



RESEARCH PAPER

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Study on Fish biodiversity of some landing sites and markets of Barpeta District, Assam, India

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Abstract

In a study conducted in the Barpeta district of Assam, India, 60 species of fishes belonging to 9 orders and 23 families were identified. Data collection was done by survey of landing sites and markets and information collected from fishermen. Order wise abundance of fish species are Osteoglossiformes 02; Clupeiformes 01; Cypriniformes 22; Characiformes 01; Siluriformes 15; Cyprinodontiformes 01; Synbranchiformes 01; Perciformes 16; Tetraodontiformes 01. The family Cyprinidae had the highest number of 20 species followed by the family Bagridae with 6 species and Channidae with 4 species. Most species were used as food and some species had ornamental values also.

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Introduction

Fishes are the most abundant class of vertebrates and are also used as a food all throughout the world. Fishes provide a good source of proteins for human and many fishes also have ornamental values. Fishes are easily available and have a global diversity of 32,500 species, of which almost 15,000 species of freshwater. Freshwater habitats have a high density of fishes as compared to marine habitat (Pir *et al.*, 2019).

Barpeta district of Assam, India has many fresh water habitats including many fish rearing ponds. The fishery sector plays a major role in the local economy of the region.

Many studies have been conducted on the fish diversity of Barpeta district of Assam. A study of the Beki River of the region reported 114 species of fishes belonging to 73 genera, 11 orders and 31 families (Kalita and Sarma, 2015). In a study by Thakuria and Deka (2020), 65 economically important fish species were reported from the Kapla *Beel*, which is a fresh water flood plain wetland of Barpeta. 51 species belonging to 7 orders and 17 families were reported from four sampling station of the Pahumara River of Barpeta District (Bhuyan, 2023). Another similar study in the Puthimari *Beel* of the region reported 46 species of fishes belonging to 37 genera, 8 orders and 19 families (Talukdar and Rajbongshi, 2018).

Human activities like over fishing, destruction of habitats or pollution of habitats are causing an adverse effect on the fish population (Yin *et al.*, 2022). This study tries to find out the Ichthyofaunal diversity of the Barpeta district of Assam by surveying some fish landing sites and markets. Fishes having food value as well as ornamental values are taken into consideration in this study.

Materials and methods

Study Area

The study was conducted in the Barpeta district of Assam, India. It is a riverine plain lying in the lower Brahmaputra valley. According to Rajbongshi *et al.*, 2016, the Barpeta district is the highest fish seed producing district in Assam.

Collection of data

During this study various landing sites were surveyed and information was collected from local fishermen. Fish markets were also visited and data on fishes were collected. 4 (four) markets and 3 (three) fish landing sites were surveyed during the study.

The markets were Barpeta daily market, Mandia market, Satrakanara market and Baghbar market. The fish landing sites were Brahmaputra River (near Baghbar), Bhelengi River (near Barpeta) and Alengi *beel* (near Baghbar). Fish abundance was based on frequency and amount of catch of various species. Type of water body like river, lakes or *Beels*, natural pond from which fishes were collected and the IUCN status of the species were recorded. Fishes having ornamental values were also recorded.

Identification of fishes

Fishes were identified on the sites of collection. Unidentified species were brought to the laboratory for identification in fresh condition. The fish species were identified using various literatures (Sarma, 2017).

Results and discussion

A total of 60 species of fishes belonging to 9 orders and 23 families were identified during the study. The various species of fishes, their orders and families along with IUCN status and abundance are given in tabular form (Table 1).

The Cypriniformes with 22 species, Perciformes with 16 and Siluriformes with 15 species were the most abundant orders. 2 species were recorded from the orders Osteoglossiformes. Rest of the orders viz., Clupeiformes, Characiformes, Cyprinodontiformes, Synbranchiformes and Tetraodontiformes had 1 species each (Table 2).

The order Cypriniformes is the most dominant order recorded during the survey. The second most dominant order is Perciformes and third is Siluriformes. Similar results were reported by Kanon *et al.*, 2022. The orders Cypriniformes, Perciformes, Siluriformes and Clupeiformes were also reported from the Kapla *Beel* of the study area (Chakravartty, *et al.*, 2012).

