

HICKORIES OF LOUISIANA

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Eleven species of hickories have been collected in Louisiana. The genus *Carya* is divided into true hickories (Section *Carya*) and the pecan hickories (Section *Apocarya*). The most reliable way to separate these two groups of hickories is by using the terminal buds. True hickories have overlapping (imbricate) bud scales with more than 6 scales per bud. The pecan hickories have 4-6 bud scales that do not overlap (valvate). The number of leaflets also help in identification. True hickories may have 3-9 leaflets but usually have 5-7 leaflets per alternate leaf. The pecan hickories can have 5-21 leaflets but usually have more than 7 (except for nutmeg hickory) leaflets that commonly are falcate (sickle- or scythe-like).

The pecan hickories in Louisiana include bitternut hickory (*Carya cordiformis*), nutmeg hickory (*C. myristiciformis*), bitter pecan or water hickory (*C. aquatica*), and pecan (*Carya illinoensis*). Two hybrids have also been reported--*C. x brownii* is a hybrid between bitternut and pecan and *C. x lecontei* is a hybrid between bitter pecan and pecan. Dr. Wilbur Duncan (Prof. emeritus from U. of GA) separates this section by saying that it has leaflets 5-21; often falcate, with terminal leaflet smaller or about equal to the adjacent ones (may be larger in nutmeg hickory), outer bud scales valvate and seams of fruit husk winged or keeled. Nuts are round in cross-section in pecan and nutmeg hickory and are flattened in bitter pecan and bitternut hickory. Kernels are sweet in pecan and nutmeg but bitter in the other two species.

Carya illinoensis (pecan) is native from Mexico to Louisiana and Mississippi and north to Iowa, Indiana, and Illinois. It usually occurs on moist but well-drained ridges in river bottoms. The wood is not as strong or heavy as it is in true hickories but is used for veneer, flooring, and furniture. All hickories are prized for fuel, charcoal, and wood chips for grilling meats. Numerous commercial varieties have been developed emphasizing size of the fruit and the thin fruit wall. This taxon is recognized by its fruit shape and by the largest number of leaflets of all the *Carya* species. The leaflets are falcate and asymmetrical at the base. Young plants and stump sprouts can be confused with bitter pecan but pecan usually has larger more pubescent leaves. Wild or "native" pecans have smaller fruits which have a thicker wall but much sweeter kernels.

Carya aquatica (bitter pecan or water hickory) grows low bottomland areas but can occur on clay soils elsewhere. It has flattened fruits that usually retain their husk and float around on water so they are commonly found as concentric rings of young plants around depressions in lowland woods. The kernels are bitter. The buds are reddish brown with yellow glands that disappear with age. The bark is shaggy (peels upward) unlike that of pecans. The husk of the fruit splits to the base in pecans but only about halfway on bitter pecans.

Carya cordiformis (bitternut hickory) is distinguished by its smooth bark and its very distinctive yellow buds. It can be identified in the field by one terminal bud even if no leaves are present. Its leaflets are thin and have fine teeth on the margins. The fruit wall is white and the husk is very thin with ridges along the shoulders of the slightly flattened small nuts. The saplings of bitternut hickory are very limber and as a child, I found them to be excellent trees to climb and "ride-over-to-the-ground" in games of "follow-the-leader" played with my numerous

cousins. Its thin-walled fruits are favorites of squirrels in early fall. The kernels are too bitter for human consumption. This tree usually grows on upland clay soils or in alluvial soils along streams. Even old trees have smooth bark.

Carya myristiciformis (nutmeg hickory) has fewer leaflets (5-9) than the other pecan hickories. The terminal leaflet is usually as large as or larger than the lateral ones. Its buds and young twigs are covered with yellowish to brownish scales. The undersides of the leaflets are covered with silvery to gold-colored scales that are thick enough to give the whole crown a metallic sheen that is gold-tinted. The fruit is round and resembles the fruit of a nutmeg with its purple specks. Some round enough to use as marbles. The husk is thin but the fruit wall is very hard and thick and is very difficult to crack. The thin but sweet kernel seems not worth the effort needed for extraction (sometimes not even by squirrels). The bark of the old trees is as shaggy as that of shagbark hickory with which it sometimes occurs.

