



# Diversity of Fishes in the Rasulpur River of Purba Medinipur District, West Bengal

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## ABSTRACT

The present study envisaged with the fish diversity of Rasulpur River in the Purba Medinipur district of West Bengal. The experimental study was conducted during the period of March - June, 2018 to record the different types of important fish species available in this river. The river filled with the varying salinities of water and enriched with varieties of brackish water fishes. The results of the present investigation showed that, the total 21 fin fish species belonging to 10 Orders, 18 Families & 21 Genera; 12 shell fish species belonging to 4 Order, 7 Family 11 Genera were observed during study period. Among the collected fish species, Order-Perciformes showed most dominant constituting 38% followed by the Order- Rajiformes 10%, Order- Siluriformes, Pleuronectiformes Clupeiformes 9% each and Order-Anguilliformes & Beloniformes constitute 5%. The Crustacean species includes the Order Decapoda, Xiphosura, Sessikia, Stomatopoda Order-Xiphosura was found 9%, Order Sessikia & Stomatopoda was also found 8% each. The species of Order- Gobiidae, Aulopiformes and clupiformes showed very rich abundance, i.e, almost 75%. Fishing operations were done throughout the year but fish production fluctuates in the Rasulpur river. Therefore, recently fish production abruptly decreases day by day owing to severe man made river pollution.

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### **Introduction:**

Fishes are one of the important commodities in the economy of many nations as they have been a stable item in the diet of many peoples. India is one of the 17 mega biodiversity

countries of the world. With only 2.5% of the land area, India accounts for 7.8% of the recorded species of the world. In India, 2118 species of fish belonging to 711 genera, 123 sub family, 209 families and 54 orders with

119 species of coldwater, 34 species of cold-warm water, 372 species of warm water, 72 species of warm-brackish-marine water, 18 species brackishwater, 68 species warm-brackishwater, 87 species of brackish-marine water and 1,348 species of marine water fishes (NFDB report 2017-2018). According to National Bureau of Fish Genetic Resources(NBFG), Lucknow, India., database, now contains information on 2662 native finfishes (Freshwater-877, Brackishwater-113 and Marinewater-1672) reported from Indian waters belonging to 1019 genera under 246 families and 42 orders; and 291 exotic fishes. As per the FAO, a sustainable fisheries development envisages an eco-friendly, equitable mode of development that can sustain livelihood over generations. Among the different states of the country, West Bengal holds the high diversity of fish resources (Sanyal et al., 2012).

FishBase (Froese and Pauly, 2016) has listed 917 freshwater fish species (out of 2465 total fish species) as occurring in our country.

Biodiversity loss in freshwater ecosystem is an increasing phenomenon, mainly due to human activities (Abell, 2002). Dubey et al., (2017) opine that climate resilient aquaculture have been possible in Indian Sundarban areas. Mandal et. al., (2012) stated that indigenous knowledge associated with conservation of

chocolate Mahseer (*Neolissocheilus hexagonolepis*) by the War-jaintia community practiced in Meghalaya state. The principal causes are the habitat destruction and defragmentation, exotic species introduction and global climatic change impacts (Saunders et al., 2002). Payra et.al, (2014) stated that different crafts and gears operated in brackish water fed canal for harvesting fishes in different seasons to maintain livelihood of the fishermen communities inhabited in the South Bengal coastal area. Mandal et. al., 2016 observed on parasitic occurrence in indigenous climbing perch, *Anabas testudineus* (Bloch, 1972) from West Bengal State of India. The Midnapore costal tract (longitudinal extension 87°20'E to 88°5'E & latitudinal extension 21°30'N to 22°2'N) in between Hooghly& Subarnarekha estuarine confluence with the Bay of Bengal, although very short in length, it display unique habitat diversities in respect to vegetation composition, occurrence of dunes, mudflats, sandflat & other ecological parameters like variation of salinity, temperature, texture of sediments etc. Purba Medinipur district is part of the lower Gangetic Plain & Eastern coastal plains. Topographically, the district can be divided into two parts: a) almost entirely flat plains on the West, East& North and b) The coastal plains on the South. The vast expanse of land is forms of alluvium & is composed of younger & costal alluvial. The elevation of the

district is within 10 metres above main sea level (Bandyopadhyay. et al., 2009). The district has a long coastline of 65.5 km along its southern & south eastern boundary. Tidal floods are quite regular in the five Blocks. Rasulpur River is one of the important river in the Eastern coastal parts of Purba Medinipur district of West Bengal. It is the last tributaries of the Hooghly River. The total river length is 19 km and this river connected into the Bay of Bengal with Odisha canal & other small canals and main distributaries of this river is Itaberia and Mugberia canals.

