

Diversity Status of Fishes in Mauns and Chours of Samastipur, N.Bihar

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Abstract Extensive field survey and fish sampling was done to assess the abundance and distribution of fishes in flood plain wetlands specially mauns and chours in Samastipur district of N. Bihar. A total of 43 species from 31 genera, 18 families and 8 orders were reported. The survey result showed that among the total fish species collected, Order Cypriniformes held a major portion of the district's fish fauna. Fish of the Family Cyprinidae was the most abundant (37.2% of the total fish species), followed by the Family Channidae (9.3%) & Bagridae. As far as conservation status is concerned the percentage of fish under the threatened category is almost up to 25.5% i.e. 2.32% endangered, 2.32% near threatened and 20% vulnerable of the total collected fish species while status of 58.13% was Lower risk near threatened. A large number of them have edible as well as aquarium species value.

Keywords: diversity, fishes, mauns, chours

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1. Introduction

Exploration of the components of biodiversity is an important step in recognising the existence of varied units of the biological architecture of the ecosystem as well as helps to assess the status its units so that precise management plans can be put in place. Wetlands are the natural resources known for its high biological diversity. These are fragile but productive and vital ecosystems for their role in conservation of biodiversity. Fishes are one the key group of these water bodies. Large variety of fishes flourishes these ecosystems exploiting the varied niches available there in. The group supports other species of varied animal diversity and act as a good indicator of healthy ecosystems. Though fish is largely explored vertebrate group but still a number of fish species are unexplored in wetlands.

Studies of freshwater fishes in the Indian subcontinent have been limited to scattered works on commercial fisheries. Out of the 2500 species of fishes that have been recognised in the Indian subcontinent, 930 are categorised as freshwater species. The freshwater fishes are distributed amongst approximately 20 orders 100 families and 300 genera. Quite a good amount of literature is currently available on Indian fishes especially on identification and systematics of freshwater fishes of India which starts from Hora's contribution during 1920-1950s to very recent texts [1,2,3].

The Bihar is endowed with rich aquatic and fisheries resources in the form of rivers, flood plains, wetlands

(Chours), ox-bow lakes (Mauns), reservoirs, tanks and ponds. Bihar is the fourth largest inland fish producing states in India. As many as 87 species of fishes belonging to 20 different families were recorded from this region. Quite a large number of air-breathing fishes had made their permanent abode in the Chours, swamps and wetlands of the Kosi belt. However in past few decades the wetlands have witnessed severe stress owing the increasing anthropogenic activities and this has resulted into environmental degradation and loss of units of biodiversity including freshwater fishes [4,5,6,7].

The review of the literatures revealed that there were no much-published work on the Fish fauna of Chours of north Bihar fishes except fish fauna of Kawar lake wetland and work on the Fishes of Uttar Pradesh and Bihar [8]. In addition to this, the general nature and distribution of Fishes in Peninsular region in India are given [8-14].

Samastipur is one of the richest district in terms of Chours and Ox-bow lakes (Mauns) formed by the meandering courses of a number of rivers including Budhi Gandak, Baya, Kosi, Kamla, Kareh and Jhamwari and Balan. Besides, thousands of big and small ponds (pokhari), mauns, and swamps are also used for fisheries.

Study Area: Samastipur district lies between 25° 27' to 26° 05' north latitudes and 85° 31' to 86° 23' east longitudes. The district covers a total area of 2579 sq. km. The climate of this district is on the whole dry, hot in summer and mild cold in winter. The total wetland area in the district is 15022 ha including 553 small wetlands having area less than 2.25 ha which comprises about 6 per cent of the geographical area of the district.

Rivers/streams contribute almost 48 per cent of wetland extent of the district that accounts for 7252 ha. It includes Budhi Gandak, Baya, Kosi, Kamla, Kareh and Jhamwari and Balan. The other dominating wetland categories of the district are natural waterlogged (3953 ha), lakes/ponds (2664 ha) and ox-bow lakes/cut-off meanders (404 ha). Water spread is 10867 ha in post-monsoon which is decreased 34 per cent in pre-monsoon (7133 ha).

2. Materials & Methods

Major oxbow lakes and Chours were surveyed regularly. Locations including areas of maximum and minimum human activities were selected besides; two large ponds in each of 20 blocks of the district were also selected randomly for the study. Sampling was done pre-monsoon

and post monsoon during the study period from February 2017 to May 2019.

