



Research Paper

# GLOBANOMALINA FROM THE PALAEOCENE SEDIMENT OF PONDICHERRY AREA, CAUVERY BASIN, SOUTHERN INDIA

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This paper records the occurrence of nine species of well preserved planktonic foraminiferal genus *Globoanomalina* viz., *Globoanomalina planocompressa*, *G. compressa*, *G. imitata*, *G. ehrenbergi*, *G. chapmani*, *G. ovalis*, *G. australiformis*, *G. luxorensis*, *G. pseudomenardi*. The recorded planktonic foraminiferal genus are useful for biostratigraphic purpose and indicate a Late Paleocene age (P3 to P5 Zones) for the study area.

Keywords: *Globoanomalina*, Foraminifera, Pondicherry, Palaeocene, Cauvery basin

## INTRODUCTION

The Pondicherry area includes the northernmost of the three outcrops of marine sediments and occupies an area of nearly 30 sq (Figure 1). Miles NW of Pondicherry. The study area is situated to the NE of the city of Pondicherry (Figure 2). Where Palaeocene to early Eocene rocks are well exposed. The samples for the present study were collected from the dug-well and excavated house foundation and also well-cutting in the village of Saidarpet near the coconut farm behind the rice mill (N11°59'36.7":E79°45'0.5"); calcareous marlstone and claystone were collected from the NE of the village Tiruchitrabalam – Saidarpet Cross road Bridge cutting (Figure 5) (N12°00'5.3":E79°46'33.6") and calcareous fine grained sandstone, behind the temple of the village Panchavadi (N12°00'49.0":

E79°46'08.7") (Figure 4) and in the pond section of the village Ravathamkuppam (N12°00'55.7": E79°46'33.6") (Figure 3) in the Pondicherry area. The exposures of Pondicherry area are very scanty and samples were mainly collected from the unlined open wells, bridge cuttings and pond sections and nallas. In the laboratory, samples were processed for foraminifera using standard processing technique (Glaessner, 1945) and the samples were disaggregated by following techniques detailed in Jones (1956).

## GEOLOGICAL SETTINGS

The Cauvery basin represent passive margin sedimentary systems developed in response to the separation of the Indian subcontinent from Australia and Antarctica in the early Cretaceous time, contemporaneous with the first phase of

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seafloor spreading responsible for the formation of the Indian Ocean. The basin forming a half graben morphology trending NE-SW with a regional dip 5°-10° to the east and southeast due to the result of continental rifting between India, Australia and Antarctica plates (Veevers *et al.*, 1991). Blanford (1865) was the first to study and describe these rocks and gave the earliest geological account of the Pondicherry area. The presence of marine Lower Tertiary sediments was first reported by Furon and Lemoine (1939) who noted the occurrence of larger foraminiferal genera *Assilina* and *Discocyliina*. Rajagopalan (1964 and 1965) on the basis of detailed mapping classified the Cretaceous and Lower Tertiary sequence into three distinct lithological units which are in ascending order, the Valudavur, the Mettuveli and the Pondicherry Formations. The upper

