

Basics of Plant Identification

FLORAL CHARACTERISTICS



ament (catkin)



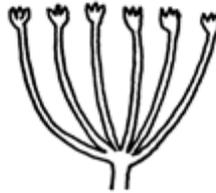
spike



raceme



panicle



umbel



corymb

FRUIT TYPES

I. Gymnosperms

(Naked Seed - Seed Does Not Develop Within a Carpel)

A. Cone - Composed of woody, leathery or fleshy scales, each with one or more seeds; scales generally arranged along a central axis.

Example: [Pine](#)

B. Aril - Single seed partially or wholly surrounded by a fleshy covering.

Example: [Yew](#)

II. Angiosperms

(Seeds develop within a Carpel)

A. [Dry Fruits](#) (Dry pericarp - carpel walls)

Dry Fruits

(Dry pericarp - carpel walls)

A. Indehiscent Fruits

1. Achene - One-seeded, unwinged fruit; often feathered (plumose).

Example: [Sycamore](#)

2. Samara - Winged, achene-like fruit.

Example: [Ash](#), [Maple](#)

3. Nut - Usually one-seeded with a bony, woody, leathery, or papery wall and usually partially or completely enclosed within a husk.

Example: [Oak](#), [Birch](#)

B. Dehiscent Fruits

With a single carpel (chamber)

1. Follicle - Carpel splits along one suture to release seeds.

Example: [Magnolia](#)

2. Legume - Pod-like fruits which splits along two lines of suture.

Example: [Yellowwood](#)

With 2 or more fused carpels (chambers)

1. Capsule - May open in one of several ways.

Example: [Catalpa](#)

B. [Fleshy Fruits](#) (Fleshy Pericarp - Carpel Walls)

FRUIT TYPES

Fleshy Fruits

(Fleshy pericarp - carpel walls)

1. Pome - Pericarp cartilaginous (papery), enclosing numerous seeds; fleshy portion derived from sepals, petals, and stamens.

Example: [Mountain Ash](#)

2. Drupe - Usually one-seeded; within a thin exocarp (skin), fleshy mesocarp and stony endocarp.

3. Berry - Usually multi-seeded; entire pericarp fleshy.

TWIG CHARACTERISTICS

1. Buds

a. types

- terminal
- pseudoterminal
- lateral
- superposed (more than one bud per leaf axil)
- floral
- vegetative
- mixed

b. covering

- naked
- scaly
- imbricate
- valvate
- single, cap-like scale

2. Leaf Scars

3. Vascular Bundle Scars (located inside leaf scars)

4. Stipule Scars (modified leaves next to petiole)

5. Lenticels

6. Pith

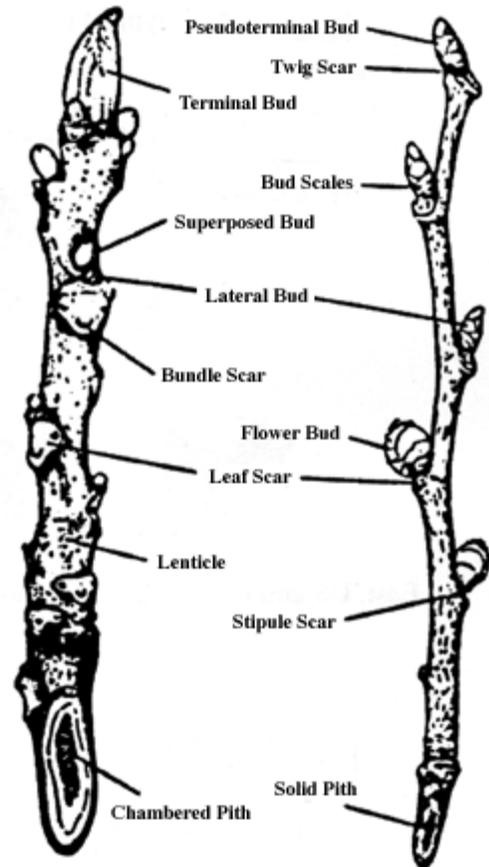
a. solid

- homogeneous
- diaphragmed (alternating dark and light layers)