The study was conducted every last week of each month, between 6.00 and 8.12.00 a.m. The fish samples were captured with the help of local skilled fishermen in three pre selected sampling sites. Dragnet, Castanet, Scoop net, Basket trap, and so forth were used for capturing fish. Fish markets were monitored regularly for commercial fish collection Fish species available at the local market and caught by local fishermen from the lakes and chours were also purchased.

The collected specimens were preserved in 5-10% formalin according to the size and brought to laboratory. The fishes were identified with the help of standard taxonomic literature [2,3,9,10,12,15,16]. The identification of the species was done mainly on the basis of the colour pattern, specific spots or marks on the surface of the body, shape of the body, structure of various fins, mouth shapes etc.

Table 1. Fish species in flood plains of Samastipur their status and economic importance

Order	Family	Species	Local Name	Status	Economic importance
Cypriniformes	Cyprinidae	1.Labeo rohita	Rehu	NA	Edible,
		2. Labeo gonius	Kursa	LR-nt	Edible
		3.Labeo dero	Arangi	NA	Edible,
		4. Puntius ticto	Pothia	LR-nt	Edible Aquarium species
		5. P.conchonus	Sidhari	LR-nt	Edible Aquarium species
		6.P.sophore	Pothia	LR-nt	Edible Aquarium species
		7.P.sarana	Darahee	LR-nt	Edible Aquarium species
		8.P.phutunio	Sidhari	LR-nt	Edible Aquarium species
		9.C.reba	Reba	LR-nt	Edible
		10.Catla catla	Catla	NA	Edible,
		11.Oxygaster bacaila	Chalhawa	VU	Edible
		12.Aspidoaria morar	Chilwa	LR-nt	Edible
		13.Chela laubuca	Chelhwa	NA	Edible, Aquarium species
		14.Esomus darnicus	Dendua	NA	Edible, Aquarium species
	15.Lepidocephalus guntea	Nakati	VU	Edible	
		Cobitidae	16.Botia dario	Baghua	NA
Siluriformes	Siluridae	17.Wallago attu	Boari	NA	Edible,
		18.Ompok bimaculatus	Jalkapoor	NA	Edible, Aquarium fish
		19.M.vittatus	Tengra	NA	Edible, Aquarium species
		20.M.cavasius	Tengra	LR-nt	Edible Aquarium species
		21.M.tengara	tengara	LR-nt	Edible Aquarium species
	Schilbeidae	22.Ailia coilia	Patasi	LR-nt	Edible
		23.Eutropiichthys vacha	Bachwa	VU	Edible
		Heteropneustidae	24.Heteropneustes fossilis	Singhi	VU
Channiformes	Claridae	25.Clarias batrachus	Magur	VU	Edible, Medicinal value, Aquarium species
	Channidae	26.Channa punctatus	Garai	LR-nt	Edible Aquarium species
		27.C.striatus	Sauri	LR-nt	Edible Aquarium species
		28.C.gachua	Chenga	NA	Edible Aquarium species
		29.C.maurilius	Saur	LR-nt	Edible Aquarium species
Clupeiformes	Notopteridae	30.Notopterus notopterus	Bhuna	LR-nt	Edible Aquarium species
	Clupeidae	31.Gadusia chapra	Chapri	LR-nt	Edible Aquarium species
	Engraulidae	32.Setipinna phasa	Phasa	LR-nt	Edible
Tetraodontiformes	Tetraodontidae	33.Tetradon cutcutia	Galphulani	LR-nt	Edible Aquarium species
Beloniformes	Belonidae	34.Xenentodon cancila	Kauwa	LR-nt	Edible, Aquarium species
Perciformes	Anabantidae	35.Anabas testudineus	Kabai	VU	Edible, Medicinal value, Aquarium species
		36.Colisa fasciatus	Kotri	NA	Edible, Aquarium species
	Centropomidae	37.Ambassis nama	Chamwa	NA	Edible, Aquarium species
		38.A.ranga	Chanari	NA	Edible, Aquarium species
	Sciaenidae	39. Sciana coitor	Patharchatwa		
	Nandidae	40.Badis badis	Sumha	NA	Edible Aquarium species
		41.Nandus nandus	Dhebari	LR-nt	Edible Aquarium species
Mastacembeliformes	Mastacembelidae	42.Macrogathus aculeatus	Gaichi	LR-nt	Edible Aquarium species
		43.Mastacembelus armatus	Bami	LR-nt	Edible Aquarium species

NT- Near Threatened; EN- Endangered; VU- Vulnerable; LRnt- Lower risk near threatened; LRlc- Lower risk least concern; LC- Least concern; DD- Data Deficient; NE- Not evaluated.

