

# **Sedimentological and Palynological Analysis of Paleogene Sediments in Ogbunike Area Southeastern Anambra Basin, Nigeria: Implications for Paleogeography, Paleoenvironments and Hydrocarbon potentials**

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The Paleogene sediments located in Ogbunike shows a linear northwest-southeast trending features, located between kilometer 11.3 and 14.5 along Enugu- Onitsha expressway and belong to the Anambra basin. Sedimentological examination of the exposed three outcrops show that the area comprises five lithofacies association - The mudrock facies association, lower sandstone facies association, middle sandstone facies association, bioturbated sandstone facies association and the upper sandstone facies association. The sedimentological analyses indicate a high energy, wave dominated and fluvial to shallow marine environment. The lithofacies associations indicate vertically stacked fluvially - tidally influenced and shoreface superimposed on five depositional cycles. The textural analysis of the cross-bedded sandstones reflects a fluvially dissected shallow environment with tidal imprints. Paleocurrent analysis indicates a radial pattern or fan-shaped which imply fluvial and rose diagram shows that the provenance is northwest while the current flow is in the southeasterly direction.

The palynological analysis from fourteen samples of coaly and fossiliferous mudstone shows similarity of result in terms of paleogeography. The recovered palynomorph assemblage indicate marine- (Acritarchs and dinoflogallates - Apectodinium lyperacanthun, Xenicodinium lubricum, Eisenackia Crassitabulata and Homotryblium Tinuispinosum ) and lower percentage of pollen and spores (Eg Buttinia andreevi, Retidiporites magdalenensis, Echimonocolpites, Echitriporites trianguliformis, and Critaeturites cristatus ) which indicate freshwater environment. The presence of pteridophytes also suggests a humid environment of deposition. This give the impression that the environment is marine with influenced of continental detritus.

This study indicates that marginal marine connection probably occurred in Anambra, Gongola and Bida basin during the paleogene time. Regionally, this idea support that there exist connection between the Mediterranean in the paleogene and the Gulf of Guinea.