

Major Families of Flowering Plants

Eudicots

Apiaceae (Umbelliferae) – Carrot or Parsley family

The flowers are arranged in a compound umbel. They are tiny, with 5 distinct petals, 5 stamens, and an inferior ovary. The stigmas have two branches, but it will likely require magnification to see this. The leaves have a characteristic sheathing at the base of the petiole. The leaf blades are usually lobed to very finely divided. Native members: cow parsnip, sweet cicely. Domestic members: carrot, parsley, caraway, dill, celery, cumin, coriander, and anise. Other: poison hemlock was used to execute Socrates. This family makes compounds that are toxic to most insects. NEVER TASTE WILD MEMBERS OF THIS FAMILY.

Asteraceae (Compositae) – Sunflower family

This is perhaps the largest family of flowering plants. Its flowers are arranged in composite heads of ray flowers, disk flowers or most commonly, both. The individual disk flowers have a tube-like corolla. Ray flowers have a short tube at the base and strap-shaped corolla. The ovary is inferior. The calyx is missing or modified into a pappus, which helps disperse the dry fruit. Native members: asters, sunflowers, erigeron, gumweed, yarrow, pearly everlasting, sagebrush, senecio, gaillardia, black-eyed susan, goldenrod, thistles. Domestic species: sunflowers, lettuce, marigold, chicory, chrysanthemum, zinnia. Other: dandelions and salsify are introduced Asteraceae from Europe.

Brassicaceae (Cruciferae) – Mustard family

The small flowers have four distinct petals, a superior ovary, and six stamens, two short and four long. They bloom on a stalk at the top of the plant. The inflorescence is a raceme. The stalk grows longer as the newest buds form at the end and the seed pods develop below the current blooms. The dry fruit is a silique. It can be long and narrow or short and wide. Native species: bladderpods, many “weeds” that bloom in spring, wallflower, toothwort. Domestic species: mustard, canola, cabbage, cauliflower, broccoli, turnip, radish, alyssum, arabis, candytuft. Other: woad, a blue dye plant from Britain.

Cactaceae – Cactus family

Found only in the Western Hemisphere, cacti have leaves that are reduced to spines. The stems of the plant take over the job of photosynthesis. The flowers have many sepals and petals (actually tepals), which gradually change from sepal-like to petal-like. The numerous stamens and the perianth are fused at the base. The ovary is inferior. There is one pistil. Native species: devil’s tongue, prickly pear. Other: some species are toxic as well as having spines. There are epiphytic cacti that have adapted to tropical forest life and lost their spines. Cactus-like plants of the Eastern Hemisphere belong to other families.

Campanulaceae – Bellflower family

The flowers have their petals fused into a bell shape. The style has three branches. The ovary is inferior. Native species: harebell or bluebell (same as the bluebells of Scotland), lobelias, Venus’ looking glass. Domestic species: campanulas, bellflowers. A subgroup within this family, the lobelias, has bilaterally symmetrical flowers.

Caryophyllaceae – Pink family

The flowers have 2-5 styles. The petals are distinct and often have a very narrow base and wider apex (clawed petals). They are often notched at the outer edge. The calyx is persistent. The dry fruit is a capsule. The thin, pointed leaves are opposite at swollen nodes. Native species: corn cockle, chickweed, silene, sandwort, campion. Domestic species: carnation, pinks, sweet william, baby’s breath, soapwort. Other: pinking shears produce a zig-zag pattern like the edge of the flower petals.

Cucurbitaceae – Squash family

This family is mainly herbaceous vines with tendrils. The flowers are unisexual, with both sexes on one plant (monoecious). It is one of the few rosid families with connate petals. The ovary is inferior so the “baby” squash or other fruit is beneath the petals and sepals. It has three connate carpels, which you can see as three parts in the fruit. This is an important family of food plants. Native species include the coyote gourd of the southern plains and the wild bur cucumber. Domestic members: pumpkin, squash, cucumbers, watermelons, cantaloupe, gourds (including luffa).

