

MICROFAUNAL CONTENT IN MARINE SEDIMENTS AND ITS SIGNIFICANCE

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INTRODUCTION

From beach to deep sea marine sediments have been subjected to extensive studies to obtain informations about oceanography and paleo-oceanography. Beach sand, if examined through a microscope show that, amongst grains of quartz and other minerals, there are many small shells. This component of sediment may include the juveniles of molluscs and others, potentially large, marine organisms, but there will be many minute shells of organisms which are never to grow larger than the grains of enclosing sand. They are bivalved carapace of microscopic arthropods (ostracoda), the coiled chambered shells of protozoans (foraminifera), fragments of coralline algae, and many other skeletal kinds. On the sea bed of the continental shelf and slope, an even greater diversity of microscopic skeletons may accumulate in the sediment, accompanied by the pollen and spores and land plants, blown there by the wind. On the floor of deep ocean, there accumulate a grey, sticky ooze, composed almost entirely of the remains of planktonic unicellular plants and protozoans, many thousands of their skeletons being preserved in each gram of sediment. There they are termed as ooze (eg. foraminiferal ooze, Nannofossil ooze, Pteropod ooze etc.). All of these are potential microfossils. After the passage of geological time, they form part of the sedimentary rock.

MATERIAL AND METHODS

Their frequent abundance and small size enable to work with very small quantity of samples. In field they can be obtained by three types of sampling : a) core sample, (subsurface sediments), (b) Grab samples (surface sediments) and (c) dredge sample (consolidated rocks).

Depending upon group of microfossils samples can be processed in many ways. The important methods are (a) preparation of smear slide and (b) wet sieving and separating the microfossils by (i) hand picking and/or (ii) using flaotation methods.

CLASSIFICATION

Based on the composition of shells, microfossils can be subdivided as following:

- (A) Calcareous microfossils
 - i. Foraminifera
 - ii. Calcareous Nannoplankton
 - iii. Ostracodes
 - iv. Pteropods
 - v. Calpionellids
 - vi. Calcareous algae
 - vii. Bryozoa
- (B) Siliceous microfossils
 - i. Radiolaria

- ii. Marine diatoms
- iii. Silicoflagellates and Ebridians

(C) Phosphatic microfossils

- i. Conodonts and other phosphatic microfossils

(D) Organic-walled microfossils

- i. Dinoflagellates, Acritarchs and Tasmanitids
- ii. Spores and pollen in the marine realm
- iii. Chitinozoa

SIGNIFICANCE

As the present is considered a key to the past by Geologists, so too it holds the promise of the future. Therefore, study of ecology of these microfossils in modern environments in various oceans/seas is very important. Understanding of ecology can be used as a tool to solve various problems of oceanography and paleo-oceanography. Some of these applications in various fields are listed below:

- i. Studies related with exploration of oil.
- ii. Water mass studies
- iii. Current patterns
- iv. Topography and bathymetry
- v. Paleoclimates and its application to develop futuristic models including variations in monsoonal precipitations
- vi. Sea level changes
- vii. Tectonics
- viii. Marine pollution
- ix. Marine Archaeology

REFERENCES FOR FURTHER READING

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