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A REPORT ON INTERTIDAL MACROFAUNA OF TALSARI (BALASORE : ORISSA)

S. MITRA AND A. MISRA

Zoological Survey of India, F.P.S. Building, 27, J. L. Nehru Road, Kolkata-700 016

INTRODUCTION

Talsari is a less popular tourist spot of Orissa, situated on the tributaries of Subarnarekha Estuary. Despite of Anthropogenic pressure and various types of fishing activities, this place is rich in marine faunal diversity. The first author investigated the intertidal faunal resources of this area since 1995 to 2003. As several types of marine habitats are found in this small area (2.5 sq. km. only), different types of faunal composition are found here in distinct zonation. Previously Goswamy (1992) reported some marine fauna of Digha coast. Rao & Misra (1986) reported the Macrofauna of Digha Beach of West Bengal. Very recently Chatterjee & Mitra (2003) reported the Estuarine Molluscs of Talsari. But till date there is no comprehensive report on the intertidal fauna of this region. Bairagi (1995); Subba Rao *et al.*, (1792) and Mitra *et al.*, (1997, 1998) contributed on some marine fauna of Digha coast.

The present paper deals with a comprehensive list comprising 90 species belonging to seven phyla of the Intertidal Macrofauna of Talsari with short notes on habitat choice, zonation, status of availability, threats and some recommendation for their conservation.

MATERIALS AND METHODS

Talsari is a small coastal village in the District of Balasore of Orissa, close to Orissa-West Bengal border. There is a large mud flat, which remains submerged during high tides. The village is criss-crossed by the canals connected to the tributaries of the river Subarnarekha at its confluence with the Bay of Bengal. A natural Mangrove cover consisting of *Sonneratia apatala*, *Exocaria agalocha* and *Acanthus* sp., is coming up on the south west side of the village. Recently the Govt. of Orissa constructed a fishing harbour. A large Molluscan fishery has also been established on the Southeastern part of Talsari. The Intertidal beach is very much extended (more than 600 mt.) on Eastern portion of this area.

The observation and collection of specimens for this study were made on weekly/fortnightly basis. Horizontal and vertical survey were made in different time and tidal conditions. Littoral fauna was collected during low tide from the Sandy shore, as well as Mud flat area, Boulder, Rocks & Jetties, and also from Mangrove vegetations.

During sample collections and observation, type of the substrate, abundance, habit and habitats of individual species were noted.

Specimens were preserved in 70% Alcohol or in 10% Formalin after proper narcotisation, and attempts were made to identify all the collected specimens up to species level whenever possible.

RESULTS AND DISCUSSION

In our study a total of 90 species of intertidal macrofauna belonging to 71 genera, 48 Families, 23 Orders, 11 Classes and 7 Phyla have been counted. (The Faunal list is given in Table 1). Among this groups phylum-Mollusca is dominated (55%) with a list of 49 species whereas phylum-Echiurida and Brachiopoda represented with a single species only. (The phylum wise species composition is shown in Fig. 1). The Intertidal Fauna of Digha coast studied by Rao & Misra (1984) comprises only 44 species of Macrofauna. Ovbiously due to occurrence of a diverse type of habitat the Faunal composition of Talsari beach is so healthy. Fauna associated with mudflat & mangrove area are totally absent in Digha beach. Due to excessive tourism pressure some animals shifted their population from Digha beach to Talsari sea beach, such as *Ocypode macrocera, Thorsonia investigatoris, Carcinoscorpious rotundicauda*.

According to habitat, most of the species found in Sandy beach (41%) where sandy beach with siltation and mud habitat dwelling species accounted 18% in each case, a total 6% animals are available in Mangrove forest as epifauna (Fig. 2).

Status of the Intertidal macro-fauna also observed, and 36% species are accounted as very common, whereas 11% species are considered as rare in this area. Some species are commercially exploited (19%) in large scale. Due to Anthropogenic activity, habitat loss and some other causes some species (14%) are threatened here also (Fig. 3).

