiny axillary solitary or clustered flowers.
 - d Leaves opposite, entire; flowers monosporangiate, 1-3 in axils; carpels 2, ovary 4-loculed. **CALLITRICHACEAE**, p. 290
 - d' Leaves whorled, dichotomously dissected; flowers monosporangiate, solitary; carpel and locule 1. **CERATOPHYLLACEAE**, p. 61

SECTION I-B-3. PERIANTH OF EITHER CALYX OR COROLLA BUT NOT BOTH

- a Carpels more than 1, separate.
 - b Vines; leaves opposite, mostly compound; usually dioecious. **RANUNCULACEAE**, p. 62
 - b' Prickly shrubs or small trees; flowers in axillary clusters appearing before or with pinnately compound leaves; corolla present, calyx absent. **RUTACEAE**, p. 234 (See b'.)
 - b'' Herbs or rarely non-prickly shrubs, not vines; carpels becoming achenes, follicles, or berries.
 - c Flowers hypogynous. **RANUNCULACEAE**, p. 62
 - c' Flowers perigynous. **ROSACEAE**, p. 168
- a' Carpels 2 or more, at least the ovaries united or partly united, or carpel 1.
 - d Herbs, sometimes herbaceous vines.
 - e Plants non-green, without chlorophyll; leaves small and scalelike. **MONOTROPACEAE**, p. 159
 - e' Plants green, with chlorophyll.
 - f Small decumbent plants of wet places; blades round-ovate; sepals 4, stamens 8, carpels 2; flower tinged with red or yellow. **SAXIFRAGACEAE**, p. 166

- f' Without the above set of characters.
 - g Ovary 1-loculed.
 - h Leaves 3-foliolate, pinnately compound, decompound, or whorled and dichotomously dissected.
 - i Submersed aquatics; leaves whorled, dissected. **CERATOPHYLLACEAE**, p. 61
 - i' Not submersed aquatics or, if so, then leaves not as above.
 - j Leaves 3-foliolate; stamens diadelphous. **FABACEAE**, p. 191
 - j' Leaves not 3-foliolate; stamens separate.
 - k Flower hypogynous; leaves decompound. **RANUNCULACEAE**, p. 62
 - k' Flower perigynous; leaves pinnately compound. **ROSACEAE**, p. 168
 - h' Leaves simple or compound but not as above.
 - l Some or all leaves opposite, palmately lobed or palmately compound; stigmas 2; locule 1; dioecious herbs; erect, or vines. **CANNABACEAE**, p. 82
 - l' Without the above set of characters.
 - m Leaves opposite.
 - n Calyx corollalike, investing ovary in such way that flower appears epigynous; bracts below flower or flower-cluster. **NYCTAGINACEAE**, p. 94
 - n' Calyx not as above.
 - o Filaments united in a tube; flowers in spikes or heads, often woolly; fruit a utricle. **AMARANTHACEAE**, p. 97
 - o' Filaments not united in a tube.
 - p Leaves minute and scalelike. **CHENOPODIACEAE**, p. 94
 - p' Leaves not as above.
 - q Style 1, elongate, or stigma a brushlike tuft. **URTICACEAE**, p. 84
 - q' Styles or stigmas or both 2 or more; stigma not brushlike.
 - r Flowers monosporangiate, the carpellate without perianth, enclosed by 2 bracts; fruit 1-seeded. **CHENOPODIACEAE**, p. 94
 - r' Flowers perfect or monosporangiate, not enclosed in bracts; calyx present; fruit 1-seeded or placenta free central. **CARYOPHYLLACEAE**, p. 100
 - m' Leaves alternate or all basal.
 - s Fruit a capsule, seeds more than 1; placentae 3, parietal.
 - t Plant stellate-pubescent; without stipules. **CISTACEAE**, p. 120
 - t' Plant glabrous or hairs simple; with stipules. **VIOLACEAE**, p. 121
 - s' Fruit 1-seeded, usually an achene or a utricle.
 - u Stipules sheathing; stems erect or trailing or twining, rarely prickly; fruit an achene. **POLYGONACEAE**, p. 107
 - u' Stipules absent or not sheathing; flowers small, often greenish.
 - v Style 1, sometimes very short, or absent; stigma 1 or a brushlike tuft. **URTICACEAE**, p. 84
 - v' Styles or stigmas or both 2-3; stigma not brushlike.
 - w Leaves spine-tipped, narrow. **CHENOPODIACEAE**, p. 94
 - w' Leaves not spine-tipped.
 - x Plants often mealy (with whitish scales); calyx herbaceous or fleshy; flowers bractless or the carpellate enclosed by 2 non-scarious bracts. **CHENOPODIACEAE**, p. 94
 - x' Plants not mealy; calyx usually scarious; each flower subtended, but not enclosed, by 1 or more dry or scarious, sometimes spiny, bracts. **AMARANTHACEAE**, p. 97
 - g' Ovary with 2 or more locules.
 - y Flowers monosporangiate (if rarely some perfect ones present, then blades large, peltate, lobed); styles 2-3, each often lobed or dissected; capsule 2-3-loculed, 1-2 seeds in each locule. **EUPHORBIACEAE**, p. 218
 - y' Flowers bisporangiate or other characters not as above.
 - z Leaves opposite or whorled.

