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A STUDY ON ICHTHYO-DIVERSITY OF JIA BHARALI RIVER, ASSAM, INDIA

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Abstract:

An attempt has been made to study the fish fauna found in Jia Bharali River,Sonitpur, Assam. The field survey was undertaken from April 2013 to March 2014 in the river Jia Bharali. The river is an important tributary of the mighty Brahmaputra. Total 56 species of 19 families (under 8-orders) were identified during the study period. The maximum representation of the order–Cypriniformes (41.07%; N=23) followed by Siluriformes (21.42%; N=12), Perciformes (17.85%; N=10), Synbrachiformes, Clupiformes and Beloniformes (each 5.3%; N=3), Tetradontiformes and Anguilliformes (each 1.78%; N=1). The present paper deals with an exhaustive list of ichthyofauna, collection locality, scientific name, local name based on their locality and their conservation status as per IUCN status.

Key words: Fish diversity, Jia-Bharali River, Sonitpur.

INTRODUCTION

Fishes are the important elements in the economy of many nations as they have been a stable item in the diet of many people. They constitute slightly more than half of total number of approximately 54,711 recognized vertebrate species of fish [Nelson 2006]. Of these, 8411 are fresh water species and 11650 are marine. India is one of the mega biodiversity country in the world and occupies the ninth position in terms of fresh water mega biodiversity [Mittermeier, R.A and C.G Mittermeier (1997)].In India ,there are C,2500 species of fishes, of which C,930 lives in fresh water and C,1570 are marine [Kar, D. (2003a)].The Northeastern region of India is considered to be one of the hotspots of fresh water fish biodiversity in the world (Kottelat and Whitten, 1996; Ramanujam *et al*. 2010).

Assam has an excellent sub-tropical climate for development of fresh water fish culture in a variety of aquatic bodies. The state of Assam which forms about 30% of the North-Eastern region has Brahmaputra and the Barak systems and their numerous tributaries (Combined length,

5,050 Kilo-Meter). The Brahmaputra is the major river of Assam, flows from east to west and runs through a distance of 730 kms, having 42 tributaries of which 27 are in the north bank and 15 in the south bank. The Jia Bharali, one of the major tributaries of the river Brahmaputra , flows down from the lower Himalayas in Arunachal Pradesh in the north-eastern India and runs through the middle of Sonitpur district of Assam for about 66 km before meeting the Brahmaputra at Tezpur (92°53'53"E: 26°39'15"N). The Jia Bharali river catchment area is bounded by longitudes 92°00'-93°25'E and latitude 26°39'-28°00'N. The river known as Kameng in Arunachal Pradesh flows orthogonal to the Himalayan thrust pattern and deflects along the Tipi thrust in north and foothills fault in the south respectively, before debouching into the foreland at Bhalukpung (92°65'E: 27°01'N) where it takes the name of Jia Bharali. Its upper reaches originate in the upper Himalayan range at an elevation of ~5400m and in the lower Panch mile range at an elevation of ~69m. The upper stretches of river Jia Bharali from Bhalukpung to Balipara (under Nameri National park, Assam) in Sonitpur district spanning about 100 km provided excellent spots for sport fishing and rafting. The river has become the most famous eco-tourism centre of state where Assam Bhoroli Anglers Association organise angling competition every year during the winter season. The anglers come from different parts of the world for angling of golden mahseer which is also known as Tiger of Himalayan River. The mahseer is a migratory fish running the main river for spawning and its distribution has more to do with the water temperature prevailing in the streams rather than the altitudinal range (Vass, K. K., 2005).The Jia Bharali River system passes through a thick forest cover having rich bio-diversity and flows through the Doimara reserve forest, Pakke Wildlife Sanctuary and Eagle Nest Wildlife Sanctuary in Arunachal Pradesh and in the lower catchment after Bhalukpung, Jia bharali flows through the Nameri National park and Balipara reserve forest of Assam. The surface water temperature 22°-27°C in wet seasons and 17°-23°C in the dry seasons and water is slightly alkaline in nature during both the seasons [Khound *et al* (2012)]. The ecological condition of Jia Bharali River is quite favourable for diversity of fish fauna along with its subtropical humidity. Considering this background a preliminary survey was carried out to determine the fish fauna of the Jia Bharali River.

1. MATERIALS AND METHODS

To collect various data on capture fishes, investigations were conducted twice in a month from April 2013 to March 2014. Investigations of fishes were conducted in four selected catchment areas with the help of fishermen during the time of fishing. The selected catchment area are respectively-Jamugurihat (26°44'14"N: 92°56'15"E), Towbhanga (26°52'44"N: 93°3'8E), Chariduar (26°52'N: 92°46'50"E) and Panch mile (26°40'37"N: 92°50'52" E). Fishing gear applied were mostly gill net, lift net, cast net, hooks and lines, bamboo traps etc. The market survey was conducted in morning during 7-10am and evening during 4-7pm at the nearest markets of the river site. Secondary data were also collected through observation and interaction with local people and fishermen communities of embankment areas. Fishes were preserved individually in 6% formaldehyde solution for identification and classification literatures of

Talwar and Jhingran (1991), Vishwanath, W. (2000) and Nath and Dey (2000) were followed. Information on local name, economic value and behaviour pattern was obtained from fishermen.

