

Bivalve and Gastropod Diversity of Borli Coast, Dist. Raigad, Maharashtra

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Abstract : Borli, a small village in district Raigad dominated by fisherman community has about 2 km long rocky shore rich in Molluscan fauna. It is almost a virgin shore as there is little scope for tourism here. Fishermen's activity is found to some extent. Yet, conservation of molluscan fauna is essential and for this baseline data needs to be prepared. The current paper aims at highlighting abundance of various molluscan species season-wise. The year long study envisages recording of seasonal variation in occurrence of Bivalves and Gastropods. The results showed the inhabitation of 7 bivalves with dominance of *Crassostrea* spp. and 30 gastropods with maximum number of *Planaxis sulcatus*. Abundance of these two species was observed to be almost round the year.

Key words : Molluscan fauna, *Crassostrea*, *Planaxis*

Introduction

The long coastline of Peninsular India provides innumerable opportunities to study infinite aspects of marine biodiversity. The west coast of India has always augmented the research interests of scientists' fraternity as the varied topography supports diversity of life forms. Exploration of marine biodiversity has been focused on the coasts of Sindhudurg, Malwan and Ratnagiri in Maharashtra and Goa (Apte, et. al. 2012). Studies have also been carried out along the coast of Mumbai (Datta, et. al. 2010) however minimal studies have carried out along the Raigad coast.

Borli (18° 30' N, 72° 50' E) a small coastal village in Murud Taluka about 20 kms from Alibaug has a 2 km long rocky coastline with few a sandy patches. A rocky shore being biologically rich niche, is ideal for studying inter tidal ecology. The phylum Mollusca is the largest of all phyla, inhabiting inter tidal zone. Borli coast is an ideal location to study the vast molluscan diversity owing to the superlative conditions for their survival.

The diversity and variation in molluscs of the shoreline between Alibaug and Murud need to be documented for the purpose of the conservation and education to quantify the impact of anthropogenic activities upon them.

Materials and Methods

Empty shells were collected for identification. Collected shells were brought to the laboratory and brushed to clean. Animals present in large numbers were collected and preserved in 6% formalin in glass bottles. Animals present in smaller number were photographed to avoid ecological damage. Identification of shells was done using identification keys.

The study location was visited once a month during low tide from June 2012 to May 2013. Water sample was collected and analyzed to assess the quality of water. The species abundance was studied by quadrant method (1m² quadrant). The diversity of the species was then assessed on a scale of 1 to 10 depending on their abundance. Scale 10 indicates abundance while scale 1 shows scarce presence. Other figures from 1 to 10 show minimum to maximum abundance.



Study Location

Results and Discussions

Table 1: The seasonal variations in water parameters of Borli coast

Parameters	Monsoon (June, July, Aug)	Early post-monsoon (Sept, Oct, Nov)	Late post-monsoon (Dec, Jan, Feb)	Pre-monsoon (Mar, Apr, May)
Temp °C.	24.8	25.2	22.6	28.5
Dissolved Oxygen	5.95	6.5	7.3	6.5
pH	8.3	7.79	8	8.5
Total Solids gm/L	19.02	17.03	16.85	18.4
Chlorides gm/L	17.49	17.94	17.49	19.084
Salinity ppt	31.59	32.42	31.59	34.47
Phosphates mg/L	3.2	0.75	0.9	3.2
Nitrates mg/L	19	1.12	14	2.9
Nitrites mg/L	6	9.1	11	2
Ammonia mg/L	4.71	3.6	3.49	5.04
Sulphates mg/L	1900	2499	2600	2750
Silicates mg/L	20.52	26.27	18	15.4

The quality of water remained almost stable and didn't show significant fluctuations during the study period. The sea water could sustain a healthy ecosystem throughout the study period and only nitrite and ammonia exceeded the prescribed limits.

Total 37 species of molluscs belonging to 30 genera, and 25 families were recorded. 7 species of Bivalvia and 30 species of Gastropoda were listed from the inter tidal zone during low tide.

Crassostrea spp. was the most abundant from class Bivalves while *Planaxis sulcatus* was the dominant Gastropod. *Crassostrea spp.* are found to be dominant along the Indian coastline (D. Mohan, et. al. 2013) also *Crassostrea spp.* are known to be highly adaptable and can survive even in waters polluted by heavy metals (Baheerathi and Revathy, 2013). *Planaxis sulcatus* is found to be abundant on most of the rocky beaches of Southeast Asia (Rahman and Barkati, 2004). Among other bivalves; *Pittar*

spp and *Gafrarium spp* showed considerably large in number while other species were abundant only in late post-monsoon period. In remaining gastropods, *Nerita oryzarum* were numerous followed by *Astrea stellata* during almost all seasons but predominantly, in late post-monsoon and pre-monsoon periods. *Tibia spp* and *Torinia spp* represented in very small numbers in almost all the seasons but were negligibly small in number in early post-monsoon period. The overall finding states abundance of molluscs during late post-monsoon and pre-monsoon periods and meager presence during monsoon and early post-monsoon periods. The scarcity during monsoon could be attributed to vigorous tidal movements.