As Talsari sea beach is very nearer to Digha beach (12 km), a very popular sea resort of West Bengal, a large number of tourists come here all the year round, of which a large number of students use to collect zoological specimens from here. These are one of the causes to decline the faunal population. Besides this, the recent advent of aquaculture industry in this area leads to the destruction of lot of invertebrate juveniles (including their egg capsules). The fishermen collect the post larval stages of tiger prawn (*Penaeus monodon*) and throw away the other forms catched in the same net (Juveniles of fish and other invertebrates) on the beach. This unscrupulous daily activity causes heavy loss of biodiversity of this area and causes ecological imbalance. Development of molluscan fishery is playing also a negative role in case of Biodiversity conservation, because it

depends here only on capture fishery. Establishment of a Fishing Harbour in the vicinity by the Govt. of Orissa in the recent past may lead to the rapid destruction of this unique ecologically diverse sea beach as well as its faunal resources.

The intertidal fauna of Digha beach is somewhat different in respect of Talsari beach, because the Digha beach is purely sandy and there are some artificial rocks on upper and supralittoral zone on the other hand Talsari has all types of coastal ecosystems. Species no. 4, 6, 14, 17, 22, 26, 27, 28, 29, 32, 33, 35, 37, 38, 41, 44, 45, 46, 57, 58, 59, 61, 62, 63, 65, 68, 69, 72 and 82 of Table No. 1 of this article are not available at the sandy shore of Digha.

Table 1. : List of intertidal macro fauna along with their habitat & status data

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
I.	**PHYLUM CNIDARIA**		+									
	Class HYDROZA Order THECATA Family CAMPANULARIIDAE											
1.	*Obelia spinulosa* (Bell)	+	+						+			
	Class ANTHOZOA Subclass HEXACORALLIA Order ACTINARIA Family ACTINIIDAE											
2.	*Paracondylactis indicus* Dave	+						+				+
	Family METRIDIIDAE											
3.	*Metridium schillerianum* (Stoliczka)				+			+				
	Subclass OCTOCORALLIA Order PENNATULACIA Family VERETILLIDAE											
4.	*Cavernularia elegans* Herklots		+							+		+
	Family VERGULARIDAE											
5.	*Virgularia elegans* Gray	+						+				+
6.	*Virgularia* sp.		+							+		
II.	**PHYLUM ANNELIDA**											
	Class POLYCHAETA Family AMPHINOMIDAE											
7.	*Chloeia parva* Baird	+			+			+				
	Family NEREIDIDAE											
8.	*Neries* sp.	+						+				

Table 1. : *(Cont'd.)*

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
	Family ONUPHIDAE											
9.	*Onuphis* sp.	+							+			
10.	*Diopatra cuprea* (Bosc)	+	+					+				
	Family LUMBRINERIDAE											
11.	*Lumbriconereis heteropoda* Morenzeller	+						+				
	Family GLYCERIDAE											
12.	*Glycera alba* (Muller)	+						+				
13.	*G. convoluta* Keferstein	+						+				
	Family TEREBELLIDAE											
14.	*Loimia medusa* (Savigny)		+					+				
	Family PHYLLODOCIDAE											
15.	*Eteone ornata* Fauvel	+						+				
16.	*Eteone barantollae* Fauvel	+										
III.	**PHYLUM ECHIURIDA**								+			
	Class ECHIURA Order ECHIUROINEA Family THALASSEMATIDAE											
17.	*Anelassorhynchus microrhynchus* (Prasad)			+						+		+
IV.	**PHYLUM ARTHROPODA**											
	Class CRUSTACEA Sub class CIRRIPEDIA Order THORASICA Family BALANIDAE											
18.	*Balanus amphitrite* Darwin				+			+				
	Family CHTHMALIDDAE											
19.	*Chthamallus stellatus* (Poli)				+	+			+			
	Order DECAPODA Family DIOGENIDAE											
20.	*Diogenes costatus* Henderson	+						+				
21.	*Clibanarius padavensis* De Man		+	+				+				
	Family COENOBITIDAE											
22.	*Coenobita cavipes* Stimpson				+	+			+			

