

Sorting Out Live Oaks: Varieties, Hybrids, Cultivars & Forms

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Live oak (*Quercus virginiana*) is placed within the white oak group due to its flowering and fruiting characteristics. Unlike most other oaks its shoot growth pattern is indeterminate and manifold, and so its wood is diffuse porous. Across its range, different scientists have visualized the species differently depending upon the specific trees and sites observed. Unique tree localities and physiographic regions, coupled with the variability of leaf forms have all led to different sortings of live oak varieties. Add to the natural variability the plasticity of leaf appearance from site to site with hybridization, compounded with confusion over similar looking associated species in the same area, and live oak becomes a genetic complex with tremendous range and identification difficulties. To recognize the genetic concept of live oak, requires more carefully clarifying species, cultivars, hybrids, and varieties.

New Species

The Cuban live oak, once considered a live oak variety (*Quercus virginiana* var. *sagreana*) is now considered a separate species (*Quercus oleoides* var. *sagreana*). Cuban live oak is thought by some to be an old hybrid of *Q. virginiana* var. *geminata* and *Q. oleoides*. *Quercus minima* is now the scientific name for dwarf live oak. In the recent past, dwarf live oak was called (*Quercus virginiana* var. *minima*, or var. *dentata*). Dwarf live oak is now a separate species and not a variety of live oak. Unfortunately for clear thinking regarding this species, dwarf live oak hybridizes with live oak. Texas live oak (*Q. fusiformis*) was considered a scrubby, upland variety of live oak once called *Q. virginiana* var. *fusiformis* or *Quercus oleoides* var. *quaterna*, but is now seen as a unique species. Texas live oak and live oak generate hybrids in Texas where they overlap.

Until recently a shrubby variety of live oak was called maritime live oak (*Quercus virginiana* var. *maritima*). This small statured variety was found on sand dunes back away from the water's edge along beaches. This maritime live oak variety was misidentified early in the last century but has now been reclassified as a variety of *Quercus x laurifolia*. This variety is equivalent to *Quercus hemisphaerica* (Darlington Oak). This tree has red oak group traits including bristle tipped leaves which fall just before new leaves in early Spring. The acorns have thin saucer shaped caps, not the top- or bowl-shaped caps of live oak. There is now no maritime live oak classification accepted.

Historic Varieties

Live oak has been seen as having a number of varieties depending upon how specific an observer wants to be and how much of the live oak range is reviewed. Here there is a functional value in using the list of historic Sargent varieties, which are based primarily on site and leaf size, to demonstrate the variability of live oak as seen by one observer at the turn of the last century. Note – even though the leaves may change sizes, the acorn and flower sizes are almost always conserved across all live oak varieties. Below are listed the historical Sargent live oak varieties and where they occur. See Figure 1.



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Table 1: Historical listing of Sargent's live oak varieties and where they occur.
See Figure 1 map for graphical distribution.

map #	genus	species	variety/ form name	description
1.	Quercus	virginiana	virginiana	typical live oak across range (see live oak range map in Figure 2)
2.			dentata (minima)	shrub on coastal sand dunes across the live oak range
3.			eximea	narrow leaved, small tree of EC Louisiana
4.			fusiformis	small leaved, small tree of WC Texas with spots in SW- Oklahoma & NE Mexico
5.			geminata	medium sized tree on sandy soils from NC to MS
6.			grandifolia	large leaf form in Florida
7.			macrophylla	large leaved, medium sized trees in Texas
8.			pygmaea	leaves with small lobes near end on a small shrub, acorn almost enclosed by cap with short stalk in Florida (a hybrid with Q. Chapmani)
9.			sagreana	Cuban live oak on Western end of island
10.			virescens	leaves bright green with few hairs on medium sized trees in C & S Florida

