

SIMAROUBACEAE (Quassia Family)

A family of about 13 genera and 111 species, trees and shrubs of primarily tropical areas of the New World and Old World. The Leitneriaceae has been traditionally considered to be a monotypic family, endemic to se. North America; a variety of recent studies have suggested its inclusion in the Simaroubaceae (Angiosperm Phylogeny Group 1998, 2003; Bogle in FNA (1997). References: Angiosperm Phylogeny Group (1998, 2003).

- 1 Leaves compound; [species alien, aggressively naturalizing in upland sites] **Ailanthus**
- 1 Leaves simple; [species native, in wetland sites] **Leitneria**

Ailanthus Desfais (Tree-of-Heaven)

A genus of 5 species, trees, native to Asia and Australia. References: Hu (1979).

* **Ailanthus altissima** (P. Miller) Swingle, Tree-of-Heaven, Copal Tree, Stink-tree. Pd, Mt, Cp (GA, NC, SC, VA): roadsides, forests, disturbed areas, including cities, especially in moist, fertile soils; common, native of e. Asia. Late May-early June; July-October. In our area, this tree is now an aggressive and noxious weed, colonizing even undisturbed forests and outcompeting the native vegetation. As serious a weed as it is here, it is (at the time of this writing, at least), much worse to the north, now the dominant tree in fencerows, woodlots, and forests in the urbanized, suburbanized, and even rural Northeast. It can be recognized vegetatively by its large pinnately compound leaves, very stout twigs (over 1 cm thick), and the characteristic and unpleasant odor of the crushed foliage. [= RAB, C, F, G, K, S, W]

Leitneria Chapman (Corkwood)

A monotypic genus, endemic to se. North America. References: Bogle in FNA (1997); Channell & Wood (1962).

Leitneria floridana Chapman, Corkwood. Cp (GA): swamps and cabbage palm / sawgrass marshes; rare (GA Special Concern). This species occurs in scattered sites from the Coastal Plain of sw. GA west to e. TX, and north in the Mississippi Embayment to AR and MO. [= FNA, GW, K, S]

SOLANACEAE (Nightshade Family)

A family of about 94 genera and nearly 3000 species, shrubs, trees, vines, and herbs, nearly cosmopolitan but especially diverse in South America. References: Hunziker (2001).

- Subfamily Cestroideae, Tribe Cestreae: *Cestrum*
- Subfamily Cestroideae, Tribe Nicotianeae: *Calibrachoa*, *Nicotiana*, *Nierembergia*, *Petunia*
- Subfamily Solanoideae, Tribe Solaneae: *Capsicum*, *Physalis*, *Salpichroa*, *Solanum*
- Subfamily Solanoideae, tribe Datureae: *Datura*
- Subfamily Solanoideae, tribe Lycieae: *Lycium*
- Subfamily Solanoideae, tribe Nicandreae: *Nicandra*

Calibrachoa Llave & Lexarza (Seaside Petunia)

A genus of {}. references: Hunziker (2001)=Z.

* **Calibrachoa parviflora** (Antoine Laurent de Jussieu) D'Arcy, Wild Petunia, Seaside Petunia. Cp (NC, VA): upper edges of salt marshes, waste areas, garbage dumps; rare, naturalized from tropical America. Tatnall (1946) documents its occurrence in Virginia: "upper edge of salt marsh, Wachapreague," Accomack Co., Fernald & Long 4169, 26 July 1934. [= K; *Petunia parviflora* Antoine Laurent de Jussieu -- RAB, C, F, G, S, Z]

Capsicum Linnaeus (Red Pepper, Chile)

A genus of about 10 species, herbs and shrubs, of tropical America.

* **Capsicum annum** Linnaeus, Red Pepper, Chile. Pd, Cp (NC, SC, VA): naturalized or persistent from gardens; commonly cultivated, rare as a naturalized species. June-frost. A very influential food crop introduced from the New World to the Old World, now important in various (especially tropical or subtropical) cuisines, including Hunan, Szechuan, Indian, various African, Mexican, and others. [= RAB, S; *C. annum* var. *annuum* -- K]

Capsicum frutescens Linnaeus, Tabasco Pepper, is reported in e. GA (Jones & Coile 1988). [*C. annum* Linnaeus var. *frutescens* (Linnaeus) Kuntze -- K]

Cestrum Linnaeus (Night-flowering Jessamine)

A genus of 150-200 shrubs (rarely trees or vines), of Tropical America. References: Hunziker (2001)=Z.

Cestrum nocturnum Linnaeus, Night-flowering Jessamine, is reported for GA (Small 1933). [= K, Z; *C. parqui* – S]

Datura Linnaeus (Jimsonweed)

{needs thorough rework, based on herbarium material and clarification of nomenclature}

A genus of about 10 species, of s. North America (probably originally native to sw. United States and Mexico). Several species of *Datura* are known to have been in our area at the time of first settlement by Europeans. They may have been weeds in Indian fields, or grown for their hallucinogenic properties. The common name "Jimsonweed" is a corruption of "Jamestown Weed."

References:

- 1 Calyx 3-5 cm long, the tube strongly angled, the angles even narrowly winged; corolla 7-10 cm long; capsule erect, dehiscent by 4 valves **D. stramonium**
- 1 Calyx 5-15 cm long, the tube terete or slightly angled; corolla 12-20 cm long; capsule inclined or nodding, irregularly dehiscent.
 - 2 Corolla with 10 teeth, lavender; spines of capsule few, very stout-based **D. metel**
 - 2 Corolla with 5 or 10 teeth, white or pale lavender; spines of capsule many, hispid (the base only slightly thickened).
 - 3 Corolla with 10 teeth; leaves soft-pubescent **D. inoxia**
 - 3 Corolla with 5 teeth; leaves glaucescent **D. wrightii**

* **Datura inoxia** J.S. Miller. Cp, Pd (NC, SC, VA?): disturbed areas, rare, introduced from Mexico; September-October. This species may not be distinct from *D. wrightii*. [It is currently not known which records in our area apply to which taxon] [= K; *D. innoxia* -- F, S, orthographic variant; *D. meteloides* -- G, misapplied]

* **Datura metel** Linnaeus (NC): location and habitat in our area not known; rare, presumably introduced, allegedly native of tropical Africa and Asia. July-August. [= RAB, C, K, S]

* **Datura stramonium** Linnaeus, Jimsonweed. Cp, Pd, Mt (NC, SC, VA): fields, pastures, disturbed areas, especially common in severely over-grazed pastures; common, presumably introduced from further south and west. July-September; August-October. The plant is dangerously poisonous. [= RAB, C, F, K, S, W; *D. stramonium* var. *tatula* (Linnaeus) Torrey -- F; *D. tatula* Linnaeus]

* **Datura wrightii** Regel, Indian-apple. Pd (NC, SC, VA?), Cp (VA): disturbed areas; rare, introduced from Mexico. July-September; September-October. [= K; *D. meteloides* Dunal -- RAB, S, misapplied; *D. metel* -- G, misapplied]

Datura quercifolia Kunth is reported for sw. GA by Jones & Coile (1988). [= K]

Lycium Linnaeus (Matrimony-vine)

A genus of about 100 species, shrubs, of warm temperate and tropical areas of the Old World and New World (especially America).

- 1 Leaves succulent, oblanceolate, 1-5 mm wide; [plant native, in maritime situations] **L. carolinianum**
- 1 Leaves herbaceous, elliptic, ovate, or broadly oblanceolate, 8-30 mm wide; [plant introduced, persistent or naturalized, usually around old home sites] .
 - 2 Corolla lobes shorter than the corolla tube; leaves gray-green, 2-5 cm long **L. barbarum**
 - 2 Corolla lobes longer than the corolla tube; leaves bright green, 3-8 cm long **L. chinense**

* **Lycium barbarum** Linnaeus, Common Matrimony-vine. Cp (NC, SC, VA), Pd, Mt (NC, VA): old home sites, disturbed areas, along railroad tracks; introduced from s. Europe. May-November; August-December. [= K; *L. halimifolium* P. Miller -- RAB, F, G, S, W; *L. barbarum* -- C, in part (also including *L. chinense*)]

Lycium carolinianum Walter, Christmas-berry, Carolina Matrimony-vine. Cp (GA, SC): shell middens, shell mounds, shelly sand dunes, brackish marshes, maritime sand spits; rare (GA Special Concern). September-October. Ranging from se. SC and e. GA south to FL, west to e. TX; also in the West Indies. Apparently not recently seen in SC; its occurrence in that state is based on Walter's flora. [= RAB, GW, S; *L. carolinianum* var. *carolinianum* -- K]

* **Lycium chinense** P. Miller, Chinese Matrimony-vine. Mt (NC, VA), Pd, Cp (VA): old home sites; rare, introduced from China. May-November; August-December. [= RAB, F, G, K; *L. barbarum* -- C, in part]

Lycopersicon P. Miller (Tomato)
(see *Solanum*)

Nicandra Adanson (Apple-of-Peru)

A monotypic genus, an annual herb native of Peru.

* **Nicandra physalodes** (Linnaeus) Gaertner, Apple-of-Peru. Mt, Pd, Cp (NC, SC, VA): disturbed places, such as cultivated fields; uncommon, native of Peru. July-September; August-October. [= RAB, C, F, G, K, W; *Physalodes physalodes* (Linnaeus) Britton -- S]

Nicotiana Linnaeus (Tobacco)

A genus of about 67 species, of America, Australia, and s. Pacific areas. Fernald (1950) describes the genus as "rank, acrid-narcotic American herbs."

- 1 Corolla 5-8 cm long, pink; larger leaves 4-8 dm long; plant 1-2.5 m tall **N. tabacum**
- 1 Corolla 1.5-2 cm long, greenish yellow; larger leaves 1-2 dm long; plant 0.4-1 m tall **N. rustica**

* **Nicotiana rustica** Linnaeus, Indian Tobacco, Wild Tobacco. Cp, Pd, Mt (NC, SC, VA): formerly commonly cultivated by native Americans in all parts of our area, persistent following cultivation, now apparently extinct in our area; rare, originally native of Peru. This was the tobacco cultivated by American Indians at the time of contact by Europeans, and was the first tobacco taken to Europe and cultivated there. [= RAB, C, F, K, S]

* **Nicotiana tabacum** Linnaeus, Cultivated Tobacco. Pd, Cp, Mt (NC, SC, VA): persistent after cultivation; commonly cultivated, rarely naturalized, native of tropical America. June-frost; September-October. This is the tobacco currently cultivated in our area for the manufacture of cigarettes, cigars, and other smoking and chewing tobacco products. Two different strains are cultivated. Burley tobacco, with acute to acuminate leaves, grown mostly in the Mountains and upper Piedmont, is air-cured in open barns, and used mostly for cigar and pipe tobacco. Flue-cured tobacco, with obtuse or broadly acute leaves, is grown mostly in the Coastal Plain and lower Piedmont, cured in closed, cubical barns with forced heat, and used mostly for cigarettes. [= RAB, C, F, K, S]

Various other species of *Nicotiana* are cultivated as garden ornamentals, including *N. longiflora* Cavanilles, *N. alata* Link & Otto, and *N. glauca* Graham. Both *N. longiflora* and *N. glauca* are reported for e. GA (Jones & Coile 1988). They may be encountered as persistent from gardens.

Nierembergia Ruiz & Pavón (Cupflower)

A genus of about 23 species, of Mexico, Central America, and South America.

Nierembergia frutescens Durieu, Tall Cupflower, is reported from sw. GA (Jones & Coile 1988). [= K]

Petunia Antoine Laurent de Jussieu (Petunia)
(also see *Calibrachoa*)

A genus of {}.

* **Petunia xhybrida** Vilmorin [*P. axillaris* x *integrifolia*], Petunia. Cp, Pd (NC, SC, VA): disturbed areas; common, spread from cultivation, native of Argentina. May-November. Individual plants may closely resemble either parent, but this taxon in our area is best considered as a variable hybrid taxon. [= C; *P. xatkinsiana* D. Don ex Loudon -- RAB, K; *P. axillaris* (Lamarck) Britton, Sterns, & Poggenberg -- C, F, G, K, S; *P. violacea* Antoine Laurent de Jussieu -- F, S, misapplied; *P. integrifolia* (Hooker) Schinz. & Thellung -- C, G, K]

Physalis Linnaeus (Ground-cherry)
(contributed by Milo Pyne)

A genus of about 80 species, nearly cosmopolitan, but especially diverse in America. Many of the species of *Physalis* in our area occur primarily in disturbed habitats. The pre-Columbian ranges of these species are unclear; they may have been introduced to e. North America by native Americans. Of the species treated here, only *Ph. philadelphica* is definitely introduced.

- 1 Plants obviously covered with dense, stellate hairs, especially the young growth, flowering calyces, and pedicels . **Ph. walteri**
- 1 Plants glabrous to variously pubescent, the pubescence not stellate.
 - 2 Leaves glabrous or essentially so.

- 3 Perennials from rhizomes, frequently with remnant of last year's stem attached to crown; corolla with 5 dark maculations in the throat.
 - 4 Hairs on the pedicels and young stems retrorse or retrorse-spreading; fruiting calyx 5-angled, indented at base **Ph. virginiana** var. **virginiana**
 - 4 Hairs on the pedicels and young stems antrorse; fruiting calyx subterete, with 10 ribs, not indented at base **Ph. longifolia** var. **subglabrata**
- 3 Annuals from taproots; corolla with or without 5 dark maculations in the throat.
 - 5 Upper part of the stem with long, spreading hairs; corolla with 5 dark maculations in the throat.
 - 6 Leaf margins strongly dentate with 7-10 (or more) teeth per side; fruiting pedicels 12 mm or more long; mature fruiting calyx 2.5-4 cm (or more) long, the lobes long-acuminate to attenuate; corolla pubescent internally **Ph. cordata**
 - 6 Leaf margins entire, or dentate with 1-8 teeth per side; fruiting pedicels less than 10 mm long; mature fruiting calyx 2.5 cm or less long, the lobes triangular-acuminate; corolla glabrous internally.
 - 7 Leaves mostly toothed nearly to the base with 5-8 teeth per side; leaf blade thick in texture, not translucent; fruiting calyces 2-3.5 cm long, 1.2-3 cm wide, the lobes triangular to narrowly lanceolate, the apex narrowly acute to acuminate, (3.5-) 4.5-6.5 mm long **Ph. pubescens** var. **pubescens**
 - 7 Leaves entire or with few teeth, usually 1-4 teeth per side; leaf blade thin in texture, flaccid and translucent; fruiting calyces 1.2-2.5 cm long, 1-1.5 cm wide, the lobes ovate to deltoid, the apex acute, 3-3.5 mm long **Ph. pubescens** var. **integrifolia**
 - 5 Upper part of the stem glabrous or glabrate (when young, sometimes with minute, deflexed hairs in lines); corolla with or without 5 dark maculations in the throat.
 - 8 Corolla 4-10 mm long entirely yellow, without 5 dark maculations in the throat; anthers 1-2.3 mm long; berry 8-11 mm in diameter **Ph. angulata** var. **angulata**
 - 8 Corolla 7-15 mm long, yellow and with 5 dark maculations in the throat; anthers 2.5-4 mm long; berry to 40 mm in diameter **Ph. philadelphica**
- 2 Leaves variously pubescent, the hairs copious and villous to sparse and appressed.
 - 9 Flowering calyces 6 mm or less long; annuals from taproots.
 - 10 Stems, young growth, and major veins of the leaves covered with villous pubescence intermixed with sessile glands; leaves gray-green, prominently and coarsely dentate to the base, with well-defined reticulate venation, especially visible on the lower surface, frequently drying orange or with orange spots; anthers yellow, perhaps with a bluish tinge; body of mature calyx about as long as broad, abruptly acuminate at apex; berry tawny orange when mature **Ph. grisea**
 - 10 Stems, young growth, and major veins of leaves with fine, non-villous pubescence; leaves green, obscurely dentate, often in the upper half only, or entire, without well-defined reticulate venation, drying green or brownish; anthers blue or violet; body of mature calyx longer than broad, long-acuminate at the apex; berry green when mature.
 - 11 Leaves mostly toothed nearly to the base with 5-8 teeth per side; leaf blade thick in texture, not translucent; fruiting calyces 2-3.5 cm long, 1.2-3 cm wide, the lobes triangular to narrowly lanceolate, the apex narrowly acute to acuminate, (3.5-) 4.5-6.5 mm long **Ph. pubescens** var. **pubescens**
 - 11 Leaves entire or with few teeth, usually 1-4 teeth per side; leaf blade thin in texture, flaccid and translucent; fruiting calyces 1.2-2.5 cm long, 1-1.5 cm wide, the lobes ovate to deltoid, the apex acute, 3-3.5 mm long **Ph. pubescens** var. **integrifolia**
 - 9 Flowering calyces 6 mm or more long; perennials from rhizomes.
 - 12 Pubescence viscid, generally composed of glandular trichomes mixed with fine, short hairs and long, multicellular hairs; leaf blades broadly ovate to suborbicular, the base rounded, truncate, or cordate (occasionally widely cuneate) **Ph. heterophylla**
 - 12 Pubescence seldom if at all glandular-viscid, composed of trichomes of varying lengths, from dense, spreading, and long-villous to sparse, strigose, and appressed; leaf blades narrowly ovate to broadly lanceolate, the base cuneate (rarely truncate).
 - 13 Pedicels and flowering calyces pubescent with minute, appressed, antrorse hairs; hairs on the calyx primarily confined to 10 narrow longitudinal strips consisting of simple, appressed hairs 0.5 mm or less long **Ph. longifolia** var. **subglabrata**
 - 13 Pedicels and flowering calyces densely pubescent with divergent and appressed hairs mixed (or only with appressed retrorse hairs); hairs on the calyx scattered more or less evenly over the surface, not confined to 10 longitudinal strips.
 - 14 Pedicels with both divergent and antrorse hairs; principle leaf blades 5-8 cm long; filaments 0.5 as wide as the anthers; spots at the base of the corolla inconspicuous or absent; berry more than 14 mm in diameter when mature **Ph. lanceolata**
 - 14 Pedicels with short, appressed, retrorse hairs, or with short retrorse and longer divergent hairs intermixed; principle leaf blades 3-6 cm long; filaments as wide or wider than the anthers; spots at base of the corolla prominent; berry less than 12 mm in diameter when mature **Ph. virginiana** var. **virginiana**