Table 1. : *(Cont'd.)*

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
	Family OCYPODIDAE											
23.	*Ocypoda macrocera* H. Milne Edwards	+						+				+
24.	*Ocypoda ceratopthalma* (Pallas)	+								+		
25.	*Macropthalmus transversus* (Latreille)	+						+				
26.	*Uca (Deltuca) rosea* (Tweedie)			+			+	+				
27.	*Uca (Celuca) triangularis* Bengali Crane			+			+	+				
28.	*Uca (Celuca) lacteal annulipes* (Edwards)			+			+	+				
29.	*Uca acuteus* Stimpson						+		+			
30.	*Dotilla blanfordi* (Alcock)	+						+				
31.	*Dotillopsis* sp.	+					+					
	Family GRAPSIDAE									+		
32.	*Varuna litterata* (Fabricius-1798)			+					+		+	
33.	*Metaplax dentipes* (Heller-1865)			+				+				
	Family PORTUNIDAE											
34.	*Scylla serrata* De Haan			+				+			+	
35.	*Scylla tranquibarica*			+						+		+
	Class MEROSTOMATA Order XIPHOSURIDA Family XIPHOSURIDAE											
36.	*Tachypleus gigas* (Muller)	+	+					+			+	+
37.	*Carcinoscorpius rotundicauda* (Latreille)		+	+					+		+	+
V.	**PHYLUM MOLLUSCA**											
	Class GASTROPODA Order ARCHAEOGASTROPODA Family TROCHIDAE											
38.	*Umbonium vestiarium* (Linnaeus)			+				+			+	
	Family NIRITIDAE											
39.	*Nerita (Amphinerita) lineata* (Gmelin)				+				+			
40.	*Nerita (Dostina) violacea*				+				+			
	Order MESOGASTROPODA Family LITTORINIDAE											
41.	*Littorina (Littorina) melanostoma* Gray					+		+				
42.	*Littorona (Littorinopsis) scabra* (Linnaeus)				+			+				

Table 1. : *(Cont'd.)*

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
	Family TURITELLIDAE											
43.	*Turritella attenuata* Reeve	+	+					+			+	
	Family POTAMIDIDAE											
44.	*Cerithidea (Cerithidiopsis) cingulata* (Gmelin)			+				+				
45.	*Cerithidea (Cerithidea) obtusa* Lamarck					+			+			
46.	*Telescopium (Telescopium) telescopium* Montfort			+				+				
	Family NATICIDAE											
47.	*Natica tigrina* (Roeding)	+						+			+	
48.	*Natica vitellus* (Linnaeus)	+						+			+	
49.	*Natica lineata* Lamarck	+							+		+	
	Order NEOGASTROPODA Family MURICIDAE											
50.	*Murex tribulus* Linnaeus		+						+		+	
51.	*Cymia lacera* (Borne)				+			+				
	Family NASSARIIDAE											
52.	*Nassarius foveolatus* (Dunker, Reeve)		+	+					+			
	Family OLIVIDAE											
53.	*Amalda ampla* (Gmelin)	+						+			+	+
	Family TURRIDAE											
54.	*Turricula javana* (Linnaeus)		+									
	Family AGLAJIDAE											
55.	*Melanochlamys* sp.	+	+							+		+
	Order BASOMATOPHORA Family ELLOBIIDAE											
57.	*Ellobium gangeticum* (L. Pfeiffer)			+					+			
58.	*Cassidula nucleus* Mortyn			+					+			
59.	*Pythia plicata* Ferussac			+					+			
	Order SOLEOLIFERA Family ONCHIDIIDAE											
60.	*Onchidium typhae* Buchannan			+			+	+				