Modern Varieties

The most commonly accepted varieties of live oak today are: 1 = *Quercus virginiana* var. *virginiana* – the typical live oak across its range; and, 2 = *Quercus virginiana* var. *geminata* -- the sand live oak of the lower coastal plain growing upon sand dunes and sand ridges from Southeast North Carolina to Southeast Louisiana. Sand live oak is a small to medium sized tree with paired acorns on the end of each seed stalk. Sand live oak leaves have edges more tightly curled under than typical live oak. The top leaf surface shows indentations along where leaf veins occur. The tricomes (hairs) on the leaf underside are both star shaped and upright shaped. The sand live oak flowers roughly 2 to 3 weeks after live oak (*Quercus virginiana* var. *virginiana*). Sand live oaks are typically 30-40 feet tall and two feet in diameter, growing in clumps.

Remember, *Quercus virginiana* var. *minima* (var. *dentata*) -- dwarf live oak is now considered a separate species named *Quercus minima* and is not a variety of live oak. The species dwarf live oak is a small leaved shrub on the beach sands of the lower coastal plain from SE North Carolina to E Texas including coastal Florida. *Quercus virginiana* var. *fusiformis* – Texas live oak is now *Quercus fusiformis*, a separate species. Texas live oak is a small, shrubby, small tree with small leaves and elongated fruit growing on dry, upland, and inland sites in central Texas with spots in SW Oklahoma & NE Mexico.

Hybrids & Cultivars

Live oak forms a number of hybrids with other oaks. Cataloged hybrids include crosses with: *Q. bicolor* (= x *nessina*); *Q. durandii*; *Q. fusiformis*; *Q. lyrata* (= x *comptoniae* -- a fast growing tree with good cold tolerance for hardiness zones 7-9); *Q. macrocarpa*; *Q. minima* (= *succulenta* -- a *Q. virginiana* var. *geminata* cross); and, *Q. stellata* (= x *harbisonii*). In addition, there are several live oak cultivars: **Cathedral** ‘SDLN’; **Grandview Gold** (gold colored foliage); **Highrise** ‘QVTIA’ (upright / columnar form); and, **Shadowlawn**.

Conclusions

Live oak identification can be confusing given all the variability in visible traits present. Better identification of hybridization with many other oaks, and the new cultivars being made available, will produce ever more indecision regarding which genes belong with what scientific name. Live oak is a wonderful complex of ecological success we are only recently starting to examine.



(For further information on live oaks please see the other publications in this series which cover – scientific naming, growth features, and management, identification and biological characteristics, major pests, and a bibliography of important information.)