Physalis angulata Linnaeus var. ***angulata***, Smooth Ground-cherry. Cp, Pd (NC, SC, VA): disturbed areas, open woodlands, agricultural fields; common (VA Watch List). August-October. Var. *angulata* is widely distributed in Tropical America, north to se. VA and MO, and scattered as an adventive further north. Var. *pendula* (Rydberg) Waterfall is (in North America) more western, east to nw. TN and, allegedly, to SC. It can be distinguished from var. *angulata* by the following characters: principle cauline leaf blades generally more than 2.75x as long as wide (vs. less than 2.5x as long as wide), flowering pedicels 1.5-2.5 cm long, elongating to 3.0-4.0 cm long in fruit (vs. flowering and fruiting pedicels 0.5-1.0 cm long), pedicels and calyx covered at anthesis with fine, even, antrorse hairs, especially at the base of the calyx (vs. pedicels and calyx essentially glabrous at anthesis except for hairs on the margins of the calyx lobes). [*Ph. angulata* -- RAB, K, S, infraspecific taxa not distinguished; *Ph. angulata* -- F, G]

Physalis cordata P. Miller, Toothleaf Ground-cherry. Cp (NC): disturbed areas; rare. July-October. This species is scattered in the Southeastern United States, and is more widespread in Mexico, Central America, and West Indies. [= K; *Ph. pubescens* var. *glabra* (Michaux) Waterfall -- RAB; *Ph. barbadensis* var. *glabra* (Michaux) Fernald -- F]

Physalis grisea (Waterfall) M. Martínez, Gray Ground-cherry, Strawberry-tomato, Dwarf Cape-gooseberry. Mt, Pd (NC, VA): wooded slopes, disturbed areas; uncommon. July-September; August-October. The species is mainly distributed in ne. United States, south (mainly) to NC, TN, and MO, and scattered further south. The fruits are edible, sweet, and tasty. Martínez (1993) discusses the nomenclature of this species, showing that the *P. pruinosa* Linnaeus is properly applied to a Mexican and Central American species. [= K; *Ph. pubescens* var. *grisea* Waterfall -- RAB, C; *P. pruinosa* Linnaeus -- F, G, S, W, misapplied]

Physalis heterophylla Nees, Clammy Ground-cherry. Pd, Mt, Cp (NC, SC, VA): disturbed areas, dry rocky woodlands; common (uncommon in Mountains, rare in Coastal Plain). May-July; July-September. Widespread in e. and c. United States and adjacent Canada. [= RAB, C, F, G, S, W; *Ph. heterophylla* var. *ambigua* (Gray) Rydberg -- F, G; *Ph. heterophylla* var. *clavipes* Fernald -- F; *Ph. heterophylla* var. *nyctaginea* (Dunal) Rydberg -- F; *P. heterophylla* var. *heterophylla* -- K; *Ph. ambigua* (Gray) Britton -- S; *Ph. nyctaginea* Dunal -- S]

Physalis lanceolata Michaux, Sandhills Ground-cherry. Cp (NC, SC): sandhills; rare (NC Rare). June-July; July-September. Endemic to sandhill habitats of (primarily) sc. and (rarely) se. NC (northern limit in Lee, Wayne, and New Hanover counties), south through SC to just over the Savannah River in Richmond County, GA. Many earlier floras included midwestern material in the concept of this species; it is, however, limited to the Carolinas and Georgia. [= RAB; *Ph. lanceolata* -- F, G, S, in part only, the concept also including *Ph. hispida* (Waterfall) Cronquist]

Physalis longifolia Nuttall var. ***subglabrata*** (Mackenzie & Bush) Cronquist, Longleaf Ground-cherry. Mt, Pd (NC, VA): open woodlands, gardens and disturbed areas; uncommon. June-August; August-October. The species is widespread in e. and c. United States; var. *subglabrata* is more eastern, var. *longifolia* more western. [= C, G, K, W; *Ph. virginiana* P. Miller var. *subglabrata* (Mackenzie & Bush) Waterfall -- RAB; *Ph. subglabrata* Mackenzie & Bush -- F, S]

* ***Physalis philadelphica*** Lamarck, Tomatillo. Pd (NC): naturalized after cultivation; rare, native of Mexico and Central America. June-August; July-October. See Kartesz & Gandhi (1994) for a discussion of this group. It is the large-flowered plant (and therefore *Ph. philadelphica* in the narrow sense) that is weakly naturalized after cultivation in c. NC. [= C; *Ph. ixocarpa* auct. non Brotero ex Hornemann -- F, G, in part; *Ph. philadelphica* var. *immaculata* Waterfall -- K]

Physalis pubescens Linnaeus var. ***integrifolia*** (Dunal) Waterfall, Thinleaf Downy Ground-cherry. The distribution, abundance, and habitats of the two varieties are poorly known. July-September; August-October. Widespread in the American tropics, north to PA and IA. [= C, K; *Ph. pubescens* var. *pubescens* -- RAB, in part only; *Ph. pubescens* -- F, G, S, W, in part only; *Ph. turbinata* Medikus -- G, S (at least as applied by G, S); *Ph. pruinosa* Linnaeus, misapplied]

Physalis pubescens Linnaeus var. ***pubescens***, Thickleaf Downy Ground-cherry. The distribution, abundance, and habitats of the two varieties are poorly known. July-September; August-October. Widespread in the American tropics, north to VA. [= C, K; *Ph. pubescens* var. *pubescens* -- RAB, in part only; *Ph. barbadensis* Jacquin var. *barbadensis* -- F; *Ph. pubescens* -- G, S, W, in part only; *Ph. barbadensis* Jacquin -- G, S]

Physalis virginiana P. Miller var. ***virginiana***, Virginia Ground-cherry. Pd, Mt, Cp (NC, SC, VA): woodlands and disturbed areas; common. April-May; June-July. This complex species is widespread in e. and c. North America. Var. *virginiana* is the most eastern of a number of varieties, some of the others being var. *campaniforma* Waterfall, var. *polyphylla* (Greene) Waterfall, and var. *texana* (Rydberg) Waterfall. The validity and true affinities of some of these varieties is, at present, uncertain; var. *texana* may be actually affiliated with *Ph. longifolia*. [= RAB, K; *Ph. virginiana* -- C, F, G, S, W, infraspecific taxa not distinguished; *Ph. intermedia* Rydberg -- S; *Ph. monticola* C. Mohr -- S]

Physalis walteri Nuttall, Dune Ground-cherry. Cp (NC, SC, VA): dunes of sea-beaches, openings in maritime forests; uncommon (VA Rare List). May-September. This species ranges from se. VA south to s. FL and west to s. MS. See Sullivan (1985) for further information on this species and its relatives. It is largely replaced on the Gulf Coast by the related *Ph. angustifolia*, with which it locally intergrades in peninsular FL. *Ph. viscosa* Linnaeus is South American. [= C, K; *Ph. viscosa* Linnaeus ssp. *maritima* (M.A. Curtis) Waterfall -- RAB; *Ph. maritima* M.A. Curtis -- F; *Ph. viscosa* -- G, S]

Physalis acutifolia (Miers emend Sandwith) Sandwith, native to AZ and vicinity, was collected once in NC (in 1936), from a nursery in Mecklenburg County, NC. It is probably not established. It is most similar to *Ph. angulata*, but differs in its white to cream-colored corollas, with yellow basal spots, and the presence of 5 hairy pads, alternating with the stamens near the base of the corolla limb. [= K]

Physalis alkekengi Linnaeus, Chinese-lantern Plant, native of Japan, Korea, and n. China, is commonly cultivated as an ornamental and occasionally naturalized in e. North America, as at scattered locations in TN (Chester, Wofford, & Kral 1997). It is perennial, readily recognized by its mature calyces red-orange and up to 5 cm long. [= K]

Physalis arenicola Kearney, Sandhill Ground-cherry, reported from nc. GA by Jones & Coile (1988) and for "cypress-heads and

scrub thickets" by GANHP (GA Special Concern). [= K; *Ph. arenicola* var. *ciliosa* (Rydberg) Waterfall]

Physalis cinerascens (Dunal) A.S. Hitchcock var. *cinerascens*, native to OK, TX, and Mexico, occurs locally in the Southeastern United States in weedy situations; it has been found once in our area, in a disturbed habitat in SC. It is probably not established. It resembles *Ph. walteri* in having stellate pubescence, but differs in having leaves ovate to suborbicular, with margins sinuate, dentate, or entire (vs. leaves obovate, with margins entire), anthers at least 1.5x as long as the filaments (vs. anthers equal to or shorter than the filaments), and fruiting pedicels mostly at least 1.5x as long as the calyces (vs. fruiting pedicels equal to or shorter than the fruiting calyces). [= K] {add to key and full treatment}

Physalis longifolia Nuttall var. *longifolia* occurs east to PA, WV, KY, TN, and GA (Kartesz 1999). [= K]

Physalis missouriensis Mackenzie & Bush, reported from nc. GA. [= K; *Ph. pubescens* Linnaeus var. *missouriensis* (Mackenzie & Bush) Waterfall]

Physalis peruviana Linnaeus, Cape Gooseberry or Po'ha, is also cultivated. Native to South America, it is now cultivated for its edible fruit in various tropical and temperate areas, and is known to rarely persist in e. North America. [= K]

Salpichroa Miers

A genus of about 17 species, herbs and shrubs, native of South America. References: Hunziker (2001)=Z.

* ***Salpichroa organifolia*** (Lamarck) Baillon. Cp (NC, SC, VA), Pd (NC, SC): gardens, roadsides, disturbed areas; rare, introduced from n. South America. May-November. [= RAB, K, Z; *Perizoma rhomboidea* (Gillies & Hooker) Small -- S; *Salpichroa rhomboidea* (Gillies & Hooker) Miers]

Solanum Linnaeus (Nightshade, Tomato, Potato, Horse-nettle)

A genus of about 1700 species, trees, shrubs, vines, and herbs, of tropical and temperate regions of the Old and New World. References: Schilling (1981)=Z; Bohs & Olmstead 1997; Olmstead & Palmer 1997.

- * ***Solanum capsicoides*** Allioni. Cp (SC), Pd (NC): introduced. [= K; *S. aculeatissimum* -- RAB, misapplied]
- * ***Solanum carolinense*** Linnaeus var. ***carolinense***, Horse-nettle, Ball-nettle. Cp, Pd, Mt (NC, SC, VA): [= K; *S. carolinense* -- RAB, C, F, infraspecific taxa not distinguished]
- * ***Solanum dimidiatum*** Rafinesque. Cp (SC): disturbed areas; rare, introduced from w. North America. April-June. [= C, K; *S. torreyi* A. Gray -- RAB, F]
- * ***Solanum dulcamara*** Linnaeus, Bittersweet, Nightshade. Mt (NC, VA), Pd, Cp (VA): introduced from Europe. [= RAB, C; *S. dulcamara* var. *dulcamara* -- F, K]
- * ***Solanum elaeagnifolium*** Cavanilles, Silverleaf Nightshade, White Horse-nettle. Cp (NC, SC), Pd (NC): disturbed areas; rare, introduced from sc. North America. June-September. [= C, F, K; *S. elaeagnifolium* -- RAB, orthographic error]
- * ***Solanum lycopersicum*** Linnaeus, Tomato. Cp, Pd, Mt (NC, SC, VA): persistent and weakly naturalized around gardens, especially where compost or sewage sludge is spread; commonly cultivated, rare as a naturalized species. June-frost. The species is native to the Andes Mountains of nw. South America. *S. lycopersicum* is one of the most important and influential of edible species introduced from the New World to the Old World. There appears to be little reason to separate *Lycopersicon* from *Solanum*. [*Lycopersicon esculentum* -- RAB, C, G, infraspecific taxa not recognized; *Solanum lycopersicum* Linnaeus var. *cerasiforme* (Dunal) Spooner, J. Anderson, & R.K. Jansen -- K; *Solanum lycopersicum* var. *lycopersicum* -- K; *Lycopersicon lycopersicon* (Linnaeus) Karsten -- S; *Lycopersicon esculentum* var. *cerasiforme* (Dunal) Alefani; *Solanum lycopersicum* Linnaeus]
- * ***Solanum nigrum*** Linnaeus ssp. ***nigrum***, European Black Nightshade. Cp (SC): disturbed areas; rare, introduced from Eurasia. May-November. [= Z; *S. nigrum* -- RAB, F, infraspecific taxa not distinguished; *S. nigrum* -- C, in part; *S. nigrum* ssp. *nigrum* -- K]
- * ***Solanum physalifolium*** Rusby, Hairy Nightshade. Cp, Pd (NC, VA): introduced from South America. [= K; *S. sarrachoides* Sendtner -- RAB, C, Z, apparently misapplied; *S. sarachoides* -- F, orthographic error and apparently misapplied]
- * ***Solanum pseudocapsicum*** Linnaeus, Jerusalem-cherry. Pd (NC): rarely cultivated, probably not established, introduced from Mediterranean Europe. [= K; *S. pseudo-capsicum* -- F, orthographic variant]
- * ***Solanum pseudogracile*** Heiser, Dune Nightshade. Cp (NC, SC): ocean dunes, usually with *Uniola paniculata*; uncommon. May-October. Ranging from e. NC south to FL, west to LA. [= K, Z; *S. gracile* -- RAB, misapplied]
- * ***Solanum ptychanthum*** Dunal, American Black Nightshade. Mt, Pd, Cp (NC, SC, VA): disturbed areas; common. June-December. [= K, Z; *S. americanum* P. Miller -- RAB, F, misapplied; *S. nigrum* -- C, in part]
- * ***Solanum rostratum*** Dunal, Buffalo-bur, Kansas-thistle. Cp (NC, SC, VA), Mt, Pd, (NC, VA): introduced from w. North America. [= RAB, C, F, K; *S. cornutum* Lamarck, misapplied]
- * ***Solanum sisymbriifolium*** Lamarck, Sticky Nightshade. Cp (NC, SC): disturbed areas; uncommon, introduced from South America. July-September; September-October. [= RAB, C, F, K]
- * ***Solanum tuberosum*** Linnaeus, Potato, Irish Potato, White Potato. Cp, Pd, Mt (NC, SC, VA): commonly cultivated, rarely

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escaped or spontaneous from thrown-out tubers, introduced from Andean South America. June-August. [= RAB, C, K]

* ***Solanum viarum*** Dunal, Tropical Soda Apple. Cp (NC, SC): pastures; rare, introduced from South America (s. Brazil, Paraguay, and n. Argentina). This species has only recently appeared in our area, but has been publicized as a severe, extremely aggressive, and rapidly spreading weed further south (Wunderlin et al. 1993, Mullahey et al. 1993, Mullahey 1996). [= K]

Solanum americanum P. Miller, north to e. GA. [= K; *S. nodiflorum* Jacquin]

Solanum carolinense Linnaeus var. ***floridanum*** (Shuttleworth ex Dunal) Chapman, occurs in sandy pinelands in GA and FL (Kartesz 1999). [= K; *S. floridanum* Shuttleworth ex Dunal – S]

Solanum carolinense Linnaeus var. ***hirsutum*** (Nuttall) A. Gray, occurs in GA and AL (Kartesz 1999). [= K]

Solanum citrullifolium A. Braun var. *citrullifolium*. [= K]

Solanum melongena Linnaeus, Eggplant, is planted in gardens but does not persist. [= K]

Solanum nigrescens Mart. & Gal. occurs in NC, SC, GA, etc. (Kartesz 1999). {investigate} [= K]

Solanum pumilum Dunal is known from dolomitic Ketona glades in Bibb County, c. AL (Allison & Stevens 2001) and historically in GA (GAHP).

Solanum triflorum Nuttall. Introduced in c. TN. [= K]

SPHENOCLEACEAE (Chickenspike Family)

A family of one genus and 2 species, annual herbs, of tropical regions, native of the Old World. References: Rosatti (1986)=Z.

Sphenoclea Gaertner (Chickenspike)

A genus of 2 species, annual herbs, native of the Old World.

* ***Sphenoclea zeylanica*** Gaertner, Chickenspike. Cp (SC), Pd (NC): rice plantations, reservoirs, other disturbed wetlands; rare, native of Old World tropics. August-October. The spelling of the epithet "*zeylandica*" is an error (presumably from an idea that the epithet refers to New Zealand rather than Ceylon). [= RAB, GW, K, S, Z]

STAPHYLEACEAE (Bladdernut Family)

A family of 5 genera and about 27 species, trees and shrubs, of temperate Northern Hemisphere, especially e. Asia.

Staphylea Linnaeus (Bladdernut)

A genus of 11 species, trees and shrubs, of temperate Eurasia and e. North America.

Staphylea trifolia Linnaeus, Bladdernut. Pd, Mt, Cp (NC, SC, VA): nutrient-rich bottomland forests, extending upslope over calcareous or mafic rocks; common. April; September-October. Ranging from Quebec west to MN, south to GA, n. AL, n. MS, and OK; disjunct in panhandle FL. The opposite, trifoliolate leaves with serrulate margins are distinctive. [= RAB, C, F, G, GW, K, S, W]

STERCULIACEAE (Chocolate Family)
(see **MALVACEAE**)

STRYCHNACEAE
(see **LOGANIACEAE**)

STYRACACEAE (Storax Family)

A family of about 11 genera and 160 species, trees and shrubs, of warm temperate and tropical regions of America, Mediterranean, se. Asia, Malesia.

