NINE

ECOLOGY OF MUDBANKS — BENTHOS

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ABSTRACT

Occurrence, abundance and seasonal distribution of the benthic fauna of the mudbank area at Alleppey were investigated. The substratum at the mudbank area being of an unconsolidated and unstable nature due to the fresh supply of sediments and their periodic movement, it was thougt that the fauna therein may be of a recent colonisation and a study on the animal-sediment relationship would be of interest. This was well established during the present studies with regard to the occurence and numerical abundance of species and the benthic population in general.

INTRODUCTION

It is generally recognised that the benthic fauna and flora play an important role in the marine food chain and a knowledge of benthos is one of the important pre-requisite to have a comprehensive picture of the fishery potential of an area. Mudbanks, known for their fishery potentials, therefore, prompted the authors to investigate the role of benthos in these areas. A perusal of the literature (Seshappa 1953; Kurien, 1953;1967; Damodaran 1973) on the bottom fauna reveals that our knowledge on the sub-tidal bottom fauna of the Indian seas in general is very little.

Mudbanks have been classified into four categories (Chapter 3) based on the nature of sediments that come into suspension. It may be expected that, the source of these sediments being different, the faunal assemblage may be different too. Hence a study on the bottom fauna of the different mudbanks is necessary to have an understanding on the qualitative and quantitative picture of the level-bottom communities and their role in the mudbank fishery.

MATERIAL AND METHODS

Since the observations had to be carried out from an indegenous country craft, heavy gear had no place in the choice of instruments. A Van-veen type grab of 0.03m^2 was used for sampling the bottom fauna. The highly unconsolidated nature of the mud, particularly during the mudbank, did not permit the operation of the dredge, which would easily get buried in the mud.

Materials for the presnt study were regularly collected continuously from June 1971 to August 1972; from the same 4 stations described earlier (see Chapter 5). Samples were sieved using a 0.5 mm sieve to seperate the macro-fauna and the meio-fauna. All those animals retained by a 63μ sieve were treated as meio-benthos. All the meio-benthos were treated together due to poor individual abundance. The bottom fauna was expressed in No./0.1 m of the substratum.

All the organisms were treated in phylogenetic sequence and, wherever possible, identifications were carried out up to genus and species levels. When such identifications were not possible they were treated groupwise.

DISTRIBUTION OF BENTHOS IN THE AMBALAPUZHA - PURAKKAD AREA

Foraminifera

Although a number of species belonging to different genera are recorded from many regions of southwest coast of India, only a few species of the genera *Discorbis, Spirolocolina, Potalina* and *Textulyria* were present in the samples from the Ambalapuzha area. They were distributed in all the stations and round the year, except in April, May and June. They were found to be abundant in stations 1 and 2 (Table 1 and 2). Monthwise occurrence of different groups showed wide fluctuations; however, foraminifera showed the first peak in November-January followed by another peak in June–August. The highest number of

Table 1

Monthly variations in the mean number of various groups of organisms expressed in 100s per 0.1 m² of bottom sample.

STATION 1

Organisms	Mudbank season 1971			Post-mudbank season				Pre-mudbank season					Mudbank season 1972		
	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug
Foraminifera	367	210	—	1572	1008	5896	40596	37064	7316	21772	—	—	—	96	—
Nematoda	—	74	210	1512	1452	5464	27996	22808	3716	60	—	3696	—	22	—
Polychaeta	—	1	—	12	—	—	—	12	—	—	—	—	—	22	—
Ostracoda	—	3	70	120	264	310	648	—	336	24	—	—	—	—	—
Copepoda	7	8	2	9	24	—	24	—	—	24	—	24	—	1	—
Amphipoda	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Crustacean nauplii	—	—	48	24	12	—	—	—	—	—	—	—	—	—	—
Arachnida	—	—	—	12	12	—	—	—	—	—	—	—	—	—	—
Pelecypoda	—	10	2498	267	318	354	517	36	72	—	—	24	—	—	—

Table 2

Monthly variation in the mean number of various organisms expressed per 0.1 m².

STATION 2

Organisms	Mudbank season 1971			Post-mudbank season 1971				Pre-mudbank season 1972					Mudbank season 1972		
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Foraminifera	2191	19	234	48	522	180	420	50	288	312	—	—	—	960	71760
Nematoda	—	265	58	216	432	3264	984	2793	727	6600	99	288	2510	480	—
Polychaeta	—	—	2	—	—	12	—	24	—	—	—	—	—	—	—
Ostracoda	13	3	16	—	12	24	48	—	—	—	—	—	—	—	—
Copepoda	—	7	2	12	—	120	24	—	4	—	—	—	—	—	—
Amphipoda	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Crustacean nauplii	—	—	1	36	—	—	—	—	—	—	—	—	—	—	—
Arachnida	—	3	1	12	—	—	—	—	—	—	—	—	—	—	—
Pelecypoda	9	3	180	27	46	480	—	—	—	—	—	—	—	—	—