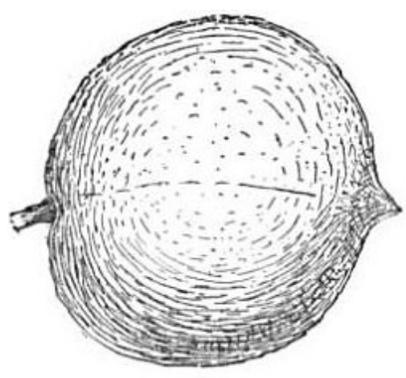
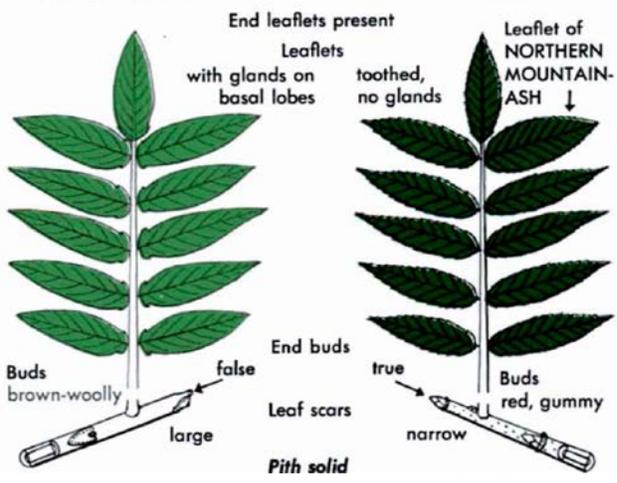
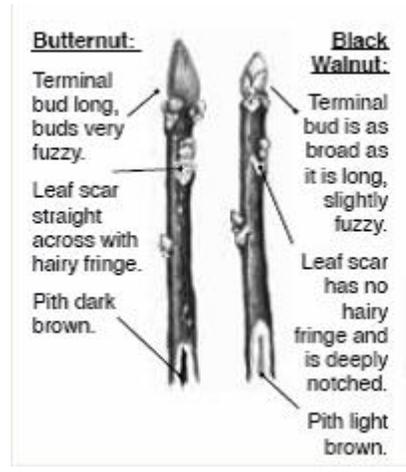
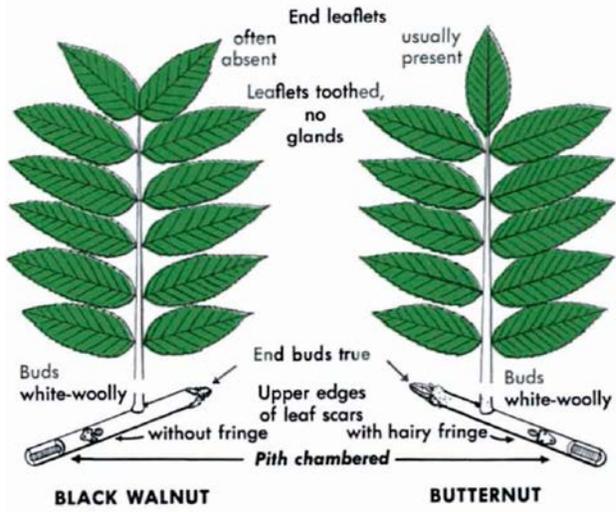
b. chambered

c. hollow

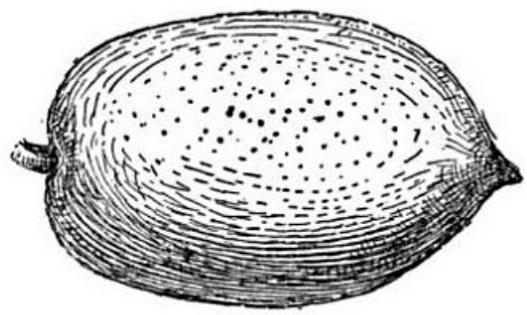
7. Thorns, Spines, Prickles



Example using Black Walnut (*Juglans nigra*) Vs Butternut (*Juglans cinerea*)



Fruit of Black Walnut



Fruit of Butternut

BARK CHARACTERISTICS

1. Pattern
2. Color
3. Hardness
4. Thickness

LEAF CHARACTERISTICS

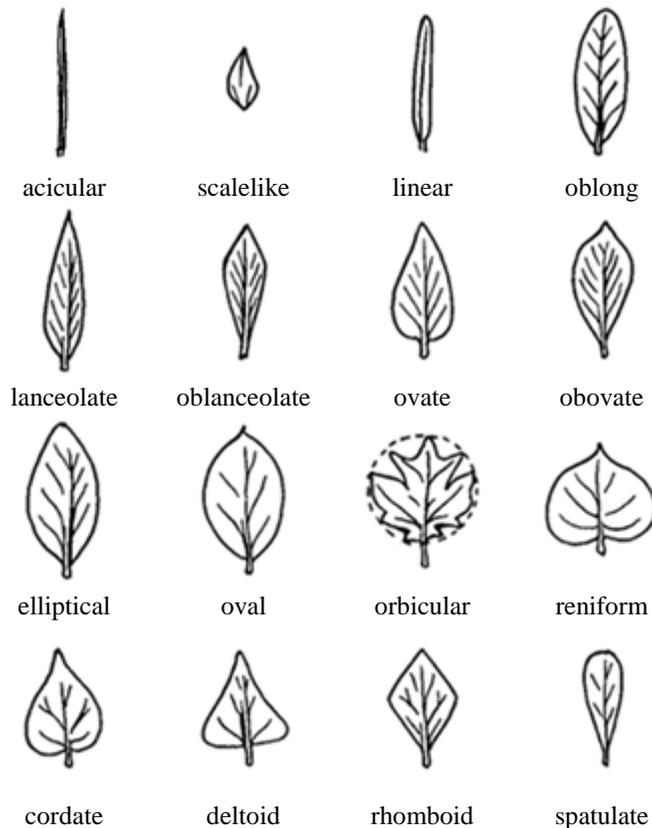
1. Arrangement

- alternate
- opposite (MAD CAP HORSE = Maple Ash Dogwood Caprifoliaceae Horsechestnut)
- whorled
- fascicles

