



International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.549

IJFAS 2016; 4(5): 670-674

© 2016 IJFAS

www.fisheriesjournal.com

Received: 15-07-2016

Accepted: 16-08-2016

Manotosh Das

(1) Research Scholar
Department of Aquaculture
Management & Technology
Vidyasagar University
Midnapore, West Bengal, India.
(2) Fishery Field Assistant
Department of Fishery
Govt. of West Bengal, India

Dr. Joydev Maity

Assistant Professor
Department of Aquaculture
Management & Technology
Vidyasagar University
Midnapore, West Bengal, India

Basanti Samanta

Guest Lecturer Dept. of Fisheries
Ramnagar College
Purba Medinipur West Bengal,
India

Correspondence

Manotosh Das

(1) Research Scholar
Department of Aquaculture
Management & Technology
Vidyasagar University
Midnapore, West Bengal
(2) Fishery Field Assistant
Department of Fishery
Govt. of West Bengal, India

Marine molluscan fauna found at Digha coast, West Bengal, India

Manotosh Das, Dr. Joydev Maity and Basanti Samanta

Abstract

The present study shows the short coastal line (158.2 km) of West Bengal offers a wide variety of biotic components which are used by the locals for their sustenance. Shell fish collection is an old occupation in this region. Due to the increasing demand of fin fishes and shell fishes, these are caught abundantly without considering their sizes and ages. The fin fishes and shell fishes are not only caught from their feeding ground but also caught from their breeding ground. For this reason the fin fishes and shell fishes are being disturbed in their natural breeding ground. The shellfish resources of the coastal water in the Digha coast are not heavily exploited. Cumulative effect of pollution and other natural factors are also responsible for reduction of shellfish availability in this zone.

Keywords: Species, Mollusca, Bivalvia, Gastropoda Cephalopoda, Biodiversity, Digha Coast

1. Introduction

Molluscs are soft bodied animals, a large and most important group of invertebrates which occupies all the possible habitats except aerial. They are found 10190 meter deep in the ocean to 5000 meter of elevation (Ramakrishna and Dey, Rec. Zool. Surv. India, Oce. Paper No. 320). It is a highly diversified group, differs in size, shape, number as well as its habit and habitat. It estimates 31643 number of marine molluscs, 8765 number of freshwater molluscs and 24503 number of terrestrial molluscs, making a total number of 64,912 molluscan species (approx. 65,000). It made a conservative estimate 66535 number of molluscan species of which the Indian share is 5070 number of molluscan species, among them 3400 marine molluscs, 183 freshwater molluscs and 1487 terrestrial molluscs. (Ramakrishna and Dey, Rec. Zool. Surv. India, Oce. Paper No. 320).

Molluscs exhibits of significant diversity in shell shape, sculpture and colouration. The marine mollusks display flamboyance in colour and within and between the species comparison to the terrestrial and freshwater molluscs. Diversity is also evident in mollusca in their feeding habits. They are herbivores, carnivores, scavengers and deposit feeders, suspension feeders, commensalism and parasites.

The marine molluscs have an important place in an ecosystem. Molluscs plays an important role in maintaining the ecosystem. They are the major food source for humans as well as other secondary consumers in the ecosystems. Their role in the ecosystem cannot be over looked as many of them are commercially important species and other are biological indicators as well as important in food web. It is proposed to conduct the study on the marine molluscs along the Digha coast.

Some studies on marine biodiversity of Digha coast as well as surrounding coastal areas were carried out in the past. For the first time Goswami (1992) started his work on the overview of marine biodiversity of Digha coast.

But, the first comprehensive account of marine mollusks were prepared by Ramkrishna *et al.*, 2003. Keeping view of these studies, the study was planned to monitor the population of individual group, their distribution and status. This report deals with comparative account of marine molluscan fauna at various present study locations.