Table 2. Percentage contribution of Number of Families, Genera and Species under various orders

S. No	Order	Families (%)	Genera (%)	Species (%)
1.	Cypriniformes	11.7	32.25	37.2
2.	Siluriformes	23.52	22.58	20.93
3.	Perciformes	23.52	19.35	18.6
4.	Channiformes	5.88	3.22	9.3
5.	Clupeiformes	17.64	9.67	6.97
6.	Tetraodontiformes	5.88	3.22	2.32
7.	Beloniformes	5.88	3.22	2.32
8.	Mastacembeliformes	5.88	6.45	4.65

3. Results and Discussion

Wetlands are the creation of the river in the flood plain area. Once known for its lucrative fishery as well as repository of rich biodiversity, the wetland are facing multidimensional threats and is under severe pressure. Consequently there has been drastic reduction in the abundance and distribution range of fishes in North Bihar and recorded altogether 71 species from the lakes of Gandak basin [17]. But as of now some of the species seem to have been eliminated out of the wetlands.

In the present ichthyofaunal study, a total of 43 fish species belonging to 18 families, 8 orders and 31 genera were recorded from the wetlands largely from Mauns and Chaur of the district (Table 1). On the basis of percentage composition and species richness, order Cypriniformes was dominant (14 species) followed by Siluriformes (9 species) Perciformes (7 species) Ophiocephaliformes (4 species), Clupeiformes (3species); Mastacembeliformes (2 species) and Tetronodontiformes (1 species) & Beloniformes, (1 species). Percentage Contribution of Family, Genera and Species under 8 orders is given in the Table 2.

The dwindling diversity of fishes in the wetland in Bihar is reflected from the reports of other workers also. They reported presence of 42 species from an Oxbow lake in Samastipur [18]. The total of 33 fish species belonging to 6 orders were collected from the Shershah Suri pond in Sasaram and the presence of 40 species from another oxbow lake (Tirkulia Lake) in north Bihar [19,20]. However, recorded 54 species from river Gandak in N. Bihar [8].

With regard to the conservation status, according to [21] of the total species collected those under the threatened category are almost up to 25.5% i.e. 2.32% endangered, 2.32% near threatened and 20% vulnerable of the total collected fish species while status of 58.13% was Lower risk near threatened. Furthermore a sizeable number are aquarium species. The major carps like Catla, *Cirrhinus mrigala*, *Labeo rohita* and *L. fimbriata*, were once available in large numbers growing to a very large size. These fishes became increasingly scarcer in recent years. Apart from carps, the lake used to support a rich fishery of catfishes, perches, murrels and eels. Presently the fishery consist mostly air breathing fishes which are also depleted. Their number has not dwindled so drastically as the major carps.

The commercial catches are represented by Carps, Catfishes, Feather-backs, Eels, Perches, Murrels and rest of them belonging to miscellaneous category(50% or more). *Clarias batrachus* and *Heteropneustes fossilis* carry high economic value; though these are becoming

rare. Besides the Carp species *Mystus cavasius*, *Ompok bimaculatus* & *Wallago attu* have moderate economic value. Out of 43 species, thirty are commercially important as aquarium as well as edible species, 13 species have food values and two species are classified as coarse food fishes as they form food for poor people of this region. Three species are suitable for aquarium, while five species have importance in public health, as they are larvivorous and 4 are of medicinal value.

The Wetlands in north Bihar have been the worst victim of the anthropogenic pressures and have undergone tremendous ecological changes. These are facing multidimensional threats and are under severe pressure in the face of ever increasing human interference [22,23]. Plethora of factors viz. Weed infestation, siltation, pollution, eutrophication, agricultural encroachments water abstraction, illegal fishing, besides conversion of wetland for aquaculture contributing to the decline in habitat quality and species population has been growing in the past few decades.

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