The true hickories in Louisiana include Shellbark hickory (*C. laciniosa*), shagbark hickory (*C. ovata*), Mockernut hickory (*C. alba*, previously *C. tomentosa*), black or Texas hickory (*C. texana*), sand hickory (*C. pallida*), Red hickory (*C. ovalis*), swamp hickory (*C. glabra* var. *hirsuta* formerly *C. leiodermis*), and pignut hickory (*C. glabra* var. *glabra* and/or var. *megacarpa*).

Carya laciniosa (shellbark hickory) is becoming a rare tree throughout its range. It probably never occurred in dense populations throughout a lot of its range from Arkansas to Pennsylvania. The only specimens I have seen from Louisiana are plants grafted several years ago to native pecan and/or bitter pecan trees. These plants occur in the woods on Tensas National Wildlife Refuge. This tree is easily distinguished by its large fruit and by the thick twigs and large fruit. The plates of bark that peel off are larger than those produced by shagbark hickory.

Carya ovata (shagbark hickory) has large buds and shaggy bark. Its leaves usually have 5 leaflets (sometimes 7 and almost always some with 3) that are densely hairy along the margins when young. Old leaves, late in the season, have white tufts of hairs near the tips of the teeth on the margins of the leaflets. This is the choice nut tree particularly for those who do not grow pecans. In East Tennessee every farmer left some shagbark trees in or along edges of pastures and fields for the fruit and each one knew the location of all of the trees in the woods. A good fruit crop meant a good harvest of squirrels. I know of no better cake and/or cookie than one baked with hickory nuts and served during a showy Christmas season. This tough tree was used as a nickname for Andrew Jackson ("Old Hickory") and is the name of an excellent brand of butcher knives that have hickory handles. Because hickory wood was not used extensively for lumber, many large trees of several hickories occur in remnant upland hardwood forests in eastern U.S.

Carya alba (mockernut hickory, formerly known as *C. tomentosa*) has large buds and usually has 7-9 leaflets. Like those of shagbark, the terminal leaflets are usually larger than the lateral ones but they lack the tufts of hairs characteristic of shagbark. The bark of old trees is rigid but does not peel off. The nuts are large, thick-walled, and have much thinner kernels than shagbark. Although the meat is sweet, this nut is second choice for both man and squirrels. The young twigs, leaflets, and rachis of the leaves are usually hairy (hence *C. tomentosa*). The wood is usually white throughout (hence *C. alba*). Mockernut and Texas or black hickory are our common upland hickories that are easily distinguished by mockernut having much larger buds.

Carya texana (Texas or black hickory) has 5-7 leaflets and the terminal leaflet is not much larger than the lateral ones. Its bark is rough but not peeling. It is the only hickory with tufts of rust-colored hairs on the twigs, buds, petioles, and the lower surfaces of leaflets. Most of these hairs are lost before the end of the growing season. The best diagnostic characters for this common upland hickory is the presence of orange scales on the lower leaf surfaces, buds, and shucks (fruit husks). The lower leaf surface looks rusty and the upper leaf surface is dark, glossy green. Nuts are smaller than those of mockernut but the kernels are equally sweet.

Carya pallida (sand hickory) is rare in Louisiana where it has been collected from St. Helena, Tangipahoa, and Washington parishes. The young leaves are silvery on the lower surfaces which is unusual in hickories. Petioles have tufts of hairs on them. It has 7 to 9 leaflets per leaf and the leaf-bearing twigs are thin (3-6 mm across). This is the common upland hickory on the sandy western and southern exposed mountains and ridges of the southern Appalachians.

