



REVIEW OF RESEARCH

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“MICROPALAEONTOLOGICAL STUDY FOSSILS FROM QUATERNARY AND RECENT SEDIMENTS BETWEEN JAIGARH TO VENGURALA, WEST COAST MAHARASHTRA, INDIA.”

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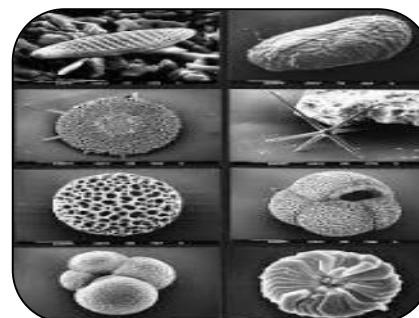
ABSTRACT

The present investigation deals with studies of the microfossil contents from quaternary and recent sediments between Jaigarh to Vengurala. It is rich in microfossils in quaternary and recent sediments. The quaternary and recent sediments of the West Coast contain a great assemblage of foraminifera. These foraminiferal forms are indicative of coastal environments. The agglutinated foraminifera like *Globigerinina bulloides*, *G. rebescens*, *G. falconensis*, *G. calinda* etc. are characteristics of environment. This fauna is survived in a reducing environment with comparatively low pH. The examined fauna of Carbonaceous clay and mud suggest low salinity, low pH and reducing conditions of deposition during quaternary period. The changes in the sea shore have contributed to the present configuration of the evident. The elevated beds all along the west coast in general and at the sediments between Jaigarh to Vengurala. The lignite bed occurs about 100 MSL from the west coast of India. The samples are studied for its microfossil contents. The foraminiferal assemblage is cosmopolitan and shows the dominance of clumped foraminifera, mainly represented by the species of *Trochammina*, *Jadammina* and *Haplochromines* characterizes the sandy shores. The palynoflora is also indicative of a near-shore. Taxonomical and morphological study help in the overcoming differences and thereby making comparisons between assemblages of different geological ages. Relative morphology helps to study environments has proved useful in palaeoecological interpretations. The present data is useful for the studies of the microfossil contents west coast of India.

KEYWORDS: Micropaleontological study, west coast Maharashtra.

INTRODUCTION

Foraminifera are a widely distributed and diverse orders of protists in marine environments. They play an important role in ecological and paleo-ecological studies due to their high numerical density in marine sediments and the excellent preservation potential of their shells. The changes in sea shore have contributed to the present configuration of the evident. The elevated beds all along the west coast in general and at sediments between Jaigarh to Vengurala. The lignite bed occurs about 100 MSL from the west coast of India. The samples were studied for its microfossil contents. The foraminiferal assemblage is cosmopolitan and shows the dominance of clumped foraminifera mainly represented by the



species of Trochammina, Jadammina and Haplophragmoides characterizes the sandy shores. The palynoflora is also indicative of a near-shore. Taxonomical and morphological study help in the overcoming differences and thereby making comparisons between assemblages of different geological ages. Relating morphology help to study environments has proved useful in palaeoecological interpretations. The model proposed by Jones and Charnock in (1985) has subsequently been adapted and still serves as the main reference for such palaeoecological interpretations. The quaternary and recent sediments of the West Coast contain a great assemblage of foraminifera. These foraminiferal forms are indicative of coastal environments. The agglutinated foraminifera like *Globigerina belloites*, *G. rebescens*, *G. falconensis*, *G. calida* etc. were characteristics environment. This fauna is survived in a reducing environment with comparatively low pH. The examined fauna of Carbonaceous clay and mud suggest low salinity, low pH and reducing conditions of deposition during quaternary period.

MATERIAL AND METHODOLOGY:

Sand samples were collected by standard sample collecting methods. During the January 2011 to December 2011. These samples were labelled at the collection sites with special code. Processed and treated with Wet sieving treatment and purified in the Laboratory.

- i. Identification and labelling of samples as to location and depth.
- ii. Crushing of sample by various standard methods.
- iii. Desegregation of sample by soaking with various dispersants.
- iv. Wet sieving treatment.
- v. Separation of samples from the loose sediments.
- vi. Drying sample by various standard methods.
- vii. Placing of residues in labelled vials, envelopes and polythene bags etc.
- viii. Examination and Identification under paleontological microscope.

The quaternary, subrecent and recent sediments are found within two to three km. inland from the present coast. This paper is based on the reconnaissance survey carried out along the coast. The ecological study of living forms has taken as a base for information to compare and construct palaeo-oceanographic environments of the fossils preserved in the quaternary and recent sediments. Globigerinae is a suborder of foraminifera's that were found as marine plankton. They produce hyaline calcareous tests are known as fossils. The group has included more than 100 genera and over 400 species, of which about 30 species are extinct. One of the most important genera is Globigerina; vast areas of the ocean floor are covered with Globigerina ooze (Murray J.W.(1873), dominated by the shells of planktonic forms.

Table No. 1. Assembles of Foraminifera species in between Jaigarh to Vengurla.

