

# **Scientific Notes on Some Species of Genus *Globorotalia* from Kafe Field, Offshore Western Niger Delta, Nigeria**

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## **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

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## **ABSTRACT**

In this paper, some species of the Genus *Globorotalia* from the study area were identified and taxonomic notes on them were transcribed. The study area is located in Kafe field, offshore western Niger Delta, Nigeria. The clayey and shaly components of the ditch cuttings obtained from five wells at 18.29 m intervals were used. Standard micropaleontological preparation method was used. The identified species of the Genus *Globorotalia* from the study are *Globorotalia mayeri* CUSHMAN & ELLISOR, *Globorotalia continuosa* BLOW, *Globorotalia obesa* BOLLI, *Globorotalia menardii* "A" BOLLI and *Globorotalia foshi lobata* BERMUDEZ.

**Keywords:** *Scientific notes; Globorotalia; Kafe field; Western Niger Delta; Nigeria.*

## **1. INTRODUCTION**

Genus *Globorotalia* CUSHMAN is planktonic foraminifera and belongs to the Family

*Globorotaliidae* CUSHMAN and Subfamily *Globorotaliinae* CUSHMAN. Study area is located in the Kafe field, offshore western Niger Delta area of Nigeria (Fig. 1). The Niger Delta is

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situated in the Guinea Gulf on west coast of Central Africa. Niger Delta is located between latitudes 4° and 6° N and longitudes 3° and 9° E in south-south geo-political region of Nigeria [1]. Cenozoic Niger Delta is situated at the intersection of Benue Trough and South Atlantic Ocean where a triple junction developed during separation of South America and Africa in Late Jurassic [2]. Study aim is to identify and record taxonomic notes on Genus *Globorotalia* in study area.

## 2. GEOLOGICAL SETTING

Niger Delta is made up of three subsurface formations, namely: Akata, Agbada and Benin Formations [3-7]. They were deposited in marine, transitional and continental environments, respectively; together they form a thick, overall progradational passive-margin wedge [3]. Akata Formation, which is Paleocene to Pliocene age, is basal unit and composed mostly of marine shales that constitute source rock within the basin. Agbada Formation consists of alternating sandstone, siltstone and shale sequences that

make up petroleum reservoirs of the basin. Agbada Formation is Eocene to Quaternary age (Figs. 2 and 3). On the other hand, Benin Formation is Oligocene to Recent age and made up of non-marine fine to coarse-grained sands interlayered mudstone and shale [3].

## 3. METHODS OF STUDY

Ditch cuttings samples retrieved at 18.29 metres intervals from five wells were used. Standard micropaleontological preparation method for foraminiferal samples was used. Unwashed ditch cutting samples were initially rinsed to remove drilling mud and then dried. Twenty grammes of each dried sample was soaked for four hours in kerosene and detergent solution over night. Disaggregated samples were washed under running water over a 63 µm sieve mesh. Washed residues were dried on hot electric plate at temperature of 85°C, and sieved into three size portions: coarse (2 µm), medium (600 µm) and fine (63 µm). They were put in labelled sample bags. Their foraminiferal contents were identified under binocular microscope at x40 and recorded.

