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A NOTE ON THE BRYOZOANS OF THE SHELF SEDIMENTS OFF VISAKHAPATNAM

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EARLY work on the sediments of the continental shelf off Visakhapatnam and the east coast of India has been reported from this department.[1-4] Of the important groups of microfauna, such as the Foraminifera, Ostracoda, Polyzoa (Bryozoa), Mollusca, etc., whose remains have been found to be well distributed in these sediments, it is the Foraminifera that has received considerable attention.[5-8] The authors have undertaken studies on the ostracod and bryozoan assemblages of these shelf sediments and it is the purpose of this note to give a preliminary account of the bryozoan fauna of the sediments of the continental shelf off Visakhapatnam, on the east coast of India.

Many sediment samples were obtained during the years 1952-57 and in 1964 from the continental shelf off the east coast of India, north of Madras, using the Lafond-Dietz snapper type sampler. Of these, twenty-five samples covering a depth range of 11·5 to 104 fathoms and representative of the different types of sediments carpeting the shelf right off Visakhapatnam have been selected for the present study. The station locations where these samples were obtained are shown in the figure.

Suitable aliquots of the sediment samples were disaggregated overnight with sodium-hexametaphosphate solution and washed through a sieve of 0·062 mm. openings until the material was cleared of silt and clay. The residue on the sieve was dried and sieved through a series of sieves of 0·5 mm., 0·25 mm., and 0·125 mm. openings respectively. The sieved fractions were examined under a binocular microscope for the bryozoan faunal remains which were found mostly in the coarser two fractions of the material.

A total of twenty-three bryozoan species have been recognised in the marine sediments off Visakhapatnam. Of these, one is a cyclostome and the rest are all cheilostomes. The following is the list of fauna encountered in the area :

Actisecose regularis, Calyptotheca suluensis, Celleporaria aperta, Cleidochasma areolatum, Escharina pesensaris, Hippaliosina acutirostris, H. spathulifera, Microporella orientalis, Mucropetraliella thenardii, Nellia tenella, Schismopora redoutei, Setosellina constricta, Smittipora abyssicola, Spiroporina longicollis, Steganoporella cf. sulcata, Cyclostomata crisiaelongata, Adeonellopsis sp., *Cellaria sp.*, **Lacrimula* sp., *Lagenipora* sp., *Rhynchozoon* sp., and *Scrupocellaria* sp. In addition, one Reteporid has been found. (*Miss P. L. Cook of the British Museum—Natural History, who was shown this material opined that Lacrimula species is a new one.)

