VOLUME-6 | ISSUE-1 | JANUARY-2017 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

Original Research Paper

INTERTIDAL MACROBENTHOS FROM ESTUARY OF BHAYANDER AND NAIGAON, THANE, MAHARASHTRA, INDIA

Zoology

KEYWORDS: : Macrobenthos, Bhayander, Naigaon, Nerita, Sea anemone, Scylla.

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ABSTRACT

Benthos due to their differential tolerance has been considered as the best indicator organisms of environmental stress or aquatic pollution. The present investigation was undertaken from May 2008 to June 2009 with the objective of understanding diversity of intertidal Macrobenthos of Bhayander and Naigaon estuary. In the present study 25 species of Macrobenthos belonging to 4 Phylum's have been identified at both the Station No.1 Bhayander and Station No.2 Naigaon. Macrobenthos population was composed of 14 species of Gastropoda, 3 species of Bivalvia, 3 species of Polychaeta, 3 species of Crustacea, 1 species of Anthozoa and 1 species of Arachnida apart from insect eggs, larvae and juveniles.

INTRODUCTION

The studies of benthic animals and communities have gained importance with the increasing realization of the significant role they play in the trophic cycle. (Pillai 1977) The term benthos is widely referred to flora and fauna which are intimately associated with sediments in an aquatic environment. They support a rich variety of floral and faunal assemblage of marine bottom communities, viz., bacteria to vertebrates. Their distribution in the marine environment starts from intertidal zone to deep sea. The benthos are mainly divided into 1) Macrobenthos and 2) Meiobenthos. The Macrobenthos comprises the larger, more visible, benthic organisms that are greater than 1 mm in size. While Meiobenthos comprises tiny benthic organisms that are less than 1 mm but greater than 0.1 mm in size. Benthos plays a vital role in the marine food chain and in the recycling of essential life sustaining elements like Carbon, Nitrogen and Phosphorus in the marine ecosystem. (Pillai 1977)

The benthic ecosystem of coral reefs, mangroves and intertidal mud flats serves as a good feeding, breeding, spawning and nursery grounds for many marine organisms of economical importance, variety of migratory birds, fishes, sea mammals and reptiles. Benthos due to their differential tolerance has been considered as the best indicator organisms of environmental stress or aquatic pollution. (Pillai N. K., 1990)

Benthic fauna have a great potential to indirectly control the fate and subsequent bioavailability of sedimentary contaminants in their immediate environment (Sandens et. al. 2000)

According to Duda et. al. (1982), macrobenthos play an important role in the food chain either at secondary level as feeders of detritus and plant matter or at tertiary level as food for predators like crabs and fishes. Macrobenthic fauna prey on all lower forms of life and help to process organic matter helping nutrient recycling in the energy cycle of benthic ecosystem. (Pawar et. al. 2007)

Information on the bottom fauna of Mumbai coast is scanty and mainly restricted to the subtidal region with limited data available for the intertidal region and hence the present investigation was undertaken from May 2008 to June 2009 with the objective of understanding diversity of intertidal Macrobenthos of Bhayander and Naigaon estuary.

MATERIAL AND METHODS

The collection of macrobenthos was done on monthly basis from 10cm depth surface soil using a 10cm x 10cm metal scoop corer. 5 scoops were randomly collected and were pooled together. 15 ml of 10% $MgCl_2$ was used to narcotize the macrofaunal organism in the soil sample and to prevent their fragmentation while sieving. The sediment collected was drained through a sieve of mesh size 0.425mm then the fauna collected on the sieve was preserved in 10% formalin which was prepared in the filtered estuarine water. The individuals were identified to the lowest possible taxon and then the dominant taxa was determined. (Ansari Z. A. and M. V. Gauns, 1996)

Study Area

The present study was carried out at two stations Bhayander and Naigaon respectively.

Station 1: The first station at Bhayander is located 19^0 19' N and 72^0 51' E. (Google Earth 2008) The Bhayander is geographically surrounded by sea from the West side, by the estuary from the north side and by open and occupied land from the south and east side. The estuarine water is mainly from the buffering of Ulhas River with the Arabian sea which amalgamates its water in the Thane creek and Vasai creek.