2. Materials and Methods

2.1 Study Site: The history of old and new Digha both is not so old. In 18th century, the Digha village under Birkul Parganas under the British rules was a health resort for the British

in India. It was considered as a most popular weekend beach resort in our West Bengal. In the present day, about 40 lakhs over tourists visit Digha every year. Digha beach is situated close to the Gangetic mouth on the east coast of India facing the Bay of Bengal at latitude $21^{\circ} 36' N$ and longitude $87^{\circ} 30' E$. Here, the sea is quite shallow with very little wave action on the beach and an extensive area about 250 m of the intertidal zone is exposed during low tides. The beach slope is shore is very low up to the low water mark. The shore was subjected to considerable erosion in the recent past and the bank is presently protected with the construction of a sloping sea -wall. The climate of study area is presented as below-

Table 1: Climatic conditions of Digha coast.

Parameters	Limit
Annual rainfall	1000 mm to 1300 mm
Temperature	16°C to 35.5°C
Relative humidity	50% in December and 78% in July
Wind flow (average)	30 Km / hour
Tidal amplitude (average)	2 meter

There are so many variable molluscan species inhabit at Digha and its surrounding coastal areas. The coastal line is straight & large inter-tidal zone. The beach is flat & compact. The beach is made up of sand mixed with variable proportions of silt & which makes it very compact. Digha has potential coast line of about 10 km which offers scope for more effective exploitation of marine fishery resources. There are 8 number of different ghats (spots) studies at Digha coast. The ghats (spots) and their nature at Digha are as follows –

Table 2: Various Ghats (spots) and its nature at Digha Coast

Ghats (spots)	Nature
Paschim Gadadharpur	Beach with sand and rocks.
Udaypur	Beach with sand and mud.
Ongaria Ghat	Beach with sand and rocks.
Jatranala Ghat	Beach with sand and gravels.
New Digha	Beach with sub- littoral rocky boulders.
Hospital Ghat	Beach with sand and rocks.
Sea Hawk Ghat	Beach with sand and rocks.
Digha Mohana	Estuary with sandy, muddy & rocky area.

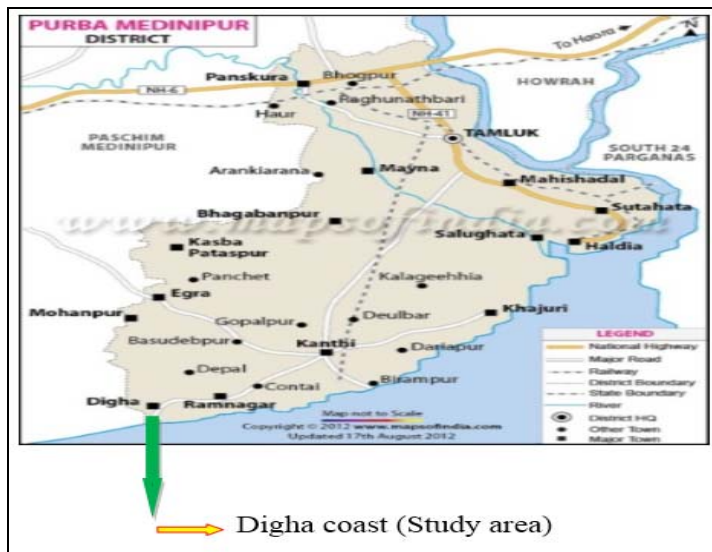


Fig 1: Purba Medinipur District Map.

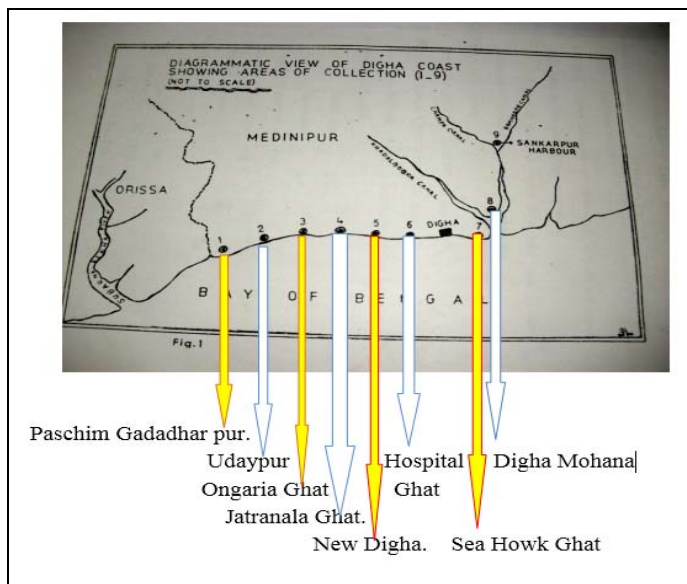


Fig 2: Diagrammatic view of Digha Coast showing areas of collection.