- 1 Corolla lobes 4; fruit elongate, winged, 2.5-5 cm long; petioles 15-25 mm long **Halesia**
- 1 Corolla lobes 5; fruit globose, not winged, 0.5-0.9 cm in diameter; petioles 2-10 mm long **Styrax**

Halesia Ellis ex Linnaeus (Silverbell, Snowdrop Tree)

A genus of about 5 species, trees and shrubs, of e. North America and e. Asia. The genus was named to honor Stephen Hales; it therefore seems more appropriate to pronounce the genus with three syllables (the accent on the first) than the commonly heard four, which thoroughly distorts the honoree's name. The number of taxa in our area and their appropriate taxonomic level are in dispute; recent analyses vary from 2-4, with specific or varietal status. References: Fritsch & Lucas (2000)=X; Reveal & Seldin (1976)=Y; Sargent (1921); Godfrey (1988)=Z.

- 1 Petals united only basally, the lobes longer than the tube; fruits broadly 2-winged; leaves broadly obovate to suborbicular, 1-2x as long as wide.
 - 2 Corolla 10-15 mm long **H. diptera** var. **diptera**
 - 2 Corolla 20-30 mm long [**H. diptera** var. **magniflora**]
- 1 Petals united for most of their length, the tube longer than the lobes; fruits narrowly or broadly 4-winged; leaves elliptic-oblong, ca. 2x as long as wide.
 - 3 Corolla 7-10 (-12) mm long, the style strongly exerted (1/3 to 1/2 the length of the corolla tube beyond its mouth), the anthers at the mouth of the corolla tube or slightly exerted; fruit obovate in outline, broadest towards the tip, strongly narrowed to the base, narrowly winged **H. carolina**
 - 3 Corolla (12-) 15-30 mm long, the style included or slightly exerted, the anthers within the mouth of the corolla tube; fruit ellipsoid to slightly obovate in outline, broadest near the middle, broadly winged.
 - 4 Corolla (18-) 20-30 mm long, the style included, the anthers well inside the mouth of the corolla tube; large tree, to 40 m tall **H. tetraptera** var. **monticola**
 - 4 Corolla (12-) 15-20 mm long, the style slightly exerted, the anthers just within the mouth of the corolla tube; shrub to small tree, rarely exceeding 10 m in height **H. tetraptera** var. **tetraptera**

Halesia carolina Linnaeus, Little Silverbell. Pd (SC): sandy alluvial forest; rare (SC Rare List). March-April; September-October. Ranging from s. SC south to panhandle FL, west to s. MS. [= K, Y, Z; *H. parviflora* Michaux -- RAB, GW, S; *H. carolina* -- X, in a broad sense]

Halesia diptera Ellis var. **diptera**, Common Two-wing Silverbell. Cp (SC): forested edge of brackish marsh; rare (SC Rare List). April-May; August-September. Var. *diptera* ranges from s. SC south to panhandle FL, west to n. AL, sw. AR, and e. TX. [= Y, Z; *H. diptera* -- RAB, GW, K, S, infraspecific taxa not distinguished]

Halesia tetraptera Ellis var. **monticola** (Rehder) Reveal & Seldin, Mountain Silverbell. Mt (NC, VA?): cove forests, moist ridges, mostly above 1000m in elevation; common (VA Watch List). April-May; August-September. Apparently limited to the higher mountains of the Southern Appalachians of NC, TN, and VA (?), but the range obscure, perhaps limited to the area south of Linville Gorge, notably the Great Smoky Mountains. [= K, Y; *H. carolina* -- RAB, F, G, W, infraspecific taxa not distinguished and apparently misapplied; *H. tetraptera* -- C, infraspecific taxa not recognized; *H. monticola* (Rehder) Sargent -- S; *H. carolina* -- X, in a broad sense]

Halesia tetraptera Ellis var. **tetraptera**, Common Silverbell. Mt (NC, SC, VA), Pd (NC, SC), Cp (NC, SC): moist slopes, coves, creek-banks, bottomlands; common (uncommon in lower Piedmont and Coastal Plain). March-May; August-September. Ranging from w. VA, WV, s OH and s IL, south to FL and e. TX (and cultivated elsewhere). [= K, Y; *H. carolina* -- RAB, F, G, W, infraspecific taxa not recognized and apparently misapplied; *H. tetraptera* -- C, infraspecific taxa not distinguished; *H. carolina* Linnaeus -- S, apparently misapplied; *H. carolina* -- X, in a broad sense]

Halesia diptera Ellis var. *magniflora* Godfrey, differing in its larger flowers, 2-3 cm long (vs. 1-1.5 cm) and in dry to moist rather than wet habitats, is endemic to sw. GA and panhandle FL. [= Y, Z; *H. diptera* -- GW, K, S, infraspecific taxa not distinguished]

Styrax Linnaeus (Snowbell, Storax)

A genus of about 120 species, trees and shrubs, of s. Europe, Malesia, se. Asia, se. North America, and tropical America. References: Gonsoulin (1974)=Z. The differences of opinion about the correct grammatical gender (covering all 3 possibilities!) are ignored in the synonymy, all endings standardized to the masculine "-us."

- 1 Leaves generally broadly obovate, sometimes broadly ovate, 5-14 cm long, 4-10 cm wide, the apices acute to short-acuminate, densely and finely pubescent beneath, giving the underside of the leaf a pale color; inflorescence usually of 5-20 flowers **S. grandifolius**
- 1 Leaves narrowly elliptic to ovate or obovate, usually 2-8 cm long, 1-4 cm wide, the apices short- to long-acuminate, glabrous or sparsely pubescent beneath (to densely pubescent and then giving the underside of the leaf a rusty color in var. *pulverulentus*); inflorescence usually of 1-7 flowers.
 - 2 Leaves oblong-elliptic, glabrous or sparsely pubescent on the undersurfaces and petioles, the margins usually distantly

- toothed toward the apices); pedicels 10-14 mm long; calyces essentially glabrous; new growth glabrous to sparsely pubescent **S. americanus** var. **americanus**
- 2 Leaves elliptic to ovate to oblanceolate or obovate, sparsely to densely scurfy-hairy on the undersurfaces and petioles, margins entire to serrate; pedicels 4-6 mm long; calyces and pedicels densely scurfy-hairy; new growth densely matted pubescent **S. americanus** var. **pulverulentus**

Styrax americanus Lamarck var. **americanus**, American Snowbell, American Storax. Cp (NC, SC, VA), Pd (NC, SC), Mt (VA): swamp forests, pocosin edges, other moist to wet habitats; uncommon (rare in Piedmont, rare in VA) (VA Watch List). April-June; July-September. Var. **americanus** ranges from ne. WV, OH, s. IN, s. IL, s. MO, south to s. FL and e. TX. See discussion below on var. **pulverulentus** and the presence in our area of transitional plants. [= C, F, Z; *Styrax americanus* -- S, in the narrow sense; *S. americanus* -- RAB, G, GW, K, W, in part, infraspecific taxa not distinguished]

Styrax americanus Lamarck var. **pulverulentus** (Michaux) Perkins ex Rehder, Downy American Snowbell. Cp (SC): wet pine flatwoods; rare. April-May; July-September. "Good" var. **pulverulentus** ranges from SC south to s. FL and west to e. TX and se. MO; some plants in NC and SC are transitional between the two varieties and will not be easily assigned. [= F, Z; *S. americanus* -- RAB, G, GW, K, W, in part, infraspecific taxa not distinguished; *S. pulverulentus* Michaux -- S]

Styrax grandifolius Aiton, Bigleaf Snowbell, Bigleaf Storax. Pd, Cp, Mt (NC, SC, VA): upland forests, bluffs; uncommon (rare in Mountains) (VA Watch List). April-May; August-September. Ranging from se. VA south to s. FL, west to e. TX, north to se. MO. [= RAB, C, F, K, S, Z, W]

SYMPLOCACEAE (Sweetleaf Family)

A family of 1 genus and about 250 species, trees and shrubs, of tropical and warm temperate America and Asia.

Symplocos Jacquin (Sweetleaf)

A genus of about 250 species, trees and shrubs, of tropical and warm temperate America and Asia.

Identification notes: The foliage has a sweet taste, and an odor and taste similar to green apples. Sometimes the leaves are glossy and appear subcoriaceous, somewhat resembling *Kalmia latifolia*.

Symplocos tinctoria (Linnaeus) L'Heritier de Brutelle, Sweetleaf, Horsesugar. Cp (NC, SC, VA), Mt (NC, SC), Pd (NC, SC): moist bottomland forests, pocosin edges, mesic forests, ridgetop forests; common (rare in Piedmont). March-May; August-September. Widespread in Southeastern United States, ranging from DE south to n. FL and west to e. TX and se. OK. The range in our area is discontinuous and interesting, the species rather abundant in the Coastal Plain throughout our area, and in the Mountains of NC and SC (absent from the VA mountains!), but present in the Piedmont only near its borders with the other provinces and in scattered sites in the central Piedmont. The leaves have a subcoriaceous and rather evergreen appearance, but are (in our area) only semi-evergreen. As the name implies, the leaves are somewhat sweet, but the sweetness seems variable from plant to plant, season to season, and taster to taster. Whether sweet or not, the taste is distinctive and is helpful (once learned) in distinguishing this rather nondescript shrub or small tree. Where protected from fire, *S. tinctoria* can reach considerable size, up to 20 cm in diameter and 10 m tall, with longitudinally striped bark. [= RAB, C, F, G, GW, K, S, W; *S. tinctoria* var. *pygmaea* Fernald -- F, G (probably based on fire sprouts)]

Symplocos paniculata (Thunberg) Miq. has been reported as spreading from plantings in the District of Columbia (Whittemore 2003). {not yet keyed}

TAMARICACEAE (Tamarisk Family)

A family of about 4 genera and 78 species, shrubs and trees, of Eurasia and Africa (especially from the Mediterranean to c. Asia). References: Gaskin in Kubitzki & Bayer (2003).

Tamarix Linnaeus (Tamarisk, Salt-cedar)

A genus of about 54 species, trees and shrubs, native of Eurasia and Africa. References: Baum (1978)=Z.

- * **Tamarix africana** Poiret, African Tamarisk. (SC). [= K]
- * **Tamarix aralensis** Bunge, Russian Tamarisk. (NC). [= K]
- * **Tamarix canariensis** Willdenow, Canary Island Tamarisk. (NC, SC). [= K]
- * **Tamarix chinensis** Loureiro, Five-stamen Tamarisk. (NC). [= K]
- * **Tamarix parviflora** DC., Small-flower Tamarisk. (NC, VA). [= K]
- * **Tamarix ramosissima** Ledeb., Salt-cedar. (NC, SC, VA). [= K]

Tamarix gallica Linnaeus, French Tamarisk, is reported as introduced in NC and SC by RAB and Kartesz (1999) (perhaps in error), and for GA (Kartesz 1999). [= K]

Tamarix tetragyna C. Ehrenb., Four-stamen Tamarisk, is reported as introduced in GA (Kartesz 1999). [= K]

TETRACHONDRAEAE

A family of 2 genera, *Polyprenum* and *Tetrachondra* (Oxelman et al. 1999). References: Oxelman et al. (1999).

***Polyprenum* Linnaeus (Polyprenum)**

The genus is monotypic; its assignment to family controversial, problematic, and unresolved. A recent molecular analysis strongly suggests that its closest relationship is with *Tetrachondra* (Oxelman et al. 1999).

***Polyprenum procumbens* Linnaeus**, *Polyprenum*. Cp, Pd, Mt (NC, SC, VA): fields, disturbed areas; common, rare in Mountains. Late May-September; August-October. Ranging from se. NY, NJ, and MO south to FL and TX, and south into tropical America. [= RAB, C, F, G, GW, K, S, W]

THEACEAE (Tea Family)

A family of about 22 genera and 610 species, trees, shrubs, and (rarely) vines, of primarily tropical and subtropical regions of the Old and New Worlds. References: Prince & Parks (2001).

- 1 Leaves deciduous, medium green above, herbaceous in texture.
 - 2 Leaves broader towards the tip, 2-2.5x as long as wide; [tribe *Gordoniaeae*] ***Franklinia***
 - 2 Leaves broadest near or below the middle, 1-1.8x as long as wide; [tribe *Stewartieae*] ***Stewartia***
- 1 Leaves evergreen, dark green above, coriaceous in texture.
 - 3 Leaves ovate to elliptic (broadest at or below the middle), 1-3x as long as wide, slightly to strongly acuminate, 5-10 (-15) cm long; [plant an introduced shrub, planted in upland soils]; [tribe *Theaeae*] ***Camellia***
 - 3 Leaves oblanceolate to narrowly elliptic (broadest at or above the middle), 2.5-4x as long as wide, acute to obtuse (rarely slightly acuminate), 8-30 cm long; [plant a small to large tree, native in acidic Coastal Plain wetlands]; [tribe *Gordoniaeae*] ***Gordonia***

***Camellia* Linnaeus (Camellia, Tea)**

A genus of about 200 species, shrubs and trees, of se. Asia.

- 1 Sepals deciduous; flowers sessile; leaves mostly ovate, acuminate, more than 4 cm wide ***C. japonica***
- 1 Sepals persistent; flowers on pedicels; leaves mostly elliptic, only slightly acuminate, less than 4 cm wide ***C. sinensis***

* ***Camellia japonica* Linnaeus**, *Camellia*. Cp (GA, NC, SC): frequently cultivated, sometimes persistent around old home sites (especially in the Coastal Plain of NC and SC); rare, native of China and Japan. [= K]

* ***Camellia sinensis* (Linnaeus) Kuntze**, *Tea*. Cp (SC): cultivated in plantations and as a horticultural novelty, rarely escaped; rare, native to China. [= K; *Thea sinensis* Linnaeus]

Camellia sasanqua Thunberg, *Sasanqua* *Camellia*, is reported as introduced in NC, SC, GA, and FL (Kartesz 1999). [= K] (not yet keyed)

***Franklinia* Bartram ex Marshall (Franklinia)**

A monotypic genus, apparently endemic to e. GA (now presumably extinct in the wild). In the North American flora, *Franklinia* is most closely related to *Gordonia*, from which it differs in its deciduous leaves (vs. evergreen) and globose fruits (vs. pointed). *Franklinia* is actually most closely related to the Asian genus *Schima* (Prince & Parks 2001). References: Bozeman & Rogers (1986).

Franklinia alata Bartram ex Marshall, *Franklinia*. Cp (GA): habitat speculative, probably dry sandy ridges, near the mouth of the Altamaha River; rare (believed to be extinct in the wild) (GA Special Concern). It was native to the Coastal Plain of GA, where it was found by William Bartram near the mouth of the Altamaha River. It has not been seen in the wild since 1790 and is now believed to be extinct in the wild. It is sometimes cultivated in our area. Bozeman & Rogers (1986) discuss the history of this tree. [= K, S; *Gordonia alata* (Bartram ex Marshall) Sargent]

Gordonia Ellis (Loblolly Bay, *Gordonia*)

A genus of about 70 species, trees and shrubs, of se. Asia except our species of e. North America.

Identification notes: *Gordonia* is one of the "bay trees" so typical of acid Coastal Plain wetlands of our area -- the other two being Sweet Bay (*Magnolia virginiana*) and Swamp Red Bay (*Persea palustris*). *Gordonia* can be distinguished from the other two species by its smooth leaves, serrate towards the tip, odorless when crushed (vs. pubescent leaves, entire-margined, aromatic when crushed). *Gordonia* is also distinctive in its narrow, conical crown, resembling *Liriodendron* or *Chamaecyparis*, and its medium-gray, deeply furrowed bark. Most individuals of *Gordonia* have at least a few orange-red leaves visible, at any season.

Gordonia lasianthus (Linnaeus) Ellis, Loblolly Bay, *Gordonia*. Cp (GA, NC, SC): pocosins, acidic, organic-rich swamp forests, wet pine savannas, bay forests; common. July-September; September-October. Ranging from ne. NC south to s. peninsular FL, west to s. MS (Sorrie & Leonard 1999), a Southeastern Coastal Plain endemic. Peat-filled Carolina bays and large peat dome pocosins typically have *Gordonia* as an important tree, surpassed in abundance and importance only by *Pinus serotina*. On deep peats, *Gordonia* individuals are stunted and rarely reach sizes larger than pocosin shrubs. [= RAB, GW, K, S]

Stewartia Linnaeus (*Stewartia*, Wild Camellia)

A genus of about 10 species, trees and shrubs, of temperate e. Asia and e. North America. Both our species of *Stewartia* are very attractive shrubs. The other species of the genus are Asian. Li et al. (2002) demonstrate that our 2 species form a clade together, separate from and basal to the Asian species; Prince (2002) shows a different tree topology. References: Spongberg (1974)=Z; Li et al. (2002); Prince (2002).

Identification notes: The leaves are borne in horizontal planes, reminiscent of *Cornus florida* and *Cornus alternifolia*. The leaves of both species are obscurely serrate or crenate, and also conspicuously and copiously ciliate-margined.