Table 1. Fish species, their IUCN status and abundance observed during the study.

SL	Scientific Name	Order	Family	IUCN Status	Abundance **
1	<i>Chitala chitala</i>	Osteoglossiformes	Notopteridae	NT	(++)
2	<i>Notopterus notopterus</i>	Osteoglossiformes	Notopteridae	LC	(++)
3	<i>Hilsa ilisha</i>	Clupeiformes	Clupeidae	LC	(++)
4	<i>Labeo rohita</i>	Cypriniformes	Cyprinidae	LC	(+++)
5	<i>Labeo bata</i>	Cypriniformes	Cyprinidae	LC	(+++)
6	<i>Labeo gonius</i>	Cypriniformes	Cyprinidae	LC	(+++)
7	<i>Labeo calbasu</i>	Cypriniformes	Cyprinidae	LC	(++)
8	<i>Cirrhinus mrigala</i>	Cypriniformes	Cyprinidae	LC	(+++)
9	<i>Ctenopharyngodon idellus</i>	Cypriniformes	Cyprinidae	NE	(+++)
10	<i>Cyprinus carpio</i>	Cypriniformes	Cyprinidae	VUL	(+++)
11	<i>Hypophthalmichthys molitrix</i>	Cypriniformes	Cyprinidae	NT	(+++)
12	<i>Hypophthalmichthys nobilis</i>	Cypriniformes	Cyprinidae	DD	(+++)
13	<i>Gibelion catla</i>	Cypriniformes	Cyprinidae	LC	(+++)
14	<i>Cirrhinus reba</i>	Cypriniformes	Cyprinidae	LC	(++)
15	<i>Systomus sarana</i>	Cypriniformes	Cyprinidae	LC	(+++)
16	<i>Puntius sophore</i>	Cypriniformes	Cyprinidae	LC	(+++)
17	<i>Puntius javanicus</i>	Cypriniformes	Cyprinidae	LC	(+++)
18	<i>Esomus danricus</i>	Cypriniformes	Cyprinidae	LC	(+)
19	<i>Amblypharyngodon mola</i>	Cypriniformes	Cyprinidae	LC	(+++)
20	<i>Cabdio morar</i>	Cypriniformes	Cyprinidae	LC	(++)
21	<i>Salmostoma bacaila</i>	Cypriniformes	Cyprinidae	LC	(++)
22	<i>Pethia ticto</i>	Cypriniformes	Cyprinidae	LC	(++)
23	<i>Devario devario</i>	Cypriniformes	Cyprinidae	LC	(++)
24	<i>Botia dario</i>	Cypriniformes	Cobitidae	LC	(++)
25	<i>Lepidocephalichthys guntea</i>	Cypriniformes	Cobitidae	LC	(++)
26	<i>Piractus brachypomus</i>	Characiformes	Serrasalminidae	NE	(+++)
27	<i>Mystus cavasius</i>	Siluriformes	Bagridae	LC	(++)
28	<i>Mystus vittatus</i>	Siluriformes	Bagridae	LC	(++)
29	<i>Mystus tengara</i>	Siluriformes	Bagridae	LC	(++)
30	<i>Sperata seenghala</i>	Siluriformes	Bagridae	LC	(++)
31	<i>Sperata aor</i>	Siluriformes	Bagridae	LC	(++)
32	<i>Rita rita</i>	Siluriformes	Bagridae	LC	(+)
33	<i>Ompok pabo</i>	Siluriformes	Siluridae	NT	(+)
34	<i>Wallago attu</i>	Siluriformes	Siluridae	LC	(++)
35	<i>Ailia coila</i>	Siluriformes	Schilbeidae	LC	(++)
36	<i>Clupisoma garua</i>	Siluriformes	Schilbeidae	LC	(++)
37	<i>Eutropiichthys vacha</i>	Siluriformes	Schilbeidae	LC	(++)
38	<i>Pangasius pangasius</i>	Siluriformes	Pangasiidae	LC	(++)
39	<i>Bagarius yarrelli</i>	Siluriformes	Sisoridae	NT	(++)
40	<i>Clarias magur</i>	Siluriformes	Claridae	EN	(++)
41	<i>Heteropneustes fossilis</i>	Siluriformes	Heteropneustidae	LC	(++)
42	<i>Xenentodon cancila</i>	Cyprinodontiformes	Belontiidae	LC	(++)
43	<i>Monopterusuchia</i>	Synbranchiformes	Synbranchidae	LC	(++)
44	<i>Parambassis ranga</i>	Perciformes	Ambassidae	LC	(++)
45	<i>Parambassis lala</i>	Perciformes	Ambassidae	LC	(+)
46	<i>Chanda nama</i>	Perciformes	Ambassidae	LC	(++)
47	<i>Nandus nandus</i>	Perciformes	Nandidae	LC	(++)
48	<i>Oreochromis mossambicus</i>	Perciformes	Cichlidae	NE	(++)
49	<i>Glossogobius giuris</i>	Perciformes	Gobiidae	LC	(+)
50	<i>Anabas testudineus</i>	Perciformes	Anabantidae	DD	(++)
51	<i>Trichogaster fasciatus</i>	Perciformes	Belontiidae	LC	(++)
52	<i>Trichogaster lalia</i>	Perciformes	Belontiidae	LC	(++)
53	<i>Channa gachua</i>	Perciformes	Channidae	LC	(++)
54	<i>Channa punctatus</i>	Perciformes	Channidae	LC	(+++)
55	<i>Channa marulius</i>	Perciformes	Channidae	LC	(+)
56	<i>Channa striatus</i>	Perciformes	Channidae	LC	(+++)
57	<i>Mastacembelus armatus</i>	Perciformes	Mastacembelidae	LC	(++)
58	<i>Macrognathus pancalus</i>	Perciformes	Mastacembelidae	LC	(+++)
59	<i>Macrognathus aral</i>	Perciformes	Mastacembelidae	LC	(+++)
60	<i>Leiodon cutcutia</i>	Tetraodontiformes	Tetraodontidae	LC	(+)