The abundance of Molluscan life forms was maximum during the Post-Monsoon period as the nutrients during that season were sufficient and also concentration of solids during the post monsoon period facilitates the propagation of filter feeders (Beasley, et. al. 2005).

Table 2: Seasonal variation of fauna at Borli Coast

Sr. No.	Fauna	Monsoon	Early post-monsoon	Late post-monsoon	Pre-monsoon
		(June, July, Aug)	(Sept, Oct, Nov)	(Dec, Jan, Feb)	(Mar, Apr, May)
Bivalves					
1	<i>Arca torcosa</i>	2	1	2.3	1.8
2	<i>Crassostrea</i> spp.	8.7	6	6.6	7.1
3	<i>Gafrarium divaricata</i>	2.3	1	3.1	2.1
4	<i>Paphia</i> spp.	0.7	0	2.6	1.1
5	<i>Sunetta</i> spp.	1	1.3	3.4	1.9
6	<i>Pittar</i> spp.	1.3	2	4.1	2.5
7	<i>Gastrana</i> spp.	0.3	2.3	4.2	2.3
Gastropoda					
1	<i>Bursa tuberculata</i>	4	2.7	5.9	4.2
2	<i>Cantharus spiralis</i>	2.3	5.3	6.6	4.7
3	<i>Cantharus</i> spp.	3	3.7	6.6	4.4
4	<i>Cyprea grayana</i>	3.3	4.7	7.3	5.1
5	<i>Cyprea maculifera</i>	2	2.3	6.4	3.6
6	<i>Cerithidium rubus</i>	3.3	4.3	7.9	5.2
7	<i>Cerithium morus</i>	3	5	8.3	5.4
8	<i>Astrea stellata</i>	6	6.7	9.2	7.6
9	<i>Deodora</i> spp.	1.3	4	8.1	4.5
10	<i>Hemifusus pugilinus</i>	0.7	1	7.2	2.9
11	<i>Natica picta</i>	2	2	8.3	4.1
12	<i>Natica rufa</i>	3.7	2.3	9.3	5.1
13	<i>Natica albicilla</i>	2.7	2.3	9.3	4.8
14	<i>Nerita chamaeleon</i>	2.7	3.3	10	5.3
15	<i>Nerita oryzarum</i>	7	6.7	9.7	8
16	<i>Nerita</i> spp.	2.3	5.5	8.3	6.4
17	<i>Planaxis sulcatus</i>	9.3	7.7	9.9	8.9
18	<i>Potamedes</i> spp.	5.3	5.3	8.9	7.9
19	<i>Pyrene</i> spp.	1.3	1	9.4	4.3
20	<i>Thais carnifera</i>	0.7	1	1.6	4.1
21	<i>Tibia</i> spp.	1	0.7	0.9	4.2
22	<i>Torinia doruosa</i>	1	0.3	1.1	4.2
23	<i>Trochus radiates</i>	1.7	2	2.2	5.3
24	<i>Turbo brunneus</i>	3.3	1.7	1.3	6
25	<i>Turris</i> spp.	1.3	0.7	2.3	4.8
26	<i>Nassarius</i> spp.	1	0.3	4.4	4.6
27	<i>Conus</i> spp.	1.3	1	3.1	5.2
28	<i>Clavus javana</i>	1.7	1	3.6	5.4
29	<i>Celina radiate</i>	1.3	1	3.8	5.4
30	<i>Surcula javana</i>	2	0.3	4.1	5.5
	Total	97.8	99.4	211.3	175.9

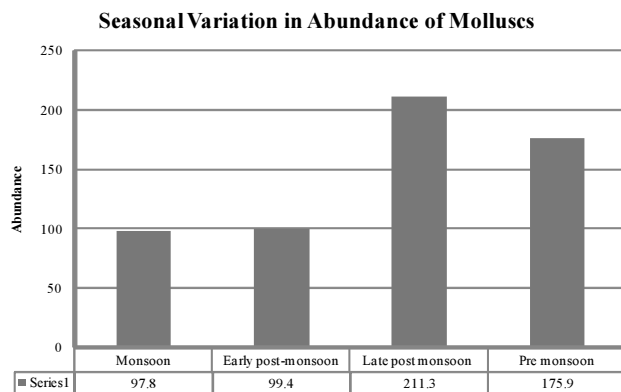


Fig.2: Seasonal variation in Abundance of Molluscs

Conclusion

Year long study of Borli Coast showed 7 species of Bivalves and 30 species of Gastropods. The increasing tourist activity at nearby beaches and rapid urbanization along the coast emphasizes the need for conservation by application of stringent laws and regulations. To invite tourists or to accommodate them, resorts and hotels are being constructed along the coast. This construction activity is likely to pose threat to the biodiversity of Borli coast. Strict implementation of the provisions of Coastal Regulation Zone should be considered to prevent any impact of the anthropogenic activities on the coastal ecosystem.

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