Fabaceae (Leguminosae) – Pea family

The bean subfamily has flowers of a distinctive form with a keel, wings, and a banner – the classic pea flower. The stamens are usually fused around the ovary. The fruit is a legume, a two-sided pod. The leaves are usually composite. This family is important in soil fertility because its roots harbor nitrogen-fixing bacteria. It is a very large family and is found worldwide. Native members: clovers, vetches, locoweeds, lupines, locust trees, kudzu. Redbuds are a basal branch of this family. Kentucky coffee tree and palo verde belong to the Caesalpinia subfamily; the silk tree and mesquite belong to the mimosa clade of this subfamily. The bean subfamily includes locust trees, milkvetch, and golden banner. Domestic members: beans, peas, indigo, peanuts, alfalfa, lentils, licorice, wisteria. Other: In French, “legume” means a vegetable. Legume seeds are an important protein source for most of the world’s peoples.

Lamiaceae (Labiatae) – Mint family

Mints have square stems and leaves that are opposite. Their flowers have two-lipped tubes with bilateral symmetry. The sepals are fused into a tube or cup shape, and they persist, sheltering the developing fruit. The fruit is a four-seeded schizocarp. Many produce aromatic oils. Native species include: skullcap mint, germander, bee balm, giant hyssop. Horehound is a common introduced weed. Domestic species: rosemary, sage, thyme, oregano, marjoram, basil, lavender, peppermint, rosemary, spearmint, coleus, *Ajuga*, lamb’s ear, catnip, dead nettle (*Lamium*). Other: This family is known for its aromatic oils.

Malvaceae – Hibiscus family

The five large petals are joined with base of the stamens. The filaments of the stamens are fused around the style. The ovary is superior, although it is embedded in the fused petal-stamen bases. The branches of the stigma reflect the number of locules in the ovary, which may vary from four to five on the same plant. The fruit is a capsule or a schizocarp. The calyx is persistent and there may be an epicalyx (whorl of bracts outside the true calyx). Native species include: mallows, cheeseweed, winecups, fanpetals. Domestic species: okra, cotton, hibiscus, *Abutilon*, hollyhock, *Sidalcea*. Other: mucilaginous sap is a distinctive feature.

Onagraceae – Evening-primrose family

The flower has a four-branched stigma, four broad, distinct petals, and eight stamens. The ovary is inferior (beneath the petals and sepals). A floral tube connects the ovary to the other flower parts. The fruit is a capsule that splits into four sections. Native species: fireweed, willowherb, evening primroses, primrose-willow. Domestic species: *Clarkia*, *Fuchsia*, and *Oenothera* species.

Papaveraceae – Poppy family

A thick, superior ovary with the stigma set directly on top (little or no style) is characteristic of this family. Members usually have four distinct petals, although some have six or more. The petals are crinkly and showy. There are many stamens. The sepals enclose the bud and fall off when the flower opens. The fruit is usually a short, thick capsule, but it can also be a long, thin one. Species include various poppies and bloodroot, as well as the former fumitory family – bleeding hearts, squirrel corn, Dutchman’s breeches, and *Corydalis*. Other: the sap is often acrid, and opaque.

Ranunculaceae – Buttercup family

This is one of two common families that have numerous distinct carpels. The rose family is the other one. Ranunculaceae members produce either a cluster of pods (follicles) or a bunch of feathery seeds (achenes) from each flower. Petals are distinct and can vary in number. There are numerous stamens. The sepals are often petal-like, in which case the petals are usually tiny or not present. Leaves are often divided or compound. Native species: buttercups, baneberry, columbine, larkspur, monkshood, *Clematis* (leather flower, virgin’s bower), anemone, meadow- rue, hepatica, marsh marigold. Domestic species: *Nigella*, *Trollius*, and hellebore; many of the natives have domestic cousins. Other: this family is found worldwide.