- 1 Style 1, with a 5-lobed stigma; seeds 5-7 mm long, shiny, plump, angled; fruits lobed, the lobes rounded; leaves mostly 4-10 cm long; petioles narrowly winged, not enclosing and concealing the terminal and lateral buds; calyx subtended by 2 persistent bracts, each 2-4 mm long; leaf blades mostly 5.5-11 cm long **S. malacodendron**
- 1 Styles 5, separate; seeds 8-10 mm long, dull, flat, thin (to slightly winged); fruits lobed, the lobes angled; leaves mostly 6-15 cm long; petioles widely winged, enclosing and concealing the terminal and lateral buds; calyx subtended by 1 persistent bract, 11-14 mm long; leaf blades mostly 7-15 cm long **S. ovata**

Stewartia malacodendron Linnaeus, Silky Camellia, Virginia *Stewartia*. Cp (GA, NC, SC, VA), Pd (GA, NC, SC), Mt (NC): mesic forests, especially on beech-dominated bluffs or "islands" in Coastal Plain swamps; uncommon, rare in Piedmont and Mountains (GA Rare, VA Rare List). May-June; September-October. Primarily Coastal Plain, se. VA south to FL, west to se. TX, but extending inland to the Piedmont of Ga, NC, and SC and the Mountains of NC. [= RAB, K, W, Z; *Stewartia malachodendron* -- C, F, G (orthographic variant); *Stuartia malachodendron* -- S (orthographic variant)]

Stewartia ovata (Cavanilles) Weatherby, Mountain Camellia, Mountain *Stewartia*. Mt (GA, NC, SC, VA), Pd (GA, NC, VA), Cp (VA): mesic forests, especially acidic bluffs, often in openings in rhododendron thickets ("hells"), in the Coastal Plain of VA restricted to ravines; rare (SC Rare List, NC Watch List, VA Rare List). Late June-July; August-September. Primarily Appalachian: e. KY, sc. VA, e. VA south to c. NC, w. SC, e. and c. TN to n. GA and n. AL, avoiding, however, the higher mountains, and extending into the Coastal Plain in e. VA. The species is most abundant in the Cumberland Plateau of KY and TN. [= RAB, C, F, G, K, W, Z; *Malachodendron pentagynum* (L'Héritier) Small -- S]

THYMELAEACEAE (Mezereum Family)

A family of about 45-53 genera and 500-800 species, mostly trees and shrubs, of cosmopolitan distribution, but especially diverse in Africa (Van der Bank, Fay, & Chase 2002). References: Van der Bank, Fay, & Chase (2002); Herber in Kubitzki & Bayer (2003).

Dirca Linnaeus 1753 (Leatherwood, Leatherbark)

A genus of 3 species, shrubs, of North America (including Mexico). *Dirca* is in subfamily Thymelaeoideae (Van der Bank, Fay, & Chase 2002). References: Nevling (1962)=Z.

Dirca palustris Linnaeus, Leatherwood, Leatherbark, Wicopee, Rope-bark. Pd (NC, SC, VA), Mt (NC, VA), Cp (VA): very rich forests, on slopes or bottomlands, limited to calcareous or mafic rocks such as limestone, calcareous siltstone, calcareous shale, gabbro, or amphibolite, in marl ravine bottoms in the Coastal Plain of VA; uncommon, rare south of VA and in VA Coastal Plain (NC Watch List, SC Rare List). March-April; June-July. Widespread in e. North America, from Nova Scotia and s. Quebec, south to FL, AL, and OK. The curiously flexible twigs and swollen nodes are distinctive. The tan-brown bark is extraordinarily tough and was used by the native Americans for cordage; the common names refer to this property. [= RAB, C, F, G, K, S, W, Z]

Edgeworthia Meisner 1841 (Paperbush)

A genus of 3 species, shrubs, of e. Asia.

Edgeworthia papyrifera Siebold & Zuccarini, Paperbush, is reported for Rabun County, GA by Jones & Coile (1988). [= K]

TILIACEAE (Basswood Family)
(see MALVACEAE)

TRAPACEAE (Water-chestnut Family)
(see LYTHRACEAE)

TROPAEOLACEAE (Nasturtium Family)

A family of 1-3 genera and about 90 species, herbs, of Central and South America. References: Sparre & Andersson (1991)=Z; Bayer & Appel in Kubitzki & Bayer (2003).

Tropaeolum Linnaeus 1753 (Nasturtium)

A genus of about 85-90 species, herbs, of tropical Central America and South America (s. Mexico to Peru). References: Sparre & Andersson (1991)=Z.

Tropaeolum majus Linnaeus, Nasturtium, is cultivated and rarely persistent or present around refuse areas, as in se. PA (Rhoads & Klein 1993). *T. majus* is considered by Sparre & Andersson (1991) to be a taxon of hybrid origin, not known from wild populations. It is probably not truly established in our area. [= K, Z]

TURNERACEAE (Turnera Family)

A family of about 10 genera and 100 species, shrubs, herbs, and trees, of tropical and subtropical Africa and America.

Piriqueta Aublet

A genus of about 21 species, of tropical and subtropical America and Africa.

Piriqueta caroliniana (Walter) Urban var. ***caroliniana***. Cp (SC): longleaf pine sandhills, sandy soils of roadsides, woodland edges, and disturbed areas; uncommon. May-September. Var. *caroliniana* ranges from SC south to n. FL. The species as a whole ranges from SC south to FL; Cuba and Hispaniola; and in Central and South America. [*P. caroliniana* -- RAB, infraspecific taxa not distinguished; *P. cistoides* (Linnaeus) Grisebach ssp. *caroliniana* (Walter) Arbo -- K; *P. caroliniana* -- S, in the narrow sense]

Piriqueta cistoides (Linnaeus) Grisebach is reported for GA (Kartesz 1999). {Investigate} [*P. cistoides* ssp. *cistoides* -- K] {not yet keyed}

ULMACEAE Mirbel 1815 (Elm Family)
[also see CANNABACEAE]

As here circumscribed (excluding the Celtidaceae), a family of 6-7 genera and about 35 species, of temperate, subtropical, and boreal Northern Hemisphere, rarely extending into the Southern Hemisphere). Zavada & Kim (1996) discuss compelling reasons to recognize the Celtidaceae as a family distinct from the Ulmaceae. The distinctiveness of the Celtidaceae from the Cannabaceae and Moraceae is more questionable. References: Sherman-Broyles, Barker, & Schulz in FNA (1997); Zavada & Kim (1996); Todzia in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Leaves strongly 3-veined from the base, the venation otherwise pinnate; fruit a drupe with thin flesh **[Celtis -- see CANNABACEAE]**
- 1 Leaf venation pinnate throughout, the venation strictly pinnate; fruit dry, a samara (flat and winged) or nutlike (with numerous fleshy protuberances).
 - 2 Fruit nutlike (with numerous fleshy protuberances); primary lateral veins mostly forking before reaching the margin; [small trees of swamp forests of the Coastal Plain from se. NC and SC southwards] **Planera**
 - 2 Fruit a samara (flat and winged); primary lateral veins mostly parallel and unforked to the leaf margin; [small to large trees, widespread in our area] **Ulmus**

Planera J.F. Gmelin 1791 (Planer-tree, Water-elm)

A monotypic genus, a tree, of temperate se. North America. References: Barker in FNA (1997); Todzia in Kubitzki, Rohwer, & Bittrich (1993).

Planera aquatica (Walter) J.F. Gmelin, Planer-tree, Water-elm. Cp (NC, SC): river swamps where flooded (often to depths of 1-2 m) in the winter; common (uncommon in NC and limited to the Waccamaw River and the Lumber River). Ranging from se. NC south to n. FL, west to e. TX, and north in the Mississippi Embayment to w. TN, w. KY, s. IL, and se. MO. [= RAB, C, F, FNA, G, GW, K, S]

Ulmus Linnaeus 1753 (Elm)

A genus of about 25-30 species, trees (rarely shrubs), of temperate and boreal regions of the Northern Hemisphere (most diverse in c. and n. Asia). References: Sherman-Broyles in FNA (1997); Wiegrefe, Sytsma, & Guries (1994); Kurz & Godfrey (1962)=Z; Todzia in Kubitzki, Rohwer, & Bittrich (1993). Key adapted in part from FNA

- 1 Leaf blades mostly less than 7 cm long, the base symmetrical to somewhat oblique.
 - 2 Samaras ciliate-margined; twigs often cork-winged; flowers appearing in the late winter to late spring; upper surfaces of leaves glabrous to scabrous; [native tree, though often weedy]; [subgenus *Oreoptelea*, section *Chaetoptelea*] **U. alata**
 - 2 Samaras with glabrous margins; twigs never cork-winged; flowers appearing in the late winter to late spring or in late summer to fall; upper surfaces of leaves glabrous; [introduced trees, planted and sometimes naturalized or persistent]; [subgenus *Ulmus*, section *Microptelea*].
 - 3 Flowers appearing in the late summer to fall; leaf base generally oblique; leaves 1.5-2.5 cm wide, the lateral veins forking 5 or more times per side **U. parvifolia**
 - 3 Flowers appearing in the late winter to late spring; leaf base generally symmetrical; leaves 2-3.5 cm wide, the lateral veins forking 3 or fewer times per side **U. pumila**
- 1 Leaf blades mostly more than 7 cm long, the base moderately to strongly oblique.
 - 4 Leaf uppersurface slightly to very strongly scabrous; leaf undersurface tomentose or villous, with tufts of hairs in the vein axils; flowers and fruits sessile or subsessile (on pedicels 0-2 mm long), not pendulous, in dense fascicles; [subgenus *Ulmus*, section *Ulmus*].
 - 5 Leaves without ciliate margins; samara glabrous except along the margin of the notched apex; [introduced tree, planted and sometimes naturalized or persistent] **U. procera**
 - 5 Leaves with ciliate margins; samara pubescent on the body with reddish hairs; [native tree] **U. rubra**
 - 4 Leaf uppersurface glabrous (or slightly to moderately scabrous on stump sprouts or seedlings); leaf undersurface glabrous to tomentose, with or without tufts of hairs in the vein axils; flowers and fruits pedicellate (on pedicels 5-20 mm long), pendulous, in fascicles or racemes.
 - 6 Leaf undersurfaces glabrous or slightly pubescent, but always with tufts of hairs in the vein axils; branches never with corky wings; inflorescence a fascicle; [trees widespread in our area]; [subgenus *Oreoptelea*, section *Blepharocarpus*].
 - 7 Leaf bases strongly oblique; larger leaves 10-15 cm long; primary leaf teeth acuminate, often curved inward; [tree widespread in our area] **U. americana** var. **americana**
 - 7 Leaf bases moderately oblique (rarely nearly symmetrical); larger leaves 7-10 cm long; primary leaf teeth acute, not curved; [tree restricted to moist calcareous sites in the Coastal Plain of SC and perhaps NC] **U. americana** var. **floridana**
 - 6 Leaf undersurfaces moderately white or yellowish soft-pubescent, lacking prominent tufts of hairs in the vein axils (differing from the general pubescence of the surface); branches often developing corky wings; inflorescence a raceme or racemose cyme; [trees of calcareous areas immediately west of our area]; [subgenus *Oreoptelea*, section *Trichoptelea*].
 - 8 Leaves 7-8 (-14) cm long, lanceolate to ovate, the undersurface with yellowish-gold pubescence; buds and young twigs glabrous; calyx lobes 5-6; seeds thickened **U. serotina**
 - 8 Leaves 9-11 (-16) cm long, obovate, the undersurface with whitish pubescence; buds and young twigs pubescent; calyx lobes 7-8; seeds inflated **[U. thomasi]**

Ulmus alata Michaux, Winged Elm. Cp, Pd, Mt (NC, SC, VA): rock outcrops, dry and mesic forests and woodlands, bottomlands, old fields, disturbed areas, common (rare in the Mountains). February-March; March-April. Ranging from n. VA west to MO, south to c. peninsular FL and c. TX. [= RAB, C, F, FNA, G, GW, K, S, W, Z]

Ulmus americana Linnaeus var. ***americana***, American Elm, White Elm. Cp, Pd, Mt (NC, SC, VA): swamps, bottomland forests, moist slopes, especially on relatively or strongly nutrient-rich substrates; common (rare in Mountains of NC and SC). February-March; March-April. Ranging from Nova Scotia, New Brunswick and Québec west to se. Saskatchewan, south to n. FL and c. TX. An ascomycetous fungus, *Ceratocystis ulmi*, is the cause of the Dutch Elm disease. In our area, the effects of the disease appear to have been mild or nonexistent, especially in natural areas. [= Z; *U. americana* -- RAB, C, F, FNA, G, GW, K, W, infraspecific taxa not distinguished; *U. americana* -- S, in the narrow sense]

Ulmus americana Linnaeus var. ***floridana***, Florida Elm. Cp (SC): shell middens, other calcareous forests; uncommon. January-March; February-April. Ranging from e. SC (or se. NC?) south to c. peninsular FL, west to panhandle FL. [= Z; *U. americana* -- RAB, C, F, FNA, G, GW, K, S, W, infraspecific taxa not distinguished; *U. floridana* Chapman -- S]

* ***Ulmus parvifolia*** Jacquin, Chinese Elm, Lacebark Elm. Cp, Mt (VA), Pd (NC, VA): disturbed areas; rare, introduced from China and Japan. August-October; September-November. [= FNA, K]

* ***Ulmus procera*** Salisbury, English Elm, English Cork Elm. Cp, Mt (VA): disturbed areas; rare, introduced from Europe. [= C, FNA, K; *U. minor* P. Miller, misapplied]

* ***Ulmus pumila*** Linnaeus, Siberian Elm, Dwarf Elm. Cp, Pd, Mt (VA): disturbed areas; rare, introduced from Asia. [= C, F, FNA, K]

Ulmus rubra Muhlenberg, Slippery Elm, Red Elm. Mt, Pd, Cp (NC, SC, VA): moist to fairly dry calcareous forests, rich bottomlands, rich cove forests in the low Mountains; common (rare in Coastal Plain of NC and SC). February-March; March-April. Ranging from ME, Québec, and Ontario west to MN and ND, south to panhandle FL and c. TX. [= RAB, C, FNA, G, K, W, Z; *U. fulva* Michaux -- S]

Ulmus serotina Sargent, September Elm. Mt (GA): mesic limestone forests; rare (GA Rare). Eastward to e. TN (Chester, Wofford, & Kral 1997) and nw. GA (Jones & Coile 1988). It was collected on the French Broad River by Rugeley in 1842, and has been attributed to NC by Mohr. [= C, FNA, F, G, K, S] {add other refs?}

Ulmus glabra Hudson, Wych Elm, Scotch Elm, is introduced from Europe in ne. United States, and has been reported from VA and DC (Sherman-Broyles in FNA 1997). [= FNA, K]

Ulmus thomasi Sargent, Cork Elm, Rock Elm, approaches our area from the west, ranging east to e. TN (Chester, Wofford, & Kral 1997), e. KY. and WV (Sherman-Broyles in FNA 1997). [= C, F, FNA, K; *U. thomasi* -- G, orthographic variant]

URTICACEAE A.L. de Jussieu 1789 (Nettle Family)

A family of about 45 genera and 1000 species, herbs, shrubs, vines, and trees, of cosmopolitan distribution in tropical, subtropical, and temperate regions. References: Boufford in FNA (1997); Friis in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Leaves alternate.
 - 2 Flowers in axillary spikes; plant a woody herb to 4 m tall; [tribe *Boehmerieae*] ***Boehmeria nivea***
 - 2 Flowers in terminal panicles, axillary panicles, or axillary fascicles; plant an herb to 1.5 m tall.
 - 3 Leaves 4-13 cm wide, with stinging trichomes; [tribe *Urticeae*] ***Laportea***
 - 3 Leaves 0.8-2 cm wide, lacking stinging trichomes; [tribe *Parietarieae*] ***Parietaria***
- 1 Leaves opposite.
 - 4 Plant with stinging trichomes, these having a distinct bulbous or cylindrical base, and a stiff, translucent apex; [tribe *Urticeae*] ***Urtica***
 - 4 Plant without stinging trichomes (or these minute and not apparent), the non-stinging hairs (if present) soft and flexible, lacking a bulbous or cylindrical base.
 - 5 Flowers in axillary spikes; foliage dull, yellow-green; [tribe *Boehmerieae*] ***Boehmeria cylindrica***
 - 5 Flowers in axillary panicles or fascicles; foliage shiny, bright green; [tribe *Lecantheae*] ***Pilea***

Boehmeria Jacquin 1760 (False-nettle)

A genus of about 80 species, trees, shrubs, and perennial herbs, of warm temperate, subtropical, and tropical regions of the Old World and New World. References: Friis in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Leaves opposite; plant a monoecious herb to 1.5 m tall ***B. cylindrica***
- 1 Leaves alternate; plant a dioecious herb to 4 m tall ***B. nivea***

Boehmeria cylindrica (Linnaeus) Swartz, False-nettle. Cp, Pd, Mt (GA, NC, SC, VA): swamp forests, bottomlands, bogs, marshes, other wetlands; common. July-August; September-October. Ranging from Québec and MN south to FL and NM. [= RAB, C, F, FNA, G, GW, K, S, W; *B. cylindrica* var. *drummondiana* (Weddell) Weddell -- F; *B. drummondiana* Weddell -- S]

* ***Boehmeria nivea*** (Linnaeus) Gaudichaud-Beaupré, Ramie. Cp (SC): waste ground; rare, introduced from Asia. This plant is

cultivated for the fiber of its stems, which is extracted and used for fabric in a manner reminiscent of linen (from *Linum usitatissimum*). [= RAB, FNA, K; *Ramium niveum* (Linnaeus) Small -- S]

Laportea Gaudichaud-Beaupré 1830 (Wood-nettle)

A genus of about 21 species, shrubs, perennial herbs, and annual herbs, of tropical and warm temperate e. Asia and temperate e. North America. References: Friis in Kubitzki, Rohwer, & Bittrich (1993).