Figure 1: Showing Cretaceous Tertiary Succession of Cauvery Basin, South India

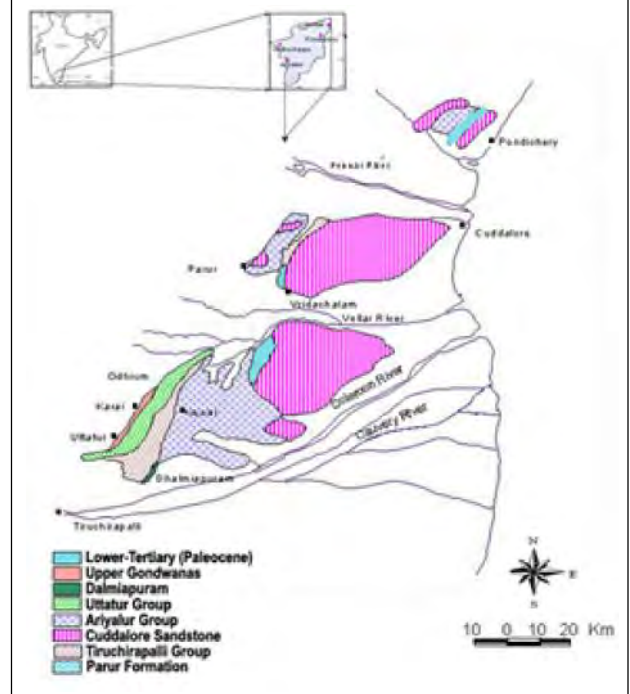


Figure 2: Geological Map of Pondicherry Area, Cauvery Basin

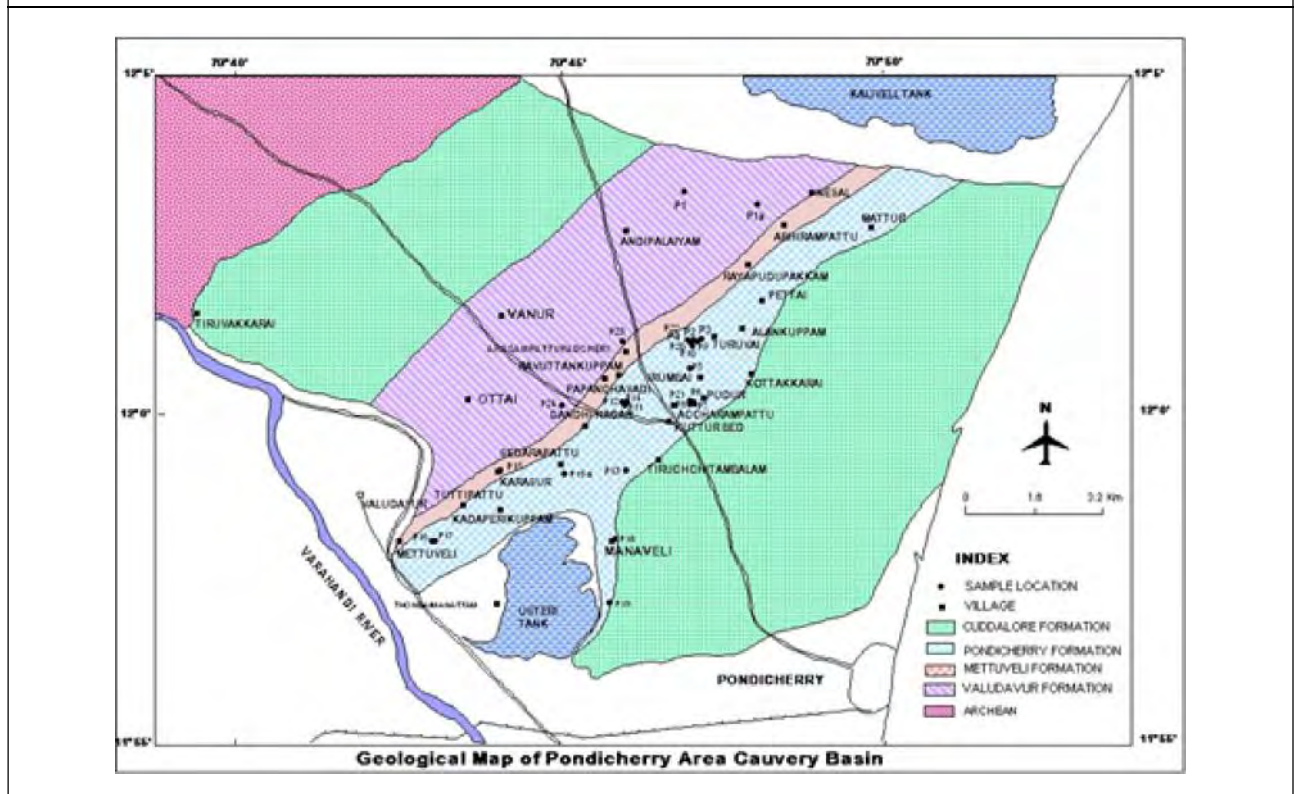


Figure 3: a and b Ravathankuppam Pond Section



Figure 4: Papanchavadi Section



Figure 5: Saidarpet and Trichtrambalam Cross Road Bridge Section



Cretaceous of this area comprises the Valudavur and the Mettuveli Formations. The Pondicherry Formation is of early Tertiary age (Palaeocene-early Eocene). The three formations which are having total thickness of less than 1000ft extend over a strip of almost eleven to sixteen km long and about four miles wide in NE-SW direction. The three units are apparently conformable to each other. It is overlain by the Cuddalore Sandstone of Miocene age. Sundaram *et al.* (2001) gave a detailed work on the lithostratigraphy of Pondicherry area and the succession comprise the Valudavur and Mettuveli Formations (Maastrichtian) and Karasur and Manaveli Formations (*Palaeocene*).

## MATERIALS AND METHODS

Twenty four samples from 1.77 m Ravathakuppam pond section (N12°0'92" E79°46'56") were collected for the planktonic and benthic foraminiferal study. Major lithology of the section is Calcareous Sandstone and Marl contains numerous ichnofossils. The sample collected from the field was disaggregated for microfossil separation following standard procedure as detailed in our previous papers (Malarkodi *et al.*, 2013).

### Planktonic Foraminifera (*Globanomalina*)

Planktonic foraminifera are generally common to abundant throughout the carbonate facies of the Pondicherry sequence. The genus *Globoanomalina* are recovered from the Karasur Formation of Pondicherry area. Genus *Globanomalina* as having a micro-perforate wall with low, bluntly margined perforation pits. All of the species of *Globanomalina* are normal perforate. *Globanomalina* is herein include the smooth-walled species of the Paleocene. *The genus Globoanomalina viz., Globoanomalina*

*planocompressa, G. compressa, G. imitata, G. ehrenbergi, G. chapmani, G. ovalis G. australiformis, G. luxorensis, G. Pseudomenardi* are recorded and are useful for biostratigraphic purpose and indicates Late Palaeocene age (P3 to P5 Zones) for the study area.

## RESULTS AND CONCLUSION

Genus *Globoanomalina* are recovered from the Karasur Formation of Pondicherry area. *Globoanomalina* occurs in the carbonate facies of the Pondicherry area and found associated with the well known guide fossils of the Palaeocene age, i.e., *Subbotina, Morozovella, Acarinina and Igorina*. Occurrence of *Globoanomalina*, indicates late Palaeocene age (P3-P5-Zone).

The recorded foraminiferal genus *Globanomalina* indicates Late Palaeocene age (P3 to P5 Zones) for the study area and the associated benthic and planktonic foraminifera indicates mixed environment from neritic to abyssal environment.

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