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Icthyofaunal Diversity of the River Padma at Murshidabad, West Bengal

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ABSTRACT

Background: Fish are considered as bio-indicators of the health of aquatic ecosystems. Recently, native fish species were declining due to anthropogenic pollution and records of fish availability in a specific area of the Padma Riverine System aided in understanding the current status of fish and which fish need conservation.

Methods: The fish diversity in Murshidabad district's Padma River was studied for twelve months, from October 2021 to September 2022, with the help of local fishermen. Freshly caught fish is immediately transported to a laboratory, identification is followed by Talwar and Jhingran (1991) and Rahman (2005) techniques.

Result: A total of 49 fish species belonging to 11 orders, 24 families were recorded. Siluriformes (17 species) had the most dominance, followed by cypriniformes (12 species) and anabantiformes. Among the species collected, eight were threatened, thirty were less threatened, one was extremely rare and one had not yet had their status determined. These fishes were classified as threatened (16.33%), less threatened (61.23%) and exceedingly rare (2%). Based on the findings, it is concluded that the Padma River could be used as a refuge for the conservation of Murshidabad's threatened freshwater fishes.

Key words: Conservation, Fish diversity, Freshwater, Padma river, Threatened species.

INTRODUCTION

Fish are aquatic animals that lack limbs with digits.They have paired and unpaired fins which serve various purpose. Approximately 95% of living fish species are ray-finned fish, belonging to the class Actinopterygii, with around 99% of those being teleosts. Lévêque *et al*., (2008) manifested that researches related to fishes in India are in exploratory stage.

Fish are very varied animals and can be graded in many ways. Fish diversity is composed of three elements: morphological diversity, community availability and relative abundance. Natural freshwater resources abound in India, which is divided into rivers, ponds, ditches, bells, lakes, haors, bars, mudflats and waterways (Shinde *et al*., 2009). These commodities are supplied by a diverse aquatic life. The River Padma has been used for indigenous fisheries with various fishing implements since ancient times (Tikadar *et al*., 2021). Several studies have recently been conducted on the Padma River fisheries. However, fish diversification has only been partially synthesized and evaluated. There is no available data on the fish diversity and composition in the Padma River running through Murshidabad district which drains directly into the Bay of Bengal.As a result, the purpose of this research was to look into the fish population of the Padma River at Murshidabad district.

MATERIALS AND METHODS

Study area and duration

The Padma River (Fig 1) is a tidal river of West Bengal that originates from the Gangotri glacier and falls into the Bay of Bengal through the Murshidabad district. The specimens were collected from four different sites (Fig 2a, 2b, 2c and 2d) in Padma River running through Murshidabad district, Khandua, Taranagar, Kantakhali and Sammatinagar were the sampling locations. Table 1 displays the latitude and longitude of four separate sites. This survey was conducted from October 2021 to September 2022 during a 12-month period.

The procedure of collection of specimens and their identification

Fish specimens were gathered, maintained and identified using morphometric and meristic characteristics. The specimens were set aside in flat plastic jars filled with a 10% buffered formalin solution (Joadder *et al*., 2015). According to Talwar and Jhingran (1991) and Rahman (2005), the specimens were identified using morphometric and meristic characteristics.

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RESULTS AND DISCUSSION

During the study period, there were a total of 49 species of fish found (Table 2), distributed over 11 orders and 24 families. Out of these, fish species belonged to the Cyprinidae family, were the most (Table 4 and Fig 4), but fishes from other family like Channidae, Belonidae, Siluridae, Pangasidae, Calaridae, Heteropneustidae, Schibeidae, Bagridae, Sisoridae, Notopteridae, Clupeidae, Mastacembelidae, Anabantibae, Gobiidae were also found. 14 species were regularly found throughout the year, 8 were threatened 30 were less threatened 1 is exceedingly rare and 1 had not yet had their status determined. The most prevalent order among the species that were collected was the Siluriformes (Table 3 and Fig 3) followed by Cypriniformes. Similar type of experiment was also carried out at the Rajsahi area by (Hasan *et al*., 2016). In their study the most fish species belongs to the order Cypriniformes were found in the Rajsahi area (Hasan *et al*., 2016).

Table 1: Latitude and longitude of four separate sites.

Sites	Latitude	Longitude
Khandua	24°26′47.7″N	88°12′13.3″E
Taranagar	24°26′58.2″N	88°13′16.1″E
Kantakhali	24°26′57.3″N	88°09′52.7″E
Sammatinagar	24°27′31.6″N	88°08′03.2″E

Source- Google map.