2.2 Seasonal abundance of Molluscan species

Molluscan species are available at Digha Coast more or less throughout the year. Highest population density is in post monsoon period from the month of September to December

due to optimum water salinity and temperature. Availability goes down lowest in monsoon period mainly in the month of July due to lowest water salinity. Population density is optimum in summer season from March to June.

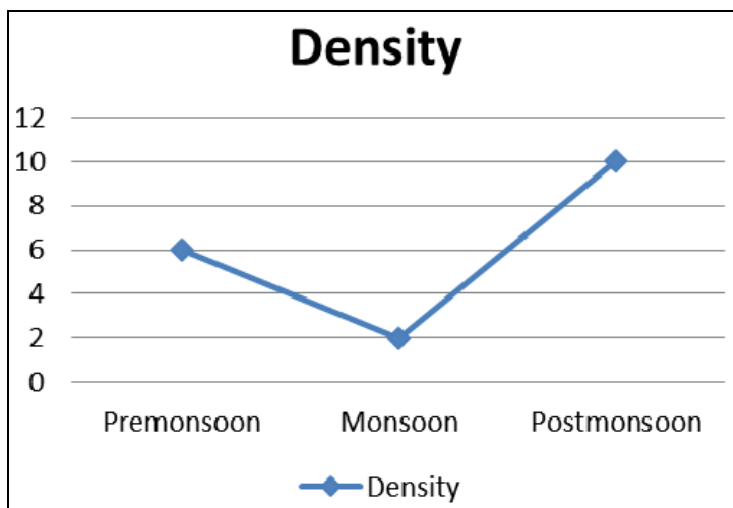


Fig 1: seasonal abundance of Molluscan Species at Digha Coast.

3. Results and Discussion

During present period a total number of 28 species of Bivalve belonging to 13 families, 26 number of species of Gastropoda belonging to 14 families and 4 number of species of Cephalopoda belonging to 3 families have been identified at

Digha coast of West Bengal. All of these except cephalopoda habitat (Sandy bottom) can be found in the different ghats (spots) of Digha coast.

3.1 Molluscan Species Available at Digha Coast Bivalvia

Table 3: List of Bivalvia available at Digha Coast.

Sl.No	Family Name (13)	Genera (21)	Specimen (28)
1.	Arcidae.	Anadara.	<i>Anadara granosa</i> (Lamarck)
			<i>Anadara inequivalvis</i> (Bruquiere).
2.	Corbiculidae.	Polymesoda.	<i>Polymesoda bengalensis</i> (Lamarck).
3.	Donacidae.	Donax.	<i>Donax incarnates</i> (Gmelin).
			<i>Donax scortum</i> (Linnaeus).
4.	Mactridae.	Mactra.	<i>Mactra mera</i> (Reeve).
			<i>Mactra luzonica</i> (Deshayes).
			<i>Mactra violacea</i> (Gmelin).
			<i>Mactra plicataria</i> (Linnaeus).
5.	Mytilidae.	Perna.	<i>Perna viridis</i> (Linnaeus).
6.	Ostreidae.	Saccostrea	<i>Saccostrea cuculata</i> (Newton & Smith)
7.	Pharidae.	Pharella.	<i>Pharella javanicus</i> (Linnaeus).
		Siliqua.	<i>Siliqua albida</i> (Dunker).
			<i>Siliqua radiata</i> (Linnaeus).
8.	Psammobiidae.	Apolymetis.	<i>Apolymetis edentula</i> (Spengler).
9.	Pholadidae.	Barnea.	<i>Barnea candida</i> (Linnaeus).
10.	Solenidae.	Solen	<i>Solen brevis</i> (Gray).
11.	Tellinidae.	Tellina.	<i>Tellina sinuate</i> (Spengler).
		Strigilla.	<i>Strigilla splendida</i> (Auton).
		Macoma.	<i>Macoma birmanica</i> (Phillipi).
<i>Macoma truncate</i> (Jonas).			
12.	Ungulinidae	Diplodonta.	<i>Diplodonta bulata</i> (Dunker).
13.	Veneridae.	Timoclea.	<i>Timoclea imbricate</i> (Sowerby).
		Meritrix.	<i>Meritrix meritrix</i> (Linnaeus).
		Polecyora.	<i>Polecyora trigona</i> (Reeve).
		Paphia.	<i>Paphia textile</i> (Gmelin).
		Dosinia.	<i>Dosinia prostata</i> (Linnaeus).
		Glauconome	<i>Glauconome sculpta</i> (Sowerby).