- aa Leaves whorled; prostrate small herbs; flowers in small clusters; sepals 5; stamens 3-4; stigmas and locules 3. **MOLLUGINACEAE**, p. 100
- aa' Leaves opposite; septa of ovary sometimes incomplete.
 - bb Flower perigynous; style 1; sepals 4. **LYTHRACEAE**, p. 208
 - bb' Flower hypogynous; styles 2-5; sepals 5. **CARYOPHYLLACEAE**, p. 100
- z' Leaves alternate or all basal.
 - cc Locules of ovary 2.
 - dd Sepals 4; stamens 6, 4, or 2. **BRASSICACEAE**, p. 137
 - dd' Sepals 2; stamens many; blades palmately lobed. **PAPAVERACEAE**, p. 75
 - cc' Locules of ovary more than 2; sepals usually 5; stamens usually 10.
 - ee Locules usually 5; carpels united below (about halfway), divergent above, the beaks dehiscing crosswise. *Penthorum* in **SAXIFRAGACEAE**, p. 166
 - ee' Locules about 10; berry dark purple. **PHYTOLACCACEAE**, p. 94
- d' Woody plants.
 - ff Leaves and young stems covered with brownish or silvery peltate scales; carpel 1. **ELAEAGNACEAE**, p. 206
 - ff' Leaves and stems without such scales.
 - gg Anthers opening by uplifted lids; plants aromatic. **LAURACEAE**, p. 58
 - gg' Anthers not opening by uplifted lids.
 - hh Leaves or leaf-scars opposite; flowers sometimes monosporangiate.
 - ii Style 1; stamens usually 2; fruit a samara or drupe; calyx minute, 4-cleft or -toothed. **OLEACEAE**, p. 293
 - ii' Styles 2 (rarely more); stamens 4-10, often 8; fruit of 2 (rarely 3 or more) samaras; calyx evident or minute. **ACERACEAE**, p. 229
 - hh' Leaves or leaf-scars alternate.
 - jj Vines; sepals minute; petals sometimes coming off as a cap; stamens opposite petals; leaves palmately veined or compound. **VITACEAE**, p. 223
 - jj' Not vines.
 - kk Trees; leaves 2-ranked; stamens and sepals 5 or stamens and calyx-lobes 3-9; stigmas 2; fruit a samara or a drupe. **ULMACEAE**, p. 80
 - kk' Shrubs; leaves not 2-ranked or, if so, then stigma 1.
 - ll Leaves 2-ranked, stamens 8, sepals 4, flowers yellow, or leaves not 2-ranked, flowers pink; fruit a drupe. **THYMELAEACEAE**, p. 210
 - ll' Leaves not 2-ranked; flowers not pink.
 - mm Flowers greenish-white; stamens and sepals 5. **RHAMNACEAE**, p. 222
 - mm' Flowers yellowish; stamens and petals 4-5; sepals minute and deciduous. **AQUIFOLIACEAE**, p. 218

SECTION I-B-4. FLOWERS HYPOGYNOUS OR PERIGYNOUS;
PERIANTH OF BOTH CALYX AND COROLLA; PETALS SEPARATE

- a Stamens more than twice as many as petals.
- b Carpels 2 or more, separate or slightly united at base of ovaries.
 - c Carpels 5 (6), united about halfway, upper portions divergent as horns that dehisce crosswise in fruit; herbs; blades simple, serrate, elliptic. *Penthorum* in **SAXIFRAGACEAE**, p. 166
 - c' Plants not as above.
 - d Sepals, petals, and stamens attached to hypanthium (flower perigynous); sepals and petals usually 5; stipules usually present; herbaceous and woody. **ROSACEAE**, p. 168
 - d' Sepals, petals, and stamens attached to receptacle (flower hypogynous).
 - e Vines.
 - f Leaves simple, alternate, palmately veined; dioecious. **MENISPERMACEAE**, p. 75
 - f' Leaves compound, opposite; styles long, plumose in fruit. **RANUNCULACEAE**, p. 62
 - e' Not vines.
 - g Herbs.
 - h Aquatics with floating entire peltate blades; petals and sepals usually 3, purple. **CABOMBACEAE**, p. 61