Table 1. : *(Cont'd.)*

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
	Class BIVALVIA Order ARCOIDA Family ARCIDAE											
61.	*Anadara granosa* (Linnaeus)		+					+			+	
62.	*Anadara inequivalvis* (Bruguiere)		+					+			+	
63.	*Scapharca deyrollei* Joussneume		+					+			+	
	Order MYTILOIDA Family MYTILIDAE											
64.	*Perna viridis* (Linnaeus)				+					+		+
65.	*Modiolus striatus*				+	+		+				
	Order OSTREOIDA Family OSTREIDAE											
66.	*Cassostrea madrasensis* Preston				+			+			+	
67.	*Saccostrea cucullata* (Born)				+	+		+			+	
	Family VENERIDAE											
68.	*Meretrix meretrix* (Linnaeus)		+	+				+			+	
69.	*M. casta* (Linnaeus)			+				+			+	
70.	*Pelecyora trigona* Reeve	+							+		+	
71.	*Paphia malabarica* (Schroeter)		+							+		
72.	*Paphia textiles* (Gmelin)		+							+		
	Family MACTRIDAE											
73.	*Mactra violacea* Gmelin	+						+			+	
74.	*Mactra (Mactrinula) luzonica* Deshayes	+						+			+	
	Family CULTELLIDAE											
75.	*Siliqua radiata* (Linnaeus)	+							+		+	
	Family PSAMMOBIIDAE											
76.	*Sanguinolaria (Soletettina) acuminata* Deshayes	+							+			
	Family DONACIDAE											
77.	*Donax scortum* Linnaeus	+							+			
78.	*Donax incurnatus* Gmelin	+						+				+
	Family TELLINIDAE											
79.	*Macoma birmanica* (Philippi)	+							+			

Table 1. : *(Cont'd.)*

Sl. No.	Name of Specimen	Habitat						Status				
		A	B	C	D	E	F	1	2	3	4	5
	Order ADAPEDONTA Family SOLENIDAE											
80.	*Solen brevis* Gray	+							+		+	
81.	*Solen* sp.	+								+		
	Family GLAUCONOMIDAE											
82.	*Glauconome orientalis* (Gmelin)			+					+			+
	Order MYOIDA Family PHOLADIDAE											
83.	*Pholus orientalis* (Gmelin)	+						+			+	
84.	*Martesia fragilis* Sowerby				+					+		
	Family TEREDIIDAE											
85.	*Teredo calva* Gmelin				+	+			+			
	Family LATERNULIDAE											
86.	*Laternula truncata*			+						+		
VI.	**PHYLUM BRACHIOPODA**											
	Class INERTICULATA Family LINGULIDAE											
87.	*Lingula translucida* Lamarck		+	+					+			+
VII.	**PHYLUM ECHINODERMATA**											
	Class HOLOTHUROIDEA Order DENDROCHIROTIDA Family CUCUMARIIDAE											
88.	*Thorosonia investigatoris* (Koehler & Vaney)	+	+							+		+
	Order MOLPADIA Family CAUDINIDAE											
89.	*Acaudina molpadiodes* (Semer)	+	+					+				+
	Class ASTEROIDEA Order PAXILLOSIDA Family ASTROPECTINIDAE											
90.	*Astropecten indicus* Doederlin	+						+				+

Abbreviations used are as follows :

For denoting the habitats :

A : Sandy beach; **B** : Sandy beach with siltation; **C** : Mud; **D** : Boulder/Rocks/Jetties; **E** : Mangrove epifauna; **F** : Hard soil with grass bed.

For suggesting the status of the specimens :

1 : Very common; **2** : Common; **3** : Rare; **4** : Commercially exploited; **5** : Threatened due to human activity.

