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Key to common deciduous trees in winter

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KEY TO COMMON DECIDUOUS TREES
IN WINTER

AND

KEY TO COMMON WOODS

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KEY TO COMMON DECIDUOUS TREES IN WINTER.

Of the technical expressions used in the following key a few which are not usually found in glossaries or are not self-explanatory may need definition. The *leaf-scar* is here understood as the scar left by the petiole or leaf-base exclusive of the stipules. The *stipule-scars* when present appear mostly as small triangular or linear marks either side of the upper edges of the leaf-scar, and may sometimes encircle the stem. Within the leaf-scars and sometimes in the stipule-scars appear traces of the fibrovascular bundles which were continued into the framework of the leaf. These are *bundle-scars*, and usually take the form of minute dots or projections. As applied to leaf-scars the terms *oval* and *elliptical* are here understood as implying, respectively, elongation lengthwise and crosswise of the twig. *Spurs* are short, secondary shoots in which there may be many internodes much abbreviated. A *rank* of bud-scales, leaf-scars or spurs is a row parallel to the axis. All the structures mentioned in this key may be seen with a hand lens magnifying twenty diameters.

I. LEAF-SCARS ALTERNATE.

A. *Buds covered by a single scale.*

Salix (WILLOWS). Bud-scale with two lateral ridges. End bud not larger than the others. Bundle-scars three. Stipule-scars small.

Magnolia (MAGNOLIAS). Bud-scale with two lobes (stipules) attached to base of petiole. End bud much larger than the others. Bundle-scars many. Stipule-scars encircling stem.

B. *Buds covered by a few scales or rudimentary leaves, often very hairy.*

1. *Stipule-scars encircling stem.*

Liriodendron Tulipifera (TULIP TREE). Leaf-scars large, semi-oval. Bundle-scars numerous. Bud-scales dotted.

Platanus (PLANE TREES). Leaf-scars encircling the buds. Bundle-scars five. Bud-scales smooth.

2. *Stipule-scars not encircling the stem, often small.*

Tilia (LINDENS). Pith cylindrical, continuous.

Castanea (CHESTNUTS). Pith sharp-angled, continuous.

Celtis occidentalis (HACKBERRY). Pith cylindrical, chambered.

3. *Stipule-scars obsolete or none.*

a. *Pith chambered, often angled.*

Juglans (WALNUTS). Leaf-scars large, three-lobed.

b. *Pith continuous, cylindrical.*

Cladrastis tinctoria (YELLOW-WOOD). Leaf-scars nearly encircling buds. Bundle-scars five. Wood yellow. Pith mostly pale or pinkish, narrow. Buds more or less conical, often superposed.

Gymnocladus Canadensis (KENTUCKY COFFEE TREE). Leaf-scars broadly U-shaped or crescentic. Bundle-scars in three to five groups. Wood yellowish. Pith brownish red. Buds depressed, surrounded by an incurved, hairy ring of bark, superposed.

Ailanthus glandulosus (CHINESE SUMACH). Leaf-scars broadly U-shaped or semi-oval. Bundle-scars seven to nine. Wood pale. Pith brownish, very broad. Buds depressed-globose, not superposed.

c. *Pith continuous, angled.*

Carya (HICKORIES, CERTAIN SPECIES). Leaf-scars more or less three-lobed. Pith brownish. Buds ovoid or elongated, often superposed.

C. *Buds covered by several scales or rudimentary leaves, seldom very hairy.*

1. *Bundle-scars usually five or more, sometimes in three groups.*

a. *Buds ovoid.*

Carya (HICKORIES, CERTAIN SPECIES). Buds often superposed, only one or two at the tip of a twig. Bud-scales several, spirally arranged, large.

Quercus (OAKS). Buds never superposed, sometimes collateral, several or many clustered at the tip of a twig. Bud-scales numerous, opposite in several ranks, small.

b. *Buds elongated.*

Fagus (BEECHES). Buds solitary. Bud-scales of medium size, in two or more ranks. Branchlets with slender spurs, usually in two ranks.

c. *Buds depressed.*

Ginkgo biloba (MAIDENHAIR TREE). Buds solitary. Bud-scales spirally arranged, small. Branchlets with numerous short, stout spurs in several ranks.