Rosaceae – Rose family

The flowers have a cup-like receptacle with the petals, sepals, and numerous stamens attached to the rim. There can be numerous distinct carpels or only one, but the ovaries are placed within the receptacle cup. There are usually five petals and five sepals in the natives. The fleshy fruits vary from pomes to drupes to aggregates of drupelets (blackberry) to the strawberry’s accessory fruits formed from the receptacle. The dry fruits are usually achenes. Native species include: agrimony, serviceberry, chokeberry, hawthorns, avens, ninebark, cinquefoil (*Potentilla*), raspberry, blackberry, dewberry, wild roses, wild cherries, wild plums, wild strawberries, brambles, meadowsweet. Domestic species include: apple, cherry, raspberry, strawberry, peach, apricot, *Spiraea*, *Cotoneaster*.

Scrophulariaceae – Snapdragon or figwort family (NOTE: Now divided into several other families.)

The flowers have petals that are fused at the base, but have separate lobes. There are usually two or four functional stamens plus another sterile stamen. The sepals are fused only at the base. Native species include: figwort (*Scrophularia*). Naturalized species: mullein. Domestic species: *Nemesia*, *Buddleja*, *Diascia*, *Sutera* (bacopa of horticulture).

Other families formerly in Scrophulariaceae include:

Plantaginaceae includes: penstemon, veronica, foxglove, snapdragon, toadflax (*Linaria*), plantain (*Plantago*), water hyssop (*Bacopa*), turtlehead (*Chelone*), hedgehyssop (*Gratiola*), Canadian toadflax (*Nuttallanthus*), Culver’s root (*Veronicastrum*).

Orobanchaceae includes: broomrape, Indian paintbrush, lousewort (*Pedicularis*), witchweed, beechdrops, false foxglove (*Agalinis* and *Aureolaria*), bluehearts, cow-wheat (*Melampyrum*).

Solanaceae – Nightshade family

The flowers have connate petals that flare into a flattened, open disk. The stamens attach to the walls of this corolla tube. The sepals are distinct and persistent. The ovary is superior. The stigma is split in two at the end. Native species include nightshades and groundcherries (*Physalis*). Domestic species: tomato, potato, peppers, eggplant, tobacco, petunia, *Nicotiana*, *Nierenbergia*, *Salpiglossis*, *Schizanthus*, *Solanum* (potato vine). Jimson weed and henbane are introduced species that have alkaloid toxins. Other: Belladonna, a drug from a nightshade was used by women to dilate their eyes.

Other eudicot families

- Amaranthaceae – amaranths, pigweed, cock’s comb, snakecotton. It includes former Chenopodiaceae – goosefoot, quinoa, beets, chard, spinach, lamb’s quarters, tumbleweed, saltbush.
- Bignoniaceae – trumpet vine, *Catalpa*, cross vine, desert willow.
- Boraginaceae – borage, forget-me-not, bluebells (*Mertensia*), puccoon (*Lithospermum*), hound’s tongue, heliotrope, bugloss, stickseed, marbleseed (*Onosmodium*), comfrey.
- Convolvulaceae – morning glory, sweet potato, bindweed, dodder, *Dichondra*, dawnflower.
- Ericaceae – heath, heather, blueberry, kinnikinnic, azalea, rhododendron, mountain laurel, trailing arbutus, huckleberry.
- Euphorbiaceae – spurges, poinsettia, crown-of-thorns, threeseed mercury, sandmat, pencil “cactus.”
- Fagaceae – oaks, chestnut, chinquapin, and beech trees
- Geraniaceae – geraniums, stork’s bill, cranesbill, *Pelargonium* (horticultural geraniums)
- Myrtaceae – Eucalyptus, *Callistemon* (bottle-brush), guava, myrtle
- Oleaceae – olives, lilac, privet, ash, forsythia, fringetree
- Polemoniaceae – phlox, Jacob’s ladder, standing cypress or red gilia
- Salicaceae – willow, aspen, cottonwood, poplar

Monocots

Liliales, the lily order

Liliaceae, the lily family. The flowers have six tepals and six stamens. Three carpels fuse to form the pistil. The ovary is superior. Native species: fawn lily, trout lily, dogtooth violet (*Erythronium*); blue bead lily (*Clintonia*); Indian cucumber root (*Medeola*); fairybells, spotted mandarin (*Prosartes*); twisted stalk (*Streptopus*). Domestic species: Asian lilies, tulip, *Fritillaria*.