3.2 Gastropoda

Table 4: List of Gastropoda available at Digha Coast

S. No	Family Name (14)	Genera (18)	Specimen (26)
1.	Architectonidae.	Architectonica	<i>Architectonica perspectiva</i> (Linnaeus). <i>Architectonica laevigata</i> (Lamarck).
2.	Cassidae.	Phalium.	<i>Phalium bisulcatum</i> (Schubert & Wagner).
3.	Ellobiidae.	Pythia.	<i>Pythia plicata</i> (Fe' russac).
4.	Epitoniidae.	Acrilla.	<i>Acrilla gracilis</i> (Sowerby).
5.	Muricidae.	Thais.	<i>Thais licera</i> (Born). <i>Thais blanfordi</i> (Melvil)
6.	Melongenidae.	Pugilina.	<i>Pugilina cochlidium</i> (Linnaeus).
7.	Nassaridae.	Nassarium.	<i>Nassarium faveolatus</i> (Reeve). <i>Nassarium stolatus</i> (Gmelin).
		Nassaria.	<i>Nassaria nassaria</i> .
8.	Naticidae.	Natica.	<i>Natica guateriana</i> (Recluz). <i>Natica lineate</i> (Jousseaume). <i>Natica tigrina</i> (Roeding).
		Polinices.	<i>Polinices didyma</i> (Roeding). <i>Polinices tumidus</i> (Swainson)
9.	Olividae.	Olivancillaria	<i>Olivancillaria gibbosa</i> (Born).
		Amalda.	<i>Amalda ampla</i> (Gmelin).
10.	Potamididae.	Cerithidae	<i>Cerithidae cingulata</i> (Gmelin). <i>Cerithidae obtuse</i> (Lamarck).
		Telescopium	<i>Telescopium telescopium</i> .
11.	Terebridae.	Terebra.	<i>Terebra tenera</i> (A. Adams).
12.	Tonnidae.	Tonna.	<i>Tonna dolium</i> (Linnaeus). <i>Tonna sulcosa</i> (Swainson).
13.	Turritullidae.	Turritella.	<i>Turritella attenuate</i> (Reeve).
14.	Trochidae.	Umbonium.	<i>Umbonium vestiarius</i> (Linnaeus).

3.3 Cephalopoda

Table 5: List of Cephalopoda available at Digha Coast

S. No	Family Name (3)	Genera (4)	Specimen (4)
1.	Loliginidae.	Loligo.	<i>Loligo durauceli</i> (Gray).
2.	Octopodidae.	Octopus.	<i>Octopus macropus</i> (Risso).
3.	Sepiidae.	Sepia.	<i>Sepia aculeate</i> (Van Hasseltt).
		Sepiella.	<i>Sepiella inermis</i> (Van Hasseltt).

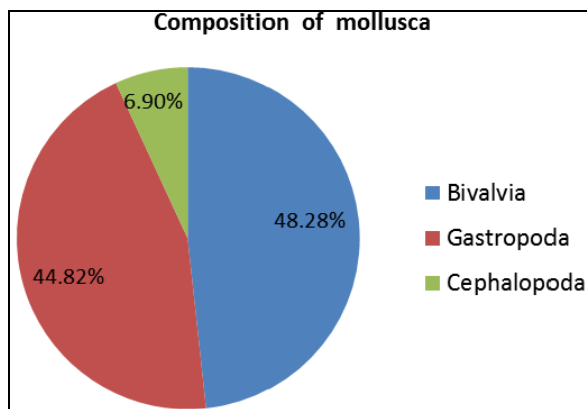


Fig 2: Composition of marine molluscan groups at Digha coast.