2. Composition

- simple
- compound
- pinnately compound
- bipinnately compound
- palmately compound

3. Shape



4. Leaf Margins



revolute



entire



repand



sinuate



crenate



serrate



dentate



doubly serrate



doubly crenate



lobed

5. Leaf Apex



acuminate



acute



mucronate



cuspidate



obtuse



rounded



truncate



emarginate

6. Leaf Base



cuneate



acute



obtuse



inequilateral



obtuse



rounded



truncatae



auriculate

Angiosperms Vs Gymnosperms

ANGIOSPERMS

The seeds are enclosed in a carpel. There are approximately 385 families and 215,000 species.
Angiosperms fall into 2 classes:

DICOTS: Generally with 2 cotyledons; leaf venation is either pinnate or palmate, and the stem vascular bundles form a ring around a central pith.

MONOCOTS: Generally with one cotyledon; parallel leaf venation, and vascular bundles distributed throughout the stem cross-section.

Families Represented Prominently in the Great Lakes

ACERACEAE



Includes two genera and about 120 species. One genus, *Dipteronia* contains two small tree species, both native to China. The other species are in the genus *Acer*. Leaves are opposite, usually simple with palmate venation, (occasionally pinnately compound); usually deciduous; often with brilliant fall foliage; fruit a double samara.

-
- [Acer](#)
-

BETULACEAE



Contains 6 genera and about 150 species of trees and shrubs, primarily in cooler portions of the Northern Hemisphere. Leaves are simple, deciduous, alternate; species monoecious; flowers in aments. Staminate aments are preformed (except for *Carpinus*). Fruit is a small nut, subtended by a papery or semi-woody involucre (cluster of bracts); ripens in autumn (except for *Betula nigra*).

-
- [Betula](#)
 - [Alnus](#)
 - [Carpinus](#)
 - [Ostrya](#)
 - [Corylus](#)

BETULA



Leaves are ovate to deltoid and doubly serrate. Buds are imbricate with no terminal bud. Fruit is a winged nut borne in an erect or pendant catkin (ament) with 3-lobed bracts. Scales are deciduous at maturity, gradually releasing nutlets from a persistent cone axis.

-
- [Yellow Birch \(*B. alleghaniensis*\)](#)
 - [Sweet Birch \(*B. lenta*\)](#)
 - [Paper Birch \(*B. papyrifera*\)](#)
 - [Mountain Paper Birch \(*B. cordifolia*\)](#)
 - [Gray Birch \(*B. populifolia*\)](#)
 - [River Birch \(*B. nigra*\)](#)
-

CARPINUS



Leaves are ovate and doubly serrate. Buds are imbricate with the terminal bud absent. Fruit is an unwinged, ribbed nut lying at the base of a 3-lobed, leaf-like bract borne in spike-like clusters.

-
- [Musclewood \(*C. caroliniana*\)](#)

MUSCLEWOOD - *C. caroliniana*



A small understory tree on moist sites in the eastern U.S. that is also sometimes referred to as American Hornbeam. Leaves are elliptical and doubly serrate with tufts of white hair at the junction of the lower surface of the main veins. Twigs are slender with acute buds that are often 4-sided in cross-section. Fruit is a small ribbed nutlet attached to the base of "halberd-shaped" leafy bracts which appear in loose strobiles. Bark is thin, smooth, and blue-gray. The trunk is fluted (muscle-like).

OSTRYA

Leaves are ovate and doubly serrate. Buds are imbricate with the terminal bud absent. Fruit is an unwinged nut enclosed in a papery sac borne in cone-like clusters.

-
- [Ironwood \(*O. virginiana*\)](#)
-

IRONWOOD - *O. virginiana*



A small understory tree with extremely dense wood common on well-drained sites throughout the eastern U.S. except for the Atlantic coastal plain and Mississippi delta. Leaves are similar to *B. alleghaniensis* but secondary veins may branch. Twigs are slender. Buds are ovoid with scales striated longitudinally. Fruits are nutlets borne in a papery sac suspended in strobiles resembling clusters of hops, hence the alternate name, Hophornbeam. Bark is smooth and reddish-brown when young; later breaking into thin, shaggy plates that give it a characteristic shreddy appearance.

CORNACEAE



Includes about 10 genera and 90 species of trees, shrubs, and herbaceous plants. They are most abundant in cooler regions of the Northern Hemisphere and are most important as an ornamental.

-
- [Cornus](#)
-

CORNUS



Leaves are opposite (except *C. alternifolia*), deciduous, entire or finely toothed margins with arcuate venation (latex web remains at veins when the leaf is pulled apart).