Other families in the lily order, Liliales:

Alstroemeriaceae has inferior ovaries and twisted petioles – *Alstroemeria*

Colchicaceae – bellwort (*Uvularia*)

Melanthaceae – trilliums (often have petals and sepals instead of tepals); death camas, fly-poison (*Amianthium*); devil’s bit/blazing star/fairy wand (*Chamaelirium*); featherbells (*Stenanthium*); bunchflower (*Melanthium*); corn lily (*Veratrum*); death camas (*Zigadenus*)

Asparagales, the asparagus order. Many of these families were formerly placed in Liliaceae.

Orchidaceae – Orchid family (Order Asparagales)

The flowers are irregular, with bilateral symmetry, and six tepals or three petals and three sepals. The one or two stamens are fused onto the style and stigma, forming a column. The ovary is superior and has three locules. The pollen is packed into a structure called a pollinium. The fruit is a capsule; seeds are minute. Native species: coral-root orchid, lady’s slipper orchid, bog-orchids, lady’s tresses, helleborine, twayblade, rattlesnake plantain. Domestic species: many horticultural species, vanilla. Other: Orchids’ minute seeds require the presence of symbiotic fungi to germinate and grow. This is one of the largest families of flowering plants, but most are tropical.

Hypoxidaceae – common goldstar

Iridaceae – have three stamens – iris, crocus, gladiolus, blackberry lily, blue-eyed grass

Amaryllidaceae

Subfamily Amaryllidoideae has inferior ovaries – amaryllis bulb (*Hippeastrum*), snowdrops, daffodil, spider lily

Subfamily Allioideae – alliums, chives, leeks, ramp, onions, crowpoison, false garlic

Asparagaceae

Subfamily Asparagoideae – asparagus

Subfamily Agavoideae – agave, yucca, hosta, camas, sunnybell

Subfamily Scilloideae – hyacinth, wood hyacinth, grape hyacinth, glory-of-the-snow, squill, star-of-Bethlehem

Subfamily Asphodeloideae, the aloe subfamily

Subfamily Hemerocallioideae – daylily, New Zealand flax

Subfamily Nolinoideae – lily-of-the-valley, Canada may lily, starry Solomon's seal, beargrass, Solomon's seal, turkeybeard, *Dracaena*, *Sansevieria* (snake plant), butcher's broom

Poales, the grass order

Poaceae (Gramineae) – Grass family

The flowers are encased in green bracts. They have a tiny, scale-like perianth (petals + sepals) called a lodicule. The stigmas are feathery and the stamens dangle outside the bracts. They are wind-pollinated. The fruit is a grain. The flowers are often grouped into a spikelet. There are hundreds of species of native grasses. The leaves usually have a sheathed base. Domestic species: wheat, rye, barley, oats, rice, corn, sugar cane, sorghum, bamboo, and many ornamentals. Other: Grasses are one of the later monocots families. Monocots appear in the Cretaceous period, but grasslands do not appear until after 30 million years ago.

Other monocot families

Araceae – calla lily, peace lily, Chinese evergreen, Dieffenbachia, caladium, anthurium, jack-in-the-pulpit, skunk cabbage, dragon lily/voodoo lily, goldenclub, arrow arum

Commelinaceae – spiderwort (*Tradescandia*), dayflower (*Commelina*)

Cyperaceae – the sedges (sedges have edges ... triangular stems in most)

Juncaceae – the rushes (rushes are round)

Typhaceae – cat-tails, bur reed

The ginger order, Zingiberales, includes Zingiberaceae (ginger), Musaceae (banana), Strelitziaceae (bird-of-paradise), Heliconiaceae (heliconia), Cannaceae (canna), Marantaceae (prayer plant). The leaves of this order look similar – strong midrib with parallel veins set at an angle to it.

