

PALYNOFACIES OF LIGNITES AND ASSOCIATED SEDIMENTS IN THE UPPER PALEOCENE TUSCAHOMA SAND OF SOUTH- WESTERN ALABAMA AND EASTERN MISSISSIPPI

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ABSTRACT

The Tuscahoma Sand of the Wilcox Group is composed of fine-grained sand, laminated sandy clay, marl, and lignite. It forms a poorly exposed belt from southeastern Alabama extending northward into western Alabama and eastern Mississippi. It is assigned to the late Paleocene planktonic foraminiferal *Morozovella velascoensis* interval zone.

Lignites in the Tuscahoma Sand occur as parasequence deposits in the highstand systems tract of a type 2 depositional sequence near the top of the formation. Organic debris associated with these highstand systems tract deposits are dominated by land-derived plant tissues such as angiosperm and gymnosperm pollen, spores of ferns, lycopods, and fungi, plant cuticle, wood in various states of degradation, charcoal or inertinite, cysts of fresh-water algae, and resins. Marine influence in some samples is indicated by the rare occurrence of dinoflagellate cysts, microforaminiferal tests linings, and the presence of gray, amorphous organic matter.

Three palynofacies are recognized within highstand systems tract deposits in the upper Tuscahoma Sand based on the occurrence of organic debris. They represent fresh-water swamp, brackish marsh, and marginal to shallow-water marine depositional environments. Lignites in the Tuscahoma Sand are dominated by an angiosperm pollen assemblage. Pollen similar to that produced by the Betulaceae and Myricaceae, modern arborescent angiosperms, is common in these assemblages, as are fern spores, spore of *Sphagnum*, woody tissue, and charcoal. Gymnosperm pollen is rare, and marine forms are absent. This assemblage reflects deposition under fresh-water swamp conditions. Carbonaceous clay samples vary in the composition of organic debris. However, many are characterized by the occurrence of herbaceous angiosperm pollen such as *Carex*, *Arecipites*, *Calamuspollenites*, and *Liliacidities*. Arborescent angiosperm pollen is also common, as are fern spores. Bisaccate conifer pollen is common, and dinoflagellate cysts are rare. Fungal elements are abundant, and woody tissue is commonly more degraded than in lignite samples. This assemblage represents deposition in coastal, brackish marsh environments. Organic debris in laminated clays, silts, and sands typically have angiosperm and gymnosperm pollen, dinoflagellate cysts, degraded terrestrial plant material, and amorphous organic matter, and represent shallow marine and marginal marine deposits.