- h' Not aquatics or, if rarely so, blades not as above. **RANUNCULACEAE**, p. 62
- g' Trees and shrubs.
 - i Twigs with complete stipule-rings; perianth-segments 9-18, similar, or sepals and petals somewhat differentiated. **MAGNOLIACEAE**, p. 56
 - i' Twigs without stipule-rings; sepals 3, petals 6, maroon. **ANNONACEAE**, p. 57
- b' Carpels 2 or more, at least the ovaries united, or carpel 1.
 - j Herbs and shrubs; leaves opposite, blades entire, gland-dotted; petals yellow, 4-5; styles and carpels 2-5; ovary 1-loculed, placentae parietal, or locules as many as carpels and placentae axile. *Hypericum* in **CLUSIACEAE**, p. 114
 - j' Without the above set of characters.
 - k Stamens many, filaments united in a sheath around styles; locules and styles or style-branches 5-many; corolla regular, petals 5; shrubs and herbs. **MALVACEAE**, p. 116
 - k' Without the above set of characters.
 - l Woody plants.
 - m Hoary-tomentose evergreen shrubs with scalelike leaves. **CISTACEAE**, p. 120
 - m' Not evergreen; leaves not scalelike.
 - n Leaves pinnately compound or decompound, present at anthesis; petals 1-5; ovary 1-loculed, parietal placenta 1. **CAESALPINIACEAE**, p. 188
 - n' Leaves simple; flowers sometimes appearing before leaves.
 - o Anthers opening by uplifted lids; plants aromatic. **LAURACEAE**, p. 58
 - o' Anthers opening otherwise.
 - p Flower perigynous; ovary 1-loculed; leaves sometimes appearing after flowers; peduncle not adnate to bract. **ROSACEAE**, p. 168
 - p' Flower hypogynous; ovary 5-loculed; leaves present before flowers; peduncle adnate to large bract. **TILIACEAE**, p. 116
 - l' Herbs.
 - q Ovary 1-loculed.
 - r Placenta 1, parietal, or seed or seeds basally attached.
 - s Stipules sheathing; fruit an achene. **POLYGONACEAE**, p. 107
 - s' Stipules absent or not sheathing.
 - t Flowers to 5 cm wide, usually solitary; corolla regular; flowering plant with 2 half-circular lobed leaves. **Berberidaceae**, p. 73
 - t' Flowers much smaller than above or spurred, irregular, in racemes or panicles; leaves not as above. **RANUNCULACEAE**, p. 62
 - r' Placentae 2 or more, parietal.
 - u Leaves palmately compound, leaflets 3-7; petals and sepals 4; placentae 2. **CAPPARACEAE**, p. 136
 - u' Leaves not palmately compound.
 - v Blades entire, lanceolate or very small; sepals 5, 2 smaller, or sepals 3, persistent; petals mostly 3-5. **CISTACEAE**, p. 120
 - v' Blades not as above; sepals usually 2, early deciduous; petals 4 to 8 to many; juice colored or milky. **PAPAVERACEAE**, p. 75
 - q' Ovary with 2 or more locules.
 - w Leaves pitcher-shaped; flowers large; bog herbs. **SARRACENIACEAE**, p. 120
 - w' Leaves not pitcher-shaped.
 - x Flowers monosporangiate; plants stellate-hairy. **EUPHORBIACEAE**, p. 218
 - x' Flowers perfect, zygomorphic; filaments united in a split sheath; locules 2; sepals 5, 2 larger; petals 3. **POLYGONACEAE**, p. 107 (See x".)
 - x" Flowers perfect; filaments separate; locules 5. *Penthorum* in **SAXIFRAGACEAE**, p. 120
 - a' Stamens not more than twice the petals.
 - y Flower with a fringed corona; vines with tendrils; blades palmately lobed. **PASSIFLORACEAE**, p. 126
 - y' Flower without a fringed corona.
 - z Stamens the same number as the petals and opposite them.

- aa Woody vines, usually with tendrils; calyx minute; ovary 2-loculed; blades simple and broadly ovate, or compound, usually palmately veined. **VITACEAE**, p. 223
- aa' Shrubs and small trees; calyx evident; ovary 2-5-loculed; blades not as above. **RHAMNACEAE**, p. 222 (See aa".)
- aa" Shrubs and herbs; ovary 1-loculed.
 - bb Anthers opening by uplifted lids; ovules basal or placentate 1, parietal. **BERBERIDACEAE**, p. 73
 - bb' Anthers opening otherwise.
 - cc Calyx usually 5-parted (4-7); placenta free central. **PRIMULACEAE**, p. 160
 - cc' Sepals 2; placenta free central or basal. **PORTULACACEAE**, p. 99
- z' Stamens the same number as petals and alternate with them, or more or fewer than petals.
- dd Carpels 2 or more, separate or only slightly united.
 - ee Styles, or stigmas, or both, united; ovaries separate.
 - ff Trees; leaves pinnately compound; flowers in large panicles. **SIMAROUBACEAE**, p. 233
 - ff' Herbs.
 - gg Carpels 2, stigmas united, styles separate; stamens usually united with stigma; pollen in pollinia. **ASCLEPIADACEAE**, p. 252
 - gg' Carpels 2-3, bases of styles united; blades pinnately divided; flowers axillary; diffuse small herbs. **LIMNANTHACEAE**, p. 238
 - ee' Styles and stigmas separate; ovaries separate or slightly united at base.
 - hh Trees or vines; flowers monosporangiate; leaves simple, palmately veined.
 - ii Vines; dioecious; flowers in racemes or panicles. **MENISPERMACEAE**, p. 75
 - ii' Trees; monoecious; flowers in spherical heads. **PLATANACEAE**, p. 79
 - hh' Plants herbaceous or flowers perfect.
 - jj Leaves thick and fleshy and petals 4-5; sepals and carpels 4-5; stamens 8-10; herbs; blades simple. **CRASSULACEAE**, p. 165
 - jj' Plants not as above.
 - kk Carpels 2, or 5 (dehiscing crosswise), united below, summits separate and often divergent; herbs; leaves simple; fruit a capsule or 2 follicles. **SAXIFRAGACEAE**, p. 166
 - kk' Carpels more than 2, or leaves compound, or both; herbs and shrubs; fruit an aggregate of achenes, berries, drupes, or follicles.
 - ll Flowers hypogynous. **RANUNCULACEAE**, p. 62
 - ll' Flowers perigynous. **ROSACEAE**, p. 168
 - dd' Carpels 2 or more, at least the ovaries united, or carpel 1.
 - mm Leaves opposite, simple, entire, gland-dotted; petals yellow or pink; rarely blades not dotted, then petals pink and plants marsh herbs; locules 3-5 or placentae parietal and locule 1; herbs and shrubs. *Hypericum* in **CLUSIACEAE**, p. 114
 - mm' Leaves not opposite, simple, entire, and gland-dotted, or one or more other characters not as above.
 - nn Trees, shrubs, and woody vines.
 - oo Leaves opposite.
 - pp Corolla not regular; leaves palmately compound. **HIPPOCASTANACEAE**, p. 228
 - pp' Corolla regular.
 - qq Flower with prominent disk which appears to cover ovary; locules 2-5; small trees and prostrate or erect shrubs, sometimes evergreen; leaves simple, pinnately veined; seeds with arils. **CELASTRACEAE**, p. 216
 - qq' Plants not as above.
 - rr Petals 4, linear; sepals 4, minute; stamens 2, rarely more; locules 2; fruit a drupe; blades entire. **OLEACEAE**, p. 293
 - rr' Petals, sepals, and stamens 5; locules 3; fruit a bladder capsule; blades 3-foliate. **STAPHYLEACEAE**, p. 227 (See rr".)
 - rr" Petals and sepals usually about 5; stamens 4-10, often 8; locules 2, rarely more; fruit of 2 (rarely more) united samaras; blades not entire, usually palmately lobed. **ACERACEAE**, p. 229
 - oo' Leaves alternate.