-
- [Flowering Dogwood \(*C. florida*\)](#)
 - [Bunchberry \(*C. canadensis*\)](#)
 - [Alternate-Leaf Dogwood \(*C. alternifolia*\)](#)
 - [Gray Dogwood \(*C. racemosa*\)](#)
 - [Round-Leaf Dogwood \(*C. rugosa*\)](#)
 - [Red-Stemmed Dogwood \(*C. stolonifera*\)](#)
 - [Silky Dogwood \(*C. amomum*\)](#)
-

FAGACEAE



Contains 8 genera and about 1,000 species of trees and shrubs, mostly in northern temperate forests. Leaves are alternate, simple, stipulate, either deciduous (dead leaves often persist, especially on young trees) or evergreen, and usually pinnate. Fruit is a nut with the outer coat partially or wholly enclosed in an involucre (bur) which matures in autumn.

-
- [Fagus](#)
 - [Castanea](#)
 - [Castanopsis](#)
 - [Lithocarpus](#)
 - [Quercus](#)

AMERICAN BEECH - *F. grandifolia*



A medium-sized, very tolerant tree of the eastern U.S with root suckers. It is a component of the climax hardwood forests. Leaves are deciduous, 3-6" long, elliptical to oblong-ovate, serrate with sharp incurved teeth, somewhat papery, and penniveined. Twigs are slender, lance-shaped, and imbricate with stipule scars. The terminal bud is about 1" long. Fruit is 2 or 3 edible nuts within a small bur with soft spines. Bark is a thin, smooth, light gray.

AMERICAN CHESTNUT - *C. dentata*



A medium-sized, intermediate in tolerance tree on well-drained slopes of the Appalachian region. It was formerly probably the most valuable hardwood species in North America (durable, easily worked wood, and edible fruit) but was devastated by chestnut blight fungus (*Endothia parasitica*). Leaves are deciduous; 5-8" long, oblong, coarsely serrate with bristle-tipped teeth, and an acuminate tip. Twigs are lustrous. Buds are ovoid and pseudoterminal with 2 or 3 visible scales. Fruits are edible nuts within a 2" globose bur, with sharp branched spines. Bark is brown with shallow fissures and broad, flat ridges.

QUERCUS

Approximately 500-600 species (with many more varieties) distributed throughout the temperate regions of the Northern Hemisphere and extending to the tropics at higher elevations. They are the most important hardwood genus in North America. There are approximately 60 species in the U.S. which are generally intermediate in tolerance. Twigs are relatively stout with stellate pith and clustered buds at the end of the twig.

Subgenera

White Oaks

Groups of *Quercus*

1. Leaves without bristle-tipped lobes - white oaks - 2
1. Leaves generally with bristle-tipped lobes or bristles on margin - red or black oaks - 4
2. Leaves are more or less deeply lobed - 3

Leaves are deciduous or persistent and usually have lobes without bristle tips.

Fruit matures in 1 season. The inner surface of the shell is glabrous and the seed is sweet.

Wood is often with tyloses.

Range extends throughout the Northern Hemisphere.

Red and Black Oaks

Leaves are deciduous or persistent, usually with bristle-tipped lobes or bristles on margins and occasionally are entire.

Fruit generally matures in 2 seasons. The inner surface of the shell is generally tomentose and the seed is generally bitter.

Wood is often without tyloses.

Range is restricted to North America.

2. Leaves coarsely or sinuately toothed or shallowly lobed or entire - [chestnut oaks](#)

3. Eastern species - [eastern white oaks](#)

3. Western species - [western white oaks](#)

4. Leaves often entire; usually oblong to lanceolate - [willow oaks](#)

4. Leaves usually pinnately lobed or broadly obovate and lobed at apex - 5

5. Eastern species - [eastern red oaks](#)

5. Western species - western red oaks

HAMAMELIDACEAE

Comprises 24 genera and about 100 species of trees and shrubs in the sub-tropic and warm-temperate regions of the world. Most species are in Asia and only 2 species are very common or important in North America.

- [Hamamelis](#)
- [Liquidambar](#)

WITCH-HAZEL - *H. virginiana*



A relatively tall shrub that is common throughout the eastern U.S. An oil obtained from the leaves, twigs, and bark is used in the production of witch-hazel rubbing lotion and branch forks are used by water diviners (dowsers). Leaves are oval, about 5" with an unequal base and margins are crenate to lobed. Buds are brown, somewhat flattened, and essentially naked with dense yellowish-brown hairs ("winged foot"). Conspicuous yellow flowers are borne in the fall and fruit matures the following year. Fruit is a short, 2-celled woody capsule from which shiny black wingless seeds are forcibly

ejected. Empty fruit may persist for several years. Bark is thin, smooth to slightly scaly, and brown with horizontal lenticels.