** (+) Rare; (++) Abundant; (+++) Highly abundant

The family Cyprinidae had the highest of 20 numbers of species. The family Bagridae had 6 species and Channidae had 4 species. The families Ambassidae, Mastacembelidae and Schilbeidae had 3 species each. The families Belontiidae, Cobitidae, Notopteridae and Siluridae had 2 species each. The rest of the families viz., Anabantidae, Belonidae, Cichlidae, Claridae, Clupeidae, Gobiidae, Heteropneustidae, Nandidae, Pangasiidae, Serrasalminidae, Sisoridae, Synbranchidae and Tetraodontidae were represented by one species each (Table 2). The families having the highest numbers viz., Cyprinidae and Bagridae were also reported from beels by Nag, *et al.*, (2017) and river Bhuyan, *et al.*, (2016) and Yousafzai and Khan (2013).

Table 2. Various Orders, Families and Number of species encountered during the study.

Order	Family	No. of species
Osteoglossiformes	Notopteridae	2
Clupeiformes	Clupeidae	1
Cypriniformes	Cyprinidae	20
	Cobitidae	2
Characiformes	Serrasalminidae	1
	Bagridae	6
	Siluridae	2
	Schilbeidae	3
Siluriformes	Pangasiidae	1
	Sisoridae	1
	Claridae	1
	Heteropneustidae	1
Cyprinodontiformes	Belonidae	1
Synbranchiformes	Synbranchidae	1
	Ambassidae	3
	Nandidae	1
	Cichlidae	1
Perciformes	Gobiidae	1
	Anabantidae	1
	Belontiidae	2
	Channidae	4
	Mastacembelidae	3
Tetraodontiformes	Tetraodontidae	1

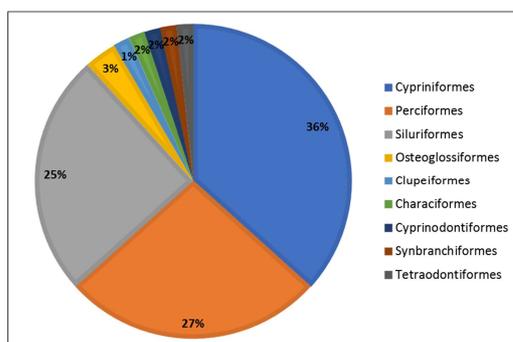


Fig. 1. Pie-diagrammatic representation of Order wise diversity of fishes in the study area.