- ss Evergreen shrubs; blades scalelike, or entire and revolute-margined.
- tt Leaves small, scalelike; hoary-tomentose. **CISTACEAE**, p. 120
- tt' Leaves not scalelike; blades entire, revolute-margined; anthers opening by terminal pores. **ERICACEAE**, p. 155
- ss' Leaves deciduous, or blades not as above.
- uu Vines; leaves simple; flowers in a terminal panicle; fruit an orange capsule, locules 3, seeds with arils. **CELASTRACEAE**, p. 216
- uu' Not vines or, if so, then leaves compound.
- vv Ovary 1-loculed; trees, shrubs, and vines.
- ww Stigmas 3, styles 3 or partly united or short; petals 5, small, corolla regular; fruit a drupe. **ANACARDIACEAE**, p. 231
- ww' Stigma and style 1; petals usually 5 (3-5); corolla regular or zygomorphic; fruit a legume. **CAESALPINIACEAE**, p. 188
- vv' Ovary with 2 or more locules.
- xx Leaves simple; locules 4-8; flowers axillary. **AQUIFOLIACEAE**, p. 218
- xx' Leaves 3-foliolate, bladelets dotted; locules 2; flowers in terminal clusters. **RUTACEAE**, p. 234
- nn' Herbs, including herbaceous vines and small plants slightly woody at base.
- yy Petals 5, corolla usually zygomorphic; stamens 5 or 10 (9); stigma, style, and locule 1; placenta 1, parietal; fruit 1-many-seeded, a legume or indehiscent; leaves usually compound, with pulvini. **CAESALPINIACEAE**, p. 188
- yy' Without the above set of characters.
- zz Fleshy non-green plants or small evergreens; stamens 8-10, twice the petals; locules 4-5; style 1; stigma large.
- aaa Plants green; anthers opening by basal pores, but later bent back against filaments, pores then appearing apical; pollen in tetrads. **PYROLACEAE**, p. 158
- aaa' Plants without chlorophyll; anthers opening by slits; pollen grains single. **MONOTROPACEAE**, p. 159
- zz' Plants green, no evergreen or, if so, not as above.
- bbb Hypanthium globose, tubular, or urn-shaped. **LYTHRACEAE**, p. 208
- bbb' Hypanthium absent or not as above.
- ccc Blades circular or spatulate, covered with reddish glandular hairs; small bog herbs. **DROSERACEAE**, p. 120
- ccc' Plants not as above.
- ddd Ovary 1-loculed.
- eee Placenta free central or basal; leaves opposite or whorled, entire. **CARYOPHYLLACEAE**, p. 100
- eee' Placenta or placentae parietal, or leaves not as above.
- fff Placenta 1, or indehiscent fruit 1-seeded, or both.
- ggg Placenta 1, parietal; seeds more than 1.
- hhh Sepals, petals, and stamens 5. **CAESALPINIACEAE**, p. 188
- hhh' Sepals 6, falling early; petals 6-9; flowering plant with 2 half-circular leaves. **BERBERIDACEAE**, p. 73
- ggg' Fruit 1-seeded.
- iii With sheathing stipules. **POLYGONACEAE**, p. 107
- iii' Stipules absent or not sheathing; petals 4.
- jjj Sepals 2; corolla irregular. **FUMARIACEAE**, p. 77

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- www Plants prostrate; blades pinnately compound; flowers axillary, solitary; fruit spiny. **ZYGOPHYLLACEAE**, p. 234
- www' Plants not as above.
- xxx Blades 3-foliolate; stamens 10. **OXALIDACEAE**, p. 235
- xxx' Blades lobed to compound but not 3-foliolate; stamens 5 or 10; fruit with long beak. **GERANIACEAE**, p. 236