Table 3

Monthly variations in the mean number of various groups of organisms expressed/ 0.1 m²

STATION 3

Organisms	Mudbank season 1971			Post-mudbank season 1972				Pre-mudbank season 1972					Mudbank season 1972		
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Foramifara	127	14	180	2	62	373	484	2052	9	12	—	—	—	—	1488
Nematoda	—	—	21	517	67	355	949	1068	24	12	—	73	—	14	115
Polychaete	—	—	—	4	—	—	—	7	—	—	—	—	—	—	—
Ostracoda	16	3	6	7	4	3	19	—	—	—	—	—	—	—	—
Copepoda	4	1	1	14	—	1	2	—	2	—	—	—	—	—	—
Amphipoda	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grustacean nauplii	—	—	7	45	62	—	—	—	—	—	—	—	—	—	—
Arachnida	—	2	2	—	2	—	—	—	—	—	—	—	—	—	—
Pelecypoda	—	3	131	160	74	2	33	29	—	—	—	—	—	—	—

Table-4

Monthly variations in the mean number of various groups of organisms expressed/0.1 m²

STATION 4

Organisms	Mudbank season 1971			Post-mudbank season 1971				Pre-mudbank season 1972					Mudbank season 1972		
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.
Foraminifera	—	42	698	—	148	669	—	160	42	24	—	—	—	7812	242
Nematoda	—	106	37	7	4	48	26	33	2	24	—	1204	88	3372	19
Polychaeta	—	—	1	7	7	10	40	—	—	—	—	4	—	—	—
Ostracoda	—	16	51	4	19	54	24	2	—	—	—	—	—	—	—
Copepoda	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—
Amphipoda	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Crustacean nauplii	—	—	4	40	—	—	9	—	—	—	—	—	—	—	—
Arachnida	—	1	2	2	2	—	—	—	—	—	—	38	—	—	4
Pelecypoda	—	39	230	48	110	8	48	—	—	—	—	—	—	—	—

71,76,000/0.1m² was observed in st. 2 in August 1972 (Table 2).

Nematoda

Nematodes were present in almost all stations. They were second only to foraminifers in the faunal abundance and the peak period of occurrence of this group was observed in November-January. The maximum number of 2,79,900/0.1 m² was recorded from st. 1 in December 1971 (Table. 1).

Polychaeta

The polychaetes in general were one of the poorly represented group in the area throughout the year. *Aramandia lanceolata* and *Glycera alba* were encountered along with *Prionospio pinnata* in the samples. They were found to be abundant in st. 4 in the months November and December.

Ostracoda

Considerable number of ostracods were recorded from all the stations. They were observed in the samples in all the stations up to January, and, in station 1, their occurrence continued up to March. The maximum of 64,800/0.1 m² was observed in st. 1 in December (Table 1).

Copepoda

Copepod fauna was represented by species of *Pseudonthessium, Harpacticus, Scotecilathricella* and *Hetenohabdes*. Most dominant of the copepods was *Harpacticus* sp. Copepods were present in all the stations and throughout the year. The maximum of 12,000/0.1 m² was observed in st. 2 in November (Table 3).

Amphipoda

Amphipoda were the most poorly represented group among the benthos. Amphipods were observed in July in st. 1 (Table 1). Their occurrence was not observed in any station afterwards. Arachnids were represented by the *Targigrades* and they were numerically less in the samples.

Pelecypoda

This group was represented mostly by *Barnea* sp. and they were observed from June to December in the samples. Mortality of molluscan fauna was observed in January.

DISCUSSION

Fluctuations of different groups through months did not show any relation to the hydrographical features. Of the benthos, foraminifers were found to be the most dominant group. Nematodes and bivalves were observed to follow in the order of numerical abundance. The peaks of foraminifers and nematodes were found to coincide with each other. The peak of benthic production in general was observed within the period November-January. Majority of the benthic components were observed to show a declining trend from January. The oil spill and churning up of the bottom, caused by anchoring and movement of the mechanised vessels, apart from providing an unstable substratum, may pollute the overlying waters and bring in the observed faunal reduction in this area. The animal diversity and abundance in stations 1 and 2 may be attributed to their preference to a sand-clay bottom rather than a silt-clay bottom. The abundance of polychaete fauna in st. 4. may be attributed to the depth which provides a stable substratum by buffering the activities of the overlying waters and the preference of silt-clay nature of the substratum.

The bottom fauna in general showed a low intensity in the mudbank. This may be due to the unconsolidated nature of the sediments which does not give a stable substratum for the animals to settle. The fishery components were mostly of pelagic and column feeders except the soles and prawns. Since they have been identified as migrant populations (see Chapter. on fisheries) and the soles come into the fishery at the fag end of the season, the low intensities of the bottom fauna does not favour any special significance on their role in the mudbank fishery.