SWEETGUM - *L. styraciflua*



A large, intolerant tree on a variety of sites (mainly bottomlands) on the piedmont and coastal plains which commonly reproduces vegetatively by root suckering. It is very important commercially, especially as a plywood veneer. It is a common ornamental with bright red fall foliage and corky twigs. The species name is derived from "storax flow". Stotax is a fragrant resin obtained from the bark which is used in soaps and perfumes. Leaves are simple, deciduous, alternate, star-shaped, palmately 5-7 lobed with lobes having an acuminate apex, finely serrate, and a truncate base. Twigs are shiny, aromatic and commonly have corky ridges. Buds have several orange-brown imbricate scales. Fruit is a globose head of 2-celled beaked (spiny) capsules which are 1" in diameter and mature in the fall. The empty fruits are often persistent throughout the winter. Bark is grayish



brown and furrowed with narrow, rounded, flaky ridges.

HIPPOCASTANACEAE



Contains 2 genera and about 15 species in North and Central America, Europe, Asia, and India. Approximately 13 species are distributed throughout the Northern Hemisphere.

-
- [Aesculus](#)

AESCULUS



Leaves are deciduous, opposite, and palmately compound with serrate leaflets. Flowers are conspicuous and borne in upright, several-flowered panicles. Fruit is a large, leathery capsule, more or less spiny, containing 1 to 6 seeds.

-
- [Horsechestnut \(A. hippocastanum\)](#)
 - [Yellow Buckeye \(A. flava\)](#)
 - [Ohio Buckeye \(A. glabra\)](#)
-

OHIO BUCKEYE - *A. glabra*

keeled bud scales



A medium-sized tree scattered from mostly bottomland sites in the western Appalachians through the central U.S. Leaves are similar to *A. flava*; leaflets are smaller and more nearly lanceolate and with a disagreeable odor when crushed. Fruit has blunt spines and the bark has thick plates. The flowers are similar to *A. flava*.

JUGLANDACEAE



Comprises 8 genera and about 65 species, primarily in the north temperate forests and mostly intermediate in tolerance. Two genera are native to the U.S. Leaves are deciduous, alternate, pinnately compound, and more or less aromatic with ovate to obovate leaflets with finely serrate margins. The nut-like fruit ripens in autumn. Family contains many valuable timber species, species bearing edible fruits, and the source of yellow dye.

-
- [Carya](#)
 - [Juglans](#)
-

CARYA



Fruit is a semi-woody husk which is usually dehiscent along 4 sutures. Twig pith is homogeneous.

Subgenera of *Carya*

- [True Hickories](#)
 - [Pecan Hickories](#)
-

JUGLANS



Fruit is a fleshy indehiscent husk and twig pith is chambered.

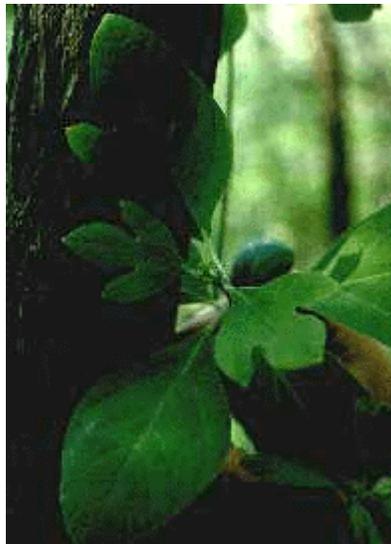
-
- [Black Walnut \(*J. nigra*\)](#)
 - [Butternut \(*J. cinerea*\)](#)

LAURACEAE

Contains about 45 genera and 2,200 species of mostly evergreen trees and shrubs found primarily in the tropics with a few species extending into the warmer temperate regions. They are generally aromatic.

-
- [Sassafras](#)
 - [Persea](#)
 - [Umbellularia](#)
-

SASSAFRAS - *S. albidium*



Usually a small, intolerant tree and a common pioneer in abandoned fields throughout the eastern U.S. except in northern New England, northern New York, and the northern Lake States. The wood is durable, a tea is made from the root bark, and extracted oils are used in soaps. Leaves are simple, deciduous, alternate, aromatic when crushed, and polymorphic (either entire elliptical), mitten-shaped (right or left handed). Twigs are green and aromatic when crushed. Buds are green with 3-4 scales. Fruit is a dark blue drupe (1/3") which matures in the fall and is borne on a bright red stalk; species dioecious. Bark is becoming thick, reddish-brown to brown with deep, irregular furrows separating broad, flat ridges.

MAGNOLIACEAE



Perhaps the most ancient of the living angiosperms; there are about 10 genera and 200 species of trees or shrubs in temperate and subtropical regions of North America and Asia. Two genera have tree species native to the U.S. (*Magnolia* and *Liriodendron*). Most species have large, showy, solitary flowers.

MAGNOLIA



Approximately 80 species with 8 native to the U.S. Leaves are entire and unlobed. Fruit is an aggregate of follicles with seeds suspended on long "threads". Buds are large with a single visible scale.