SECTION I-B-5. FLOWERS HYPOGYNOUS OR PERIGYNOUS;
PERIANTH OF BOTH CALYX AND COROLLA; PETALS UNITED

- a Stamens more numerous than corolla-lobes.
 - b Ovary 1-loculed; style 1; placentation parietal; leaves alternate or basal.
 - c Placenta and stigma 1; petals 5 (3-5); corolla zygomorphic or regular; stamens 10 (3-10); herbaceous or woody; leaves mostly 1-2 times compound. **FABACEAE**, p. 191
 - c' Placenta and stigma 1; petals 2; sepals 5, petaloid. **RANUNCULACEAE**, p. 62 (See c".)
 - c" Placentae 2, stigma 2-lobed; petals 4; corolla zygomorphic or isobilateral; stamens 6; herbs; leaves decompound or dissected. **FUMARIACEAE**, p. 77
 - b' Ovary with 2 or more locules.
 - d Styles or style-branches 5 to many; stamens many, filaments united in a column around style or styles; locules 5 to many; herbs or shrubs. **MALVACEAE**, p. 116
 - d' Plants not as above.
 - e Trees and shrubs, including some small evergreen scarcely woody plants.
 - f Styles 4 or united below; deciduous trees; flowers monosporangiate or some perfect; mostly dioecious; petals 4, stamens 16 in staminate flowers. **EBENACEAE**, p. 159
 - f' Style 1 or absent; often evergreen, sometimes small and scarcely woody; flowers usually perfect; petals 5 (4); stamens to twice as many. **ERICACEAE**, p. 155
 - e' Herbs.
 - g Corolla regular, petals 5; locules 5; blades 3-foliolate. **OXALIDACEAE**, p. 235
 - g' Corolla zygomorphic, petals 3; locules 2; blades simple. **POLYGALACEAE**, p. 226
- a' Stamens as many as or fewer than corolla-lobes.
 - h Stamens opposite corolla-lobes and as many as corolla-lobes; corolla regular, the lobes obvious; style 1; placenta free central; fruit a capsule. **PRIMULACEAE**, p. 160
 - h' Stamens alternate with corolla-lobes or fewer than corolla-lobes; corolla regular or not.
 - i Corolla scarious, veinless, usually 4-lobed, persistent on fruit; flowers small, in spikes or heads; herbs; usually, leaves basal and ribbed lengthwise. **PLANTAGINACEAE**, p. 291
 - i' Plants not as above.
 - j Plants without chlorophyll; leaves small or bractlike.
 - k White or yellow twining stem-parasites; styles and locules 2. **CUSCUTACEAE**, p. 262
 - k' Not twining; root-parasites; style and locule 1. **OROBANCHACEAE**, p. 309
 - j' Plants green, with ordinary leaves.
 - l Carpels 2, ovaries separate; stigmas, or styles, or both, united; blades entire.
 - m Styles and stigmas united; stamens separate; pollen of simple grains. **APOCYNACEAE**, p. 251
 - m' Styles separate, stigmas united; stamens usually united and adnate to stigma; pollen in pollinia. **ASCLEPIADACEAE**, p. 252
 - l' Carpels 2 or more, at least the ovaries united, or carpel 1; ovary sometimes 4-lobed and having the appearance of 4 separate ovaries.
 - n Ovary actually or appearing 4-loculed, separating at maturity into four 1-seeded (or rarely two 2-seeded) nutlets; corolla 4-5-toothed or -lobed.
 - o Leaves alternate; stamens 5. **BORAGINACEAE**, p. 268
 - o' Leaves opposite; stamens 4 or 2; style-tip 2-lobed; stem often square.
 - p Ovary usually not deeply 4-lobed; style apical, only 1 lobe stigmatic; plants often not aromatic; stamens 4. **VERBENACEAE**, p. 273

- p' Ovary usually deeply 4-lobed; style usually basal; foliage nearly always gland-dotted and aromatic; stamens 4 or 2. **LAMIACEAE**, p. 275
- n' Ovary not as above.
 - q Style, stigma, locule, and parietal placentula 1; herbs and woody plants; leaves compound or decomposed, alternate, with pulvini. **CAESALPINIACEAE**, p. 188
 - q' Without the above set of characters.
 - r Trees, shrubs, and woody vines.
 - s Anthers opening by terminal pores; not vines; deciduous or evergreen. **ERICACEAE**, p. 155
 - s' Anthers not opening by terminal pores or, if so, then plants vines.
 - t Leaves opposite or whorled.
 - u Corolla regular; petals 4; stamens usually 2. **OLEACEAE**, p. 293
 - u' Corolla somewhat zygomorphic; petals 5; fertile stamens 2-4.
 - v Trees, shrubs, and vines; capsule linear or lance-linear. **BIGNONIACEAE**, p. 311
 - v' Trees; capsule ovoid. **SCROPHULARIACEAE**, p. 296
 - t' Leaves alternate.
 - w Flowers about 1 cm wide; berry red; ovules many; locules 2; shrubs and somewhat woody vines, deciduous. **SOLANACEAE**, p. 255
 - w' Flowers smaller than above; fruit a drupe.
 - x Shrubs and vines; deciduous; ovary 1-loculed; stigmas 3. **ANACARDIACEAE**, p. 231
 - x' Shrubs and small trees; sometimes evergreen; ovary with 4-8 locules. **AQUIFOLIACEAE**, p. 218
 - r' Herbaceous plants, sometimes herbaceous vines.
 - y Aquatic or mud plants; leaves linear or dissected, bearing tiny bladders; corolla zygomorphic; stamens 2. **LENTIBULARIACEAE**, p. 312
 - y' Plants not as above.
 - z Ovary 1-loculed.
 - aa Corolla and calyx 2-lipped; flowers 6-8 mm long, in spikes; fruit reflexed, 1-seeded; leaves opposite. *Phryma* in **VERBENACEAE**, p. 273
 - aa' Plants not as above; placentulae usually 2, parietal.
 - bb Fertile stamens 4; corolla 5-lobed, 2-3 cm long; placentulae 2, T-shaped; capsule 2-horned. **PEDALIACEAE**, p. 311
 - bb' Fertile stamens as many as corolla-lobes.
 - cc Leaves alternate, opposite, or whorled; blades scalelike, or floating, or entire, or 3-foliate; placentulae 2 or rarely ovules on most of inner surface of ovary; mostly glabrous. **GENTIANACEAE**, p. 249
 - cc' Leaves alternate; blades lobed to compound, not scalelike, not floating, not entire, not 3-foliate; placentulae 2; usually hairy. **HYDROPHYLLACEAE**, p. 266
 - z' Ovary with 2 or more locules.
 - dd Flowers very small, in small axillary peduncled heads; mature fruit separating into two 1-seeded nutlets. **VERBENACEAE**, p. 273
 - dd' Plant not as above.
 - ee Fertile stamens 5 (or nearly always 5), as many as petals; corolla lobed or entire, regular or nearly so, not 2-lipped.
 - ff Vines or, if not, then 2 large bracts beneath the calyx, more or less covering it; corolla usually large and trumpet-shaped, often entire. **CONVOLVULACEAE**, p. 260
 - ff' Not vines; without such bracts beneath the calyx.
 - gg Anthers opening by terminal slits or pores, or connate or connivent in a cone, or both. **SOLANACEAE**, p. 255
 - gg' Anthers not as above.

