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Genus *Paratoralia* (Foraminifera) from the Niniyur Formation, South India, Cauvery Basin

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Abstract: ***This paper deals with an occurrence of the genus Paratorotalia (foraminifera) recorded in the Adanakurchchi limestone beds of Niniyur Formation of the south Indian, Cauvery Basin. The genus is present abundantly in the limestone beds from Adanakurhchchi area. The fossil has been described from SEM microphotograph and from a comparison with other known genera like Pararotalia tuberculifera, the present form is shown to be a new member of the genus Pararotalia. This new form has been named Pararotalia niniyurensis n. sp., The occurrence of Pararotalia in association with Thalmannita in calcareous limestone in Niniyur Formation indicates Palaeocene age to the Niniyur Formation.***

Keywords: *Pararotalia*, Foraminifera, Adanakurchchi, Niniyur, Palaeocene,Cauvery Basin.

1. Introduction

Genus *Pararotalia* are recovered for the first from the Adanakurchchi Limestone Member of Niniyur Formation. *Pararotalia* occurs in the carbonate facies of the Niniyur Formation and is found associated with the well known guide fossils of the Paleocene age i.e.*Thalmannita*, and also along with planktic foraminifera *Morozovella praecursoria* (Morozova), *Eoglobigerina spiralis* (Bolli) and *Planorotalia chapmani* (Parr) of lower Palaeocene age (P2-Zone). *Pararotalia* and *Thalmannita* constitute as much as 50% of the assemblage, Occurrence of *Pararotalia* in Adanakurchchi limestone member of Niniyur Formation indicates Palaeocene age and have been described. In addition to these, there are few other forms in this material, of which, one which is here being recognized as a new form has been studied in greater detail. The exposures of Niniyur Formation are very scanty and samples were mainly collected from the unlined open wells, quarry sections and nallas. In the laboratory samples were processed for foraminifera using standard processing technique Glaessner [1] The samples were disaggregated following techniques detailed in Jones [2].

Super family: ***ROTALIACEA*** Ehrenberg, 1839
Family: ***ROTALIIDAE*** Ehrenberg, 1839
Sub family: ***ROTALIINAE*** Ehrenberg, 1839
Genus: ***PARAROTALIA***Y Le Calvez, 1949

a) ***Pararotalia niniyurensis*** n. sp.
(Pl.1, Figs. a-l)

b) **Name**: After the village Niniyur, the type-locality for the Niniyur Formation.

c) **Repository**: The recorded holotype (BUGDPL/NF No. 105) and paratype (BUGDPL/NF o. 105A) are deposited in the Palaeontology Lab., Department of Geology, Bangalore University, Bangalore.

d) **Diagnosis** : Test small, plano-convex, umbilico-convex circular and compressed; surface rough throughout; low trochospirally coiled on the dorsal side, ventral side distinctly convex and strongly protruding; equatorial periphery circular and heavily keeled at the periphery; sutures curved and slightly depressed dorsal side, ventral sutures radial and strongly depressed; umbilical relatively narrow, deep open with an umbilical plug; aperture at the ventral wall of the formed chamber not entering the umbilicus.

e) **Measurements**

Dimensions (in mm)	*Length*	*Width*	*Thickness*
Holotype BUGDPL/NF no.105	0.35	0.30	0.14
Paratype BUGDPL/NF no.105A	0.36	0.33	0.15

Remarks : *Pararotalia niniyurensis* n. sp. differs from *P. tuberculifera* in having biconvex test, chamber of the last formed whorl sometimes more angular to sharp, rugged peripheral margin and less developed spines at the periphery, tubercles present on the dorsal side. The two forms described by Hofker (1963), (one a flat microspheric generation; while the other a robust- megalospheric form) are different from the present species and this may be new species although it has less number of chambers, strongly protruding ventral side, heavily keeled periphery and with an umbilical plug. *Pararotalia niniyurensis* probably evolved from *Pararotalia tuberculifera* by the reduction in size of test and number of chambers, its compressed nature and the development of heavy peripheral keel and umbilical plug. The present species is quite distinct in having a very broad and granular peripheral keel. This does not seem to resemble any other species of the genus *Pararotalia* known to the authors.

Location and horizon: Adanakurhcchi Limestone (N51) of the Niniyur Formation.

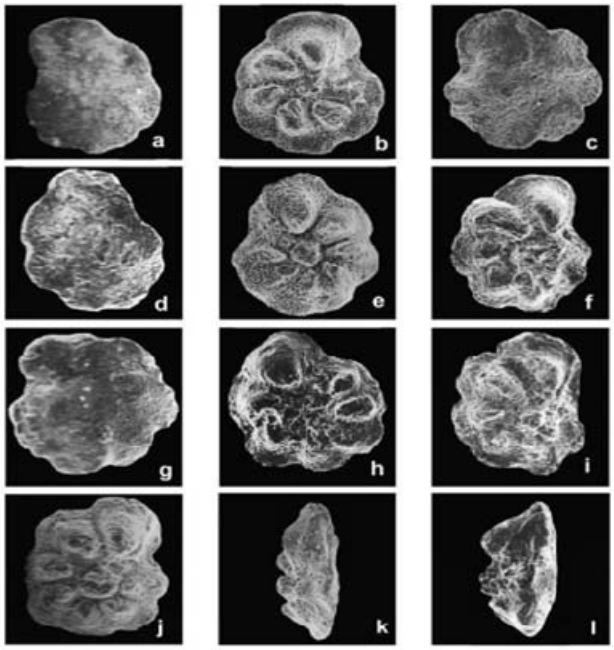

Figure a-l: Plate 1- *Pararotalia niniyurensis* n sp,

2. Discussion and Conclusions

The Pararotalia are recovered for the first time from the sediments exposed at Adanakurchchi Limestone Member of the Niniyur Formtion. The occurrence of *Pararotalia* in association with *Thalmannita* in calcareous limestone in Niniyur Formation indicates Palaeocene age to the Niniyur Formation.

3. Future Scope of the Study

Rich assemblage of benthic foraminifera were recorded while carrying out micropaleontological analysis interestingly we could recover many new species and also Early Paleocene – early Eocene foraminifera from Cauvery Basin, which are used to study the Palaeocene-Eocene Thermal Maximum (PETM), refers to a climate event that began at the temporal boundary between the Paleocene and Eocene epochs. The PETM has become a focal point of considerable geoscience research because it probably provides our best past analog to future environmental change and presents the opportunity to study climate impacts on marine communities. It also helps us to understand impacts of global warming and massive carbon input to the ocean and atmosphere, including ocean acidification. The PETM is characterized by extreme changes on Earth's surface, whereby global temperatures rose by about 6 °C (11 °F). Which could be of considerable significance in studying global warming and the climate impact on marine communities.

Studies have been focused on planktonic foraminifers so far, but during the PETM, deep-sea benthic foraminifers decreased their body-size and increased their productivity, metabolic rates, and food consumption in response to abruptly increasing temperature and changing surface water productivity. Dwarfing of ostracodes during the PETM interval suggests that their food consumption rates, and lifetimes, were less than those of ostracodes in the pre-PETM interval. It could not be studied in the present program. Hence, detailed benthic foraminiferal and ostracoda studies and their body size and PETM study could be of considerable interest for future work.

4. Acknowledgement

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