-
- [Cucumbertree \(M. acuminata\)](#)
 - [Southern Magnolia \(M. grandiflora\)](#)
 - [Fraser Magnolia \(M. fraseri\)](#)
 - [Sweetbay \(M. virginiana\)](#)
-

YELLOW-POPLAR - *L. tulipifera*

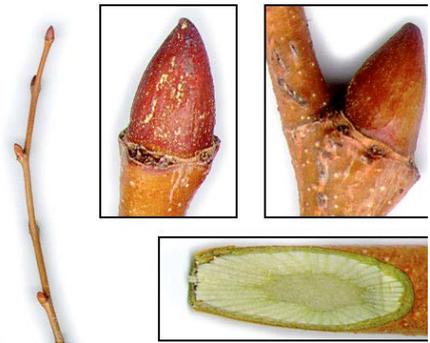


A large, intolerant tree with a clear straight trunk and oblong crown found on rich sites throughout most of the eastern U.S. except northern New England and the northern Lake States. Wood is commonly used as plywood corestock. Leaves are deciduous, about 5", generally 4-lobed; lobe margins entire; base and apex are nearly truncate (or apex notched). Twigs are stout, reddish-brown, and bitter with conspicuous stipule scars encircling the twig and a diaphragmed pith. Buds are "duck-billed" shaped with 2 valvate scales. Fruit is large (3" or more) with a cone-like aggregate of samaras. Samaras are 4-angled and deciduous from aggregate's axis. Bark is ashy-gray with long interlacing rounded ridges and the inner bark is aromatic and bitter

PLATANACEAE

A monotypic family (only 1 genus, *Platanus*), with about 10 species in North America.

SYCAMORE - *P. occidentalis*



A large tree with a spreading crown which is important for lumber, veneer, and pulp. It is intolerant to moderately tolerant on bottomland sites throughout the eastern U.S. except northern New England and the northern Lake States. Leaves are simple, deciduous, alternate, palmately 3-5 lobed with broad, shallow sinuses and margins that are prominently toothed. Petioles are enlarged at the base and enclose the bud. Stipules are leaflike. Leaf scars surround the bud and stipule scars encircle the twig. Buds are divergent and resinous with a cap-like scale. Fruit is a head of elongated achenes about 1" in diameter borne singly on long stalks (3"-6") that ripen in the fall. Bark is



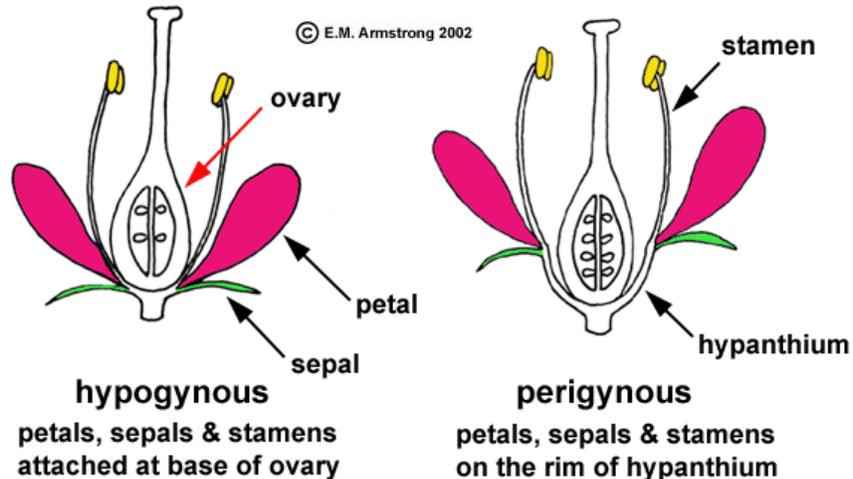
scaly with exfoliating brown
outer layers which expose
creamy white inner layers.

ROSACEAE

A large family (110 genera and 3100 species) of trees, shrubs, and herbs scattered throughout the world. Relatively few important timber species, but many species important because of their edible fruit and/or ornamental value.

- [Prunus \(Cherry\)](#)
- [Amelanchier \(Serviceberry\)](#)
- [Crataegus \(Hawthorne\)](#)
- [Malus \(Apple\)](#)
- [Sorbus \(Mountain Ash\)](#)
- [Spirea \(Spirea\)](#)
- [Rosa \(Rose\)](#)
- [Rubus \(Blackberries and Raspberries\)](#)

Superior Ovary: Above the attachment of the petals, sepals and stamens; also an ovary that is free from the hypanthium.



SALICACEAE



With 2 genera and approximately 340 species of trees and shrubs primarily in cooler regions of the Northern Hemisphere. Intolerant, pioneer, short-lived trees. Leaves are simple, deciduous, alternate, stipulate, and dioecious. Flowers of both sexes appear in amens (catkins). Fruit is a capsule and seeds have white tufts of hair, ripen in the spring and germinate promptly (brief viability).

-
- [Salix](#)
 - [Populus](#)
-

POPULUS



Leaves are usually ovate and long petioled. Twigs are slender to stout and have buds covered with several imbricated scales. Terminal buds are present with the lowest scale of lateral directly above the leaf scar.