- hh Stigmas 3; ovary 3-loculed; leaves simple and entire or compound with entire leaflets or pinnately parted into linear segments. **POLEMONIACEAE**, p. 264
- hh' Stigmas and locules not 3, or leaves not as above.
 - ii Blades compound or pinnatifid or palmately lobed; style cleft at apex or styles 2; locules 2. **HYDROPHYLLACEAE**, p. 266
 - ii' Blades entire, toothed, or shallowly pinnately lobed; style 1; stigma 1 or somewhat lobed.
 - jj Flowers in elongate single or paniced racemes or spikes; locules 2; corolla rotate or saucer-shaped, not plaited. **SCROPHULARIACEAE**, p. 296
 - jj' Flower-clusters not as above; locules 2-4, if 2, then corolla tubular, funnellform, or salverform, plaited and often twisted in bud; calyx often enlarged in fruit. **SOLANACEAE**, p. 255
- ee' Fertile stamens 4 or 2, fewer than corolla-lobes or, if the same number as corolla-lobes, then corolla irregular; locules 2.
- kk Seeds few (about 2-8) in each locule; leaves simple, opposite, blade-margins usually entire or nearly so; seeds on curved projections; capsule splitting to base elastically; if stamens are 4, then corolla is not 2-lipped. **ACANTHACEAE**, p. 310
- kk' Seeds many in each locule; leaves alternate or opposite, blade-margins various; seed-stalks and capsule not as above; if, rarely, locules are few-seeded, then usually stamens are 4 and corolla is 2-lipped. **SCROPHULARIACEAE**, p. 296

SECTION I-B-6. FLOWERS WHOLLY OR PARTIALLY EPIGYNOUS

- a Herbs.
 - b Flowers in involucrate heads; ovary 1-loculed; fruit an achene.
 - c Stamens 2-4, separate; flowers perfect; corollas tubular; calyx small, cup-shaped; leaves opposite; awns of bracts of receptacle exceeding flowers. **DIPSACACEAE**, p. 328
 - c' Stamens 5, filaments separate, anthers usually united in ring around style; flowers bisporangiate, monosporangiate, or neutral; corollas all tubular, all ligulate, or both kinds in same head; leaves opposite, alternate, or whorled, sometimes all basal. **ASTERACEAE**, p. 328
 - b' Flowers not in involucrate heads or, if so, then ovary not 1-loculed.
 - d Aquatic, some or all leaves submersed, dissected; flowers emersed.
 - e Flowers axillary or in spikes; sepals 3-4; petals 4 or none. **HALORAGACEAE**, p. 207
 - e' Flowers in umbels; perianth parts in 5's. *Sium* in **APIACEAE**, p. 240
 - d' Not aquatics as described above.
 - f Either calyx or corolla present, but not both.
 - g Small plant with decumbent stem, blades round-ovate; carpels 2, united below, ovary 1-loculed below; sepals usually 4; stamens at edge of disk, anthers yellow to red. **SAXIFRAGACEAE**, p. 166
 - g' Plants not as above.
 - h Ovary 1-loculed; sepals 5; stamens 5. **SANTALACEAE**, p. 216
 - h' Ovary with more than 1 locule, or calyx minute or pappuslike.
 - i Perianth parts (petals) 5.
 - j Petals united; stamens usually 1-3 (-5); locules 1, or locules 3, 2 empty; calyx minute or expanding late and appearing pappuslike. **VALERIANACEAE**, p. 326
 - j' Petals separate; flowers in umbels or rarely in heads.
 - k Styles 2, with stylopodium; petiole-bases sheathing; fruit dry, the two 1-seeded carpels separating at maturity. **APIACEAE**, p. 240
 - k' Styles 2-5, without stylopodium; if only 2, then plant with a single whorl of palmately compound leaves; fruit a berry or drupe. **ARALIACEAE**, p. 239