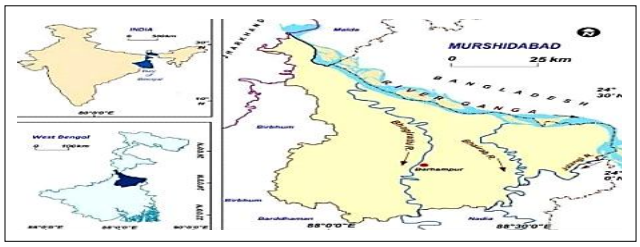

Fig 1: Map showing Padma River (Source-Google search).



Fig 2a: Khandua.



Fig 2b: Taranagar.



Fig 2c: Kantakhali.

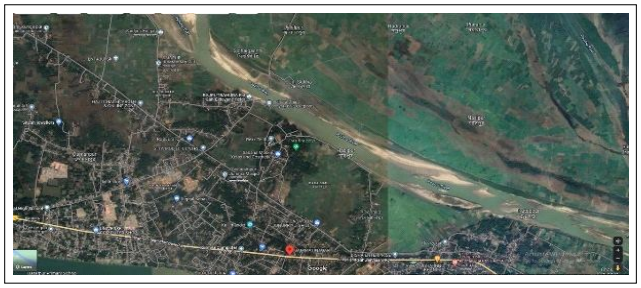

Fig 2d: Sammatinagar (Source-Google map).

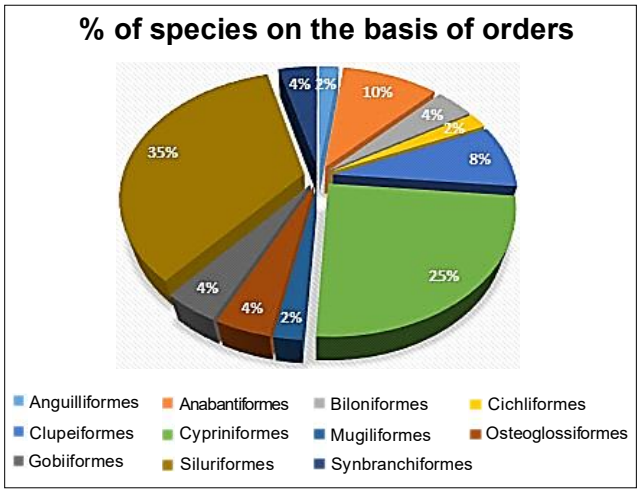

Fig 3: Distributions of different fish orders.

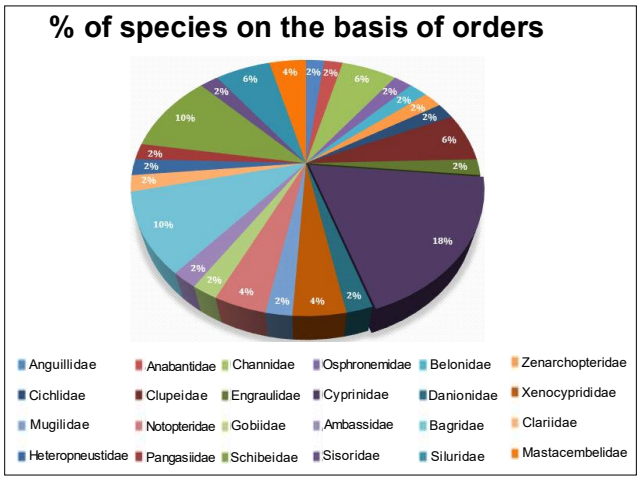

Fig 4: Distribution of different fish orders.

Table 2: List of fish species found in Padma River at Murshidabad, together with information on their conservation status.

