Biostratigraphic Studies and Source Rock Evaluation of Araromi Formation, Eastern Dahomey Basin, Southwestern Nigeria

Olumide Ogundipe[1], Olabisi Adekeye[1], Samuel Akande[1], Adedoyin Adeyilola[2]
[1]University of Ilorin; [2]Central Michigan University

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Abstract

Recent discovery of oil from offshore Cretaceous sediments in the Gulf of Guinea has increased the study and search for oil in the eastern Dahomey Basin. Araromi Formation sediments are well developed subsurface deposits in Southwestern Nigeria. Core samples from exploratory wells penetrating the tertiary and cretaceous sediments of the Dahomey basin were analyzed for paleontological studies and rock eval pyrolysis. The lithology of the strata penetrated by wells at studied interval is shale with some alternation of marls and limestone. Paleontological results showed abundant and diverse planktic and benthic foraminifera assemblages. The planktic foraminifera comprises mainly of Globotruncanella petaloidea, Heterohelix glubulosa and Heterohelix navaroensis while the benthics are mainly Virgulina sp., Nonionella auris, Bolivina afra and Bolivina explicate. Maastrichtian age was assigned to the Araromi sediments based on the recovery of age diagnostic planktic foraminifera assemblages. Two informal foraminifera zones were established based on first and last downhole occurrences of observed assemblages recovered within the studied sections. The zones are the Globotruncana aegyptica zone and the Abathomphalus mayaroensis zone for the Middle Maastrichtian and the Late Maastrichtian respectively. Paleoecological interpretations deduced from the benthic foraminifera association and the planktic/benthic ratio indicates that the sediments were deposited in a shallow marine environment. Geochemical results from pyrolysis showed the formation has Total Organic Content (TOC) ranging from 0.74-3.01 wt.%, Hydrogen Index (HI) range from 198- 280 mg/HCg and T_{max} ranging from

419 – 436°C. The source rock within the Araromi Formation contains both Type II and Type II-III kerogen.