Sr.No.	Foraminifera Species
1	<i>Globigerina bulloides</i> ,
2	<i>Globigerina rebescens</i> ,
3	<i>Globigerina falconensis</i> ,
4	<i>Globigerina calida</i>
5	<i>Globigerina conglobatus</i>
6	<i>Globigerina succulifera</i>
7	<i>Globigerina mennardii</i>
8	<i>Globigerina tumid</i>
9	<i>Globigerina mennardil</i>
10	<i>Globigerina siphomifera</i>
Total	10

The foraminiferal assemblage and change in climatic conditions was first interpreted by Pascoe, E.H. (1964), Brady, G. S and Robertson, D. (1870), Zobel (1971, 73) Shetty (1973, 77 & 83) etc. The climatic conditions during quaternary – Pleistocene subrecent and recent periods had been changed at number of times, which is shown by variation in the foraminiferal assemblage. In the recent sediments following species are found.

Globigerina bulloides, *G. rebescens*, *G. falconensis*, *G. calida*, *G. conglobatus*, *G. succulifera*, *G. mennardii*, *G. tumid*, *G. mennardil*, *G. siphomifera*.

The presence of *G. bulloides* dextrally coiled neogloboquadrinapachyderm typical indicate that cold water conditions. *Globigerina rebescens*, *G. succulifer*, *Globorotalia menardii*, *G. mennardil* and *neoflexuosa* indicate tropical warmer conditions (Shetty, 1972). The occurrence of *Globigerina bulloides* indicates upwelling of warm water condition. Dextrally coiled neogloboquadrina pachyderm typical S.S, indicate cold water conditions and their presence in these sediments indicates upwelling of water, migration of species and their deposition in these sediments. Its record in the sediments explains the presence of such a water monument (Shetty, 1979, 83). The presence of *G. succulifer*, *G. siphomifera* are indicative of high salinity of water. The *G. rebescens* indicate high salinity (>36‰) of tropical water.

RESULT AND DISCUSSION:

The quaternary sediments like carbonaceous clay, variegated clay and lignite contain planktonic foraminifera. The faunal assemblage is dominated by agglutinated forms and is represented by *Miliammina*, *Jadammina*, *Trochammina*, *Arenoporella* and *Haplophragmids*. This fauna was survived in reducing environments with low pH conditions. This fauna is indicative of marshy environment. Deusser, W. G. et al. (1981) Studied the "Seasonal changes in species composition, number, mass, size, and isotopic composition of planktonic foraminifera settling into the deep Sargasso sea." Paleogeography, Palaeoclimatology, Paleocology.

Murray (1993) has divided marsh foraminiferal fauna into three groups viz. cosmopolitan species, hyposaline marsh and hypersaline marsh. The species collected from clay belong to cosmopolitan group and suggest low salinity, low pH and reducing of deposition. The sediments are assigned to > 4000 years B.C. (Rajasekhar, C. and Kumaran, K. (1998) on the basis of radiocarbon dating. (Costello, M.J. et al. (Ed.) (2001). was prepared the European register of marine species: A check-list them, of foraminiferal assemblage indicates the climatic conditions during the deposition of these sediments. The detailed field work and collection of samples from Pliocene, sub recent and recent sediments will be focused on environment conditions of the respective period and marine species in Europe and a bibliography of guides to their identification. Foraminifera are a group of protozoans characterized by a test of one to several chambers composed of secreted calcite or agglutinated grains. Test sizes are generally in the range 0.05–1 mm. Forms with agglutinated tests are typically benthonic (bottom-dwelling) and make only a very minor contribution to pelagic sediments, which are overwhelmingly dominated by remains of globular planktonic forms. Modern species show clear latitudinal distribution patterns related to water temperature. Oxygen isotope analysis of planktonic foraminifera tests can provide estimates for past sea-surface temperatures and salinities. Isotope data from benthonic forms allow reconstruction of bottom-water mass histories. Foraminifera hence can provide important information on thermohaline structure and circulation patterns in past oceans.

CONCLUSION:

The foraminiferal assemblage indicates the climatic conditions during the deposition of these sediments. The detailed field work and collection of samples from Pliocene, subrecent and recent sediments will be focused on environment conditions of the respective periods. (K.N. Page, (2014) reviewed in reference Module in Earth Systems and Environmental Sciences. The calcareous or agglutinated tests of benthonic (bottom-dwelling) and benthic foraminifera are frequently common marine sediments, Planktonic foraminifera (*Globigerina*) first appeared in Jurassic period. Their distribution and biostratigraphy were often reduced by lumping them together under the term 'protoglobigerinids.' The stratigraphical use of Jurassic foraminifera many taxa, group can be locally

important for recognizing divisions on the scale of stages. Jurassic Radiolaria are most characteristic of relatively deep-water siliceous rocks, such as cherts, formed below the carbonate compensation depth. In such areas they can be valuable stratigraphical tools.

SIGNIFICANCE OF RESEARCH:

This research work is helpful to the study of geological time scales and Study of fossil and fossil formation. The group of foraminiferal fauna is related to deposition of crude oil. The study of foraminiferal assemblage also helps to study the recent zooplanktons which are important for ecological homeostasis.

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