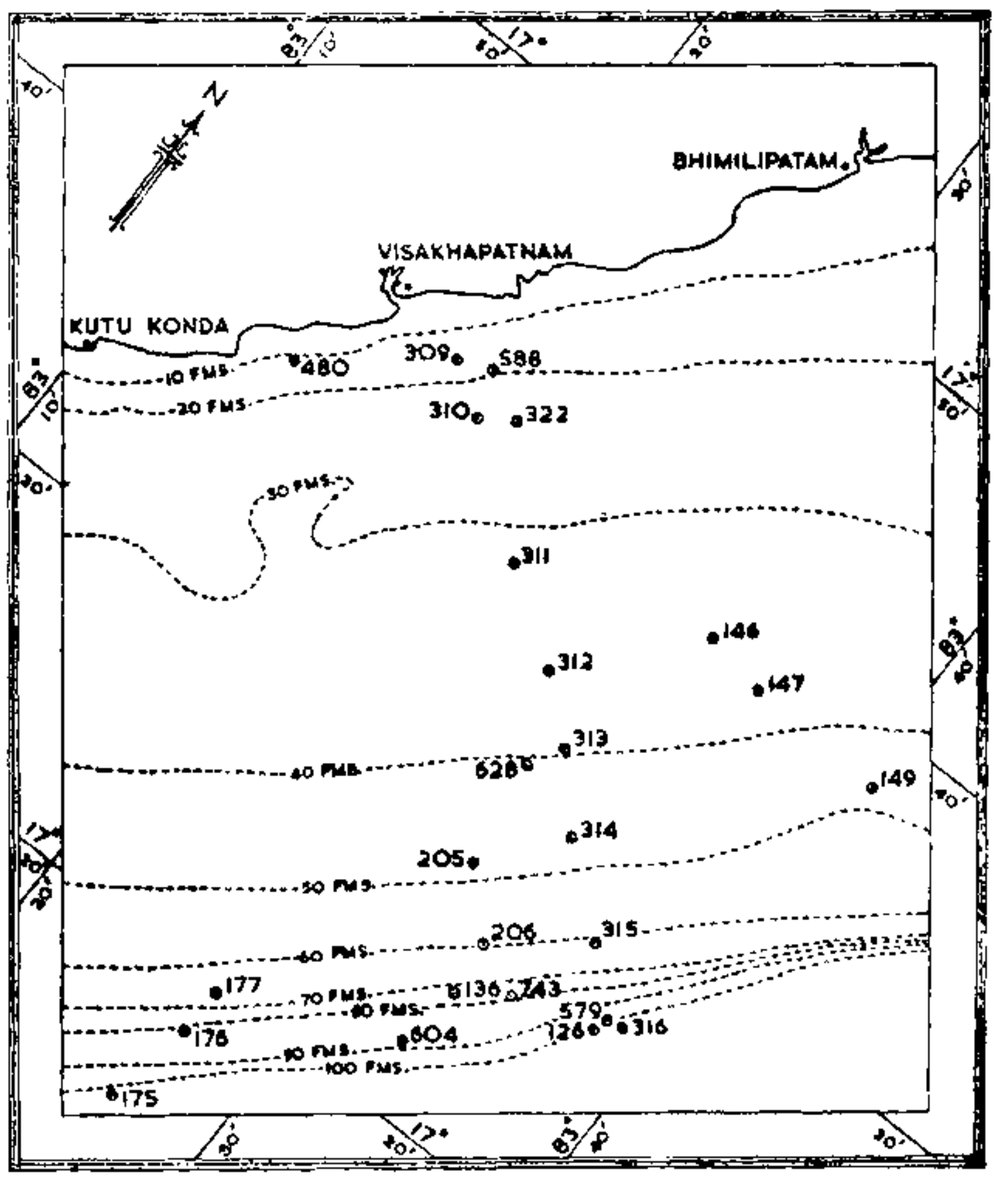

FIG. 1. Figure showing sample locations off Visakhapatnam.

No bryozoan fauna is found at depths less than 30 fathoms and also at depths of 70-90 fathoms. The middle shelf (30-70 fathoms) is richer in bryozoan fauna both in abundance and variety than the outermost shelf (90 fathoms and deeper). However, sediments from the depth range of 45-50 fathoms yielded the highest number of thirteen species.

Hippaliosina acutirostris is the only deep-water species occurring at 104 fathoms depth while *Steganoporella* cf. *sulcata* which is represented by only one specimen is restricted in its occurrence to a depth around 10 fathoms.

Of the remaining twenty-one species, five are present throughout the middle shelf :

Actisecose regularis, *Cellaria* sp., *Cleidochasma areolatum*, *Spiroporina longicollis* and *Scrupocellaria* sp.

Five species are found to occur not only in the entire middle shelf but also in the deep-water sediments beyond the shelf edge :

Cyclostomata crisiaelongata, Hippaliosina, spathulifera, Lacrimula sp., *Nellia tenella* and *Setosellina constricta.*

Three species are restricted to the depths of 45-50 fathoms :

Micropetraliella thenardii, Schismopora redoutei, and *Smittipora abyssicola.*

Two species are restricted to 35 fathoms depth :

Celleporaria aperta and *Reteporid* sp.

Six species are erratic in their distribution : *Adeonellopsis* sp., *Calyptotheca suluensis, Escharina pesensaris, Lagenipora* sp., *Microporella orientalis,* and *Rhynchozoon* sp.

Subba Rao[4] recognised the following sediment types across the shelf off Visakhapatnam as one proceeds seaward from the shore :

Nearshore sands and clayey sands (0-25 fathoms), silty clays (25-30 fathoms), Sand-silt-clay (30-40 fathoms), Relict clayey sands (40-65 fathoms), Oolitic sands (65-80 fathoms), and clayey (foraminiferal) sands on the outermost parts of the shelf.

It is significant to note that the nearshore sands and the silty clays do not support bryozoan fauna. However, the intertidal beach at Visakhapatnam is reported to have yielded 60 species of ectoproct fauna.[9]

Harmer's data[10] shows that most of the species reported here have a depth distribution of 0-60 metres and their occurrence in abundance and variety off Visakhapatnam at depths of 30-70 fathoms looks rather anomalous. The sediments present at this depth range have been shown to be relict, reworked and mixed considerably with modern sedimentary products.[2-4] The association of the bryozoan specimens with such relict sediments leads to the suspicion that some of them must also be relict and they must have been developed there during the Pleistocene low stands of the Bay of Bengal and consequently they are not endemic to the depths where they are found now. The much worn-out nature of a good number of specimens lends proof to their being reworked and involved probably in transportation along with other sedimentary materials with which they are associated.

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EFFECT OF ETHREL, NAA AND NAD ON THE INDUCTION OF FLOWERING IN PINEAPPLE (*ANANAS COMOSUS* L.)*

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ONE of the major impediments in the successful cultivation of pineapple is its erratic flowering behaviour. Even after 15-18 months' of growth, under optimum nutritional and climatic conditions, less than 20% of the plants normally flower. Since pineapple is mostly grown for canning, irregular flowering makes it difficult for growers to regulate supply of fruits to the canning factories.

Artificial induction of flowering in pineapple has been tried with various plant growth regulators in the past and some degree of success has been achieved.[1-2, 4-7, 9-10] Out of these, naphthaleneacetic acid (NAA) has shown promise for commercial use. Recently, a new chemical, namely, Ethrel (2-chloroethane phosphonic acid) has been reported to be effective in

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