-
- [Quaking Aspen \(P. tremuloides\)](#)
 - [Bigtooth Aspen \(P. grandidentata\)](#)
 - [Eastern Cottonwood \(P. deltoides\)](#)
 - [Balsam Poplar \(P. balsamifera\)](#)
 - [Black Cottonwood \(P. trichocarpa\)](#)
 - [Swamp Cottonwood \(P. heterophylla\)](#)
 - [White Poplar \(P. alba\)](#)
 - [Lombardy Poplar \(P. nigra\)](#)
-

EASTERN COTTONWOOD - *P. deltoides*



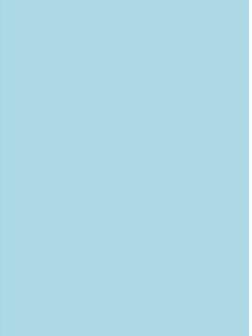
A large tree, most common on bottomland sites in the eastern U.S. and Great Plains, but not common in most of the northeast or Appalachians. It has a broad crown with spreading branches and is the largest and most important of the eastern *Populus* with uses similar to *P. tremuloides*. Leaves are up to 7" in length and deltoid with a flattened petiole. Margins are coarsely serrate with glandular teeth. Twigs are stout, angular, glabrous, and yellow-brown with divergent buds. Bark is greenish-yellow, becoming ash-grey and dividing into thick ridges separated by deep fissures.

TILIACEAE



Contains about 48 genera and 450 species of trees, shrubs, and herbs, mostly in the Southern Hemisphere, with *Tilia* the only arborescent genus in North America.

TILIA

- 
- [American Basswood \(*T. americana*\)](#)
 - [White Basswood \(*T. heterophylla*\)](#)
 - [Little-Leaf Linden \(*T. cordata*\)](#)
-

AMERICAN BASSWOOD - *T. americana*



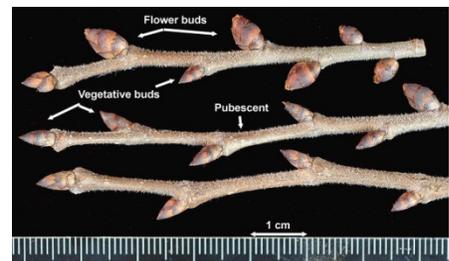
A medium-sized, moderately tolerant tree on moist well-drained sites in the northeastern and northcentral U.S. Wood is soft but commercially important and a prolific sprouter. Leaves are deciduous, simple, alternate, broadly ovate, coarsely serrate, apex generally acuminate, base generally inequally cordate, and axillary pubescence below. Twigs zigzag. Buds are large, red, and "lopsided" with 2 to 3 visible scales. Fruit is clustered nutlets with grayish tomentose subtended by a leafy bract. Bark is gray with shallow vertical furrows dividing flat-topped ridges.

ULMACEAE

Contains about 16 genera and 150 species of trees and shrubs, primarily in temperate regions of the northern and southern hemispheres.

- [Ulmus](#)
- [Celtis](#)
- [Zelkova](#)

AMERICAN ELM - *U. americana*



A medium-sized tree, intermediate in tolerance found on moist bottomlands throughout the eastern U.S. with vase-shaped form of open-grown trees. It was formerly a common ornamental, now almost devastated by Dutch Elm Disease. Leaves are simple, deciduous, alternate, about 5", coarsely doubly serrate, usually scabrous above, and often pubescent below with an inequal base. Twigs are slender and zigzag. Buds are 1/4", acute, chestnut brown, 2-ranked, with 3 or more depressed bundle scars and with pseudoterminal often divergent. Fruit is a 1/2-3/4" samara deeply notched at the apex with ciliate wing margins which matures in spring. Bark is grayish with



interlacing ridges and alternating light and dark layers of inner bark.

GYMNOSPERMS

Produce "naked" seeds, which commonly appear in a cone. There are 5 orders, 15 families, about 70 genera, and 730 species.

ORDERS:

CYCADALES (Cycads) - Tropical plants resembling palms, these are the most primitive of the present-day gymnosperms.

GNETALES - Anatomically, these are somewhat intermediate between gymnosperms and angiosperms.

GINKOALES - Currently represented by only 1 family (Ginkgoaceae), 1 genus (*Ginkgo*) and 1 species (*G. biloba*) - Ginkgo or Maidenhair Tree, native to China and Japan.

CONIFERALES (Conifers) - Contains 6 families, with only Pinaceae (Pine) and Cupressaceae (Cypress) native to North America (among other regions).

TAXALES - Consists of 1 family, Taxaceae (Yew).

Primary Families

CUPRESSACEAE

Includes about 20 genera and 140 species of trees and shrubs distributed throughout the Northern and Southern Hemispheres. About 26 species and 5 genera are native to the U.S. The trees have persistent leaves which are awl-shaped or scalelike, and fibrous bark.

