
Occurrence of Fossil Woods in Texas, Primarily the Cretaceous and Tertiary

Scott W. Singleton

Houston, Texas

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ABSTRACT

A project was initiated in 2000 to add to the body of scientific knowledge about fossil woods in the Texas Cretaceous and Tertiary periods. Plant megafossils are important because they are relatively common in certain formations and can be used along with leaf and fruit paleobotany, palynology, and dendrochronology to reconstruct terrigenous environments. The purpose of this paper is to summarize the analysis to-date of an extensive data base consisting of 330 fossil wood samples (with 3 orthogonally-oriented thin sections per sample) from over 100 localities.

The lowest Cretaceous is exposed in Central and north-central Texas and consists of the Aptian Trinity Group. Several fluvial sand units (including the Glen Rose marls) wedge out to the northwest and contain abundant fossil wood and some dinosaur remains. Preserved fossil wood belongs to the conifer families Araucariaceae (Norfolk Island Pine), Cheirolepidiaceae (proto-Cupressaceae), and Cupressaceae (cedar, juniper). The Albian Segovia Formation of the Edwards Group in south-central Texas contains a unique, isolated layer (likely an anoxic event) that preserved Cupressaceae logs encased in chert nodules, some bored by *Teredo* clams, indicating a coastal growth position and subsequent transport to and preservation in a shallow lagoon.

A continuous sequence of Campanian-Maastrichtian-Paleocene formations in the Big Bend area (Aguja, Javelina, Black Peaks formations) documents the withdrawal of the Cretaceous seaway and the associated floodplain environments along those shores. Conifers and the first preserved Texas hardwoods have been well documented in these sediments by previous researchers. The late Paleocene/early Eocene Wilcox deltas of Central Texas had extensive floodplains and lowland swamps (which produced the primary lignite deposits in Texas) that preserved fossil woods of the Taxodiaceae/Cupressaceae (e.g., bald cypress) and tropical hardwoods which were similar to those documented in the Paleocene of Big Bend.

The thermal maximum of the mid-Eocene (represented by the Yegua Formation) and the slightly drier late Eocene Jackson Group are well-known among collectors for their diversity of tropical hardwoods, many of which are preserved as whole logs in fluvial, estuarine and near-shore environments. Conifers are represented by Podocarpaceae (currently restricted to the southern hemisphere) and hardwoods by over a half-dozen

tropical families, including *Palmae* (palms), *Leguminosae* (legumes such as acacia and mimosa), *Juglandaceae* (tropical hickories), *Apocynaceae* (dogbane family), and *Elaeocarpaceae*.

The cool-down of the Oligocene (Catahoula Formation) and Miocene (Fleming Formation) are represented by the invasion from the north of temperate woods of the elm and oak families and the gradual extinction of tropical families, although many of these families contain temperate genera in addition to tropical genera (for instance, *Palmae* [palms], *Leguminosae* [locusts], and *Juglandaceae* [hickory]), and thus successfully held on at least to the Pliocene or longer.