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### Association of molluscan fauna with the coral reefs of Gulf of Mannar

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#### ABSTRACT

*Coral reefs are one of the important ecosystems in India. Major coral families of Gulf of Mannar such as Acroporidae, Pocilloporidae, Poridae were collected. The above reef building corals harboured 51 numbers of molluscan species during this study. Pteria chinensis, Ostrea sp, Nerita rumphi and Cypraea tigris were noted from the study area. The gastropods are mostly associated with the coral reefs than the bivalves. The present study will reveal the diversity of molluscan fauna harbored in the different habitat of corals.*

**Keywords:** Molluscs, coral reefs, Gulf of Mannar, bivalves.

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#### INTRODUCTION

The Gulf of Mannar is endowed with three distinct Marine ecosystems namely Coral ecosystem, Seagrass ecosystem and Mangrove ecosystem. The reefs of Gulf of Mannar are fringing or patchy reefs thriving in very shallow waters (20 cm – 5 m) and are found encircling almost all islands. This area habitat for 104 species of hard corals, 13 species of sea grasses which are supporting the population of turtles, dugongs, 450 species of fishes, 79 species of crustaceans, 99 species of echinoderms, 108 species of sponges and 484 species of molluscs [1]. Among them, reef associated gastropods are also abundantly found and form as major members in the marine food web. Molluscs are associated with corals, either because they use coral as a habitat, or they feed on the coral tissue / mucus [2]. So far about 484 species of molluscs were reported from this region, out of which 260 species are gastropods [3]. In addition to that various destructive fishing practices in the shallow coastal region of Gulf of Mannar making severe threat to coral reef ecosystem [4]. Branching corals are better habitats for byssate forms and massive corals are more suitable for boring bivalves [5]. The present study is to estimate molluscan diversity based on its coral reef habitat.

## MATERIALS AND METHODS

### Study area

The study area includes the Tuticorin group of Islands of Gulf of Mannar. Namely Van ( $8^{\circ}50'11''\text{N}$ ,  $78^{\circ}12'38''\text{E}$ ), Koswari ( $8^{\circ}52'7.64''\text{N}$ ,  $78^{\circ}13'30.22''\text{E}$ ), Vilanguchalli ( $8^{\circ}56'17''\text{N}$ ,  $78^{\circ}16'11''\text{E}$ ) and Karaichalli ( $8^{\circ}57'14.72''\text{N}$ ,  $78^{\circ}15'8.46''\text{E}$ ) Islands (Fig. 1). Ecologically this group of Islands has a combination of notable coral reefs, sea grass beds and sandy bottom which might attract more number of species.

### Field methods

The coral samples were collected during the low tide with various sizes in the study area. For instance, colonies of *Acropora* sp, *Pocillopora* sp and *Porites* sp were sampled in the Gulf of Mannar. The estimation of molluscan fauna was carried out from June to November 2010. The surface dwellers and predatory molluscs of coral colonies were collected. Simultaneously the embedded or penetrated molluscs were also collected through broken down of collected reef samples. The collected molluscans were examined and the species were identified.

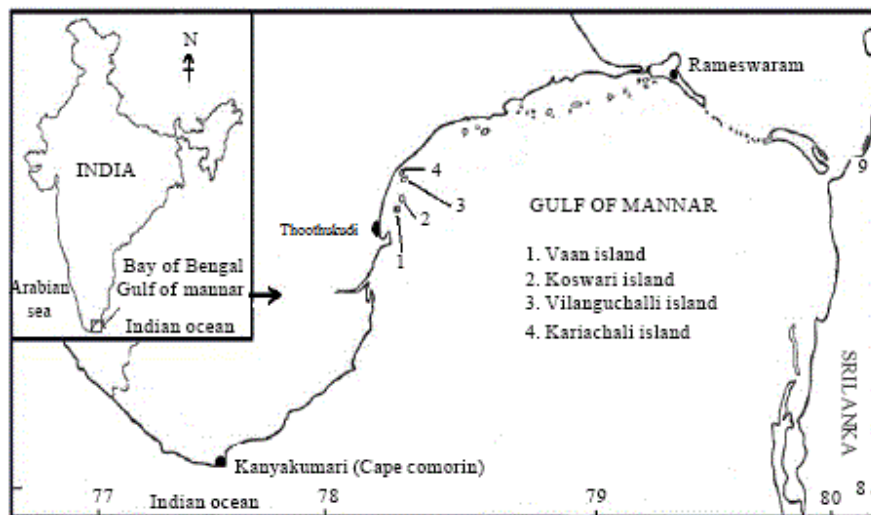


Fig. 1 Study area

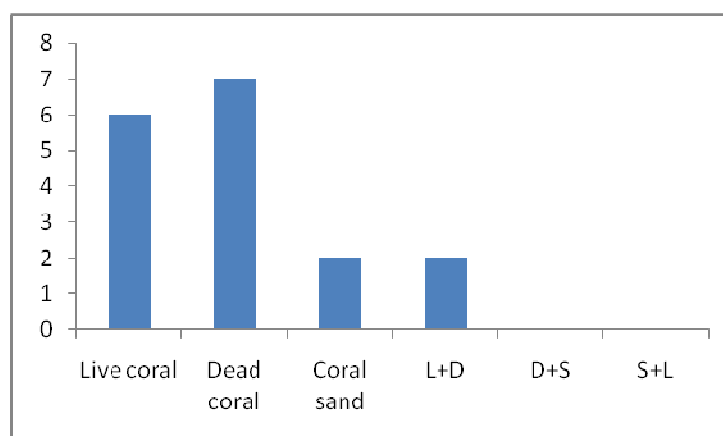
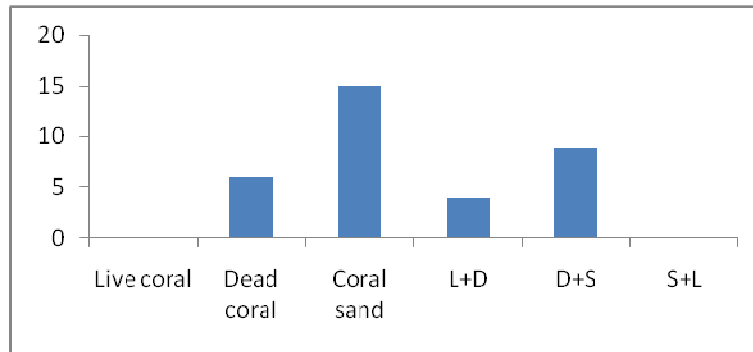


