

1. Please note: See the book, *A Tour of the Flowering Plants*, for full scientific name attributions.
4. Shared, derived traits are called synapomorphies. Derived traits are called apomorphies. Ancestral traits are called plesiomorphies.
5. Left: Yuccas in winter, west of Denver, Colorado. This is a member of the agave family, Agavaceae. It is a monocot. Right: speargrass, *Aciphylla*, of the carrot family; Remarkables Range, New Zealand. It is a eudicot.
7. *Nymphaea* cultivar, water lily; basal angiosperm, order Nymphaeales
8. *Nelumbo*, the Chinese or sacred lotus; basal eudicot, order Proteales
9. *Platanus occidentalis*, American sycamore; basal eudicot, order Proteales
11. The Canellales is the fourth order of magnoliids. Its members include winter's bark, Winteraceae. The anise tree of Florida and SE US is an *Illicium*.
12. Photos: *Liriodendron*, tulip tree; *Sassafras*, staminate flowers; *Aristolochia*, pipe vine, a native of the Sonoran desert; *Peperomia*, a common houseplant
13. Please note: listings for Colorado natives should not be considered complete in this presentation, although this is the only native basal angiosperm. Hydatellaceae is a small family from Australasia and India. It was recently moved to Nymphaeales from the monocots.
16. Photos: *Acorus*, sweet flag; *Sagittaria*, arrowhead (Alismataceae); *Zantedeschia*, calla lily (Araceae); *Pistia*, water lettuce (Araceae)
17. Weber & Wittmann segregate *Najas* into its own family. They list about 10 species of *Potamogeton*. There is another small family of one genus, Ruppiaceae, with one member, ditchgrass, *Ruppia*. The horned pondweed, *Zannichellia*, which Weber & Wittmann place in its own family, is probably a part of Potamogetonaceae, but this family is not clearly sorted out.
18. Photo is *Dioscorea villosa*, wild yamroot, native to the eastern US.
19. *Calochortus venustus* at DBG on left; nodding onion, *Allium cernuum*, on right. Other features of the seeds, including the structure of the inner coat, distinguish the two groups. Outer coat of Asparagales seeds is phytomelan, if the outer coat is present.
20. Photos: *Colchicum*, autumn crocus; *Zigadenus*, wand lily or death camas; *Alstroemeria*; *Smilax*, greenbrier – winter stem showing the characteristic tendrils and thorns; *Calochortus gunnisonii*, mariposa lily
21. Weber & Wittmann place *Trillium* in its own family. They do not recognize Colchicaceae. They place *Prosartes* and *Streptopus* in Uvulariaceae.
23. Photos: *Iris missouriensis*, wild iris; *Allium* from Reynolds Park, wet meadow; *Yucca* - foliage; *Calypso bulbosa*, fairy slipper orchid
24. Weber & Wittmann list genera *Androstephium* and *Triteleia* in Alliaceae. These are placed in the Asparagales, in Themidaceae, which also holds *Brodiaea*. W&W put *Maianthemum* in Convallariaceae and *Nolina* in Nolinaceae. *Leucocrinum* is now in Agavaceae, although that family may get some restructuring. *Leucocrinum* does not belong in Liliaceae. It is related to the houseplant, spiderwort, *Chlorophyton*.
25. Photos: palm with staminate inflorescences (Arecaceae); *Andropogon gerardii*, big bluestem grass (Poaceae); *Pontederia cordata*, pickerel weed (Pontederiaceae); *Musa ornata*, ornamental banana – shows typical Zingiberales venation (Musaceae)
26. Grass is *Panicum virgatum*.
28. Monocots make up about 22% of flowering plants. Basal angiosperms are the remaining 3%.
30. Photos: *Mahonia aquifolium*, Oregon grape; *Anemone patens*, pasque flower; *Papaver nudicaule*, Iceland poppy; *Dicentra formosa*, Western bleeding heart