Laportea canadensis (Linnaeus) Weddell, Wood-nettle. Mt, Pd, Cp (GA, NC, SC, VA): moist, nutrient-rich forests, especially abundant in cove forests in the Mountains and bottomlands in the Piedmont; common (rare in Coastal Plain). Late June-August; late July-October. Ranging from Nova Scotia and se. Manitoba south to panhandle FL and OK. By mid-summer, *Laportea* often becomes the aspect dominant in rich, moist cove forests of the mountains (especially those with extensive seepage), visually replacing the diverse spring flora. The stinging hairs can penetrate pants made of light-weight or loosely woven fabrics. [= RAB, C, F, FNA, G, GW, K, W; *Urticastrum divaricatum* (Linnaeus) Kuntze -- S]

Parietaria Linnaeus 1753 (Pellitory)

A genus of about 20 species, annual and perennial herbs, of nearly cosmopolitan distribution. References: Hinton (1968)=Z; Friis in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Leaves softly pubescent; [plant an alien weed] ***P. judaica***
- 1 Leaves glabrescent; [plants native, sometimes weedy in calcareous or coastal areas].
 - 2 Main lateral veins diverging from the midvein above the usually narrowly cuneate leaf base; larger leaves 2-5x as long as wide ***P. pensylvanica* var. *pensylvanica***
 - 2 Main lateral veins diverging from the midvein at the usually truncate, rounded, or broadly cuneate leaf base; larger leaves 1-2x as long as wide.
 - 3 Achene without a flanged stipe, the minute apiculate tip located asymmetrically, the achene usually 1.2 (-1.4) mm long ***P. praetermissa***
 - 3 Achene with a flanged stipe, the minute apiculate tip located symmetrically at the pole of the achene, the achene 0.8-1.0 mm long ***P. floridana***

*? ***Parietaria floridana*** Nuttall, Florida Pellitory. Cp (GA, NC, SC): coastal shores, sometimes weedy in calcareous situations; rare (NC Watch List). March-frost; April-frost. This species has smaller leaves than *P. praetermissa*. It ranges from DE south to FL and west to TX, on the outer Coastal Plain. It may be only introduced in our area. [= FNA, GW, K, Z; *P. nummularia* Small -- C, F, S]

* ***Parietaria judaica*** Linnaeus, Pellitory-of-the-wall. Cp (VA): disturbed urban areas; rare, introduced from Europe. [= FNA, K; *P. diffusa* Mertens & Koch]

Parietaria pensylvanica Muhlenberg ex Willdenow var. ***pensylvanica***, Pennsylvania Pellitory, Rock Pellitory. Mt (GA, NC, VA), Pd, Cp (NC, VA): in circumneutral soils, such as in thin soils at the bases of calcareous or subcalcareous cliffs or on calcareous shale barrens; uncommon, rare in VA Coastal Plain and NC (GA Special Concern, NC Watch List). April-October; May-October. The species is widespread in North America (though scattered and irregular in much of its range), from Maine west to British Columbia, south to e. NC, w. NC, AL, TX, NV, and Mexico. Var. *pensylvanica* is eastern and northern; var. *obtusata* (Rydberg ex Small) Shinnars is southwestern. [*P. pensylvanica* -- C, FNA, G, GW, K, RAB, S, W, infraspecific taxa not recognized; *P. pensylvanica* -- F (sensu stricto)]

Parietaria praetermissa Hinton, Coastal Pellitory. Cp (GA, NC, SC): shell middens, coastal hammocks; rare (NC Watch List). March-frost; April-frost. Ranging from e. NC south to FL and west to LA. [= FNA, GW, K, Z; *P. floridana* Nuttall -- RAB, C, F, S, misapplied]

Pilea Lindley 1821 (Clearweed)

A genus of about 250 species, annual and perennial herbs, nearly cosmopolitan in tropical and warm temperate regions of the Old World and the New World. References: Friis in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Leaves 0.5-1.0 (-1.8) cm long ***P. microphylla***
- 1 Leaves 4-10 cm long.
 - 2 Achene 1-1.5x as long as broad, tuberculate, dark brown or black, the margins slightly paler ***P. fontana***
 - 2 Achene 1.5-2x as long as broad, smooth, green or light brown, with slightly raised dark to black lines and mottlings ***P. pumila***

Pilea fontana (Lunell) Rydberg, Blackfruit Clearweed, Lesser Clearweed. Cp, Mt (NC, SC, VA), Pd (NC, SC): swamp forests, freshwater marshes, calcareous wetlands; common (SC Rare List). August-September; September-November. Ranging from e.

Canada west to MN and ND, south to FL, IN, and NE. Only reliably distinguishable from *P. pumila* using fruits, *P. fontana* is, however, somewhat less shiny and transparent-translucent. [= RAB, C, FNA, G, GW, K, W; *Adicea pumila* (Linnaeus) Rafinesque - S, in part only]

* ***Pilea microphylla*** (Linnaeus) Liebmann, Rockweed, Artillery Weed. Cp (GA, SC): old rock and brick walls, urban areas; rare. January-December. Although listed by RAB for the Carolinas as "a weed in and around greenhouses, not established as part of our flora," this species is well-established and weedy in Charleston, SC and Savannah, GA. It is presumably adventive from further south. [= RAB, FNA, K, S]

Pilea pumila (Linnaeus) A. Gray, Greenfruit Clearweed, Coolwort, Richweed. Mt, Pd (GA, NC, SC, VA), Cp (NC, SC, VA): swamp forests, bottomlands, freshwater marshes; common. August-September; September-November. Ranging from Québec west to MN, south to FL, LA, and OK. [= RAB, C, FNA, G, GW, W; *P. pumila* var. *pumila* -- F, K; *Adicea pumila* (Linnaeus) Rafinesque -- S, in part only (including in concept *P. fontana*)]

Urtica Linnaeus 1753 (Stinging Nettle)

A genus of about 80 species, annual and perennial herbs, nearly cosmopolitan, but primarily in temperate regions of the Northern Hemisphere. References: Woodland (1982)=Z; Woodland, Bassett, Crompton, & Forget (1982); Friis in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Plant a tap-rooted annual; stipules 1-3 mm long, spreading or deflexed; inflorescences usually shorter than the subtending leaf petiole, each panicle consisting of a mixture of pistillate and staminate flowers.
 - 2 Flower clusters subglobose; mature achenes ovate, 1-1.5 mm long, less than 1 mm wide; leaf teeth generally blunt, the sides of the tooth convex ***U. chamaedryoides***
 - 2 Flower clusters elongate; mature achenes triangular, 1.5-2.5 mm long, 1-1.5 mm wide; leaf teeth generally sharp, the sides of the tooth straight ***U. urens***
- 1 Plant a rhizomatous perennial; stipules 5-15 mm long, erect; inflorescences usually surpassing the subtending leaf petiole, each panicle of either pistillate or staminate flowers.
 - 3 Plants dioecious (male and female flowers always on separate plants); stems usually weak, sprawling, branching; stems strongly hispid with stinging hairs; leaf blades strongly hispid with stinging hairs on both surfaces; leaf teeth commonly 5-6 mm long ***U. dioica***
 - 3 Plants mostly monoecious (with male and female flowers in separate inflorescences on the same plant), rarely an entire plant male or female; stems upright, erect, less branched; stems glabrous to puberulent or strigose, lacking (or nearly so) stinging hairs; leaf blades glabrous or glabrescent above (lacking stinging hairs), glabrous to puberulent below (with some stinging hairs); leaf teeth commonly 2-3.5 mm long ***U. gracilis***

Urtica chamaedryoides Pursh, Dwarf Stinging Nettle. Cp (GA, NC, SC), Pd (NC, SC): rich moist soil, usually on floodplains; rare (NC Rare). November-May; May-July. Ranging from WV, KY, se. MO and OK south to FL, TX, and Mexico; very rare east of the Blue Ridge. Notable locations in our area include Stevens Creek (Richmond County, SC), and various sites on very rich levees of the Roanoke River (NC). Gaddy & Rayner (1980) report the common winter flowering of this species in our area. [= RAB, C, F, FNA, G, K, S, Z]

* ***Urtica dioica*** Linnaeus, European Stinging Nettle, Great Nettle. Mt, Cp (GA, NC, VA), Pd (NC, VA): disturbed areas, primarily in calcareous soils; uncommon, introduced from Europe. May-July; July-September. See *U. gracilis* for discussion of the two taxa. [= F, S; *U. dioica* -- RAB, W, in part only (also see *U. gracilis*); *U. dioica* var. *dioica* -- C, G; *U. dioica* ssp. *dioica* -- FNA, K, Z]

Urtica gracilis Aiton, American Stinging Nettle. Mt (NC?, VA), Pd (VA): bottomland forests and edges, particularly over limestone; rare (NC Watch List). May-July; July-September. Ranging from Labrador and Nova Scotia west to AK, south to sw. VA, w. NC (?), s. OH, s. IL, s. MO, n. TX, s. NM, and se. AZ. The native stinging nettle of e. and c. North America is best treated as specifically distinct from *U. dioica* of Europe. Woodland (1982) and Woodland, Bassett, Crompton, & Forget (1982) showed that *U. gracilis* differs from *U. dioica* in a variety of morphologic characters (see key), chromosome number (2n = 26 for *U. gracilis*, 2n = 52 for *U. dioica*), breeding system (monoecy vs. dioecy), and distribution (North American vs. Eurasian); furthermore, the two taxa could not be crossed. Woodland (1982) chose subspecific status, apparently to emphasize the close relationship of the two (and a third taxa in w. North America). The combination of morphological distinctiveness, allopatry, major differences in species biology, and incompatibility seem adequate to warrant separation as species, however. Until herbaria can be checked, it is uncertain whether *U. gracilis* occurs in NC. F (as *U. procera*), G (as *U. dioica* var. *procera*) and S include NC in the range; Woodland (1982), however, showed the range as extending only south to VA. [= F, S; *U. dioica* -- RAB, W, in part; *U. dioica* Linnaeus var. *procera* (Muhlenberg ex Willdenow) Weddell -- C, G; *U. procera* Muhlenberg -- F; *U. dioica* Linnaeus ssp. *gracilis* (Aiton) Selander -- FNA, K, Z]

* ***Urtica urens*** Linnaeus, Burning Nettle, Dog-nettle, Small Nettle. Cp (SC): disturbed areas; rare, introduced from Eurasia. April-May; May-July. [= RAB, C, F, FNA, G, K, S, Z]

VALERIANACEAE (Valerian Family)

A family of about 10 genera and 300 species, herbs (rarely shrubs), nearly cosmopolitan in distribution. References: Ferguson

(1965).

- 1 Stem leaves pinnately compound **Valeriana**
- 1 Stem leaves simple **Valerianella**

Valeriana Linnaeus (Valerian)

A genus of about 200 species, herbs and shrubs, of temperate North America and Eurasia, s. Africa, and Andean South America.

- 1 Corolla tube 3-4 mm long [**V. officinalis**]
- 1 Corolla tube 12-16 mm long **V. pauciflora**

Valeriana pauciflora Michaux, Pink Valerian, Long-tube Valerian. Pd (VA): very nutrient-rich alluvium in floodplain forests; rare. May: June. Ranging from MD, se. PA, and sw. PA, west to s. IL, south to n. VA, sc. TN, KY, and MO. [= C, F, G, K, W]

Valeriana officinalis Linnaeus, Garden-heliotrope, is a European species sometimes cultivated in our area; it may escape or persist. [= C, K]

Valerianella P. Miller (Corn-salad)

A genus of about 50 species, herbs, of temperate North America, Eurasia, and n. Africa. *Valerianella* species exhibit an interesting set of fruit polymorphisms; the fruit forms in a single species are often strikingly different, and these forms were traditionally regarded as separate taxa. Ware (1983) demonstrated that they were under simple genetic control, and that different fruit forms were found in the same population. Thus, some taxa previously considered distinct are best considered mere fruit types. The fruit consists of three locules, one of which is fertile and dorsal to or more-or-less flanked by the two sterile locules. The sterile locules may be elongate, forming (between them) a groove, or they may be expanded laterally well beyond the width of the fertile locule into flattened or bulbous wings. In *V. locusta*, there is additionally a corky mass on the side of the fertile locule opposite the two sterile locules. References: Ware (1983)=Z.

- 1 Fruit greatly thickened by a corky mass on the back of the fertile locule; corolla pale blue (or white) **V. locusta**
- 1 Fruit lacking a corky mass on the back of the fertile locule; corolla white.
 - 2 Corolla 1.5-2 mm long, the corolla lobes 0.4-0.8 mm long **V. radiata**
 - 2 Corolla 3-5 mm long, the corolla lobes 1-2 mm long **V. umblicata**

* **Valerianella locusta** (Linnaeus) Lat., European Corn-salad. Pd, (NC, SC, VA), Cp, Mt (NC, VA): roadsides, moist forests, bottomlands, disturbed areas; common, introduced from Europe. April-May. [= RAB, K, S, Z; *V. olitoria* (Linnaeus) Pollich -- F, G]

Valerianella radiata (Linnaeus) Dufresne. Cp, Pd, Mt (NC, SC, VA): moist forests, bottomlands, disturbed areas; common. April-May. Ranging from VA, s. IL, and KS, south to FL and TX. [= RAB, F, K, S, Z; *V. radiata* var. *fernaldii* Dyal -- F; *V. radiata* var. *radiata* -- G]

Valerianella umblicata (Sullivant) Wood. Pd, Mt (NC, VA), Cp (VA): moist forests, bottomlands, disturbed areas; rare. Ranging from s. NY west to IL, south to NC and sc. TN Chester, (Wofford, & Kral 1997). Ware (1983) raises the question of whether *V. woodsiana* is a distinct taxon; further study is needed. [= RAB, F, G, K, S, Z; *V. patellaria* (Sullivant ex A. Gray) Wood -- F, S; *V. intermedia* Dyal -- F; *V. radiata* var. *intermedia* (Dyal) Gleason -- G; *V. woodsiana* (Torrey & A. Gray) Walpers -- K, S, Z]

Valerianella chenopodiifolia (Pursh) Augustin de Candolle ranges south to s. PA, MD, and WV (Kartesz 1999) and might be expected in the northern part of our area. [= K; *V. chenopodiifolia* -- C, orthographic variant] {not yet keyed}

Valerianella dentata (Linnaeus) Pollich is reported as naturalized in central TN by Kral (1981) and Chester et al. (1997) and in nc. GA (Jones & Coile 1988). [= K] {not yet keyed}

VERBENACEAE (Verbena Family)
(also see **LAMIACEAE** and **PHRYMACEAE**)

As recently reworked, a family of about 41 genera and 950 species, trees, shrubs, vines, and herbs, widespread in tropical, subtropical, and warm temperate regions of the Old World and New World.

Aloysia de Jussieu (Bee-brush)

Aloysia triphylla (L'Héritier) Britton, Lemon Bee-brush, is allegedly introduced in NC (Kartesz 1999). {investigate, and check family placement}. [= K]

Glandularia J.F. Gmelin (Vervain)

A genus of uncertain size, herbs, of s. North America, Central America, and South America. References: Unger (1979)=Z.

- 1 Leaves finely dissected, the divisions 1 mm or less wide, the margins strongly revolute **G. pulchella**
- 1 Leaves coarsely dissected or lobed, the divisions more than 1 mm wide, the margins slightly or not at all revolute.
 - 2 Calyx lobes 3-4 mm or more long **G. canadensis**
 - 2 Calyx lobes 0.5-1.5 mm or less long **G. xhybrida**

Glandularia canadensis (Linnaeus) Nuttall, Rose Vervain, Rose Verbena, Creeping Vervain. Cp (NC, SC, VA), Pd (NC, SC): roadsides, sandhills, other dry (especially sandy) soils; uncommon. March-May. Ranging from PA, IL, and CO, south to FL and TX, and introduced elsewhere. [= K, S, Z; *Verbena canadensis* Linnaeus -- RAB, C, F, G]

* **Glandularia xhybrida** (Grönland & Rümpler) Nesom & Pruski, Garden Vervain. Cp (SC): cultivated in gardens; uncommonly cultivated, rarely escaped or persistent. March-July. Nesom & Pruski (1992) have provided the transfer to *Glandularia* of this common garden plant. [*Verbena xhybrida* Grönland & Rümpler -- RAB, G, K; *Verbena hybrida* -- C]

* **Glandularia pulchella** (Sweet) Troncoso, Moss Vervain, South American Vervain. Cp (NC, SC), Pd (SC): pastures, roadsides, other disturbed areas; common, introduced from South America. March-November. [= K, Z; *Verbena tenuisecta* Briquet -- RAB, C; *G. tenuisecta* (Briquet) Small -- S]

Glandularia bipinnatifida (Nuttall) Nuttall var. **bipinnatifida**, Dakota Vervain. Mt (GA): dry prairies on clay soils; rare (GA Special Concern). East to KY, TN, nw. GA, AL, and MD (Kartesz 1999). [= K] {not yet keyed}

Lantana Linnaeus (Lantana)

A genus of about 150 species, shrubs and herbs, of tropical and subtropical America and Africa. References: Sanders (1987)=Z.

- * **Lantana camara** Linnaeus, Common Lantana, Hedgeflower. Cp (NC, SC). [= RAB, K, S, Z]
- *? **Lantana depressa** Small var. **floridana** (Moldenke) R. Sanders, Florida Lantana. Cp (SC): edges of brackish marshes, dunes; rare, apparently introduced from FL. Native from ne. FL south to se. FL. [= K, Z; *L. ovatifolia* Britton -- RAB, S, misapplied; *L. depressa* Small -- S]
- * **Lantana montevidensis** (Sprengel) Briquet, Trailing Shrub-verbena. Cp (GA): disturbed areas; rare, introduced. Scattered locations in s. and e. GA (Jones & Coile 1988). [= K]
- * **Lantana urticoides** Hayek, West Indian Lantana. Cp (SC): [= K; *L. horrida* Kunth -- RAB, misapplied]

Phyla Loureiro (Frogfruit, "Fogfruit")

A genus of about 11 species, herbs, of tropical, subtropical, and warm temperate regions of the Old and New Worlds.

