RECONSTRUCTION OF CRETACEOUS PROVENANCES OF ABEOKUTA GROUP OF THE EASTERN DAHOMEY BASIN SOUTHWESTERN NIGERIA BASED ON THE FIRST URANIUM-LEAD DETRITAL ZIRCON GEOCHRRONOLOGY

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ABSTRACT

The Eastern Dahomey provenance studies have been based on conventional methods such as palynological studies which are now been enhanced by improved techniques in U/Pb (LA-ICP-MS) dating of detrital zircons due to lack of available high-quality chronological markers in some key beds and boundary in a long time across the globe whereas detrital zircon dating gives revelation of the distinctive geochronological pattern.

This is the first Detrital Zircon dating of Dahomey Basin and it is aimed at describing the source terrains in different palaeogeographic domains in the Abeokuta Group and to report detrital zircon dating results from sandstone formations relating to rifting and drifting at different stages of the marginal basin formation.

Samples were systematically collected from the three formations in Abeokuta Group (Ise, Afowo and Araromi formations) with each sample weighting 5kg each, detrital heavy minerals were separated from the samples by the standard procedures for mineral separation after which the detrital zircons were carefully identified under a binocular microscope. Clean detrital zircons with well-formed crystal shapes were selected and polished to yield a smooth surface exposing the interiors of most zircon grains. Cathodoluminescence images were used to detect internal textures relating to origin and choose potential target sites for the dating of zircons after which Laser Ablation Inductively Coupled Plasma Mass Spectrometry detrital zircon analysis would then be performed. Age calculations will be made using Probability Density Plots and Concordia diagrams which will then be correlated with the tectonic events of the Dahomey Basin.

Based on the above, the detrital zircons were separated from the sandstone samples for uranium-lead dating in order to further explore tectonic controls and detailed evolutional processes of the Cretaceous to Recent age of the Abeokuta Group.

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