Class	Order	Family	Scientific Name	Local name	IUCN Status
Actinopterygii	Anguilliformes	Anguillidae	*Anguilla bengalensis*	Baan	NT
	Anabantiformes	Anabantidae	*Anabas testudineus*	Koi	DD
		Channidae	*Channa marulius*	Gajal	LC
			Channa punctata	Goroi	LC
			Channa striata	Shol	LC
		Osphronemidae	*Trichogaster fasciata*	Kholsha	LC
	Beloniformes	Belonidae	*Xenentodon cancila*	Kakila	LC
		Zenarchopteridae	*Dermogenys brachynotopterus*	Gangetic halfbeak	DD
	Cichliformes	Cichlidae	*Oreochromis mossambicus*	Telapia	VU
	Clupeiformes	Clupeidae	*Gudusia chapra*	Khaira	LC
			Gonialosa manmina	Khaira	LC
			Tenualosa ilisha	Ilish	LC
		Engraulidae	*Setipinna phasa*	Phasa	LC
	Cypriniformes	Cyprinidae	*Gibelion catla*	Catla	LC
			Tor tor	Mahala	NT
			Puntius sophore	Puti	LC
			Systomus sarana	Sar puti	LC
			Salmostoma phulo	Chela	LC
			Labeo rohita	Rui	LC
			Labeo calbasu	Kalbasu	LC
			Labeo bata	Bata	LC
			Cirrhinus mrigala	Mrigal	LC
		Danionidae	*Amblypharyngodon mola*	Moya	LC
		Xenocyprididae	*Ctenopharyngodon idella*	Grass carp	NE
			Hypophthalmichthys molitrix	Silver carp	NT
	Mugiliformes	Mugilidae	*Rhinomugil corsula*	Ural	LC
	Osteoglossiformes	Notopteridae	*Chitala chitala*	Pulli	NT
			Notopterus notopterus	Foli	LC
	Gobiiformes	Gobiidae	*Awaous grammepomus*	Bele	LC
		Ambassidae	*Chanda nama*	Chanda	LC
	Siluriformes	Bagridae	*Rita rita*	Ritha	LC
			Mystus vittatus	Lal Tangra	LC
			Mystus bleekeri	Sada Tangra	LC
			Mystus cavasius	Gulsa Tangra	LC
			Sperata seenghala	Aor	LC
		Clariidae	*Clarias batrachus*	Magur	LC
		Heteropneustidae	*Heteropneustes fossilis*	Singhi	LC
		Pangasiidae	*Pangasius pangasius*	Pangas	LC
		Schilbeidae	*Clupisoma garua*	Ghaura	LC
			Pachypterus atherinoides	Batasi	LC
			Silonia silondia	Silon	LC
			Eutropiichthys vacha	Bacha	LC
			Ailia coila	Kajuli	NT
		Sisoridae	*Bagarius bagarius*	Baghair	NT
		Siluridae	*Ompok pabda*	Pabda	NT
			Ompok pabo	Pabda	NT
			Wallago attu	Boal	NT
	Synbranchiformes	Mastacembelidae	*Mastacembelus armatus*	Baim	LC
			Macrognathus pancalus	Guchi	LC

Near threatened (NT); Least concern (LC); Data deficient (DD); Not evaluated (NE); Vulnerable (VU).

Alam *et al*. (2021) conducted a research at Dharla river in Bangladesh where they found a total of 76 fish species belonging to 57 genera, 26 families and 8 orders. The most diverse family was the Cyprinidae (14 species). Experiment carried out by Dhiman *et al*. (2015) at the Passur River, Bangladesh reported 95 fish species in total which belongs to 77 genera, 45 families and 14 orders. Perciformes were the most dominant fish order followed by Siluriformes (17%) and others. According to Saha and Patra (2013) Daomodar River had 46 species of fishes during January 2011-2012 of which order Cyprinidontiforms was most dominant followed by others. Islam *et al*. (2013) in their study at Kulsi River of Assam, India found 57 fish species which belong to 16 families. Cyprinidae was the dominant family among all the families recorded.

Table 3: No. of species according to order.

Order	No. of species
Anguilliformes	1
Anabantiformes	5
Beloniformes	2
Cichliformes	1
Clupeiformes	4
Cypriniformes	12
Mugiliformes	1
Osteoglossiformes	2
Gobiiformes	2
Siluriformes	17
Synbranchiformes	2
Total no. of species	49

Table 4: No. of species according to family.

Family	No. of species
Anguillidae	1
Anabantidae	1
Channidae	3
Osphronemidae	1
Belonidae	1
Zenarchopteridae	1
Cichlidae	1
Clupeidae	3
Engraulidae	1
Cyprinidae	9
Danionidae	1
Xenocyprididae	2
Mugilidae	1
Notopteridae	2
Gobiidae	1
Ambassidae	1
Bagridae	5
Clariidae	1
Heteropneustidae	1
Pangasiidae	1
Schilbeidae	5
Sisoridae	1
Siluridae	3
Mastacembelidae	2
Total Number of species	49

CONCLUSION

The present authors' objective of the study is to compile a list of the freshwater fish that can be found in River Padma at Murshidabad district. The fishery resources of the river Padma close to Murshidabad have decreased for a number of reasons. Natural factors include erosion and sedimentation, a decline in river depth, sand blockage, a reduction in water retention and environmental degradation.

Conflict of interest: None.

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