- 1 Leaves 2-6 cm long, lanceolate, widest at or below the middle, acute at the tip; leaf teeth (5-) 7-11 per leaf side **Ph. lanceolata**
- 1 Leaves 1-4 cm long, obovate, widest above the middle, obtuse to rounded at the tip; leaf teeth (3-) 5 (-7) per leaf side **Ph. nodiflora**

Phyla lanceolata (Michaux) Greene, Marsh Frogfruit, Northern Frogfruit. Cp (GA, NC, SC, VA), Pd, Mt (VA): brackish marshes, other marshes, ditches; common (GA Special Concern). June-November. Ranging from Ontario west to SD, south to ne. FL, AL, MS, LA, CA, and n. Mexico; primarily in the outer Coastal Plain in the Carolinas, but extending inland in VA. [= C, G, GW, K, S, W; *Lippia lanceolata* Michaux -- RAB, F; *Lippia lanceolata* var. *recognita* Fernald & Griscom -- F]

Phyla nodiflora (Linnaeus) Greene, Creeping Frogfruit, Capeweed, Turkey-tangle, Matgrass. Cp (NC, SC, VA): sandy soils of roadsides, lawns, ditches, disturbed areas; common (VA Rare List). May-November. Pantropical, in North America from se. VA south to s. FL and west to CA, north in the interior to AR, se. MO, and southwards into the tropics. This species is very weedy, and is a familiar component of road margins and lawns in the southeastern Coastal Plain. [= C, G, GW, K, S; *Lippia nodiflora* (Linnaeus) Michaux -- RAB, F]

Stylodon Rafinesque (Carolina-vervain)

A monotypic genus, an herb, of se. North America.

Stylodon carneus (Medikus) Moldenke, Carolina-vervain. Cp (NC, SC, VA?): sandy woodlands, sandhills; uncommon. April-July. Ranging from e. NC (se. VA?) south to c. peninsular FL, west to e. TX. [= K; *Verbena carneae* Medikus -- RAB, F; *Stylodon carolinensis* (Walter) Small -- S]

Verbena Linnaeus (Verbena, Vervain)
(also see *Glandularia* and *Stylodon*)

A genus of about 200 species, herbs, of tropical, subtropical, and warm temperate regions of the New World and (rarely) Old World. References: Barber (1982)=Z.

- * **Verbena bonariensis** Linnaeus. Cp (NC, SC, VA), Pd (NC, SC): introduced from South America. [= RAB, C, G, GW, K, S; *V. bonariensis* var. *bonariensis* – K; *V. bonariensis* var. *conglomerata* Briq. -- K]
- Verbena bracteata** Lagasca & Rodriguez, Prostrate Vervain. Cp (NC, VA), Pd, Mt (NC): [= RAB, C, F, G, K, Z; *V. bracteosa* Michaux -- S]
- * **Verbena brasiliensis** Vellozo, Brazilian Vervain. Cp, Pd (NC, SC, VA), Mt (NC): introduced from South America. [= RAB, C, F, G, GW, K, S]
- Verbena xengelmannii** Moldenke [**Verbena hastata** x **urticifolia**]. Mt (NC): [= RAB, C, K]
- * **Verbena halei** Small. Cp (NC, SC): introduced from farther west. [= RAB, K, S; *V. officinalis* ssp. *halei* (Small) Barber -- Z]
- Verbena hastata** Linnaeus, Common Vervain, Blue Vervain, Simpler's-joy. Cp, Pd, Mt (NC, VA): [= RAB, C, F, G, GW, S, W, Z; *V. hastata* var. *hastata* -- K; *V. hastata* var. *scabra* Moldenke -- K]
- * **Verbena officinalis** Linnaeus, European Vervain, Juno's Tears. Cp (NC, SC, VA), Mt (NC, VA), Pd (VA): [= RAB, C, F, G, S; *V. officinalis* var. *officinalis* – K; *V. officinalis* var. *prostrata* Gren. & Godr. -- K; *V. officinalis* ssp. *officinalis* -- Z]
- * **Verbena rigida** Sprengel. Cp (NC, VA): introduced from South America. [= K, S]
- Verbena riparia** Rafinesque ex Small & Heller, Riverbank Vervain. Mt (NC, VA), Pd (NC): [= RAB, C, F, G, K, S, W]
- Verbena scabra** Vahl, Rough Vervain, Harsh Vervain. Cp (NC, SC, VA), Pd?, Mt? (VA): [= RAB, C, F, G, GW, K, S]
- Verbena simplex** Lehmann, Narrowleaf Vervain. Pd (NC, SC, VA), Cp, Mt (VA): [= RAB, C, F, G, K, W, Z; *V. angustifolia* Michaux -- S]
- Verbena stricta** Ventenat, Hoary Vervain. Cp (NC): [= RAB, C, F, G, K, S, W, Z]
- Verbena urticifolia** Linnaeus var. **leiocarpa** Perry & Fernald, Velvetleaf Vervain. {Cp, Pd, Mt (NC, SC, VA): } [= C, F, G, K; *V. urticifolia* -- RAB, GW, W, Z, infraspecific taxa not distinguished; *V. urticaefolia* -- S, orthographic variant, infraspecific taxa not distinguished]
- Verbena urticifolia** Linnaeus var. **urticifolia**, White Vervain. [= C, F, G, K; *V. urticifolia* -- RAB, GW, W, Z, infraspecific taxa not distinguished; *V. urticaefolia* -- S, orthographic variant, infraspecific taxa not distinguished]

Verbena litoralis Kunth occurs at scattered sites in e. and s. GA (Jones & Coile 1988). [= K]

VIOLACEAE (Violet Family)

A family of about 20 genera and 900 species, herbs, shrubs, and vines, cosmopolitan in distribution. References: McKinney & Russell (2002)=X.

- 1 Plants caulescent, 4-10 dm tall, the leaves narrowly cuneate to a petiole 0-20 mm long, also long acuminate; petals green; fruit 15-20 mm long **Hybanthus**
- 1 Plants acaulescent or caulescent, 0-5 dm tall, if caulescent, the leaves not at the same time cuneate, short-petiolate, and acuminate; petals white, yellow, violet, or blue, the lowermost spurred; fruit less than 13 mm long **Viola**

Hybanthus Jacquin (Green-violet)

A genus of about 150 species, shrubs and herbs, of tropical and warm temperate regions of the Old and New Worlds. References: McKinney & Russell (2002)=X.

- 1 [native plant of nutrient-rich forests] **H. concolor**
- 1 [alien plant of weedy areas] **H. parviflorus**

Hybanthus concolor (T.F. Forster) Sprengel, Green-violet. Pd, Mt (GA, NC, SC, VA), Cp (GA, VA): very nutrient-rich and mesic forests; uncommon. Late May-June; August-October. Ranging from VT and s. Ontario west to MI and KS, south to SC, GA, and AR. [= RAB, C, F, G, K, W, X; *Cubelium concolor* (T.F. Forster) Rafinesque -- S]

* **Hybanthus parviflorus** (Mutis ex Linnaeus f.) Baill. Cp (GA): disturbed area; rare, introduced from South America. April. First collected in North America by Tom Govus at Fort Pulaski National Monument (Chatham County, GA). It is unclear whether this is a recent introduction or an old weed introduced via ballast.

Viola Linnaeus (Violet, Johnny-jump-up, Pansy)
(contributed by B.A. Sorrie and A.S. Weakley)

A genus of about 525-600 species, herbs (rarely subshrubs), of temperate regions of the Old and New Worlds. References: Ballard (1992)=Z; Gil-ad (1998)=Y; McKinney & Russell (2002)=X; McKinney (1992); Ballard & Wujek (1994); Russell (1955); Ballard, Sytsma, & Kowal (1999). Key adapted, in part, from Ballard (1992) and Ballard & Wujek (1994).

- 1 Plant caulescent (producing aerial stems bearing leaves and flowers).
 - 2 Corolla yellow, or white with a yellow center (sometimes drying lavender); stipules entire or erose **Key A**
 - 2 Corolla wholly cream-colored, or cream with a yellow center, or blue-violet, or multicolored (blue or violet with orange or yellow) **Key B**
- 1 Plant acaulescent (with leaf petioles and flower stalks arising separately from the base of the plant).
 - 3 Corolla yellow; leaves borne more-or-less flat on the ground **Key C**
 - 3 Corolla white, blue-violet, or blue-and-white variegated.
 - 4 Plant producing stolons; corolla white (or blue in *V. appalachiensis*, *V. walteri*, and *V. odorata*) **Key D**
 - 4 Plant not producing stolons; corolla blue-violet **Key E**

Key A -- Caulescent Violets with yellow or white flowers

- 1 Corolla white with a yellow center (sometimes drying lavender); stipules long-triangular, attenuate *V. canadensis* var. *canadensis*
- 1 Corolla solid yellow; stipules ovate to narrowly ovate.
 - 2 Leaves 3-lobed *V. tripartita* var. *tripartita*
 - 2 Leaves cordate or hastate.
 - 3 Leaves at least as broad as long.
 - 4 Stems 2-several; basal leaves 4 or more; foliage glabrous to glabrate *V. pubescens* var. *scabriuscula*
 - 4 Stems 1; basal leaves 0-2; foliage densely pubescent *V. pubescens* var. *pubescens*
 - 3 Leaves distinctly longer than broad.
 - 5 Leaf blade hastate; base of leaf strongly cordate *V. hastata*
 - 5 Leaf blade narrowly ovate; base of leaf blade rounded to broadly cuneate *V. tripartita* var. *glaberrima*

Key B -- Caulescent Violets with blue, cream, or multicolored flowers

- 1 Stipules foliaceous, deeply lobed; leaves cuneate at base; [plants of weedy habitats].
 - 2 Corolla pale blue with a cream center; petals 2x as long as the sepals *V. bicolor*
 - 2 Corolla either cream with a yellow center or multicolored; petals less than 2x as long as the sepals.
 - 3 Corolla cream with a yellow center; petals shorter than the sepals or longer by up to 2 mm *V. arvensis*
 - 3 Corolla multicolored (cream to orange with a yellow center, the upper petals at least partly dark blue); petals longer than the sepals by 2 mm or more *V. tricolor*
- 1 Stipules herbaceous, fringed along the margin; leaves truncate or cordate at the base; [section *Viola*].
 - 4 Above-ground stems absent (surficial stolons present; style terminating in a slender hook ca. 1 mm long; capsules hirtellous; [plant introduced, cultivated, rarely persistent or spreading] *V. odorata*
 - 4 Above-ground stems present, ascending or prostrate (and stolon-loke rhizomes present in *V. appalachiensis* and *V. walteri*); style straight or terminating in a bent or recurved hook 0-0.5 mm long; capsules glabrous; [plants native].
 - 5 Stems immediately becoming prostrate at time of flowering; stems persistent through winter, rooting at the nodes, and generating the following year's plants at their tips (plants thus mat-forming).
 - 6 Leaf blades with scattered hairs near the margin only; petioles, peduncles and stems glabrous; stipules shallowly lacerate, with marginal processes less than 1/4 as long as the stipule *V. appalachiensis*
 - 6 Leaf blades moderately to densely puberulent over the entire surface; petioles, peduncles and stems moderately to densely puberulent; stipules deeply lacinate with marginal processes more than 1/2 as long as the stipule *V. walteri*
 - 5 Stems ascending to erect at time of flowering and fruiting; stems deciduous at end of growing season, not rooting at nodes (plants thus solitary).
 - 7 Lateral sepals glabrous within; corolla lavender, with a purple-black eyespot surrounding the throat; spur 7-20 mm long *V. rostrata*
 - 7 Lateral sepals bearded within; corolla uniformly creamy-white or blue (rarely white), lacking a contrasting eyespot around the throat; spur 3-6 mm long.
 - 8 Sepal margins eciliate; flowers lavender to violet (rarely white in albino forms); spur mostly more than 5 mm long *V. labradorica*
 - 8 Sepal margins distinctly ciliate; flowers creamy-white; spur mostly less than 5 mm long *V. striata*

Key C -- Acaulescent Violets with yellow flowers

- One species in our area *V. rotundifolia*

Key D -- Acaulescent Violets with stolons and white or blue flowers

- 1 Flowers generally blue (white or blue-and-white variegated in *V. odorata*, which has the style terminating in a conic hook).
 - 2 Above-ground stems absent (surficial stolons present); style terminating in a slender hook ca. 1 mm long; capsules hirtellous; [plant introduced, cultivated, rarely persistent or spreading] ***V. odorata***
 - 2 Above-ground stems generally present, ascending or prostrate (and stolon-like rhizomes present); style straight or terminating in a bent or recurved hook 0-0.5 mm long; capsules glabrous; [plants native].
 - 3 Leaf blades with scattered hairs near the margin only; petioles, peduncles and stems glabrous; stipules shallowly lacerate with marginal processes less than 1/4 as long as the stipule ***V. appalachiensis***
 - 3 Leaf blades moderately to densely puberulent over the entire surface; petioles, peduncles and stems moderately to densely puberulent; stipules deeply lacinate with marginal processes more than 1/2 as long as the stipule ***V. walteri***
- 1 Flowers white (and the style broad at the tip, in most species resembling a scoop).
 - 4 Leaf blades more than 1.5x as long as broad.
 - 5 Leaf blades lance-ovate, broadly cuneate to subcordate at the base ***V. primulifolia***
 - 5 Leaf blades linear to lanceolate, narrowly cuneate at the base.
 - 6 Leaf blades lanceolate, less than 8x as long as wide; plant glabrous ***V. lanceolata* var. *lanceolata***
 - 6 Leaf blades linear or narrowly lanceolate, more than 10x as long as wide; plant glabrous to pubescent ***V. lanceolata* var. *vittata***
 - 4 Leaf blades less than 1.5x as long as broad.
 - 7 Leaf blades completely glabrous (petioles may be villous); [plants of wet, acidic seepage or streamsides] ***V. macloskeyi* var. *pallens***
 - 7 Leaf blades pubescent, at least on the upper surface of the basal lobes.
 - 8 Lateral petals glabrous within; petioles and peduncles usually reddish-tinged; leaf apex acute; basal lobes of the leaf often overlapping; pubescence of the upper leaf surface often restricted to the basal lobes; [plants of mesic, often nutrient-rich forests] ***V. blanda***
 - 8 Lateral petals bearded within; petioles and peduncles green; leaf apex obtuse to rounded; basal lobes of the leaf not overlapping; pubescence of the upper leaf surface usually widespread; [plants of mesic to wet situations] ***V. incognita***

Key E -- Acaulescent Violets without stolons, with blue-violet flowers

- 1 Leaf blades deeply divided throughout, or lobed basally, or deeply toothed basally (the earliest 1-2 leaves may be simply cordate); [some species keyed both here and below].
 - 2 Leaf blades deeply divided throughout into linear or lanceolate segments (or with several narrow lateral segments and a broadly lanceolate central segment), the leaf blade (in outline) about as broad as long.
 - 3 Lateral petals glabrous within; stamens orange, conspicuously exerted; [plants of dry habitats] ***V. pedata***
 - 3 Lateral sepals bearded; stamens not orange and conspicuously exerted; [plants of moist to wet habitats, or dryish, basic sites].
 - 4 Petioles and leaf blades (the lower leaf surface at least) moderately to densely pubescent; [plants of mesic to fairly dry, woodlands, over circumneutral to basic soils] ***V. palmata* var. *subsiniuata***
 - 4 Petioles and leaves glabrous or glabrate with marginal ciliate hairs; [plants of moist to wet habitats].
 - 5 Leaf segments 9-11, with a narrow central lobe; peduncle equal to or shorter than the leaves; sepal auricles much longer than wide; [plants of ecotones at upper edges of alluvial or levee forests] ***V. brittoniana* var. *brittoniana***
 - 5 Leaf segments 5-7, with a broadly lanceolate central lobe; peduncle normally much longer than the leaves; sepal auricles wider than long or equal; [plants of moist pine savannas and pocosin ecotones] ***V. septemloba***
 - 2 Leaf blades lobed or deeply toothed only towards the base.
 - 6 Leaf blade outline oblong-lanceolate to ovate-triangular, much longer than wide.
 - 7 Petioles distinctly shorter than the leaf blades; leaf blades densely pubescent, the apex blunt, the basal teeth undeveloped or with a few coarse teeth on mature leaves; [plants of dry sandy clearings and banks] ***V. fimbriatula***
 - 7 Petioles equal to or longer than the leaf blades; leaf blades glabrate, the apex acute, the basal teeth well-developed, very coarse to lobe-like; [plants of mesic sandy soil of fields, meadows, and pine savannas] ***V. sagittata***
 - 6 Leaf blade outline ovate to subrotund, about as wide as long.
 - 8 Plant moderately to densely pubescent, at least on petioles and undersurfaces of leaves; mature leaves trilobed; [plants of mesic to dryish woodlands, in circumneutral or basic soils] ***V. palmata* var. *palmata***
 - 8 Plant glabrous or glabrate (hairs on leaf margins or on upper surface of the lobes); mature leaves either trilobed or 5-7-lobed; [plants of moist to wet habitats].
 - 9 Mature leaves trilobed, with 1 (-2) reniform or obovate lobes on each side; spurred petal glabrous; [plants