Basal angiosperms, neither monocots nor eudicots

Nymphaeaceae – water lilies (This is the second branch of the flowering plants.)

Schisandraceae – anise tree, star vine

Magnoliids, neither monocots nor eudicots

Magnoliaceae – magnolia, tulip tree (*Liriodendron*)

Lauraceae – laurel, cinnamon, avocado, sassafras, spice bush

Aristolochiaceae – Dutchman's-pipe, birthwort, wild ginger (*Asarum*); heartleaf (*Hexastylis*)

Piperaceae – black pepper (the spice), *Peperomia*

Book resources for additional study

Bayton, Ross and Simon Maughan. 2017. *Plant Families: A Guide for Gardeners and Botanists*. Quarto Publishing, University of Chicago Press. This is illustrated with attractive, accurate drawings. The information includes the history of the families and number of their members.

Dickenson, Richard and France Royer. 2014. *Weeds of North America*. University of Chicago Press. This is illustrated with photos that show the seedling and mature plant. It is arranged by family.

- Chadde, Steve W. and Regina Olson Hughes. 2019. *The New Common Weeds of the United States*. This has range maps that show where the weeds grow. It is organized by family.
- Elpel, Thomas. 2005. *Shanleya's Quest: A Botany Adventure For Kids Ages 9-99*. HOPS Press. This book teaches about several families of flowering plants while it tells an engaging fantasy story. There is also a card game about flowering plants that shows the families from the book.
- Macoboy, Stirling. 2000. *What Flower is That?* Chartwell Books. ISBN 0-7858-1187-7. Beautifully illustrated with photographs, this has an index to plant families of horticultural plants.
- Phillips, Roger and Martyn Rix. 2002. *The Botanical Garden*. Volume I. Trees and Shrubs. ISBN 1-55297-591-6. *The Botanical Garden*. Volume II. Annuals and Perennials. ISBN 1-55297-592-4. Firefly Books, Ltd. These two volumes have botanical, phylogenetic, and ecological information about horticultural plants. They are arranged by family, but do not follow phylogenetic order.
- Heywood, V. H., R. K. Brummitt, A. Culham, and O. Seberg. 2007. *Flowering Plant Families of the World*. Firefly Books. ISBN 1-55407-206-9. This large hardback has an outline of the phylogenetic classification. The families are in alphabetical order. Most have distribution maps. The information is beyond elementary students, but they may enjoy browsing the illustrations.
- Zomlefer, Wendy. 1994. *Guide to Flowering Plant Families*. University of North Carolina Press. ISBN 0-8078-4470-5. Very technical, but illustrated with nice black and white drawings.
- Spears, Priscilla. 2010. *Plant Lessons: Introducing Children to Plant Form and Function*. Second edition. Big Picture Science. See this if you need help learning about plant structures.

See also:

- Gardening books and seed catalogs that group plants by family or genus, including the Southern Living Garden Book.
- Native plant field guides, including *Wildflowers of Tennessee the Ohio Valley and the Southern Appalachians: The Official Field Guide of the Tennessee Native Plant Society* by Dennis Horn, Tavia Cathcart, and others.
- Weed guides for your area.

Websites

<http://www.life.illinois.edu/help/digitalflowers/>

Digital Flowers is a collection of images for learning about angiosperm families, from the University of Illinois. The families are not up to date – Liliaceae has many species that don't belong there, but the illustrations may be valuable to help children learn the look of most families.

http://www.botany.hawaii.edu/faculty/carr/alpha_cronq_judd_apgii.htm

Images and descriptions of flowering plants from over 200 families. The table of family names allows one to see how they are classified in three different systems. In most cases, the APGII listings will be most current.

<https://www.delta-intkey.com/angio/index.htm>

Families of Flowering Plants by L. Watson and M. J. Dallwitz. This website has a lot of information and no illustrations, but it can be useful if you are wondering about the features of a specific family.

Wikipedia listings for orders, families, genera, and species are useful. The articles include information on the lineages.