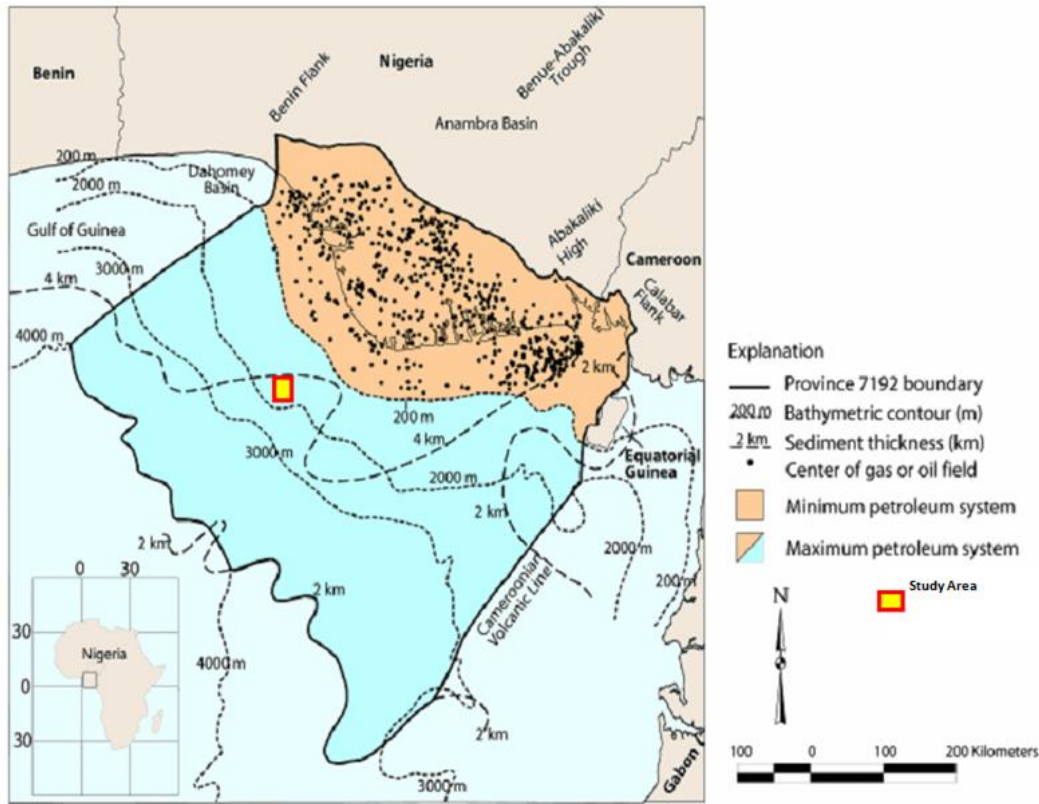


Fig. 1. Location map of the study area [7]

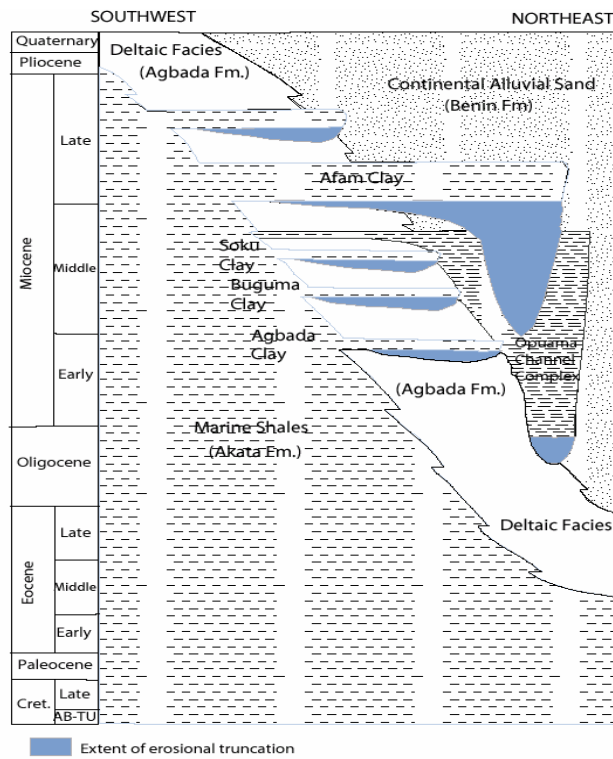


Fig. 2. Stratigraphic column showing the three formations of the Niger Delta [7,8] Foot note shows extent of erosional truncation in the basin

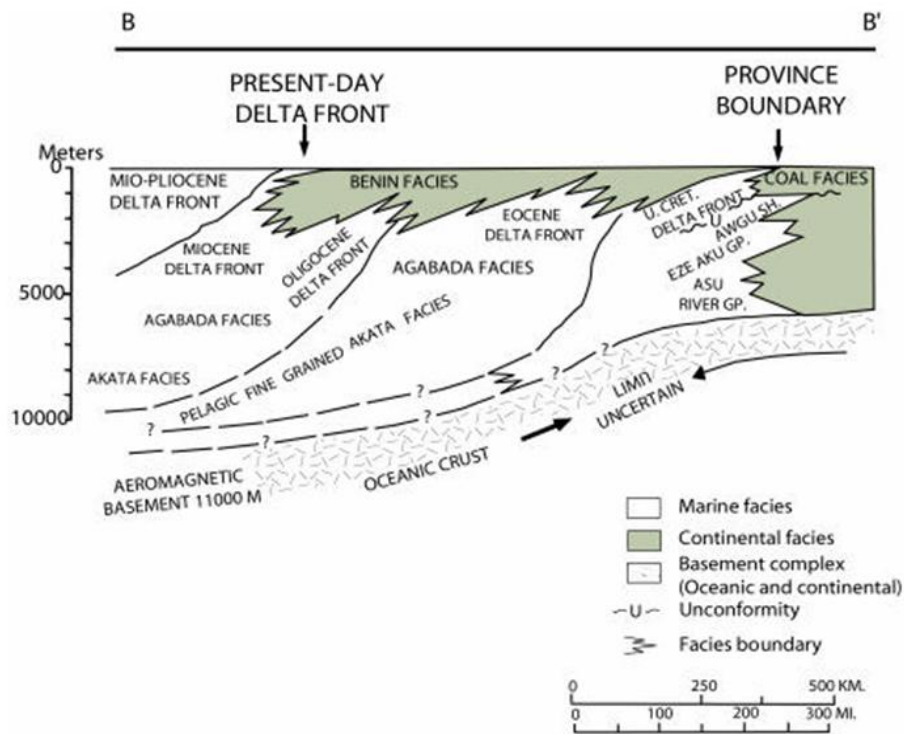


Fig. 3. Southwest-Northeast (B-B') cross-section through the Niger Delta [9]

#### 4. RESULTS

Published methods [10-18] were used to transcribe the taxonomic notes on the identified species of the Genus *Globorotalia* from the study area. Other details on the species that are in published literature were deliberately left out in this paper. The following species of Genus *Globorotalia* were identified: *Globorotalia mayeri* CUSHMAN & ELLISOR, *Globorotalia continuosa* BLOW, *Globorotalia obesa* BOLLI, *Globorotalia menardii* 'A' BOLLI, *Globorotalia fohsi lobata* BERMUDEZ. The taxonomic notes and the images of the identified species of Genus *Globorotalia* are presented below (Figs. 4 - 8).