## Materials and Methods:

### Study area:

The study area is divided into three sampling stations, i.e. Petua-ghat (Station- 1: Marine Zone), Rasulpur-ghat (Station-2: Brackish Water Zone) and Kalinagar-ghat (Station- 3: Fresh Water Zone) where fin fish & shellfish information were collected from the fishermen. Data was collected from March-June, 2018 following lunar periodicity (full moon and New moon) as during these periods higher abundance of finfishes & shell fishes were reported by the fishermen communities. Thus



by conducting eight samplings per month total 32 samples were collected during this study period from three stations.

#### **Identification of Fish samples:**

Fish samples are collected from the local landing centers from the fishermen. Generally fishermen sort non target fishes after catching in the river. Generally, the fishermen used set bag net, Set Gill Net, drift gill net and Moshari bar jal, cast net, dragnet etc. for fishing operation. The 10% of the total catches were collected by ice box (frozen) from each station for laboratory study. In the laboratory, the fish samples were sorted and identified through different methods as developed by Fischer and Whitehead, 1974; Shafi and Quddus, 1982; Talwar and Jhingran, 1991, Talwar and Kakkar, 1984 & De Bruin et al., 1995, Datta Munshi and Srivastava, 1988 and Hossain et al., 2007.

#### **Results:**

During the study period different fin fishes and shell fishes have been observed in the Rasulpur river of Purba Medinipur district. The result showed that the river rich in fin fish and shell fish diversity; the finfish belong to 10 orders & 18 families and shell fish belong to 4 order & 7 families were recorded. In the present study 21 finfish species from 21 different genera and 18 families were recorded and 12 shellfish species from 11 genera and 7 families also recorded from the Rasulpur River during March to June 2018. The members of the order

Perciformes were dominated by 8 species. But order Siluriformes, Pleuronectiformes, Clupeiformes, Rajiformes represent only 2 species and order Aulopiformes, Tetradontiformes, Anguiliformes, Beloniformes represent only single species. The order Decapoda represents 9 species and order Xiphosuran, Sessikia, Stomatopoda also represents single species. The dominated fish species are *Scatophagus argus*, *Sillago sihama*, *Terapon jarbua*, *Mugil cephalus*, *Lates calcarifer*, *Trichiurus lepturus*, *Polynemus paradiseus*, *Johnius soldad* and less abundant fishes includes followed by order Siluriformes which includes *Sperata aor*, *Hemibagrus gracilis*. The major species from order Pleuronectiformes represent *Synapturus panoides*, *Brachirus panoides*; the order Clupeiformes include species are *Coilia dussumieri*, *Setipinna phas*. The order Rajiformes include *Glaucostegus granulatus*, *Trygon sephen* species. Therefore, 7 shell fish family represented 12 species of which order Decapoda was dominant, the dominant species from this order includes *Dardanus megistos*, *Cllinectes sapidus*, *Scylla serrata*, *Portunus sanguinolentus*, *Thalamita prymna*, *Uca demani*, *Penaeus indicus*, *Penaeus monodon*, *Metapenaeus monoceros* and followed by order Xiphosura which represents *Limulus* sp. Among all these order Perciformes was most dominant constitute 38% followed by order

Rajiformes which constitutes 10%, order Siluriformes, Pleuronectiformes and Clupeiformes which comprises 9% & order Gobiiformes, Aulopiformes, Tetradontiformes, Anguilliformes, Beloniformes constitute only 5%. Therefore, Order Decapoda constitute 75% among all shell fishes and order Xiphosura constitute 9%, Order Sessikia & Stomatopoda represent 8%. Among all the fishes few shell fishes like *Penaeus monodon*, *Scylla serrata* and *P. indicus* are having good market demand due to their palatable nature.