- i' Perianth parts (petals or sepals) 4 or 3.
 - l Leaves alternate, sometimes basal; ovary 6-loculed; sepals 3. **ARISTOLOCHIACEAE**, p. 59
 - l' Leaves opposite, whorled, or alternate; locules fewer.
 - m Locules of ovary 4; sepals and stamens 4; leaves not whorled. **ONAGRACEAE**, p. 210
 - m' Locules of ovary 2; petals and stamens 3 or 4; leaves whorled. **RUBIACEAE**, p. 316
- f' Both calyx and corolla present.
 - n Petals separate.
 - o Sepals 2; ovary 1-loculed.
 - p Leaves entire, fleshy; capsule circumscissile. **PORTULACACEAE**, p. 99
 - p' Leaves toothed, not fleshy; fruit indehiscent. **ONAGRACEAE**, p. 210
 - o' Sepals more than 2 or ovary more than 1-loculed or both.
 - q Ovary only partly inferior; carpels 2, more or less united below; ovary 2-loculed or 1-loculed with 2 parietal placentae; petals 5, stamens 5-10. **SAXIFRAGACEAE**, p. 166
 - q' Ovary wholly inferior or nearly so.
 - r Flowers in dense terminal cluster subtended by 4 large petaloid bracts; petals, sepals, and stamens 4. **CORNACEAE**, p. 213
 - r' Flower clusters not subtended by large petaloid bracts.
 - s Flowers not in umbels or heads; petals usually 4 (2-6), stamens as many or twice as many. **ONAGRACEAE**, p. 210
 - s' Flowers in umbels or rarely in heads; petals and stamens usually 5.
 - t Styles 2, with stylopodia; petiole bases sheathing; fruit dry, the two 1-seeded carpels separating at maturity. **APIACEAE**, p. 240
 - t' Styles 2-5, without stylopodia; if only 2, then plant with a single whorl of palmately compound leaves; fruit a berry or drupe. **ARALIACEAE**, p. 239
 - n' Petals united.
 - u Leaves alternate on the stem or basal.
 - v Stamens usually 3; flowers monosporangiate; vines with tendrils. **CUCURBITACEAE**, p. 126
 - v' Stamens 5; flowers bisporangiate; not vines.
 - w Stamens opposite the petals; placenta free, central; ovary only partly inferior. **PRIMULACEAE**, p. 160
 - w' Stamens alternate with the petals; ovary 2-several-loculed, wholly inferior. **CAMPANULACEAE**, p. 313
 - u' Leaves opposite or whorled.
 - x Corolla-lobes 4, rarely 3; stamens 4, rarely 3; ovary 2-loculed or, if 4-loculed, then plant a small prostrate evergreen; leaves opposite with stipules or whorled without apparent stipules. **RUBIACEAE**, p. 316
 - x' Corolla-lobes 5; leaves opposite, stipules present or absent.
 - y Ovary 3-5 loculed; stamens 5; calyx deeply parted. **CAPRIFOLIACEAE**, p. 320
 - y' Ovary 3-loculed, 2 locules empty, or 1-loculed; ovule 1; stamens usually 1-3 (5); calyx minute or expanding late and becoming pappuslike. **VALERIANACEAE**, p. 326
 - a' Woody plants, including a few small scarcely woody evergreens.
 - z Leaves opposite or whorled.
 - aa Petals separate.
 - bb Stamens 4; ovary 2-loculed, 1 ovule in each locule; fruit a drupe. **CORNACEAE**, p. 213
 - bb' Stamens 8 to many; ovary 2-4-loculed, 2 or more ovules in each locule; fruit a capsule. **HYDRANGEACEAE**, p. 163
 - aa' Petals united.
 - cc Corolla 4-lobed; erect shrubs or small trees with flowers in heads, or small evergreens with prostrate stems. **RUBIACEAE**, p. 316
 - cc' Corolla 5-lobed or, if rarely 4-lobed, then plants erect shrubs with flowers not in heads. **CAPRIFOLIACEAE**, p. 320
 - z' Leaves alternate.
 - dd Flowers monosporangiate, the staminate in loose globular clusters or in erect spikes, carpellate flowers and fruits within a bur. **FAGACEAE**, p. 88

- dd' Flowers bisporangiate, or clusters not as above.
- ee Ovary 1-loculed.
 - ff Shrubs, sometimes prickly; petals, sepals, and stamens 5; epigynous hypanthium present; blades palmately lobed. **GROSSULARIACEAE**, p. 163
 - ff' Trees, without prickles; hypanthium absent; sepals and petals about 5, small or petals none; stamens about 10; leaves pinnately veined, entire or nearly so. *Nyssa* in **CORNACEAE**, p. 213
- ee' Ovary 2-5 loculed; petals present; sepals present or absent, sometimes minute or represented by only a rim.
 - gg Petals separate.
 - hh Petals, sepals, and stamens 4; ovary 2-loculed.
 - ii Petals white; flowers in terminal clusters; style 1. **CORNACEAE**, p. 213
 - ii' Petals yellow; flowers in axillary clusters; styles 2. **HAMAMELIDACEAE**, p. 79
 - hh' Petals and sepals 5; stamens 5-many.
 - jj Stamens as many as petals and opposite them; only base of ovary inferior; leaves simple. **RHAMNACEAE**, p. 222
 - jj' Stamens alternate with petals or more than petals; ovary wholly inferior or nearly so.
 - kk Leaves decomposed; stems and leaves with prickles; flowers in umbels; calyx small. **ARALIACEAE**, p. 239
 - kk' Leaves simple or once compound; stamens 5 to many; flower clusters various; calyx evident. **ROSACEAE**, p. 168
 - gg' Petals united; stamens as many as petals to twice as many or more.
 - ll Pollen sacs opening by terminal pores, or plants small trailing leafy evergreens; stamens not united in a ring at base. **ERICACEAE**, p. 155
 - ll' Pollen sacs not opening by pores; deciduous trees and shrubs; stamens united in a ring; ovary sometimes 1-loculed above. **STYRACACEAE**, p. 160

SECTION II-B. MONOCOTYLEDONS (CLASS LILIOPSIDA)