31. Proteaceae representative is *Leucospermum*. *Platanus racemosa* is the California sycamore. The Chinese lotus, *Nelumbo nucifera*, represents the Nelumbonaceae.
32. Weber & Wittmann also list a *Dicentra* in Fumariaceae (where he puts *Corydalis* and *Fumaria*). They divide the Ranunculaceae into two additional families – Helleboraceae, Thalictraceae.
34. *Delphinium nuttallianum*, Nelson's larkspur; *Actaea rubra*, baneberry; *Aquilegia coerulea*, spurless variation of the Colorado columbine; *Aconitum columbianum*, monkshood; *Psychrophila leptosepala*, marsh marigold aka *Caltha*.
35. Note that "rosids", "asterids", etc. are not capitalized. Gunnerales is a small order at the base of the core eudicots.
36. Families have either anthocyanins or betalains, but not both. Betalains occur only in Caryophyllales, but are not found in Caryophyllaceae.
37. Photos: *Amaranthus palmeri*, redroot pigweed; *Silene acaulis*, moss campion; stem of unidentified *Polygonum* or *Persicaria*, showing the ocrea (sheath at node); *Drosera*, a sundew from New Zealand. Beets, chard, and spinach are in Amaranthaceae.
38. *Kochia* has been moved into *Bassia*. Weber and Wittmann split Caryophyllaceae, adding family Alsinaceae.
39. *Frankenia jamesii* is a shrub that lives on gypsum shales near Pueblo.
40. Top row, Montiaceae: *Claytonia megarhiza* (alpine spring beauty); *Oreobroma* (pygmy bitterroot); *Lewisia rediviva* (bitterroot)
Lower row: *Pediocactus simpsonii* (mountain ball cactus); *Mirabilis multiflora* (wild four o'clock)
42. The staminate flowers are on the left; pistillate on the right
45. Photos: *Bergenia cordifolia*, bergenia; *Sedum lanceolatum*, stonecrop; *Paeonia*, peony; *Ribes odoratum*, golden currant
46. *Hamamelis mollis* blooming in February in St. Louis; *H. x intermedia* fruit; *Liquidambar acalycina* blooming in April in Berkeley, CA. Sweet gum tree, *L. styraciflua* with immature fruit.
47. Weber & Wittmann divide the sedums into several genera.
48. 1. *Ribes coloradense*, Colorado currant; 2. *Micranthes (Saxifraga) rhomboidea*, snowball saxifrage; 3. *Tolmachevia integrifolia/Sedum integrifolium*, King's crown; 4. *Heuchera parvifolia*, alpine alumroot; 5. *Micranthes odontoloma/Saxifraga odontoloma*, brook saxifrage
49. General features: distinct petals, numerous stamens.
50. Photos: *Vitis labrusca*, fox grape; *Chamerion angustifolium*, fireweed; *Geranium caespitosum*, Fremont's geranium
53. Underlined families have nitrogen-fixing members. Photos: *Cucurbita pepo*, summer squash; *Thermopsis*, goldenbanner; *Alnus incana*, mountain alder – shows bracts of previous year's pistillate flowers and coming year's staminate and pistillate catkins; *Rosa woodsii*, wood rose
54. Underlining indicates nitrogen-fixers
55. W & W place *Celtis* in Ulmaceae.
56. Photos: *Oxalis pes-caprae*, Bermuda buttercup; *Viola adunca*, early blue violet. One other order is Celastrales. It holds Parnassiaceae and Celastraceae, the bittersweet family, which includes *Paxistima*, mountain lover.
57. W & W don't use *Euphorbia*, but put spurges in *Tithymalus*. Several of their other genera have been carved from *Euphorbia*. Other sources still use *Euphorbia*. Colorado has two species of *Oxalis*.

58. *Ceanothus* is a nitrogen-fixing member of the Rhamnaceae, Rosales. *Cercocarpus* is a nitrogen-fixing member of Rosaceae, Rosales. *Oxytropis* is a nitrogen-fixing member of Fabaceae, Faboideae subfamily, Fabales. Aspen belongs in the Salicaceae, Malpighiales.

59. The subfamily of chocolate (cacao) is in the Malvaceae. It is Byttnerioideae. *Tilia* is basswood or linden trees.

Anacardiaceae, the poison ivy family, includes cashews and mangos.

60. Photos: *Erysimum*, wallflower; *Alcea rosea*, hollyhock; *Acer negundo*, box elder – pistillate flowers (center) and staminate flowers (right). Maples are in the Hippocastanoideae subfamily of Sapindaceae.

61. W & W place *Cleome* and *Polansia* in Capparaceae, the caper family.

62. *Toxicodendron* is still used by some as the genus for poison ivy.

64. *Physaria* is probably *P. viitlifera* (“fiddle-shaped” for the leaves).

66. W & W have renamed the bunchberry genus – *Chamaepericlymenum* – and changed *Monotropa* to *Hypopitys*. They divide Ericaceae as presented here into three families – Monotropaceae, Pyrolaceae, and a more limited Ericaceae.