Table1: Finfish diversity in Rasulpur river & their abundant status during March to June 2018

Order	Family	Scientific name	Common name	Abundant Status
Decapoda	Portunidae	<i>Dardanus megistos</i>	Hermit crab	—
		<i>Clinectes sapidus</i>	Blue crab	—
		<i>Scylla serrata</i>	Mud crab	—
		<i>Portunus sanguinolentus</i>	Swimming crab	—
		<i>Thalamita prymna</i>	Swimming crab	—
	Grapsidae Ocypodoidea Penaeidae	<i>Uca demani</i>	Fiddler crab	++
		<i>Penaeus indicus</i>	Indian prawn	—
		<i>Penaeus monodon</i>	Tiger prawn	—
		<i>Metapenaeus monoceros</i>	Indian prawn	++
				+++
Xiphosura	Limulidae	<i>Limulus polyphemus</i>	Atlantic horseshoe crab	+
Sessikia		<i>Balanus glandula</i>	Balanus	++
Stomatopoda	Squillidae	<i>Odontodactylus scyllarus</i>	Mantis shrimp	++

NB: Status: +++ Most abundant : ++ Abundant : + Less abundant and - Rare

Table.2: Shellfish diversity in Rasulpur River & their abundant status during March to June 2018

Order	Family	Scientific name	Common name	Abundant Status
Decapoda	Portunidae	<i>Dardanus megistos</i>	Hermit crab	—
		<i>Cllinectes sapidus</i>	Blue crab	—
		<i>Scylla serrata</i>	Mud crab	—
		<i>Portunussanguinolentus</i>	Swimming crab	—
	Grapsidae	<i>Thalamita prymna</i>	Swimming crab	++
		<i>Ucademani</i>	Fiddler crab	—
		<i>Penaeusindicus</i>	Indian prawn	—
		Ocypodoidea	<i>Penaeusmonodon</i>	Tiger prawn
Penaeidae	<i>Metapenaeusmonoceros</i>	Indian prawn	+++	
Xiphosura	Limulidae	<i>Limulus polyphemus</i>	Atlantic horseshoe crab	+
Sessikia		<i>Balanusglandula</i>	Balanus	++
Stomatopoda	Squillidae	Odontodactylus scyllarus	Mantis shrimp	++

NB: Status: +++ Most abundant : ++ Abundant : + Less abundant and - Rare

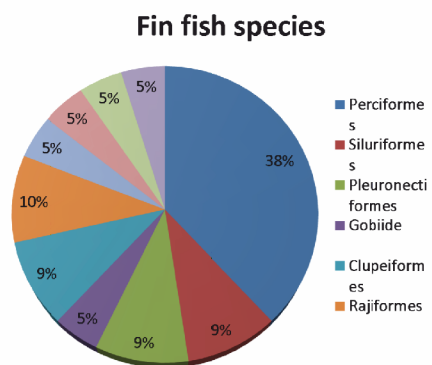


Fig -1: Finfish diversity according to the percentage of fishes available in different order

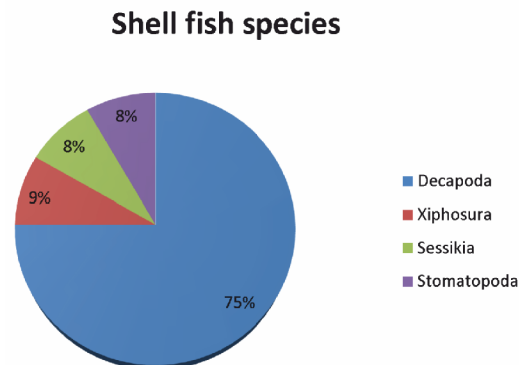


Fig-2.: Shell fish diversity according to the percentage of fishes available in different order

**Discussion:**



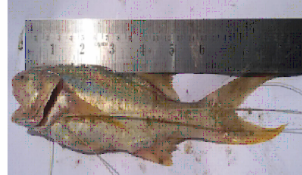
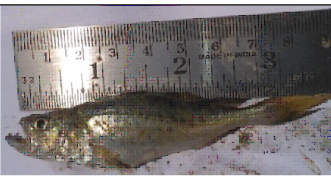
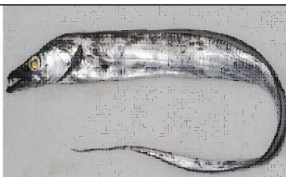