Pignut hickories (*C. ovalis* and *C. glabra* including swamp hickory) are common and have a long history of taxonomic confusion among both plant taxonomists and dendrologists. Frankly, I have spent over 40 years being frustrated when trying to identify pignut hickories to species without mature fruits, flowers, and young and old leaves--all of which are never present at the same time. My father spent a lot of his adult life using a cross-cut saw to saw timber from the hardwoods of East Tennessee mountains. He could not believe that university botanists and dendrologists could not tell red hickory (*C. ovalis*) from white hickory (*C. glabra*) (his names for the pignut hickories). He could look at a leafless tree and tell if it had red heartwood (*C. ovalis*) or had white throughout (*C. glabra*). I could verify his determinations only by cutting the tree down or by finding mature fruits. When fruit are available, *C. glabra* has pear-shaped (pointed at base) or obovate fruits. The red hickory has oval nuts. Red hickory is sometimes called false shagbark because it is the only pignut hickory that has bark that peels back (or "shags"). These hickories are called pignuts because early American settlers fed them to their hogs but they saved shagbark nuts for human consumption.

C. ovalis has 5-7 leaflets but mostly 7; *C. glabra* has 5 leaflets and less often 7.

C. ovalis has oval to subglobose fruit with husk splitting freely to the base while *C. glabra* has obovoid or pyriform fruit with husk splitting halfway to base (2 places in var. *hirsuta* and 4 places in other varieties). Bark on mature trees is distinctive--plating or shagging in *ovalis* and staying tight and grooved or ridged in *glabra*. *C. ovalis* tends to be more of an upland species and *glabra* is bottomland or on only on mesic upland sites. Swamp hickory was described by Sargent as *Carya leioderma* but is now usually called *Carya glabra* var. *hirsuta*. It has pubescent lower leaf surfaces and especially on the midrib and in axils of the veins. It is a common lowland hickory with *C. ovata*, *C. cordiformis*, *C. illinoensis* and sometimes with *C. aquatica*.

When I try to teach the identification of hickories to students, I begin by dividing them into the two sections (pecan and true hickories) based on buds and leaflet number. The yellow bud distinguishes bitternut hickory. The silvery to golden scales on the stem and the metallic sheen of the leaves distinguishes nutmeg hickory. The twigs of bitter pecan are thinner than those of pecan and the leaves tend to be smaller and less pubescent. The true hickories are separated into two groups by bud size. Shellbark, shagbark, and mockernut have large buds. The leaf-bearing twigs of shellbark are twice as thick as those of other hickories. The twigs of mockernut are hairy when young. The tufts of hair on the teeth on the leaves of shagbark are distinctive. The small-bud hickories can be separated by Texas or black hickory having reddish hairs on the twigs, leaflets, and rachis while the leaves of sand hickory are pale underneath. The leaves

of pignut hickories are difficult to separate without mature fruit. Seedlings of most true hickories with small buds are easily confused. Hickories, like people, show their true characteristics better as adults.

I have used various books to study the hickories of this area. The dendrology books by Harlow and Harrar and by Preston are helpful. My favorite book for our trees is the TREES OF SOUTHEASTERN UNITED STATES by Duncan and Duncan. This Univ. of Georgia book was 19.95 in a flex-back field guide form in 1998. It has color pictures, distribution maps, and easily understood descriptions of almost all our trees. An extensive article called "A Field Guide to the Hickories of Louisiana" by L.J. Grauke and J.W. Pratt (pp. 159-189) and one by Grauke called "Notes on the Rank of Critical Tax of the *Carya* Genus" (pp. 127-158) can be found in the 1987 Research Report of the Pecan Research-Extension Station, Shreveport, LA published by the Louisiana Agricultural Experiment Station and The Louisiana Cooperative Extension Service, Louisiana Agricultural Center, Baton Rouge. These first article mentioned has keys with line drawings of characteristics. It also has photographs of leaves, nuts, and twigs of each species.

In addition to the hickories, Juglandaceae is represented in Louisiana by two other genera. Black walnut (*Juglans nigra*) has chambered pith in its twigs and has a characteristic "green walnut" odor to its foliage and husks. Its kernels are used for food and oil and the nut walls are used in making abrasives. Black walnut is one of the better furniture woods of the world and its sap has been used to make a syrup. The Chinese Wingnut (*Pterocarya steoptera*) has small winged nuts that look like samaras. It is spreading from a street-side planting in Angie in Washington Parish and has also been collected in East Baton Rouge Parish.