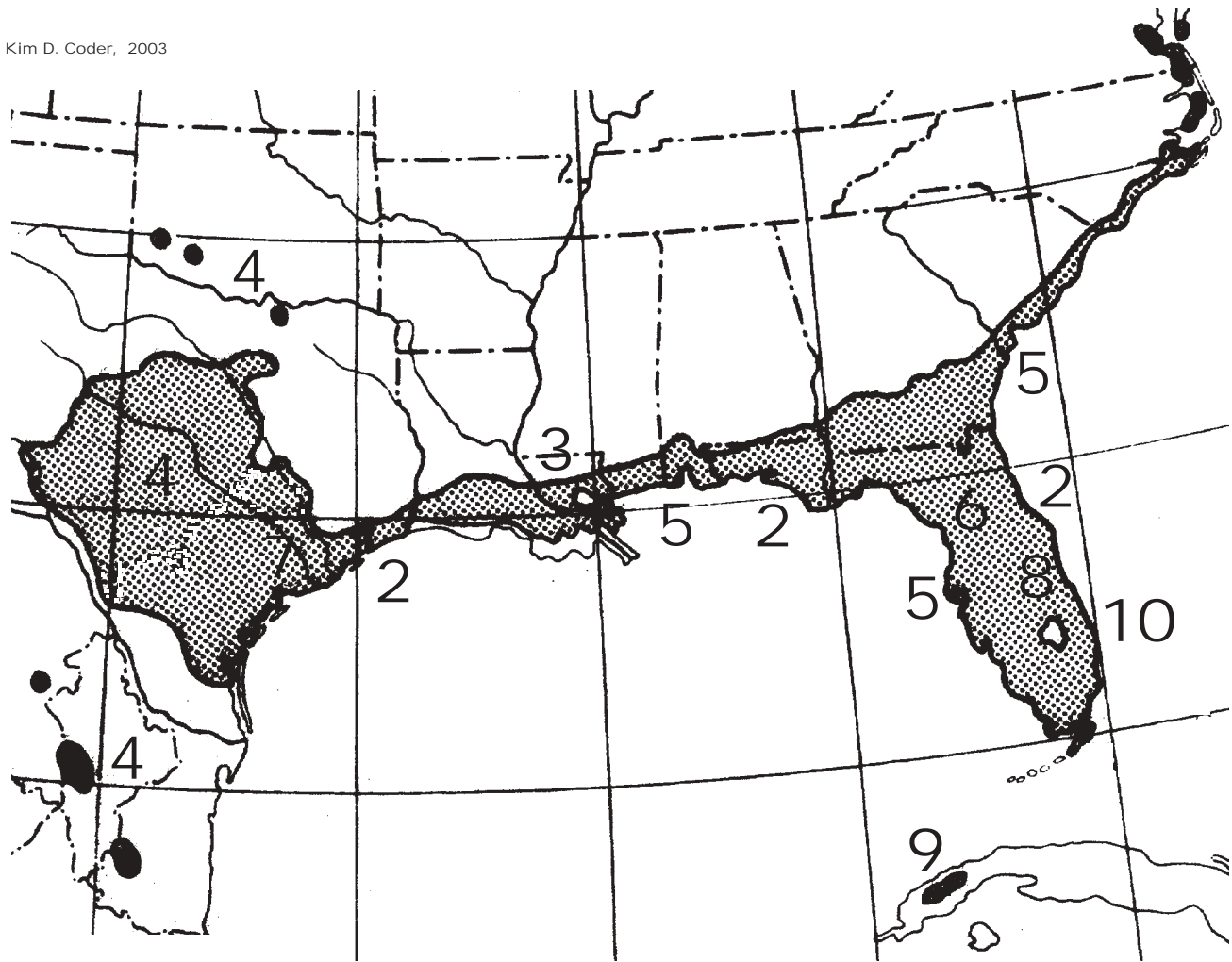


Figure 1: Live oak historic varieties.

(modified from: Little, Elbert L., Jr. 1971. Atlas of U.S. Trees: Vol. #1 -- Conifers and Important Hardwoods. USDA-Forest Service, Misc. Pub. #1146. Washington D.C.; and from, Sargent, Charles S. 1965 reprint of 1922 original. Manual of the Trees of North America: Vol. #1 (2nd corrected ed.). Dover Publishing, New York.)

Key To Live Oak (*Quercus virginiana*) Historic Varieties:

map number	variety name	description / location
1.	virginiana	typical live oak across range (all shaded areas)
2.	dentata (or minima)	shrub on coastal sand dunes across the live oak range
3.	eximea	narrow leaved small tree of EC Louisiana
4.	fusiformis	small leaved small tree of WC Texas with spots in SW-Oklahoma & NE Mexico
5.	geminata	medium sized tree on sandy soils from NC to MS
6.	grandifolia	large leaf form in Florida
7.	macrophylla	large leaved medium sized trees in Texas
8.	pygmaea	leaves with small lobes near end on a small shrub, acorn almost enclosed by cap with short stalk in Florida
9.	sagreana	Cuban live oak on Western end of island
10.	virescens	leaves bright green with few hairs on medium sized