2. *Bundle-scars three.*

a. *Leaf-scars usually two-ranked.*

Ulmus (ELMS). Leaf-scars rather large, mostly semicircular. Buds commonly of two sizes, rather large flower-buds and smaller leaf-buds. Bud-scales smooth or hairy.

Ostrya Virginica (HOP-HORNBEAM). Leaf-scars small, semielliptical. Buds mostly of about the same size. Bud-scales smooth.

Carpinus Caroliniana (HORNBEAM). Leaf-scars very small, mostly crescentic. Buds mostly of about the same size. Bud-scales hairy.

b. *Leaf-scars in more than two ranks.*

(1) *Stipule-scars more or less distinct.*

(x) *Twigs armed with mostly branched thorns.*

Gleditschia triacanthos (HONEY LOCUST). Buds depressed. Leaf-scars three-lobed. Pith roundish, white. Wood yellow.

(y) *Twigs unarmed. Branchlets with corky ridges.*

Liquidambar Styraciflua (SWEET GUM TREE). Buds ovoid. Leaf-scars semielliptical. Pith angled, brownish. Wood white.

(z) *Twigs unarmed or merely thorny tipped. Branchlets without corky ridges.*

Prunus (PLUMS, CHERRIES, PEACH, ETC.). Leaf-scars elliptical or semielliptical. Pith roundish, brown or white.

Pyrus (APPLES, PEARS, QUINCES, ETC.). Leaf-scars crescentic. Pith roundish, pale.

Populus (POPLARS). Leaf-scars three-lobed, semioval, semielliptical or crescentic. Pith sharply five-angled, brown.

Betula (BIRCHES). Leaf-scars elliptical, semielliptical, or semicircular. Pith irregularly angled, pale. Staminate catkins much developed in autumn.

(2) *Stipule-scars none.*

Nyssa (TUPELOS). Terminal buds commonly largest. No catkins.

3. *Bundle-scar one, elongated.*

Sassafras officinale (SASSAFRAS). Leaf-scars small, blackened. Twigs greenish, aromatic. Buds ovoid-globose.

Prunus serotina (WILD BLACK CHERRY). Leaf-scars small, light colored. Twigs brownish, not aromatic. Buds, at least the end ones, long-ovoid.

4. *Bundle-scar one, roundish.*

Larix (LARCHES). Leaf-scars minute, terminating persistent leaf-bases which cover the twigs. Twigs with numerous short spurs, often bearing small cones.

D. *Buds covered by the leaf-scar or finally breaking through.*

Robinia Pseudacacia (COMMON LOCUST). Twigs armed with pairs of sharp spines (stipules).

II. LEAF-SCARS OPPOSITE OR WHORLED, RARELY
ALTERNATE ON VIGOROUS SHOOTS.

A. *Bundle-scars three to nine.*

1. *Buds ovoid, conical or globose.*

Acer (MAPLES). Leaf-scars V-shaped, U-shaped, crescentic or elliptical. Buds not sticky, mostly small or of medium size.

Æsculus Hippocastanum (HORSE-CHESTNUT). Leaf-scars semicircular, semioval or triangular, straight or but slightly curved above. Buds sticky, the terminal ones large.

2. *Leaf-buds flattened-pyramidal. Flower-buds globose or turnip-shaped, pointed.*

Cornus florida (FLOWERING DOGWOOD). Leaf-scars crescentic, often much raised on the leaf base. Buds silky, greyish purple.

B. *Bundle-scars numerous, arranged in a nearly semicircular line.*

Fraxinus (ASHES). Leaf-scars broadly crescentic or semicircular. Buds pyramidal or broadly ovoid, the scales thick and leathery, brownish or black.

C. *Bundle-scars numerous, arranged in a nearly circular line.*

Catalpa (INDIAN BEANS, CIGAR TREES). Leaf-scars mostly oval or circular, usually in whorls of three. Buds hemispherical, the scales thin, brownish. Twigs bearing for many months the long cigar-shaped pods which finally split in half lengthwise to release the winged, fringe-tipped seeds.

KEY TO COMMON WOODS.

In the following key only such characters are used as may be observed with the naked eye or with a hand lens magnifying twenty diameters. But it is necessary that the observations be made on clean-cut surfaces or on thin, translucent sections made with a very sharp knife. It is often of advantage to moisten the surface. The end view or *transverse* section, *i. e.* one directly across the grain, displays usually the most characteristic features. The *radial* surface which lies in a longitudinal plane passing through the centre of the log affords also a significant view, while sometimes a *tangential* surface, or one at right angles to the radial and transverse planes, deserves special notice.

