

Palynomorph Assemblage Zones in the Context of Changing Paleoclimate, Middle Eocene to Early Oligocene of the Northwest Gulf of Mexico

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Abstract

Cooling paleoclimates over the period ca. 42 Ma to ca. 33 Ma were the driving force for the gradual disappearance of tropical and subtropical elements and the appearance of cooler elements in the palynofloras of east Texas. As a consequence, ten palynomorph assemblage zones and two biohorizons are recognized in 209 samples from 15 sections of the Crockett, Yegua, Cad-dell, Manning, and Catahoula formations. From oldest to youngest, the succession of biozones is: middle Eocene *Nuxpollenites crockettensis* Assemblage Zone, *Bombapollis texensis* Assemblage Zone, *Bursera* Assemblage Zone, *Friedrichipollis claibornensis* Assemblage Zone, and *Reticuloidosporites pseudomurus*

Assemblage Zone; late Eocene *Sequoiapollenites* Assemblage Zone, *Rhizophora* FAD, *Rhizophora* Assemblage Zone, *Nudopollis terminalis* Assemblage Zone, *Nudopollis terminalis* LAD, *Bombacacidites* Assemblage Zone, and *Pseudolaesopollis ventosus* Assemblage Zone; and the early Oligocene *Hypoxylonites* Assemblage Zone. The age of the lower Catahoula Formation is early Oligocene based on the occurrence of *Kallosphaeridium biornatum* from a locality north-west of Huntsville, Texas. A short-term cooling event near the end of the Eocene set the stage for further changes in the early Oligocene. Use of these assemblage zones greatly increases the age resolution available for late middle Eocene to early Oligocene strata of the Gulf Coast.

AGE	STAGE	GROUP	FORMATION	BIOZONE
OLIGOCENE	RUPELIAN		CATAHOULA	<i>Hypoxylonites</i> Assemblage Zone
EOCENE	PRIABONIAN	JACK-SON	MANNING	<i>Pseudolaesopollis ventosus</i> Assemblage Zone
				<i>Bombacacidites</i> Assemblage Zone
			CADELL	<i>Nudopollis terminalis</i> Assemblage Zone <i>N. t.</i> LAD
				<i>Rhizophora</i> Assemblage Zone <i>Rhizophora</i> FAD
	BARTONIAN	CLAI-BORNE	YEGUA	<i>Sequoiapollenites</i> Assemblage Zone
				<i>Reticuloidosporites pseudomurus</i> Assemblage Zone
			CROCKETT	<i>Friedrichipollis claibornensis</i> Assemblage Zone
				<i>Bursera</i> Assemblage Zone
			<i>Bombapollis texensis</i> Assemblage Zone	
			<i>Nuxpollenites crockettensis</i> Assemblage Zone	

Figure 1. Palynomorph biozones and biohorizons ca. 42 Ma to ca. 33 Ma in the northwestern Gulf of Mexico Basin: *N. t.* LAD—*Nudopollis terminalis* LAD. Not to scale.

Notes