Station 2: The second station Naigaon is located 19^0 20' N and 72^0 51' E. (Google Earth 2008) Naigaon is a small town in the Thane District of the Maharashtra state and situated diagonally opposite to Bhayander on the another side of the estuary. The approximate distance between Bhayander and Naigaon is about 5 Km.

RESULTS

Table No. 1 Diversity of Macrobenthos in estuary of Bhayander and Naigaon, Thane, Maharashtra, India.

Name of the Species	Station 1: Bhayander	Station 2: Naigaon
Phylum: - Cnidaria **Class: - Anthozoa** *Sea anemone.*	++	++
Phylum: - Annelida **Class:- Polychaeta** *Ceratonereis burmensis.*	+++	+++
Lycastis indica.	+++	+++
Neries glandicincta.	+++	+++
Phylum: - Arthropoda **Class:- Crustacea** *Scylla serrata.*	+++	+++
Varuna litterata.	+++	+++
Uca vocans.	+++	++
Class:- Insecta *Insect Larva.*	++	++
Insect juvenile.	++	++
Insect egg.	++	++

VOLUME-6 | ISSUE-1 | JANUARY-2017 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 78.46

Class:- Arachnida *Spider.*	+	+
Phylum:- Mollusca **Class:- Bivalvia** *Cuspidaria cochinensis.*	+	+
Meretrix meretrix.	+	+
Arca granosa.	+	+
Class:- Gastropoda *Assiminea beddomeana.*	+++	+++
Auricula elongate.	+++	+++
Auricula gangetica.	++	++
Fairbankia sp.	+++	+++
Haminea crocata.	++	+++
Lamillaria sp.	++	+++
Melampus ceylonicus.	+	+
Melampus singaporensis.	+	++
Nerita violacea.	++	++
Nerita crepidularia.	++	++
Oncidium veruculatum.	+	+
Turbinicola nux.	++	++
Umbonium vestiarium.	+++	++
Telescopium telescopium.	++	+++

+ + + Abundant, + + Moderate, + Rare.

DISCUSSION

The sediments at both the stations Bhayander and Naigaon were clayey – slit type rich in organic Carbon that exceeded the limits of unpolluted sediments. Bi Hongsheng and Feng Wei (1996) revealed that the diversity in sediment slit – clay is higher than the homogenous sediment of silt. The macrobenthos in Bhayander and Naigaon estuary comprised of 25 species belonging to 4 phylum's. (Table No. 1)

The Population and Biomass of Macrobenthos were highest during the Postmonsoon season with a gradual decrease in the Premonsoon and Monsoon season were seen at both the Station No.1 Bhayander and Station No.2 Naigaon.

Dahanayaka D and Wijeyaratne M. (2010) recorded 76 species of benthic invertebrates belonging to 41 families at Negombo estuary, Sri Lanka. They have also revealed that gastropods were the most abundant apart from the polychaetes and amphipods. Similar type was observed at Bhayander and Naigaon estuary of Thane, although the number of species was much less. The gastropods were the most dominant with 14 species followed by abundance of polychaetes and crustaceans, 3 species each. Among gastropods genus Assiminea and Auricula were most dominant at both the stations, whereas genus Umbonium was found to be abundant at Bhayander estuary and genus Telescopium was abundant at Naigaon estuary.

Among the polychaetes all the 3 species Ceratonereis, Lycastis and Neries were found to be abundant at both Bhayander and Naigaon estuary. Among Crustacea genus Scylla and Varuna were found to be dominant at both Bhayander and Naigaon estuary whereas Uca was dominant at Bhayander estuary and moderate at Naigaon estuary. It is to be noted that class Bivalvia was found to be rare at both Bhayander and Naigaon estuary, the genus observed were Cuspidaria, Meretrix, Arca. Sometimes Sea anemones were also observed moderately at both the estuaries that is Bhayander and Naigaon.

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