In transverse section most woods show concentric zones or layers, each of which commonly represents a year's growth, and is accordingly known as an *annual ring*. Each ring consists of two layers, differing more or less in density and color. The part first formed, and therefore on the concave side of the ring, is less dense and commonly lighter in color than the wood formed later in the season when the greater pressure of the bark induces compactness. These layers are known respectively as the *spring* and the *summer wood*.

A certain number of years after it is first formed, the wood in a tree becomes distinctly dryer, more solid, stronger and more durable. It is then called *heart-wood*. The younger, *i. e.* the outer, part being still comparatively rich in sap is called *sap-wood*. The two sorts of wood may commonly be distinguished by a marked and abrupt change of color.

In all true woods there are found numerous thin plates of more or less hardened pith extending in radial planes. These, known as *pith rays*, often produce beautiful and characteristic markings on radial or nearly radial surfaces, as in "quartered oak."

Between the pith rays, running lengthwise and forming the main body of the wood, are innumerable, often very minute, short, closed tubes, — the wood *fibrils*. In the spring-wood their cavities may often be seen as exceedingly small, regularly arranged openings,

while in the summer-wood the cavities are so narrow as to be scarcely visible except under high magnification. Among the fibrils and also running lengthwise are sometimes to be seen slender tubes, larger than the fibrils, always very long, and filled with resinous material. These *resin ducts*, as they are called, are reservoirs of the pitch which oozes from trees like pines when wounded. Such ducts appear on longitudinal surfaces as more or less conspicuous, yellowish or brownish streaks.

In many woods there are no resin ducts, but there are often numerous, commonly empty, canals sometimes considerably larger than resin ducts and sometimes much smaller in diameter. They form a continuous system of tubes throughout the wood. They are known as *pores* or vessels, and in the sap-wood serve as pipes or reservoirs for conveying upward the crude sap absorbed by the roots or for storing it together with more or less air temporarily till needed. They thus share with the wood fibrils the office of conduction which is performed alone by the fibrils of such woods as pine.

I. WITH PORES WHICH ARE DISTINCTLY OF UNEQUAL SIZE (UNEQUAL-PORED).*

A. *Summer pores in radial branching lines (radial-pored).*

Oak (QUERCUS). Pith rays partly broad and conspicuous.

Chestnut (CASTANEA). Pith rays all minute.

B. *Summer pores in concentric, wavy and sometimes branching lines appearing as finely feathered hatchings on tangential sections (arc-pored).*

Elm (ULMUS). Pith rays indistinct, heart-wood reddish brown; sap-wood greyish to reddish white.

C. *Summer pores scattered singly or in groups, imbedded in short lines of denser material which often connect the pores together into elongated series more or less concentrically arranged (link-pored).*

Common Locust (ROBINIA PSEUDACACIA). Summer pores in clusters united to form conspicuous, wavy, broken lines, often branching; pith rays fine but distinct; heart-wood reddish orange, sometimes tinged with purple or green; sap-wood yellow, particularly on transverse section; wood very heavy and hard.

* A few new terms descriptive of structural characteristics that require more or less elaborate definition are here suggested as labor-saving conveniences for the student in recording his observations.

Ash (FRAXINUS). Summer pores not much clustered, but single or more or less connected in fine, broken, wavy lines; pith rays minute, hardly visible to the naked eye except on radial section; heart-wood reddish; sap-wood pale; wood not yellow, but very heavy and hard.

Sassafras (SASSAFRAS OFFICINALE). Summer pores not much clustered, but more or less connected in short oblique lines; pith rays barely visible to naked eye except on radial section; heart-wood brownish; sap-wood pale; both with characteristic odor when freshly cut, light and soft.

D. *Summer pores isolated and scattered irregularly, sometimes but little smaller than the spring pores; the latter in some cases forming but an imperfect zone (scatter-pored).*

Hickory (CARYA). Summer pores much smaller and fewer than the spring pores; the latter forming a well-marked zone; pith rays very fine, connected by still finer cross-lines so as to form a distinct network; heart-wood and outer summer part even of the sap-wood with a tinge of red.