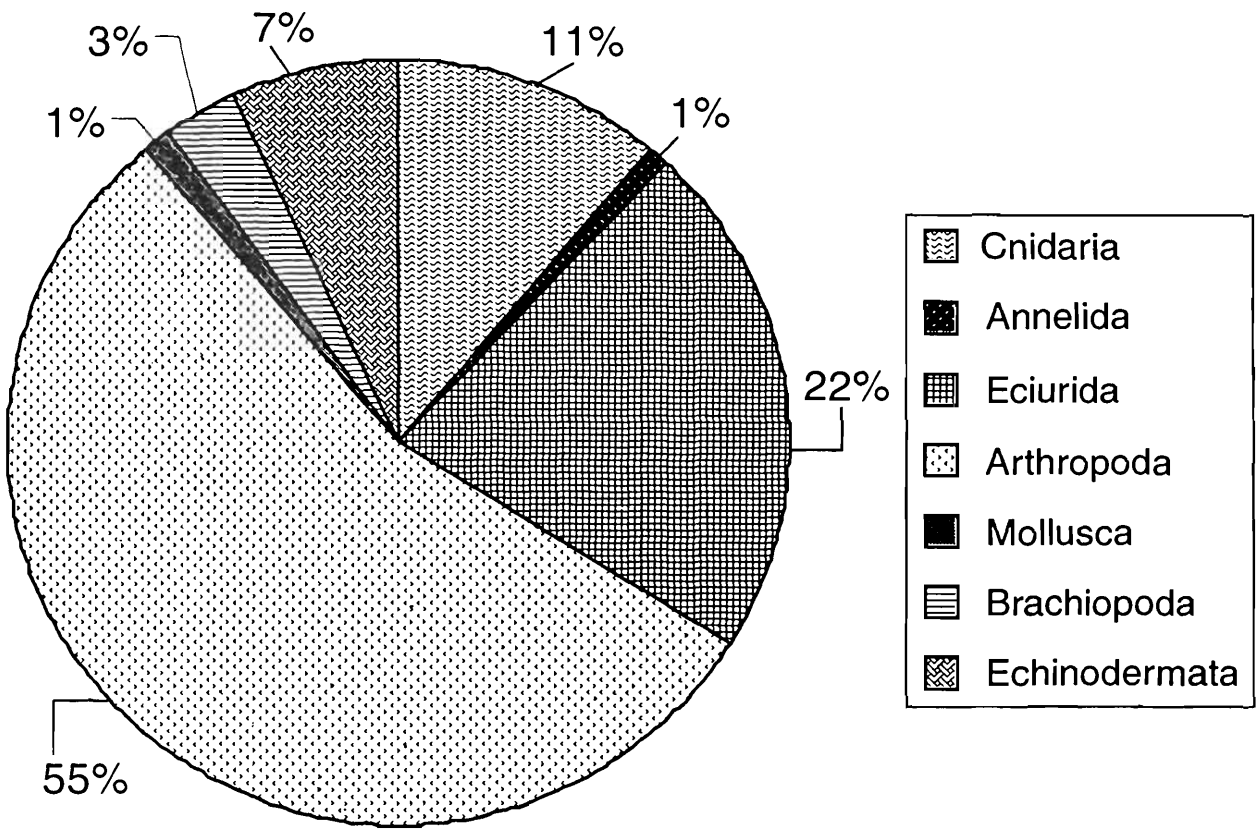

Fig. 1. : Composition of different phyla available in intertidal region of Talsari.