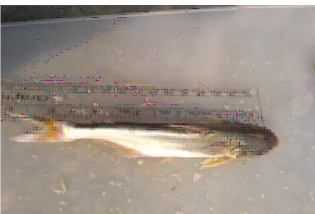
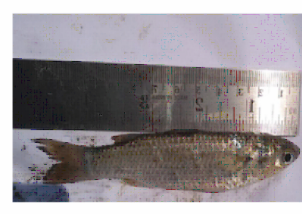

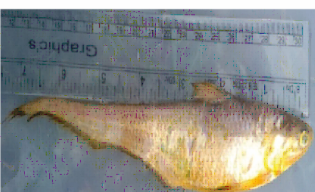

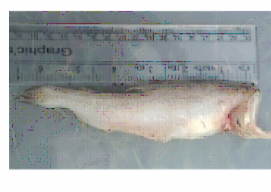
Discussion of the present work is completely based on the outcome result of different experiment. Similar types of work has been done by different scientist, like Payra et al., 2018 counted the ichthyofauna diversity in Negua diversion canal of Purba Medinipur district, Maity et al., 2017 documented the different major group of fishes available in the Haldi river and Mandal et al. in 2015 recorded the crab diversity in Digha coast. Mandal et al. 2015 also observed that different types of parasitic occurrence in the giant freshwater prawn *Macrobrachium rosenbergii* collected from coastal West Bengal. Through the survey it has been observed that 21 fin fish species and 12 shell fish species found most predominant species belong to different order. The order Perciformes was most dominant constituting 38% followed by the order-Rajiformes 10%, order-Siluriformes and

Clupeiformes 9%, order-Anguilliformes & Belontiiformes constituting 5% which reflected in the Fig. 1. The shellfish group includes Crustacean species order Decapoda, comprising 75%, order- Xiphosura 9%, order-Sessikia & Stomatopoda were found 8% which showed in the Fig.-2. Overall studies on the diversity of fishes suggest that continuous documentation is very essential for determining the present status of fishery potential in the experimental river. This will help to take fruitful strategies to conserve vulnerable fishes in future also. Further it also observed that availability of different group of fish species depends on tidal fluctuation of the river which directly influences the physico-chemical characteristics of riverine water.

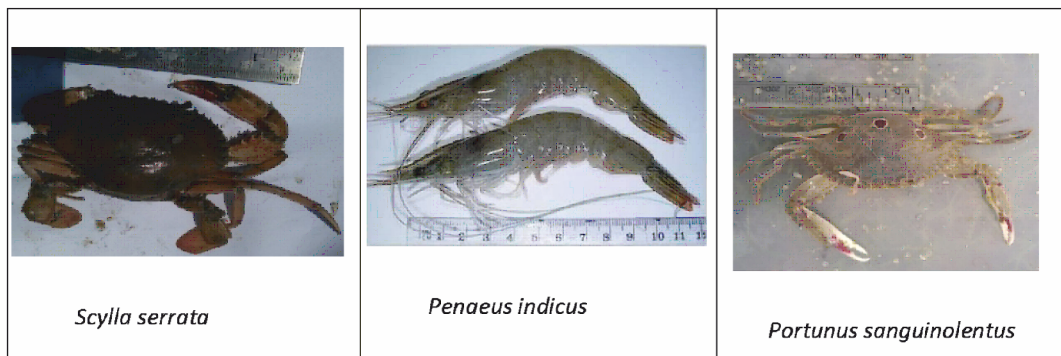
**Conclusion:**

Present study indicates that habitat loss due to environmental degradation as well as manmade pollution has seriously affected the fish faunal

population in the tidal-fed Rasulpur River. matter of major concern since they contribute  
 Therefore, the protection of these habitats is a significantly to the total biodiversity of the  
**Plates: Few important fishes in Rasulpur river** entire estuarine ecosystem of said river.

 <p><i>Sillago sihama</i></p>	 <p><i>Lates calcarifer</i></p>	 <p><i>Polynemus paradiseus</i></p>
 <p><i>Johnius soldado</i></p>	 <p><i>Trichurus lepturus</i></p>	 <p><i>Terapon jarbua</i></p>
 <p><i>Sperata aor</i></p>	 <p><i>Mugil cephalus</i></p>	 <p><i>Peripthalmus modestus</i></p>
 <p><i>Coilia dussumieri</i></p>	 <p><i>Setipina phasa</i></p>	 <p><i>Harpodon nehereus</i></p>





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