Walnut (JUGLANS). Summer pores not much smaller than the spring pores; the latter seldom forming a well-marked zone; pith rays, fine, connected by cross-lines which are sometimes rather obscure and irregular; heart-wood brownish; sap-wood pale; summer-wood not clearly distinguished from spring-wood by difference of color.

II. WITH PORES WHICH ARE ALL OF ABOUT THE SAME SIZE (EQUAL-PORED).

A. *Pores comparatively large, distinctly visible to the naked eye on longitudinal sections (large-pored).*

1. *Pith rays more or less conspicuous, especially on the radial section, often colored peculiarly (strong-rayed).*

Cherry (PRUNUS SEROTINA). Sap-wood whitish, strongly contrasted with the heart-wood which is reddish, often tinged with wine color; wood hard.

Maple (ACER). Sap-wood whitish or rosy, not strongly contrasted with the heart-wood which is pale reddish or brownish; wood hard.

Tulip whitewood (LIRIODENDRON TULIPIFERA). Sap-wood whitish, well contrasted with heart-wood which is yellowish, often greenish or violet tinged; wood rather soft.

2. *Pith rays inconspicuous, never distinctively colored (weak-rayed).*

Poplar (POPULUS). Wood very soft, commonly with a fine satiny luster, especially on radial section; sap-wood broad, whitish; heart-wood greyish, reddish, yellowish, orange or brownish, often streaked.

Birch (BETULA). Wood hard, somewhat lustrous, sap-wood broad, pale, often rosy; heart-wood reddish.

Mahogany (SWIETENIA MAHOGONI). Wood very hard, of rather dull luster; sap-wood narrow, yellow; heart-wood deep reddish brown darkening with age.

Orange-wood (CITRUS AURANTIUM). Wood hard, yellow throughout, of a deeper shade in later summer-wood, somewhat lustrous; sap-wood and heart-wood much alike in appearance.

B. *Pores comparatively small, scarcely visible to the naked eye on longitudinal section (small-pored).*

1. *Pith rays in part broad and conspicuous, especially on radial section (broad-rayed).*

Sycamore (PLATANUS). Broad pith rays very numerous and crowded, strikingly prominent on radial section though not conspicuous on tangential section.

Beech (FAGUS). Broad pith rays few in comparison with the narrow ones, quite distinct though not especially conspicuous on radial section, but appearing rather prominent as short reddish streaks on the tangential section.

2. *Pith rays all narrow and inconspicuous, though sometimes distinct on radial section (narrow-rayed).*

Olive-wood (OLEA EUROPAEA). Sap-wood whitish, cream color or pale brownish; heart-wood olivaceous, yellowish or reddish brown, strongly marked with wavy streaks of dark red or brown.

Apple-wood (PYRUS MALUS). Sap-wood more or less rosy; heart-wood reddish or brownish, streaked, if at all, with mostly straight lines.

III. WITHOUT PORES, EXCEPT IMMEDIATELY AROUND THE CENTRAL PITH (PORELESS).

A. *Resin ducts rather numerous and uniformly distributed, appearing somewhat prominently as reddish streaks on longitudinal sections (many-ducted).*

Hard Pine (PINUS, CERTAIN SPECIES). Wood medium hard and heavy, summer-wood distinctly, often conspicuously, different in color from the spring-wood.

Soft Pine (PINUS, CERTAIN SPECIES). Wood soft and light; summer-wood differing comparatively little from the spring-wood.

B. *Resin ducts comparatively few, rather irregularly distributed and not especially apparent on longitudinal sections (few-ducted).*

Larch (LARIX). Heart-wood brownish orange; sap-wood whitish; summer-wood strongly marked by deeper color.

Spruce (PICEA). Heart-wood not distinct from sap-wood; summer-wood not much different in color from the spring-wood; wood pale or whitish throughout.

C. *Resin ducts wanting (ductless).*

Red Cedar (JUNIPERUS VIRGINIANA). Heart-wood red or purplish; sap-wood whitish; wood usually with characteristic odor as of a lead pencil.

Redwood (SEQUOIA). Heart-wood maroon to terra cotta or deep brownish red; sap-wood light orange to dark amber; wood without special odor.

Hemlock (TSUGA CANADENSIS). Heart-wood pale, rosy tinged, not distinct from sap-wood; wood without special odor.