- of streamsides, floodplains, levee forests] **V. esculenta**
- 9 Mature leaves deeply lobed with 2-3 lanceolate lobes on each side; spurred petal bearded; [plants of moist to wet pine savannas and pocosin ecotones] **V. septemloba**
- 1 Leaf blades merely serrate along the margin, ovate to subrotund in outline, cordate to truncate at the base.
- 10 Leaf blades mostly longer than broad, narrowly ovate to long-triangular, tapering to an acute or even short-acuminate apex.
 - 11 Foliage moderately to densely pubescent; leaves distinctly longer than wide; [plants of dry to mesic clearings and banks] **V. fimbriatula**
 - 11 Foliage glabrous or glabrate; [plants of various habitats].
 - 12 Lateral petals bearded with clavate hairs; spurred petal glabrous within; [plants of swamps and sphagnum streamsides] **V. cucullata**
 - 12 Lateral petals with hairs of essentially uniform width; spurred petal bearded within; [plants of various habitats].
 - 13 Basal teeth no larger than the others; leaf bases cordate; [plants of mesic forests, streamsides, and seeps] **V. affinis**
 - 13 Basal teeth longer than the others; leaf bases truncate to subcordate (ignore earliest 1-2 leaves).
 - 14 Leaf outline broadly triangular, not much longer than wide; teeth on lower half of leaf numerous, pectinate **V. brittoniana** var. **pectinata**
 - 14 Leaf outline narrowly triangular-ovate, much longer than wide; basal teeth few, very coarse **V. sagittata**
 - 10 Leaf blades about as wide as long or wider, ovate to suborbicular, the apex obtuse to acute.
 - 15 Lateral petals bearded with clavate hairs; foliage glabrous or glabrate.
 - 16 Petals light blue or light violet-blue, with a dark eye and dark veins; sepals 8-12 mm long; all plants in population with unlobed leaves; [plants primarily of the Mountains] **V. cucullata**
 - 16 Petals violet-blue, with a white eye and dark veins; sepals 6-7 (-8) mm long; at least some plants in population with trilobed leaves; [plants primarily of the Coastal Plain] **V. esculenta**
 - 15 Lateral petals bearded with hairs of uniform width; foliage distinctly pubescent, glabrate, or glabrous.
 - 17 Leaf blades glabrous or glabrate, or with hairs confined to just the basal lobes; petioles glabrous or glabrate.
 - 18 Leaf blades with obvious area of hairs confined to upper surface of the basal lobes; spurred petal bearded; all plants in population with unlobed leaves **V. affinis**
 - 18 Leaf blades glabrous or glabrate, not as above; spurred petal glabrous or glabrate; all plants in population with unlobed leaves, or some leaves trilobed.
 - 19 Blades green beneath; spurred petal glabrous; at least some plants in population with trilobed leaves **V. esculenta**
 - 19 Blades red-dotted or red-tinged beneath; spurred petal glabrous or glabrate; all plants in population with unlobed leaves **V. sororia**
 - 17 Leaf blades moderately to densely pubescent on one or both surfaces, or on the petioles.
 - 20 Leaf blades equally pubescent on both surfaces, or glabrate on both surfaces.
 - 21 Leaf blades large, the apex acute, held high above the ground on long, ascending petioles, deciduous; peduncles shorter than to equalling the petioles **V. sororia**
 - 21 Leaf blades small, blunt or rounded, essentially flat on the ground, evergreen or tardily deciduous; peduncles much longer than the petioles **V. villosa**
 - 20 Leaf blades much more pubescent on one surface than the other.
 - 22 Leaf blades densely pubescent above, sparsely so below and on the petiole; leaf apex blunt to rounded; leaf blade often purple-tinged below **V. hirsutula**
 - 22 Leaf blades much more pubescent beneath and on petiole, glabrate above; leaf apex acute; leaf blade green beneath **V. septentrionalis**

Viola affinis Le Conte, Thinlineaf Violet, LeConte's Violet. (VA Watch List). [= RAB, F, G, GW, K, S, W, Y; *V. sororia* -- C, in part]

Viola appalachensis L.K. Henry, Appalachian Violet. Mt (NC): serpentine barrens, rich cove forests (especially old road beds through coves); rare (NC Rare). April-May. Ranging from PA and WV south to sw. NC. [= K, Z; *V. walteri* House var. *appalachensis* (L.K. Henry) L.E. McKinney -- X]

* **Viola arvensis** Murray, European Field-pansy. [= RAB, C, F, G, K, S, W, X]

Viola bicolor Pursh, Wild Pansy. [= K, X; *V. rafinesquii* Greene -- RAB, C, G, S, W; *V. kitaibeliana* J.A. Schultes var. *rafinesquii* Fernald -- F; *V. rafinesquei*]

Viola blanda Willdenow, Sweet White Violet. [= F, G, S; *V. blanda* -- RAB, C, W, X, in part only (also see *V. incognita*); *V. blanda* var. *blanda* -- K]

Viola brittoniana Pollard var. **brittoniana**. (NC Watch List, VA Watch List). [= RAB, G, K; *V. palmata* var. *palmata* -- C, in part only; *V. brittoniana* -- F, in the narrow sense; *V. pedatifida* G. Don ssp. *brittoniana* (Pollard) McKinney -- X, in part; *V. brittoniana* -- Y]

Viola brittoniana Pollard var. **pectinata** (Bicknell) Alexander. [= RAB, G, K; *V. palmata* var. *palmata* -- C, in part only; *V. pectinata* Bicknell -- F; *V. pedatifida* G. Don ssp. *brittoniana* (Pollard) McKinney -- X, in part; *V. brittoniana* -- Y]

Viola canadensis Linnaeus var. **canadensis**. [= RAB, C, K; *V. canadensis* var. *rugulosa* (Greene) C.L. Hitchcock -- RAB, C, misapplied as to plants in our area; *V. canadensis* -- F, G, S, in the narrow sense; *V. rugulosa* Greene -- G, misapplied as to our plants; *V. canadensis* -- W, X, in the broad sense]

Viola cucullata Aiton, Blue Marsh Violet, Bog Violet. [= RAB, C, G, GW, K, S, W, X, Y; *V. cucullata* var. *cucullata* -- F; *V. obliqua* Hill]

Viola esculenta Elliott. (VA Rare List). [= F, G, GW, S; *V. septemloba* -- RAB, in part; *V. palmata* var. *palmata* -- C, in part; *V. xesculenta* Elliott (pro sp.) (*septemloba* × *triloba*) -- K]

Viola fimbriatula Smith. In e. TN (Chester, Wofford, & Kral 1997). [= RAB, F, G, S, W, Y; *V. sagittata* Aiton -- C, in part; *V. sagittata* Aiton var. *ovata* (Nuttall) Torrey & A. Gray -- K, X; *V. sagittata* var. *fimbriatula* Sm.]

Viola hastata Michaux, Spearleaf Violet, Silverleaf Violet, Halberd-leaf Violet. [= RAB, C, F, G, K, S, W, X]

Viola hirsutula Brainerd. [= RAB, F, G, K, S, W, X; *V. villosa* Walter -- C, in part]

Viola incognita Brainerd. (VA Watch List). [= F, G, S; *V. blanda* -- RAB, C, X, in part; *V. incognita* var. *forbesii* Brainerd -- F, G; *V. blanda* Willdenow var. *palustriformis* A. Gray -- K]

Viola labradorica Schrank, American Dog-violet. Mt (NC, SC, VA), Cp (VA): moist alluvial woodlands and forests, seepage slopes, marl ravines; uncommon. Late March-May. Ranging from Labrador west to AK, south to e. VA, nw. SC, AL, and OH. Ballard concluded that *V. conspersa* was not distinct from *V. labradorica*. [= K, X, Z; *V. conspersa* Reichenbach -- RAB, C, F, G, GW, S, W]

Viola lanceolata Linnaeus var. **lanceolata**, Lanceleaf Violet. [= C, F; *V. lanceolata* -- RAB, W, X, infraspecific taxa not distinguished; *V. lanceolata* ssp. *lanceolata* -- GW, K; *V. lanceolata* -- G, S, in the narrow sense]

Viola lanceolata Linnaeus var. **vittata** (Greene) Weatherby & Griscom, Strap-leaf Violet. [= C, F; *V. lanceolata* -- RAB, W, X, infraspecific taxa not distinguished; *V. lanceolata* ssp. *vittata* (Greene) Russell -- GW, K; *V. vittata* Greene -- G, S]

Viola macloskeyi F. Lloyd var. **pallens** (Banks ex Augustin de Candolle) C.L. Hitchcock, Wild White Violet. Mt (NC, SC, VA), Pd (VA): brookbanks, seepages; uncommon. Perhaps better recognized at the specific level, as *V. pallens*, which seems distinct from the narrowly distributed *V. macloskeyi*, of CA, OR and e. NV. Ballard et al. (2001) suggest that Hispaniolan *V. domingensis* Urban is conspecific with *V. macloskeyi sensu lato*. [= RAB, C; *V. pallens* (Banks ex Augustin de Candolle) Brainerd -- F, G, GW, S; *V. pallens* var. *subreptans* Rousseaux -- G; *V. macloskeyi* ssp. *pallens* (Banks ex Augustin de Candolle) M.S. Baker -- K, W; *V. macloskeyi* F. Lloyd -- X]

* **Viola odorata** Linnaeus, Sweet Violet, English Violet. Pd (NC, VA?): gardens, lawns, disturbed places, persistent or weakly spreading from horticultural use; rare, introduced from Europe. [= C, F, G, K, S, Z]

Viola palmata Linnaeus var. **palmata**, Wood Violet. [= RAB; *V. palmata* var. *triloba* (Schweinitz) Gingins ex Augustin de Candolle -- RAB; *V. palmata* var. *palmata* -- C, in part only; *V. triloba* Schweinitz var. *triloba* -- F, G, K; *V. stoneana* -- F, G; *V. palmata* -- F, G, S, W, X, in the narrow sense; *V. chalcosperma* Brainerd -- F, S; *V. xpalmata* Linnaeus (pro sp.) -- K, in part; *V. triloba* Schweinitz -- S, W]

Viola palmata Linnaeus var. **subsinuata** Greene. (VA Watch List). [*V. palmata* var. *palmata* -- C, in part only; *V. triloba* var. *dilatata* (Elliott) Brainerd -- F, G; *V. triloba* Schweinitz var. *dilatata* (Elliott) Brainerd -- K; *V. subsinuata* Greene -- X]

Viola pedata Linnaeus, Bird's-foot Violet. [= RAB, C, F, G, K, S, W; *V. pedata* var. *lineariloba* Augustin de Candolle -- F, G; *V. pedata* var. *pedata* -- X; *V. pedata* var. *ranunculifolia* (Jussieu ex Poiret) Ging. ex DC. -- X]

Viola primulifolia Linnaeus, Primrose-leaf Violet. [= RAB, C, F, G, GW, S, W, X; *V. primulifolia* var. *acuta* (Bigelow) Torrey & A. Gray -- F; *V. primulifolia* var. *villosa* Eaton -- F, G; *V. xprimulifolia* Linnaeus (pro sp.) (*lanceolata* × *macloskeyi*) -- K]

Viola pubescens Aiton var. **pubescens**, Hairy Yellow Forest Violet. [= F, K, X; *V. eriocarpa* (Nuttall) Schweinitz var. *eriocarpa* -- RAB; *V. pubescens* -- C, GW, W, in part, infraspecific taxa not distinguished; *V. pubescens* var. *peckii* House -- F; *V. pubescens* -- G, S, in the narrow sense; *V. eriocarpon* (Nuttall) Schweinitz var. *eriocarpon*]

Viola pubescens Aiton var. **scabriuscula** Schweinitz ex Torrey, Smooth Yellow Forest Violet. [= K, X; *V. eriocarpa* (Nuttall) Schweinitz var. *leiocarpa* Fernald & Wiegand -- RAB; *V. pubescens* -- C, GW, W, in part, infraspecific taxa not distinguished; *V. pennsylvanica* Michaux var. *pennsylvanica* -- F; *V. pennsylvanica* var. *leiocarpa* (Fernald & Wiegand) Fernald -- F; *V. eriocarpa* -- G, S; *V. pubescens* var. *scabriuscula* Schweinitz ex Torrey -- K, X; *V. eriocarpon* (Nuttall) Schweinitz var. *leiocarpon* Fernald & Wiegand; *V. pubescens* Aiton var. *leiocarpon* (Fernald & Wiegand) Seymour]

Viola rostrata Pursh, Long-spurred Violet. Mt (NC, SC, VA), Pd (VA): mesic forests, often under *Tsuga*; common. April-May. Ranging from ME and Quebec west to WI, south to GA and AL. [= RAB, F, G, K, S, W, X, Z]

Viola rotundifolia Michaux, Round-leaf Yellow Violet, Early Yellow Violet. [= RAB, C, F, G, K, S, W, X]

Viola sagittata Aiton, Arrowhead Violet. [= RAB, F, S, W, Y; *V. emarginata* (Nuttall) Le Conte var. *emarginata* -- RAB, F, G; *V. emarginata* var. *acutiloba* Brainerd -- RAB, F, G; *V. sagittata* -- C, in part only (also see *V. fimbriatula*); *V. sagittata* var. *sagittata* -- G, K, X; *V. emarginata* -- S]

Viola septemloba Le Conte. [= F, G, GW, K, S, W, Y; *V. septemloba* -- RAB, in part only (also see *V. esculenta*); *V. palmata* var. *palmata* -- C, in part only; *V. septemloba* ssp. *septemloba* -- X]

Viola septentrionalis Greene. (NC, VA): (VA Watch List). NC (McMillan pers. comm.). e. TN (Chester, Wofford, & Kral 1997). [= G, K, W, Y; *V. sororia* -- C, in part; *V. septentrionalis* var. *septentrionalis* -- F; *V. sororia* var. *sororia* -- X, in part]

Viola sororia Willdenow, Dooryard Violet, Confederate Violet, Common Blue Violet. [= F, G, K, S, W, Y; *V. palmata* var. *sororia* (Willdenow) Pollard -- RAB; *V. papilionacea* Pursh -- RAB, F, S; *V. sororia* -- C, in part (also see *V. affinis*, *V. septentrionalis*); *V. langloisii* Greene -- F, K, S; *V. latiuscula* Greene -- F; *V. papilionacea* var. *papilionacea* -- G; *V. papilionacea* var. *priceana* (Pollard) Alexander -- G; *V. priceana* Pollard -- S; *V. sororia* var. *sororia* -- X]

Viola striata Aiton, Creamy Violet. Mt, Pd (NC, SC, VA), Cp (VA): mesic forests and woodlands, disturbed areas; common. March-June. Ranging from MA west to WI, south to GA, AR, and e. OK. [= RAB, C, F, G, GW, K, S, W, X, Z]

* **Viola tricolor** Linnaeus, Johnny-jump-up. [= RAB, C, F, G, K]

Viola tripartita Elliott var. **glaberrima** (Augustin de Candolle) Harper. [= RAB, G, S, W; *V. tripartita* -- C, F, K, X, in part, infraspecific taxa not distinguished]

Viola tripartita Elliott var. **tripartita**, Three-parted Violet. [= RAB, G, S, W; *V. tripartita* -- C, F, K, X, in part, infraspecific taxa not distinguished]

Viola villosa Walter, Southern Woolly Violet. (NC Watch List, VA Watch List). [= RAB, F, G, K, S, X, Y; *V. villosa* -- C, in part only (also see *V. hirsutula*)]

Viola walteri House, Walter's Violet. Mt (NC, SC, VA), Pd (NC, SC), Cp (SC): nutrient-rich woodlands and forests, especially over mafic or calcareous rocks; uncommon (rare in Coastal Plain) (NC Watch List, VA Rare List). March-May. Ranging from w. VA west to s. OH and AR, south to FL and TX. [= RAB, F, G, K, S, W, Z; *V. walteri* var. *walteri* – X]

Viola egglestonii Brainerd. In c. and se. TN (Chester, Wofford, & Kral 1997), nw. GA (Jones & Coile 1988), IN, KY, and AL (Kartesz 1999). [= K, Y; *V. septemloba* LeConte ssp. *egglestonii* (Brainerd) L.E. McKinney – X]

Viola missouriensis Greene. Throughout TN (probably in NC and VA), in KY (Kartesz 1999), and scattered in PA (Rhoads & Klein 1993). [= K, Y; *V. sororia* Willdenow var. *missouriensis* (Greene) L.E. McKinney – X]

Viola nephrophylla Greene, Northern Bog Violet, south to PA and WV (Kartesz 1999). [= K] {not yet keyed}

VISCACEAE (Mistletoe Family)

A family of about 7 genera and 385 species, epiphytic hemiparasites, of cosmopolitan distribution. The recognition of the Viscaceae as distinct from Loranthaceae appears well warranted (see Z); however, the Viscaceae should likely be combined into the Santalaceae (Angiosperm Phylogeny Group 2003). References: Kuijt (1982)=Z.

Phoradendron Nuttall (Mistletoe)

A genus of about 235 species, epiphytic hemiparasites, of tropical and rarely temperate America. References: Kuijt (2003)=Y; Kuijt (1982)=Z.

Phoradendron serotinum (Rafinesque) M.C. Johnston ssp. **serotinum**, American Mistletoe, Christmas Mistletoe. Cp, Pd, Mt (NC, SC, VA): parasitic on various species of trees, especially abundant in swamp forests (perhaps because they are less frequently cut and have older, more mature hardwoods); common (uncommon in Piedmont and Mountains). October-November (-March); November-January (-May). Kuijt (2003) interprets this as a species with four subspecies; ssp. *serotinum* is the eastern component, ranging from NJ west to s. OH, s. IN, and s. MO, south to s. FL and s. TX. The other three subspecies are distributed in sw. United States and n. Mexico. *Phoradendron* is, of course, the mistletoe familiar (at least traditionally) in e. United States as a Christmas decoration. Z comments that "the superficial likeness of *Phoradendron serotinum* to the European *Viscum album* has made the transfer of the latter's folklore to North America easy;" *Viscum album* was a sacred plant of Celtic and druidical pre-Christian European societies. The white berries of *Ph. leucarpum* are extremely poisonous. Their sticky flesh promotes the dispersal of the seeds by birds from tree to tree. The nomenclatural argument about which Rafinesquian epithet to adopt is arcane; the basionym "*leucarpum*" has nomenclatural precedence by 3 years, but the combination in *Phoradendron* can be considered a later homonym of *Phoradendron leucocarpum* Patschovsky. I here follow Kuijt (2003) in his decision to reject "*leucarpum*." [= Y; *Phoradendron leucarpum* (Rafinesque) Reveal & M.C. Johnston -- K; *Ph. serotinum* (Rafinesque) M.C. Johnston -- RAB, C, W, Z, infraspecific taxa not distinguished; *Ph. flavescens* (Pursh) Nuttall -- F, G, S; *Ph. serotinum* ssp. *serotinum* – Y]

VITACEAE (Grape Family)

A family of about 14 genera and 850 species, vines (rarely small trees or herbs), of tropical, subtropical, and temperate regions of the Old and New Worlds.