##### 4.1 Taxonomic Notes

Family: Globorotaliidae [10]

Subfamily: Globorotaliinae [10]

Genus: *Globorotalia* [10]

Species: *Globorotalia mayeri* [19] (Fig. 4)

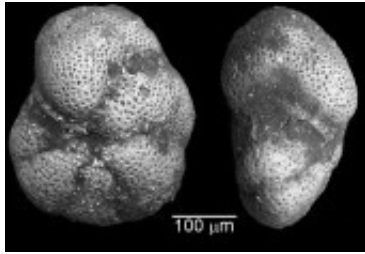


Fig. 4. Views of *Globorotalia mayeri* [19]

Test has a less lobate equatorial periphery with curved, spiral intercameral sutures and an aperture with a pronounced arched slit. Age Stratigraphic Range: Lower Oligocene to Middle Miocene [12,14].

Species: *Globorotalia continuosa* [20] (Fig. 5)

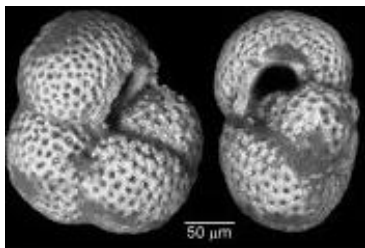


Fig. 5. Views of *Globorotalia continuosa* [20]

Test is small with four chambers in the last whorl. The aperture is high arched and comma-shaped.

Age Stratigraphic Range: Top of Middle Miocene – base of Late Miocene [12,14].

Species: *Globorotalia obesa* [21] (Fig. 6)

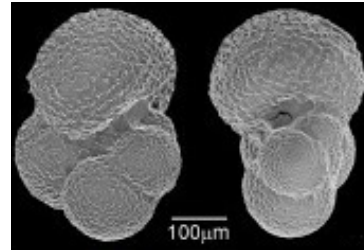


Fig. 6. Views of *Globorotalia obesa* [21]

Test is ovate and the last whorl is made up of four globular chambers parted by engraved sutures conspicuously lobate in equatorial periphery. Age Stratigraphic Range: Early Miocene to upper Middle Miocene [12,14].

Species: *Globorotalia menardii* 'A' [22] (Fig. 7)

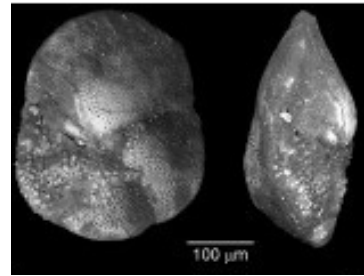


Fig. 7. Views of *Globorotalia menardii* 'A' [22]

Test has peripheral keel and limbate intercameral sutures at the spiral side, and less lobate in equatorial side, final whorl is made up of six chambers. Age Stratigraphic Range: Middle Miocene to Early Pliocene [12,14].

Species: *Globorotalia fohsi lobata* [23] (Fig. 8)

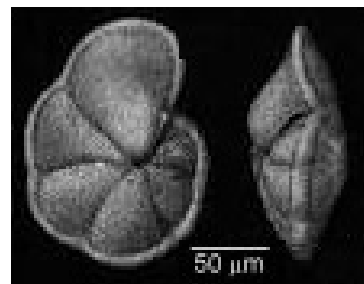


Fig. 8. Views of *Globorotalia fohsi lobata* [23]

Test has cockcomb-like equatorial periphery and distinct lobate chambers. Age Stratigraphic Range: Middle Miocene [12,14].

## 5. CONCLUSION

Five species of the Genus *Globorotalia*, namely: *Globorotalia mayeri* CUSHMAN & ELLISOR, *Globorotalia continuosa* BLOW, *Globorotalia obesa* BOLLI, *Globorotalia menardii* 'A' BOLLI, *Globorotalia foshi lobata* BERMUDEZ were identified in Kafe-1, Kafe-2, Kafe-4, Kafe-5 and Kafe-6 wells, respectively and their taxonomic notes recorded. The value of the taxonomic notes is to contribute to the study of the species of the Genus *Globorotalia* that will in turn help other researchers in the study area to easily and quickly identify these planktonic foraminifera. The taxonomic notes will help in eradication of uncertainty and arbitrary identification of species.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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