The highly abundant species include the Cypriniformes fishes of genus *Labeo* like *L. rohita*, *L. bata* and *L. gonius*. Other highly abundant species are *Cirrhinus mrigala*, *Ctenopharyngodon idellus*, *Cyprinus carpio*, *Hypophthalmichthys molitrix*, *H. nobilis*, *Gibelion catla*, *Systemus sarana*, *Puntius sophore*, *P. javanicus*, *Amblypharyngodon mola* and *Piractus brachypomus*. Perciformes fishes like *Channa punctatus*, *Channa striatus*, *Macragnathus pancalus* and *M. aral* were also found to be highly abundant. Cypriniformes species were also found to be abundant in nearby places like Nalbari district of Assam (Bhuyan, 2023).

All other Cypriniformes species excluding the above-mentioned species were found to be moderately abundant. The fishes of order Osteoglossiformes viz., *Chitala chitala* and *Notopterus notopterus* were moderately abundant. *Hilsa ilisha* of order Clupeiformes, 13 species of Siluriformes, *Xenentodon cancila* of order Cyprinodontiformes, *Monopterus cuchia* of Synbranchiformes order, 9 species of Perciformes were also moderately abundant.

Species like *Esomus danricus* of order Cypriniformes, *Rita rita* and *Ompok pabo* of order Siluriformes; *Parambassis lala*, *Glossogobius giuris* and *Channa marulius* of order Perciformes and *Leiodon cutcutia* of order Tetraodontiformes were found to be rare during the study.

Species like *Hilsa ilsha*, *Cirrhinus reba*, *Systemus sarana*, *Cabdio morar*, *Salmostoma bacaila*, *Botia dario*, *Ailia coila*, *Clupisoma garua*, *Wallago attu*, *Rita rita*, *Bagarius yarrellii*, *Pangasius pangasius*, *Leiodon cutcutia* and *Eutropiichthys vacha* were found to be present only in Rivers or Beels. All the species of fishes were captured mainly for consumption purpose and they are a good source of protein (Hossain *et al.*, 1999).

During the survey it was observed that in addition to food value, many fishes also have ornamental values. But the ornamental fish market is not well developed in the study area. Species like *Amblypharyngodon mola*, *Botia dario*, *Chanda nama*, *Channa marulius*,

Channa punctatus, *Channa striatus*, *Esomus danricus*, *Lepidocephalichthys guntea*, *Macrornathus aral*, *Macrornathus pancalus*, *Notopterus notopterus*, *Parambassis ranga* and *Trichogaster fasciatus* are considered to be of excellent ornamental values (Rahman *et al.*, 2014).

A total of 8 (eight) exotic fishes were recorded during the study which included *Hilsa Ilisha*, *Ctenopharyngodon idellus*, *Cyprinus carpio*, *Hypophthalmichthys molitrix*, *Hypophthalmichthys nobilis*, *Puntius javanicus*, *Oreochromis mossambicus* and *Piractus brachypomus*. Hilsa species occurs in marine estuarine and riverine environments (Bhaumik, 2013). Those recorded in the study area comes from the river Brahmaputra. Rests of the exotic fishes are cultured in various ponds. Such species are also reported from other districts of Assam (Nag *et al.*, 2017) and also different parts of the country (Laxmappa, 2016).

Conclusion

In the present study a survey of 4 markets and 3 fish landing sites revealed the presence of 60 species of fishes from 9 orders and 23 families. Those fishes were either captured from rivers, beels or cultured in ponds. The most abundant orders were Cypriniformes, Perciformes and Siluriformes. A maximum of 22 species were recorded from the order Cypriniformes. Among the various families the family Cyprinidae had the highest of 20 species. 18 species were highly abundant; 35 species were relatively abundant while 7 species were only rarely encountered. 13 species of high ornamental values were also recorded during the study. Seven species of exotic fishes including *Ctenopharyngodon idellus*, *Cyprinus carpio*, etc. were found to be cultured in ponds in the area. Barpeta being the leading fish seed producer of Assam, fishing is of great economic significance in the region which has a huge area of natural water bodies.

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Declaration of interests

The authors of this paper do not have any conflicts of interest.

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