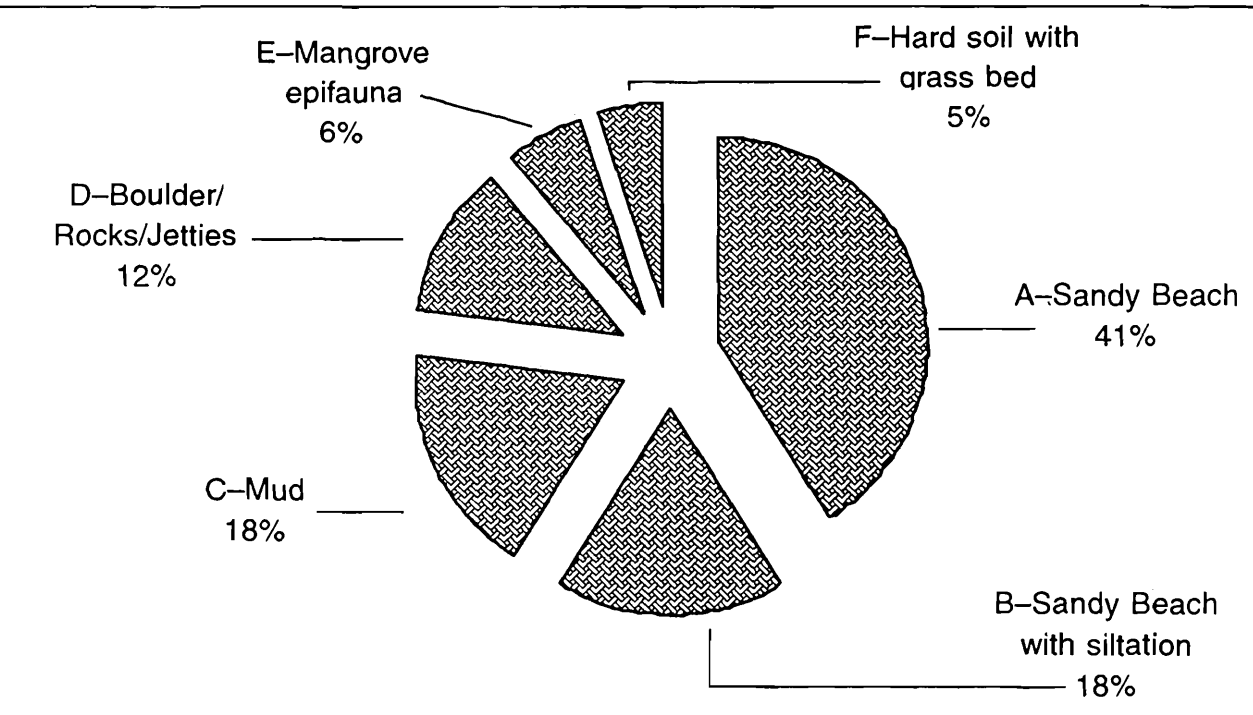

Fig. 2. : Habitat wise species composition.

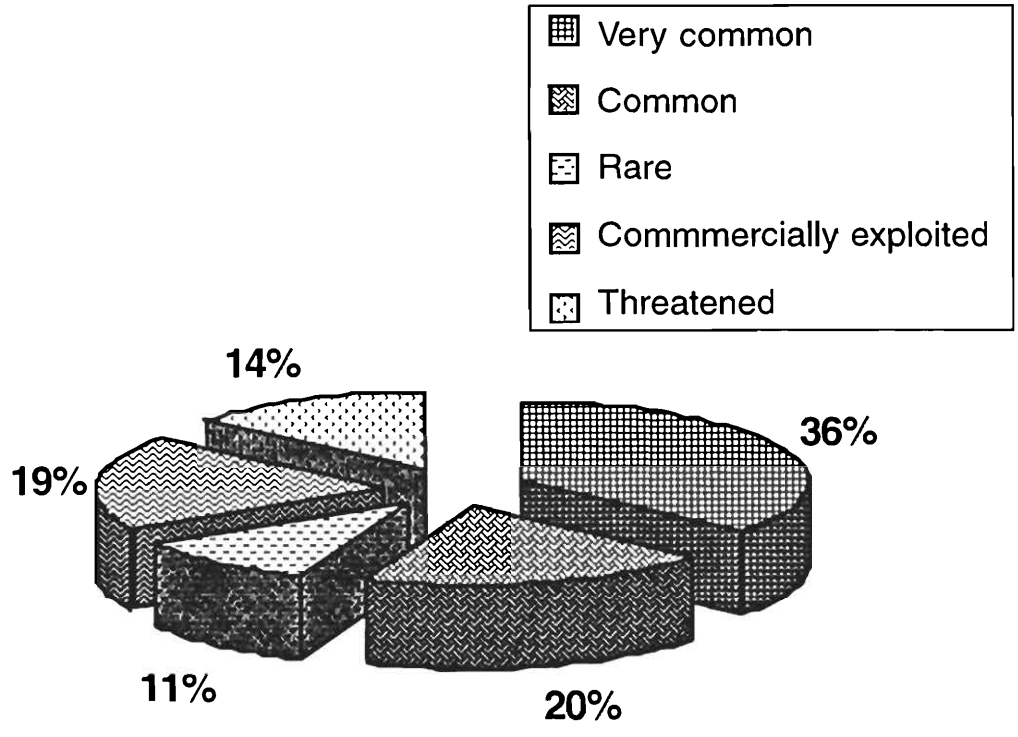

Fig. 3. : Status of the species available in the present study area.