67. Photos: *Jamesia americana*, waxflower (Hydrangeaceae); *Mentzelia*, blazingstar or stickleaf (Loasaceae); *Arctostaphylos uva-ursi*, kinnikinnick (Ericaceae); *Dodecatheon pulchellum*, shootingstar (Primulaceae)

68. 2. *Polemonium confertum*, sky pilot; 3. *Primula incana*, bird’s eye primrose; 4. *Phlox sibirica* or *P. pulvinata*, alpine phlox; 5. *Phlox longifolia*, perhaps

69. Photo: petunia flower with the corolla split. Green ovary is visible at base.

71. Boraginaceae is not yet placed in an order. Photos: *Mertensia lanceolata*, bluebells; *Eustoma grandiflorum*, prairie tulip or lisianthus; *Solanum elaeagnifolium*, silver-leaf nightshade; and *Lamium maculatum*, spotted dead nettle

72. W & W place miner’s candle in genus *Oreocarya*, instead of *Cryptantha*. They segregate the dodders from the rest of Convulvulaceae and use the genus name *Grammica* for some dodders. They use several other genera in Gentianaceae.

73. Lamiales has 22 families and 20,000 species!

76. Photos: *Orobanche*, broomrape; *Castilleja*, paintbrush; and *Pedicularis groenlandica*, red elephant head

77. Photos: *Penstemon* with fifth stamen brush-like; *Linaria dalmatica*, Dalmatian toadflax; *Plantago patagonica*, woolly plantain;

Plantago major leaf, showing the venation of the phyllodes (expanded petioles, no blade present)

78. Photos: *Verbascum thapsus*, common mullein; *Nemesia* cultivar, showing the nectar spurs; *Buddleja davidii*, butterfly bush; *Diascia*, twin spur

80. Photos: *Ilex aquifolium* cultivar, holly – pistillate flowers; *Dipsacus fullonum*, teasel; mountain parsley; *Lonicera*, honeysuckle

81. W & W place *Linnaea*, *Sambucus*, and *Viburnum* in the Caprifoliaceae.

82. In Asteraceae, the anthers fuse into a tube and the style grows through this tube.

84. Isolated disk flowers show developmental sequence left to right. The ovaries are inferior, and are white when immature. The pappus (modified sepals) is reduced to two scales. The two branches of the stigma are open the outer disk flower in left photo. The anthers are fused and are dark.

85. Photos: *Cirsium undulatum*, waxyleaf thistle; Isolated disk flowers of *Carduus nutans*, bristle thistle; and *Cynara cardunculus*, cardoon, a close relative of artichokes

The isolated flowers show the deeply lobed corolla, the elongated style, and the fluffy, white pappus.

86. Photos: *Nothocalais*, waxyleaf prairie dandelion; *Cichorium intybus*, chicory; *Tragopogon dubius*, yellow salsify flower and mature fruits.
88. Photos: *Artemisia arctica*, alpine sagewort; *Achillea*, yarrow (a red cultivar); *Matricaria discoidea*, pineapple weed; *Chrysanthemum* cultivar
89. Photos: *Townsendia*, Easter daisy; *Ericameria nauseosa*, rubber rabbitbrush; *Erigeron speciosus*, aspen fleabane – flower and mature fruits; *Conyza canadensis*, common horseweed
91. Photos: *Cosmos pinnatus*, cosmos; *Dahlia* cultivar; *Bidens*, beggar-ticks – flower and mature fruits, showing the barbed awns
92. Photos: *Eupatorium maculatum*, joe-pye weed; *Liatris*, gayfeather; and a cultivar of *Ageratum* that has white corollas and blue styles
94. Photos: *Helichrysum*, straw flower – with pink phyllaries and yellow flowers; (lower left) *Anaphalis margaritacea*, pearly everlasting – white phyllaries; *Antennaria*, pussytoes – pistillate flowers (top right) and staminate flowers (lower right)
95. Photos: *Tetraneuris* [*Rydbergia*, *Hymenoxys*] *grandiflora*, alpine sunflower; *Helenium autumnale*, sneezeweed; *Gaillardia*, blanket flower
97. Photos: *Ambrosia*, ragweed; *Ratibida columnifera*, coneflower; *Zinnia grandiflora*, plains zinnia; *Rudbeckia hirta*, black-eyed susan
98. Senecioneae photos: *Senecio integerrimus*, lambstongue groundsel; *Tussilago farfara*, coltsfoot; *Ligularia*; *Senecio rowleyanus*, string-of-pearls
100. See WorldCat listing to find this book in a library near you.