- a Flowers without typical perianth (sometimes with perianth of scales or bristles); if with minute perianth, then on a spadix, with or without a spathe.
- b Plant body thalluslike, about 1 cm long and wide or less, with or without roots; thalli solitary or in colonies; flowers seldom observed; floating aquatics. **LEMNACEAE**, p. 387
- b' Plants with stems and leaves; aquatic or terrestrial.
 - c Flowers on a spadix subtended by a spathe. **ARACEAE**, p. 386
 - c' Flowers not on a spadix subtended by a spathe.
 - d Flowers subtended by or enclosed by scales or glumes; leaves sheathing.
 - e Flowers enclosed by 2 glumes (lemma and palea); perianth represented by 2 or 3 scales (lodicules); leaf-sheaths usually open. **POACEAE**, p. 421
 - e' Flowers in axil of a single glume, sometimes a second glume forming an enclosing sac around the ovary; leaf-sheaths usually closed. **CYPERACEAE**, p. 394
 - d' Flowers not subtended by or enclosed by glumes.
 - f Erect herbs of aquatic or mud habitats; if aquatic, stems and leaves emerged; flowers in dense spikes or heads; leaves linear.
 - g Flowers in a solitary dense terminal spike, staminate flowers above, carpellate flowers below. **TYPHACEAE**, p. 462
 - g' Flowers in heads scattered along upper part of stem or its branches, staminate heads above, carpellate below. **SPARGANIACEAE**, p. 461 (See g".)
 - g" Flowers in a dense spike (spadix) borne laterally on edge of flattened scape; rhizome aromatic. **ACORACEAE**, p. 385
 - f' Submersed aquatics; floating leaves sometimes present also.
 - h Leaves alternate or, if opposite, then entire; flowers in elongate or capitate spikes or in axillary clusters.
 - i Leaves alternate or the upper opposite; flowers bisporangiate, in peduncled elongate or capitate spikes. **POTAMOGETONACEAE**, p. 382

- i' Leaves opposite; flowers monosporangiate, sessile or nearly so, both kinds clustered in the same axil. **ZANNICHELLIACEAE**, p. 385
 - h' Leaves opposite, usually toothed, linear, widened at base; flowers solitary, axillary, sessile. **NAJADACEAE**, p. 384
- a' Flowers with typical perianth.
 - j Flowers hypogynous.
 - k Carpels 2 or more, separate or slightly united at base.
 - l Carpels 3 or 6, becoming follicles.
 - m Flowers in umbels; carpels 6; stamens 9. **BUTOMACEAE**, p. 379
 - m' Flowers in racemes; carpels 3 or 6; stamens 3-6. **JUNCAGINACEAE**, p. 382
 - l' Carpels more than 6, becoming achenes; flowers whorled on axis of raceme or panicle. **ALISMACEAE**, p. 380
 - k' Carpels 2 or more, ovaries united; styles and/or stigmas may be separate.
 - n Flowers small, in small solitary heads on leafless scapes, each flower in axil of a bract; leaves all basal. **XYRIDACEAE**, p. 389
 - n' Flowers not in solitary heads at end of leafless scapes; if flowers in heads, then heads not solitary, or flowers not as above.
 - o Flowers with a glumaceous perianth of 6 similar divisions; stamens 3 or 6; leaves linear, flat or terete, sometimes septate. **JUNCACEAE**, p. 390
 - o' Perianth petaloid or of 3 green sepals and 3 colored or white petals.
 - p Terrestrial plants.
 - q Perianth of 6 (rarely 4) similar parts; stamens 6 (rarely 4).
 - r Leaves stiff, linear, spine-tipped; perianth segments large, 5-7 cm long. *Yucca* in **AGAVACEAE**, p. 475
 - r' Leaves relatively broad and net-veined, petioles well defined; flowers in small umbels; plants usually with stipular tendrils. *Smilax* in **SMILACACEAE**, p. 476 (See r".)
 - r" Leaves soft, linear (grass-like) or blades expanded, not net-veined or petiolate; flower solitary or inflorescence various. **LILIACEAE**, p. 463
 - q' Perianth of 3 green sepals and 3 white or colored petals.
 - s Leaves alternate, parallel-veined; corolla regular or zygomorphic, ephemeral. **COMMELINACEAE**, p. 390
 - s' Leaves in whorls of 3, usually not parallel-veined; corolla regular, not ephemeral. *Trillium* in **LILIACEAE**, p. 463
 - p' Aquatic or marsh plants.
 - t Perianth tubular or funnelform, limb 2-lipped or equally 6-lobed. **PONTEDERIACEAE**, p. 462
 - t' Perianth divided to base or nearly so.
 - u Flowers in a raceme; stamens 3 or 6. **JUNCAGINACEAE**, p. 382
 - u' Flowers in an umbel; stamens 9. **BUTOMACEAE**, p. 379
 - j' Flowers epigynous.
 - v Aquatic, submersed; leaves short, sessile, in crowded whorls, or long and ribbonlike; carpellate flowers eventually floating as a result of elongation of stipe or of hypanthium base. **HYDROCHARITACEAE**, p. 381
 - v' Not aquatic or, if rarely aquatic, then stem and leaves emersed.
 - w Dioecious; vines with longitudinally-ribbed whorled or alternate leaves and small greenish- white flowers in axillary panicles or spikes. **DIOSCOREACEAE**, p. 477
 - w' Not dioecious; not vines.
 - x Stamens 6. **LILIACEAE**, p. 463
 - x' Stamens 3. **IRIDACEAE**, p. 477 (See x".)
 - x" Stamens 1 or 2, united with upper portion of gynoecium. **ORCHIDACEAE**, p. 479