-
- [Thuja](#)
 - [Juniperus](#)
 - [Chamaecyparis](#)
 - [Calocedrus](#)
-

GINKGOACEAE

Currently represented by a single family, a single genus *Ginko*, and a single species, *Ginko biloba*.

-
- [Ginko](#)
-

PINACEAE

Pinaceae includes some of the most important timber-producing species.

-
- [Pinus \(Pine\)](#)
 - [Larix \(Larch\)](#)
 - [Picea \(Spruce\)](#)
 - [Pseudotsuga \(Douglas-Fir\)](#)
 - [Tsuga \(Hemlock\)](#)
 - [Abies \(Fir\)](#)
-

PINUS

[Hard Pines](#)



Needles are usually in fascicles of 2 or 3 with the sheath generally persistent. The cross-section of the needle shows 2 vascular bundles. Cone scales are usually thick at the apex and generally armed. Wood is generally hard with an abrupt transition from early to late wood.

Soft Pines

Needles are usually in fascicles of 5 and the cross-section of the needle shows one vascular bundle. The fascicle sheath is deciduous. Cone scales are usually thin at the apex and generally unarmed. Wood is generally soft with a gradual transition from early to late wood

LARIX



Includes about 10 species of deciduous trees in North America, Europe, and Asia. Most are mountainous species. Three species are native to the U.S. and all are intolerant.

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- [Tamarack \(L. laricina\)](#)
 - [Western Larch \(L. occidentalis\)](#)
 - [Subalpine Larch \(L. lyalli\)](#)
 - [European Larch \(L. decidua\)](#)
 - [Japanese Larch \(L. kaempferi\)](#)

PICEA



Includes about 40 species generally restricted to cooler portions of the Northern Hemisphere (about half the species are native to China); 7 species are native to the U.S. Twigs have distinct sterigma and grooves separating sterigma; bark scaly; generally intolerant; important for lumber and pulp.

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- [Red Spruce \(P. rubens\)](#)
 - [White Spruce \(P. glauca\)](#)
 - [Black Spruce \(P. mariana\)](#)
 - [Blue Spruce \(P. pungens\)](#)
 - [Engelmann Spruce \(P. engelmannii\)](#)
 - [Sitka Spruce \(P. sitchensis\)](#)
 - [Norway Spruce \(P. abies\)](#)
-

TSUGA



Contains 10 species in the forests of Eastern and Western North America and Asia with 4 species native to the U.S. All are very tolerant. Needles are borne on short sterigma and the terminal leader often droops.

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- [Eastern Hemlock \(T. canadensis\)](#)
 - [Carolina Hemlock \(T. caroliniana\)](#)
 - [Western Hemlock \(T. heterophylla\)](#)
 - [Mountain Hemlock \(T. mertensiana\)](#)
-

ABIES



Includes about 40 species of trees in North and South America, Europe, Asia, and northern Africa. There are 9 species in the U.S. which are generally tolerant and used primarily for pulp. The bark is relatively smooth with resin blisters when young which eventually becomes generally scaly or deeply furrowed. Buds are generally globose and are more or less resinous.

Note: In the Pacific Northwest, the native firs tend to segregate along overlapping elevational zones, with grand fir near sea level, Pacific silver fir next highest, noble fir next, and subalpine fir the highest. In the west, relationships between noble and California red fir are similar to the relationship between balsam and Fraser in the east.

Eastern Species

- [Balsam Fir \(A. balsamea\)](#)
- [Fraser Fir \(A. fraseri\)](#)

Western Species

- [Subalpine Fir \(A. lasiocarpa\)](#)
 - [White Fir \(A. concolor\)](#)
 - [Grand Fir \(A. grandis\)](#)
 - [Pacific Silver Fir \(A. amabilis\)](#)
 - [California Red Fir \(A. magnifica\)](#)
 - [Noble Fir \(A. procera\)](#)
-

PSEUDOTSUGA



Includes 6 species in the forests of North America and Asia with 2 species native to

the U.S., but only *P. menziesii* is important.

- [Douglas-Fir \(*P. menziesii*\)](#)
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TAXACEAE

Includes 5 genera and about 20 species of trees and shrubs with 2 genera native to the U.S.; *Torreya* - Torreya, with 6 species in North America and Asia; and *Taxus* - Yew, with 8 species in North America, Asia, Africa, and Europe. The Taxaceae have recently been removed from the order coniferales (because their seeds are not borne in cones) and placed (the only family) in the order Taxales.

- [Taxus](#)
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TAXODIACEAE

Formerly very important; currently with only 10 genera and about 15 species with many restricted to Asia (including *Metasequoia glyptostroboides*, dawn redwood). 3 genera are native to the U.S. - *Sequoia* (monotypic), *Sequoiadendron* (monotypic), and *Taxodium* (2 species). Bark is fibrous.

- [Sequoia \(Redwood\)](#)
- [Sequoiadendron \(Giant Sequoia\)](#)
- [Taxodium \(Baldcypress\)](#)
- [Metasequoia \(Dawn Redwood\)](#)