- 1 Branches and leaves distinctly fleshy, the leaves more than 1 mm thick when fresh; leaves 3-foliolate **Cissus**
- 1 Branches and leaves herbaceous.
 - 2 Leaves compound with (3-) 5-numerous leaflets.
 - 3 Leaves bipinnate to tripinnate **Ampelopsis arborea**
 - 3 Leaves palmately 3-5 (-7)-foliolate.
 - 4 Leaflets pinnately lobed; tendrils twining, lacking adhesive tips; berries yellow to orange when ripe **Ampelopsis aconitifolia**
 - 4 Leaflets toothed or entire; tendrils not twining, usually terminating in adhesive tips; berries dark ~~Parthenocissus~~
 - 2 Leaves simple, sometimes shallowly or deeply 3-5 (-7)-lobed.
 - 5 Tendrils not twining, terminating in adhesive disks **Parthenocissus**
 - 5 Tendrils twining, lacking adhesive disks.
 - 6 Petals separate at their tips, falling individually; pith continuous through the node **Ampelopsis**

- 6 Petals connate at their tips, falling together; pith interrupted by a diaphragm at each node (except continuous in *V. rotundifolia*) **Vitis**

Ampelopsis Michaux (Peppervine)

A genus of about 25 species, vines, of temperate and subtropical America and Asia.

- 1 Leaves compound, either palmately 5-foliolate (the leaflets additionally pinnately lobed) or bipinnate to tripinnate.
 2 Leaves palmately 5-foliolate, the leaflets additionally pinnately lobed; [introduced species, rarely escaped] **A. aconitifolia**
 2 Leaves bipinnate to tripinnate into numerous leaflets to 6 cm long and 3 cm wide; [common native species of mesic to wet habitats] **A. arborea**
 1 Leaves simple, grape-like, to 12 cm long and 9 cm wide.
 3 Leaves 3 (5-)-lobed; young twigs pubescent **A. brevipedunculata**
 3 Leaves not lobed; young twigs glabrous **A. cordata**

* **Ampelopsis aconitifolia** Bunge. Pd (NC): planted as an ornamental, rarely escaping to suburban woodlands; rare, introduced from n. China. [= K]
Ampelopsis arborea (Linnaeus) Koehne, Peppervine. Cp, Pd (NC, SC, VA), Mt (NC): swamp forests, marshes, wet thickets, moist to wet maritime forests; common (rare in Piedmont and Mountains). June-October. Se. VA (and MD?) south to s. FL, west to TX and n. Mexico, north in the interior to s. IL. [= RAB, C, F, G, GW, K, S, W]
 * **Ampelopsis brevipedunculata** (Maximowicz) Trautvetter, Porcelain-berry. Pd, Cp (NC, VA), Mt (VA): thickets and disturbed areas; rare, introduced from ne. Asia. June-July; September. [= RAB, C, F, K; *A. heterophylla* Siebold & Zuccarini -- S]
Ampelopsis cordata Michaux, Raccoon-grape, False-grape. Mt (NC*?, VA), Cp, Pd (VA): moist forests, abottomlands, and thickets, particularly where disturbed; rare (perhaps introduced only in all or part of our area). May-July. E. VA south to panhandle FL, west to TX, north in the interior to s. OH, s. IN, s. IL, MO, and NE; also introduced at scattered sites inland. Reported for NC (Asheville, Buncombe Co., NC) (A.J. Bullard, pers. comm. 2003). [= RAB, C, F, G, GW, K, S, W]

Cissus Linnaeus

A genus of about 200 species, of tropical and warm temperate areas.

Cissus trifoliata (Linnaeus) Linnaeus, Marine-ivy. Cp (GA, *SC): dredge spoil; rare, probably introduced from further south. Se. SC (Jasper County) south through GA, FL, and west along the Gulf Coast to TX, AR, and Mexico. [= K, S; *C. incisa* (Nuttall) Des Moulins -- GW, S]

Parthenocissus Planchon (Virginia-creeper, Woodbine)

A genus of about 10 species, vines, of temperate Asia and North America.

- 1 Leaves 3-lobed to 3-foliolate; [plant an introduced ornamental, rarely escaped] **P. tricuspidata**
 1 Leaves (3-) 5 (-7)-foliolate (only a few leaves on a plant 3-foliolate); [plant a native].
 2 Inflorescence with a well-developed (zigzag) central axis, the dichotomous branches very unequal, the inflorescence therefore paniculiform; tendrils usually with numerous adhesive disks (though young shoots may not have the disks yet formed); leaves usually dull above; leaflets sessile or with petiolules to 10 mm long; [plants widespread in our area] **P. quinquefolia**
 2 Inflorescence without a well-developed central axis, the dichotomous branches relatively equal, the inflorescence therefore corymbiform, as wide or wider than long; tendrils usually lacking adhesive disks (though sometimes swollen at the tip); leaves usually glossy above; leaflets with petiolules 5-20 (-30) mm long; [plants occurring in our area only in e. VA] **P. vitacea**

Parthenocissus quinquefolia (Linnaeus) Planchon, Virginia-creeper. Cp, Pd, Mt (NC, SC, VA): swamp forests, bottomlands, maritime forests and thickets, rock outcrops, mesic forests; common. May-July; July-August. ME west to IA, and NE, south to FL and TX. [= RAB, C, F, G, K, S, W; *P. quinquefolia* var. *murorum* (Focke) Rehder -- K; *P. hirsuta* (Pursh) Graebner -- S]
 * **Parthenocissus tricuspidata** (Siebold & Zuccarini) Planchon, Boston-ivy. Pd (NC): frequently grown for ornament, rarely persisting or escaped; rare, introduced from Japan and China. [= C, F, G, K]
Parthenocissus vitacea (Kner) A. Hitchcock. Cp (VA): moist forests ? {habitat}; rare? Québec west to Manitoba, WY, and CA, south to e. VA, OH, MO, TX, and AZ. Moore (pers. comm.) states that this species reaches south into e. VA; its habitats and abundance there need field and herbarium investigation. Kartesz (1999) has its distribution only south to NJ and PA on the eastern seaboard. [= C, G, K; *P. inserta* (Kerner) Fritsch -- F, probably misapplied]

Vitis Linnaeus (Grape)

A genus of about 65 species, vines, of temperate regions of Eurasia and North America. Rossetti et al. (2002) conducted a molecular phylogenetic study of Vitaceae and suggest that recognition of *Muscadinia* as a genus may well be warranted. References: Moore (1989)=Z. Key adapted with little modification from Moore (1989).

- 1 Tendrils simple; bark adherent (on all but the largest stems), with prominent lenticels; pith continuous through nodes; leaves relatively small and coarsely toothed, never deeply lobed; [section *Muscadinia*].
 - 2 Mature fruits < 12 mm in diameter; infructescences with > 12 berries; leaf blades often < 5 cm long; [from s. GA southwards] ***V. rotundifolia* var. *munsoniana***
 - 2 Mature fruits > 12 mm in diameter; infructescences usually with < 12 berries; leaf blades usually > 5 cm long; [widespread in our area] ***V. rotundifolia* var. *rotundifolia***
- 1 Tendrils bifid to trifid; bark shedding, the lenticels inconspicuous; pith interrupted by diaphragms at nodes; leaves relatively large and finely toothed, often deeply lobed.
 - 3 Mature leaves glaucous beneath (the glaucescence sometimes rather obscured by pubescence); nodes often glaucous.
 - 4 Mature 3-4 seeded berries more than 9 mm in diameter; mature leaves slightly to strongly arachnoid-pubescent beneath; nodes usually not glaucous; nodal diaphragms usually more than 2 mm in diameter ***V. aestivalis* var. *aestivalis***
 - 4 Mature 3-4 seeded berries less than 9 mm in diameter; mature leaves glabrous to glabrate beneath; nodes usually glaucous; nodal diaphragms usually less than 2 mm in diameter ***V. aestivalis* var. *bicolor***
 - 3 Mature leaves not glaucous beneath; nodes not glaucous.
 - 5 Tendrils or inflorescences present at 3 or more consecutive nodes; leaves densely pubescent beneath ***V. labrusca***
 - 5 Tendrils or inflorescences present at only 2 consecutive nodes; leaves glabrous or moderately pubescent beneath.
 - 6 Leaves reniform, glabrous beneath at maturity; tendrils absent, present only opposite the uppermost nodes, or sometimes extending down the stem ***V. rupestris***
 - 6 Leaves cordate to cordate-ovate, glabrous to pubescent beneath at maturity; tendrils present opposite most nodes.
 - 7 Nodal diaphragms less than 1 mm wide, usually less than 0.5 mm wide; growing shoot tips enveloped by enlarging, unfolded leaves ***V. riparia***
 - 7 Nodal diaphragms more than 1 mm wide; growing shoot tips not enveloped by enlarging, unfolded leaves.
 - 8 Branchlets of the season more or less terete, glabrous or arachnoid-pubescent; mature 3-4 seeded berries usually greater than 8 mm in diameter; nodes usually not banded with red pigmentation.
 - 9 Nodal diaphragms >2.5 mm wide; leaf apices usually long-acuminate; branchlets of the season with a purplish cast ***V. palmata***
 - 9 Nodal diaphragms <2.5 mm wide; leaf apices acute to short-acuminate; branchlets of the season gray, green, or brown (sometimes purple only on one side) ***V. vulpina***
 - 8 Branchlets of the season angled, arachnoid-pubescent and/or hirtellous-pubescent (or nearly glabrous); mature 3-4 seeded berries less than 8 mm in diameter; nodes frequently banded with red pigmentation.
 - 10 Branchlets glabrate to only slightly arachnoid-pubescent; nodes usually banded with red pigmentation; leaves glabrous to very slightly arachnoid-pubescent beneath; [plants mostly of the Piedmont and Mountains] ***V. cinerea* var. *baileyana***
 - 10 Branchlets slightly to densely arachnoid-pubescent; nodes usually not banded with red pigmentation; leaves slightly to densely arachnoid-pubescent beneath; [plants mostly of the Coastal Plain] ***V. cinerea* var. *floridana***

Vitis aestivalis* Michaux var. *aestivalis, Summer Grape. Cp, Pd, Mt (GA, NC, SC, VA): forests and woodlands, mostly upland; common. May-June; September-October. MA west to MO and IA, south to FL and e. TX. [= RAB, C, F, G, K, Z; *V. aestivalis* -- S (sensu stricto); *V. aestivalis* -- GW, W, in part]

Vitis aestivalis* Michaux var. *bicolor Deam, Silverleaf Grape. Mt (GA, NC, SC, VA): forests and woodlands, mostly upland; common. May-June; September-October. Ontario and MN south to n. GA and n. AL. [= Z; *V. aestivalis* var. *argentifolia* (Munson) Fernald -- RAB, C, F, G, K; *V. bicolor* Le Conte -- S; *V. aestivalis* -- GW, W, in part]

***Vitis cinerea* (Engelmann in A. Gray) Engelmann ex Millardet var. *baileyana* (Munson) Comeaux**, Possum Grape. Mt, Pd, Cp (NC, SC, VA): forests and woodlands, mostly bottomlands; common (rare in Coastal Plain). Late May-June; September-October. S. PA, s. OH, and se. IN south to SC, GA, and AL. [= K, Z; *V. baileyana* -- RAB, C, F, G, S; *V. vulpina* -- GW, in part; *V. cinerea* -- W, in part]

***Vitis cinerea* (Engelmann in A. Gray) Engelmann ex Millardet var. *floridana* Munson**, Florida Grape. Cp (GA, NC, SC, VA), Pd? (NC?, SC?, VA?): floodplain and other moist forests; common (rare in Piedmont). Late May-June; August-October. Se. VA south to FL, west to s. MS. [= RAB, C, F, G, K, Z; *V. simpsonii* Munson -- S; *V. cinerea* -- GW, W, in part]

***Vitis labrusca* Linnaeus**, Fox Grape. Mt, Pd (GA, NC, SC, VA), Cp (NC, SC, VA): forests and woodlands, wet, moist, and dry; common (uncommon in Mountains). May-June; September-October. ME west to s. MI, south to n. GA, n. AL, and n. MS. [= RAB, C, F, G, GW, K, S, W, Z; *V. labrusca* var. *subedentata* Fernald -- F, G]

***Vitis palmata* Vahl**, Red Grape, Cat Grape, Catbird Grape. Cp (GA): floodplain forests, riverbanks; rare (GA Special Concern). Mid June-late June; late July-October. IN, c. TN (Chester, Wofford, & Kral 1997), sc. GA (Jones & Coile 1988), and FL

Panhandle west to MO and TX. [= C, F, G, GW, K, S, Z]

Vitis riparia Michaux, Riverbank Grape. Mt, Pd, Cp (NC?, VA): forests and woodlands, mostly moist to wet; uncommon. April-June; August-September. New Brunswick west to se. Saskatchewan, south to VA, NC, c. and w. TN, n. MS, LA, and e. TX, and in the Pacific Northwest. [= RAB, C, G, GW, K, Z, W; *V. riparia* var. *riparia* -- F]

Vitis rotundifolia Michaux var. **munsoniana** (Simpson ex Munson) M.O. Moore, Munson Grape. Cp (GA): floodplain forests, banks of blackwater rivers; rare. Late April-May; late July-September. Sc. GA, s. AL, and FL. [= K, Z; **Muscadinia munsoniana** (Simpson ex Munson) Small -- S; *Vitis munsoniana* Simpson ex Munson]

Vitis rotundifolia Michaux var. **rotundifolia**, Muscadine, Scuppernong. Cp, Pd, Mt (GA, NC, SC, VA): forests, swamps, dunes; common (uncommon in Mountains). May-June; August-October. DE west to KY and MO, south to FL and TX. Cultivars of this species are popular in the Southeastern United States for eating grapes and for a distinctive wine. [= K, Z; *V. rotundifolia* -- RAB, C, F, GW, W; **Muscadinia rotundifolia** (Michaux) Small -- S]

Vitis rupestris Scheele. Mt, Pd (VA): along streams and in riverbank scour areas, especially in calcareous areas; uncommon (VA Rare List). April-May; August-September. MD, WV, sw. PA west to MO, south to VA, c. TN, and n. AR. [= C, F, K, W, S, Z]

Vitis vulpina Linnaeus, Frost Grape, Winter Grape, Chicken Grape. Pd, Mt, Cp (GA, NC, SC, VA): forests and woodlands, primarily upland, but also in bottomlands; common. May; July-September. Se. NY west to MO and e. KS, south to FL and nc. TX. [= RAB, C, F, G, K, S, Z, W; *V. vulpina* -- GW, in part only; *V. cordifolia* Michaux -- S]

Vitis cinerea (Engelmann in A. Gray) Engelmann ex Millardet var. *cinerea*, Graybark Grape, Pigeon Grape, may occur in our area, but is primarily more western, ranging from VA (?), wc. TN, IN, and WI, south to AL, Panhandle FL, and TX. It differs from our other two varieties of *V. cinerea* in having the branchlets of the season sparsely to densely hirtellous-pubescent, often with arachnoid-pubescent as well (vs. without evident hirtellous pubescence, or if present, then concealed by arachnoid pubescence), and the leaf undersurfaces usually more or less uniformly hirtellous-pubescent on the veins (vs. usually without hirtellous pubescence, or very sparsely so). [= RAB, C, F, G, K, Z; *V. cinerea* -- S (sensu stricto); *V. cinerea* -- GW, W, in part] {not yet keyed}

Vitis ×labruscana Bailey [*aestivalis* × *labrusca*] is the commonly cultivated Concord Grape (and related cultivars). It is sometimes persistent after cultivation. [= K] {not keyed}

Vitis vinifera Linnaeus, the European Wine Grape, has been increasingly cultivated in our area, especially in VA, now one of the leading wine-producing states in the United States. The climate of our area is too humid to be ideal for this species, and special measures are needed to reliably produce good crops of "vinifera" grapes. [= K]

ZYGOPHYLLACEAE (Creosote-bush Family)

A family of about 27 genera and 285 species, trees, shrubs, and (rarely) herbs, of tropical and subtropical regions of the Old and New Worlds.

- 1 Fruit with tubercles, at maturity separating into 10 mericarps **Kallstroemia**
- 1 Fruit with spines, at maturity separating into 5 mericarps **Tribulus**

Kallstroemia Scopoli

A genus of about 17 species, of tropical and subtropical America.

* **Kallstroemia maxima** (Linnaeus) Hooker & Arnott, Greater Caltrop. Cp (SC): disturbed areas; rare, introduced from the New World tropics. [= RAB, K, S]

Tribulus Linnaeus

A genus of about 25 species, of tropical and subtropical regions.

- 1 Corolla more than 3 cm across; plant perennial [**T. cistoides**]
- 1 Corolla less than 2 cm across; plant annual **T. terrestris**

* **Tribulus terrestris** Linnaeus, Puncture-weed, Caltrop. Cp (GA, NC, SC): dunes, sandy roadsides, ballast; rare, introduced from Mediterranean Europe. June-December. [= RAB, C, F, G, K, S]

Tribulus cistoides Linnaeus, Jamaican Fever-plant, is introduced in GA, FL, and elsewhere (Kartesz 1999). [= K, S]