SUMMARY

Talsari is a small coastal village in the district of Balasore of Orissa, close to Orissa-West Bengal bordar. There is a large mud flat which remains submerged during high tides. The village is criss-crossed by small canals connected to the tributaries of the river Subarnarekha at its confluence with the Bay of Bengal. A natural Mangrove cover consisting of *Sonneratia apatala, Exocaria agalocha* and *Acanthus* sp., is coming up on the south-west side of the village. As several types of habitats are found in this small area (2.5 km^2 only), different types of faunal composition are also found here with distinct zonation. There is no base line data regarding the intertidal macrofauna of this unique marine belt. This paper deals with a comprehensive list of the Intertidal Macrofauna of Talsari with a short note on habitat choice, zonation, status, threats and also with some recommendation for their conservation. The first author investigated the intertidal faunal resources of this area since 1995 to 2003. Till today a total of 90 species of intertidal macrofauna covering cnidarians, annelids, crabs, mollusks, lingulids, echinoderms, etc. are recorded from this area. All these species found to be under 71 genera, 48 Families, 23 Orders, 11 Classes and 7 Phyla. Among these, mollusc is dominated (55%) with a list of 49 species, whereas phylum-Echiurida and Brachiopoda represented here with a single species each only. According to habitat data, majority of the species found in Sandy beach (41%), whereas sandy beach with sufficient silt and muddy-habitat are preferred by 18% species each. Six percent of the total fauna are available in Mangrove forest as epifauna. Status of the specimens of Intertidal macrofauna also studied. Study also reve. that 36% species are recorded as very common, whereas 11% species are considered as rare in th

area. Some of the species are commercially exploited (19%) in large scale. Due to Anthropogenic activity, habitat loss and some other causes some species (14%) are threatened here also. As Talsari sea beach is very nearer to Digha beach (12 km), a very popular sea resort of West Bengal, a large number of tourists come here all the year round, of which a considerable number of students collect zoological specimens from the locality. These are some of the causes for declination of the beach faunal population. Beside this, the recent growing interest in aquacultural activities all along the east coast has introduced a new enthusiatic group among the fishermen and their daily activity destroy a good number of Invertebrates including their egg capsules, juveniles at the time of collecting the post larvae of tiger Shrimp (*Penaeus monodon*). Development of molluscan fisheries is playing also a negative role in case of Biodiversity conservation, because it depends here only on capture fishery. Very recently Govt. of Orissa constructed a Fishing Harbour, which may destroy in near future this unique ecologically diverse sea beach as well as its faunal resources.

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REFERENCES

Bairagi, N. 1995. Ocypodidae : Decapoda : Crustacea. *Est. Ecos. Ser. Hooghly-Matala Estuary. Zool. Surv. India*. Part **2** : 327-338.

Chatterjee, T. K. and Mitra, S. 2003. Esturine mollusks of Talsari (Orissa) : role in rural economy and need for their conservation, National symposium on assessment and management of biological recourses. Univ. of North Bengal. (Abstract only).

Goswami, B. C. 1992. Marine fauna of Digha coast of West Bengal, India. *J. mar. biol. Ass. India*, **34**(1 & 2) : 115-137.

Mitra, S. and Chatterjee, T. K. 1998. On the new geographical distribution of the hermit crab *Diogenes miles* (herbst) with a note on *Coenobita cavipes* (Stimpson) (Crustacea : Decapoda) from Digha coast of West Bengal. Proc. 86th Indian Sci. Congr. pp. 12. (Abstract only).

Mitra, S., Misra, A. and Ramakrishna, 1997. A preliminary account of polychaetes from Digha coast of West Bengal, proc. 84th Indian Sci. Congr. (Abstract only).

Rao, G. C. and Misra, A. 1996. The meiofauna & macrofauna of Digha beach, West Bengal, India. *Rec. zool. Surv. India*, **83**(3-4) : 31-49.

Subba Rao, N. V., Dey, A. and Barua, S. 1992. Esturine and marine molluscs. *Fauna of West Bengal, State Fauna Series*, **3** (Part 9) : 129-268.