The available marine molluscan shells which are available at Digha coast are used for production of lime, home decoration, preparation of garlands and conch etc. The meat of all available mollusks are used as good quality nutritional feed of poultry birds. Meat of few mollusks are edible used as delicious, high nutritional food for human beings. A huge amount of eroded sediments, fly ash along with several other industrial discharges have made every year this coast unsuitable for living species. This is directly reflected by the steady decline of the abundance of fin fish shell fish seeds, smaller fin fishes and other nektonic forms. The data collected during last 10 years from the Department of Fishery, Government of West Bengal, relating to fish and shell fish landings at Digha and surrounding coast, reveals a drastic reduction of total landings of different fishery resources. Operation of increased number fishing trawlers with nylon thread gears may be considered a major factor for such down

going condition. It is well known that oil and other related organic products after being discharged from different fishing trawlers, ships and other marine vessels pollute considerably both pelagic and benthic environment. Domestic sewage in small quantities is known to fertile the sea water which leads to an increase in marine productivity (Qasim, *et al.*, 1988) because of eutrophication. Waste disposal from the tourist centers of Digha and nearby fishing harbours of Sankarpur contributes pollutants into the nearby estuaries and small marshes (Annon, 2005) [8]. We should be sincere immediately to protect the biodiversity of Digha coast in West Bengal.

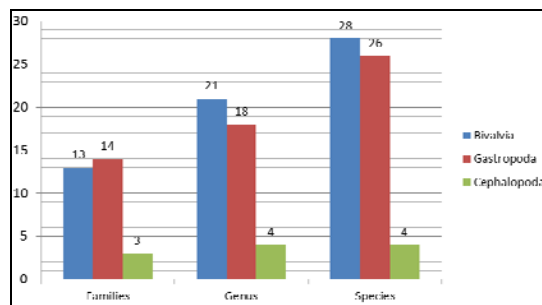


Fig 3: Taxonomic Identification of Molluscan species available at Digha Coast.



A heap of Molluscan Shell



Cradle made of Molluscan Shell



Garland made of pearls



Decoration works made of molluscan shell



Mirrors decorated by molluscan shell

Fig 3: Different uses of Molluscan Shell.



Sankha (conch) in a shop



Sankha in a shop



Molluscan Shell Dust



Doll made of molluscan shell



Shell Garland

4. Conclusion

Marine water molluscs have ability to filter water, take part in food chain as consumer and provide habitat to invertebrates is necessary to survive in water. Meat of few mollusks species are nutritious, delicious used as food of human beings. Further study needs to continue to look at habitat, seasonal abundant & availability of different molluscan species at Digha coast.

5. Acknowledgement

Authors are thankful to Prof. Bidhan Chandra Patra, Din, Faculty of Science, Vidyasagar University, Midnapur for his encouragement during the study.

6. References

1. Venkatraman K, Wafer M. Coastal & marine biodiversity of India, 2005.
2. Subba Rao NV, Dey A, Barua S. Molluscan fauna of Hugli- Matla Estuary, Estuarine Ecosystems Series, 1995.
3. Subba Rao NV, Surya Rao KV, Mitra SC. Malacological notes on Sagar Islands, 1987.
4. Subba Rao NV, Dey A, Barua S. Studies on the malacofauna of Muriganga estuary, Sundarbans, 1983.
5. Anandaraj T, Balasubramaniam V, Murugesan P, Muthuvelu S. Biodiversity of marine mollusks in east coastal area of Thanjavur district, Tamil Nadu, India, 2012.
6. Dey A. Handbook on Mangrove Associate Molluscs of Sundarbans, 2006.
7. Dey A, Jamadar YA, Mitra A. Distribution of intertidal malacofauna at Sagar Islands, 2005.
8. Annan. Studies on bio-resource assessment & management of degraded mangrove ecosystem of Midnapore Coast, West Bengal, Research Project report, 2005.
9. Bhakat RK. Coastal dunes at Digha, India. A plea for continued protection. Indian Journal of Geography & Environment. 2001; 6:54-60.
10. Chakraborty SK. Coastal Aquaculture & Environment in the context of West Bengal, India. Journal of Bio Science, Vidyasagar University, 1998.
11. Ramakrishna, Dey. Annotated Checklist of Indian Marine Molluscs. Rec. Zool. Surv. India, Oce. Paper No. 320).