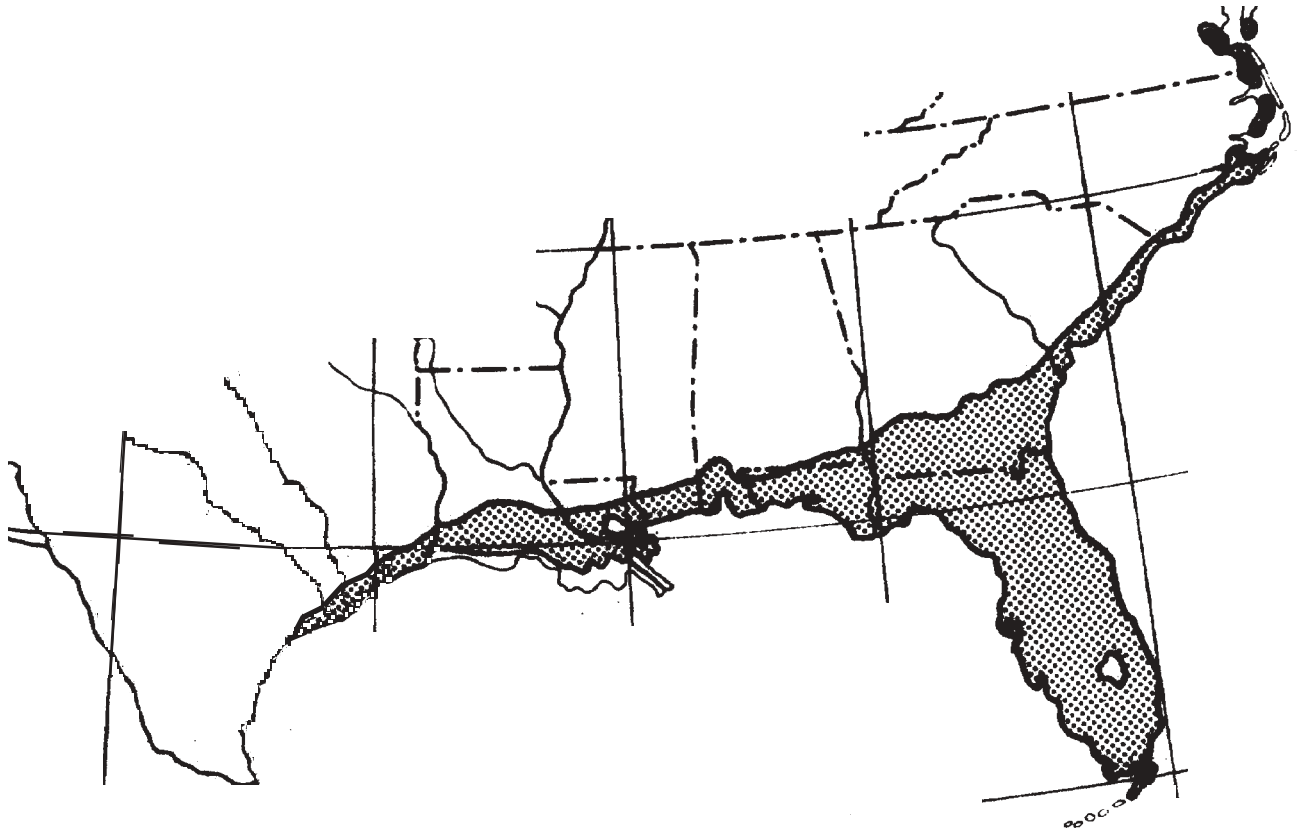


Figure 2: Live oak (*Quercus virginiana* var. *virginiana*) native range.

Modified from 1) Little, Elbert L., Jr. 1971. Atlas of United States Trees: Volume #1 -- Conifers and Important Hardwoods. USDA-Forest Service, Miscellaneous Publication #1146. Washington D.C.; and from, 2) Muller, C.H. 1961. The origin of *Quercus fusiformis*. Journal of the Linnean Botanical Society 58:1-12.