Fig. 2 Different types of habitat of Bivalves. L+D = present in both live and dead coral; D+S = present in both dead coral and coral sand; S+L = present in both live coral and coral sand



**Fig. 3** Different types of habitat of Gastropods. L+D = present in both live and dead coral; D+S = present in both dead coral and coral sand; S+L = present in both live coral and coral sand

**Table 1 :** List of molluscan species and its mode of association with corals

S. No	Name of the Molluscs	Type of coral reef habitat		
		Live coral	Dead coral	Coral sand
<b><u>Bivalves</u></b>				
1.	<i>Arca conplanta</i>	--	**	--
2.	<i>Branchidontes variabilis</i>	--	**	--
3.	<i>Chama reflexa</i>	--	**	--
4.	<i>Cardium sp</i>	--	--	**
5.	<i>Gastrochaena gigantea</i>	--	**	--
6.	<i>Isognomon nucleus</i>	**	**	--
7.	<i>Lithophaga teres</i>	**	--	--
8.	<i>Lithophaga gracilis</i>	**	--	--
9.	<i>Lithophaga nigra</i>	**	--	--
10.	<i>Lithophaga cinnamomea</i>	**	--	--
11.	<i>Modiolus metacalfei</i>	--	**	--
12.	<i>Ostrea sp</i>	**	**	--
13.	<i>Petricola lithophaga</i>	**	--	--
14.	<i>Pteria chinensis</i>	--	**	--
15.	<i>Septifer bilocularis</i>	--	**	--
16.	<i>Venus reticulata</i>	--	--	**
17.	<i>Venerupis macrophylla</i>	**	--	--
<b><u>Gastropods</u></b>				
18.	<i>Architectonica perspectiva</i>	--	--	**
19.	<i>Cantharidus interruptus</i>	**	**	--
20.	<i>Cantharus undosus</i>	--	**	--
21.	<i>Cerithium morus</i>	--	**	--
22.	<i>Cerithium obeliscus</i>	--	**	**
23.	<i>Cymatium lotorium</i>	--	**	--
24.	<i>Cypraea annulus</i>	--	**	**
25.	<i>Cypraea caurica</i>	--	**	--
26.	<i>Cypraea moneta</i>	--	**	--
27.	<i>Cypraea tigris</i>	--	**	**
28.	<i>Diodora funicata</i>	--	--	**
29.	<i>Drupa margariticola</i>	**	**	--
30.	<i>Emarginula obovata</i>	--	--	**
31.	<i>Euchelus asper</i>	--	--	**

32.	<i>Haustellum haustellum</i>	--	**	**
33.	<i>Littorina scabra</i>	--	--	**
34.	<i>Nassarius papillosus</i>	--	--	**
35.	<i>Nerita albicilla</i>	**	**	--
36.	<i>Nerita chameleon</i>	--	--	**
37.	<i>Nerita maura</i>	--	--	**
38.	<i>Nerita rumphi</i>	--	--	**
39.	<i>Nerita squamulata</i>	--	--	**
40.	<i>Phalium canaliculatum</i>	--	--	**
41.	<i>Pyrene versicolor</i>	--	**	--
42.	<i>Rissoina clathrata</i>	--	**	**
43.	<i>Strombus gibberulus</i>	--	--	**
44.	<i>Strombus canarium</i>	--	--	**
45.	<i>Trochus radiatus</i>	--	**	**
46.	<i>Trochus stellatus</i>	--	**	**
47.	<i>Trochus tentorium</i>	--	**	**
48.	<i>Turbo intercostalis</i>	--	**	**
49.	<i>Turritella acutangula</i>	--	--	**
50.	<i>Turritella attenuata</i>	--	--	**
51.	<i>Vermicularia sp.</i>	**	**	--
	** Associated		-- Not associated	

## RESULTS AND DISCUSSION

A total of 51 species of molluscs were associated with corals in Gulf of Mannar (Table 1). Gastropods represented the numerically dominant group with 34 species. And bivalves shares 17 number species. Molluscs were dwelling in different habitats, in that bivalves habituated (Fig. 2) dead and live coral with 41.17 % and 35.29 % respectively. The gastropods continue in coral sand and both in dead and coral sand with 44.11 % and 26.47 % (Fig. 3) respectively. Most of the gastropods shows epilithic mode of life with corals. The bivalves shows endolithic mode of association with corals. More gastropods than bivalves were associated with the Acroporidae, Pocilloporidae corals. The reason for this may be that bivalves need organically rich environments, especially water rich in suspended organic matter [6]. These corals may protect the gastropods and bivalves from the destructive waves. Epilithic and endolithic molluscs produce a great deal of sediment on reefs. As a substrate, coral colonies are very complex and their dead undersides and branches offer shelter and food for large number of molluscs. There are obvious general differences in the type of substrate provided by various categories of growth forms of corals [5]. Moreover, corals and molluscs were heavily exploited from the study area mainly for trade and this area constitutes major portion of shell trade in India.

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