2. RESULTS AND DISCUSSION

The collected fish species from the four different stations including their order, family scientific name, common name and conservation status (IUCN) are depicted in the Table-1 & Fig. 1-2. The fish nomenclature is based on Fishbase.org and fish status was checked the IUCN red list (IUCN 2011). A total of 56 species belonging to 38 genera, 19 families and 8 orders have been recorded from the four stations of Jia Bharali River during the study period. The fish fauna of the river belongs to the following orders- Cypriniformes, Siluriformes, Perciformes, Synbrabchiformes, Tetradontiformes, Anguilliformes, Clupeiformes and Beloniformes. In our investigation order Cypriniformes was the most dominant group represent 23 species with 41.07% contribution of the total species followed by Siluriformes with 12 (21.42%) species and Perciformes with 10 (17.85%) species, Synbrabchiformes, Clupeiformes and Beloniformes each with 3 (5.35%) species, Tetradontiformes, and Anguilliformes each with (1.78%) species. Out of 19 families order Siluriformes contributes 5 (26.0%) families followed by Perciformes 4(21.0%) and Cypriniformes, Clupiformes and Beloniformes each contributes 2 (10.0%) families and Tetradontidae and Angulliformes each with 1(5.26%) family, (1.78%;N=1), Amphinidae (1.78%;N=1), Gobiidae (1.78%;N=1), Tetradontidae (1.78%;N=1), Anguillidae (1.78%;N=10), Clupeidae (1.78%;N=1) and Belonidae (1.78%;N=1). However family Cyprinidae dominates the catch list with twenty one species followed by five species of Bagridae and Channidae. Schilbedae families with three species whereas families Cobitidae, Siluridae, Chandidae, Anabantidae, Nandidae, Mastacembelidae and Notopteridae are represented by two and remaining 8 families contained single species.

Present study recorded the presence of two endangered species (Tor putitora and Clarias batrachus) and four near threatened species (Tor tor, Ompok pabda, Ailia coila and Chitala chitala) which is one of the important findings. Presence of Tor species is significant for this river but as these is placed in endangered and near threatened category in IUCN (2011). Of these one vulnerable species (Catla catla), forty two least concern species and six not evaluated species are recorded and percent occurrence of fishes under IUCN conservation status is given (Table-3).

Table-1: Fish species recorded in Jia Bharali River and their conservation status.

S.No	Order	Family	Scientific name	Local name	IUCN status
1	Cypriniformes	Cyprinidae	*Labeo rohita*	Rou	LC
2			*Labeo bata*	Bata	LC
3			*Labeo calbasu*	Mali	LC
4			*Labeo boga*	Bhangna	LC
5			*Labeo gonius*	Kurhi	LC

6			*Labeo dero*	Nepura	LC
7			*Catla catla*	Bahu	VUL
8			*Cirrhinus mrigala*	Mirika	LC
9			*Cirrhinus reba*	Laseem	LC
10			*Aspidoparia morar*	Boliora	LC
11			*Chela labuca*	Laupatia	NE
12			*Chela atpar*	Selkona	NE
13			*Amblypharyngdon mola*	Moa	LC
14			*Tor tor*	Jonga pitha	NT
15			*Tor putitora*	Pithia	EN
16			*Tor mossal*	Lobura	NE
17			*Barilius bama*	Balisonda	LC
18			*Puntinus sophore*	Puthi	LC
19			*Puntinus sarana*	Cheniputhi	LC
20			*Esomus denricus*	Darikona	LC
21			*Resbora elanga*	Eleng	NE
22		Cobitidae	*Lepidocephalus guntea*	Botia	LC
23			*Acanthocobitis botia*	Balibotia	LC
24	Siluriformes	Bagridae	*Mystus bleekeri*	Singorah	LC
25			*Mystus cavasius*	Borsingorah	LC
26			*Mystus menoda*	Gagol	NE
27			*Aorichthys aor*	Arii	LC
28			*Rita rita*	Litha	LC
29		Siluridae	*Ompok pabda*	Pabhoh	NT
30			*Wallago attu*	Barali	LC
31		Schilbedae	*Ailia coila*	Kadali/bapati	NT
32			*Clupisoma garua*	Neria	LC
33			*Eutropeichthys vacha*	Bacha	LC
34		Claridae	*Clarias batrachus*	Magur	EN
35		Heteropneustidae	*Heteropneustes fossilis*	Singi	LC
36	Synbrabchiformes	Nandidae	*Badis badis*	Dum vacheli	LC
37			*Nandus nandus*	Gadgedi	LC
38		Amphipnidae	*Monopterus cuchia*	Cuchia	LC
39	Perciformes	Chandidae	*Chanda nama*	Chanda	LC
40			*Chanda ranga*	Chanda	LC
41		Anabantidae	*Anabus testudenius*	Kawai	DD

42			*Calisa fasciatus*	Kholihona	LC
43		Channidae	*Channa gachua*	Cheng	LC
44			*Channa marulius*	Sal	LC
45			*Channa punctatus*	Goroi	LC
46			*Channa striatus*	Shol	LC
47			*Channa stewartii*	Chengeli	LC
48		Gobiidae	*Glossogobius giuris*	Patita mutura	NE
49	Tetradontiformes	Tetradontidae	*Tetradon cutcutia*	Gangatope	LC
50	Anguilliformes	Anguillidae	*Anguilla bengalensis*	Bami	LC
51	Clupeiformes	Notopteridae	*Notopterus notopterus*	Khandhuli	LC
52			*Chitala chitala*	Chital	NT
53		Clupeidae	*Gadusia chapra*	Karoti	LC
54	Beloniformes	Belonidae	*Xenentodon cancila*	Kokila	LC
55		Mastacembalidae	*Macrognathus aral*	Turi	LC
56			*Macrognathus pancalus*	Tora	LC

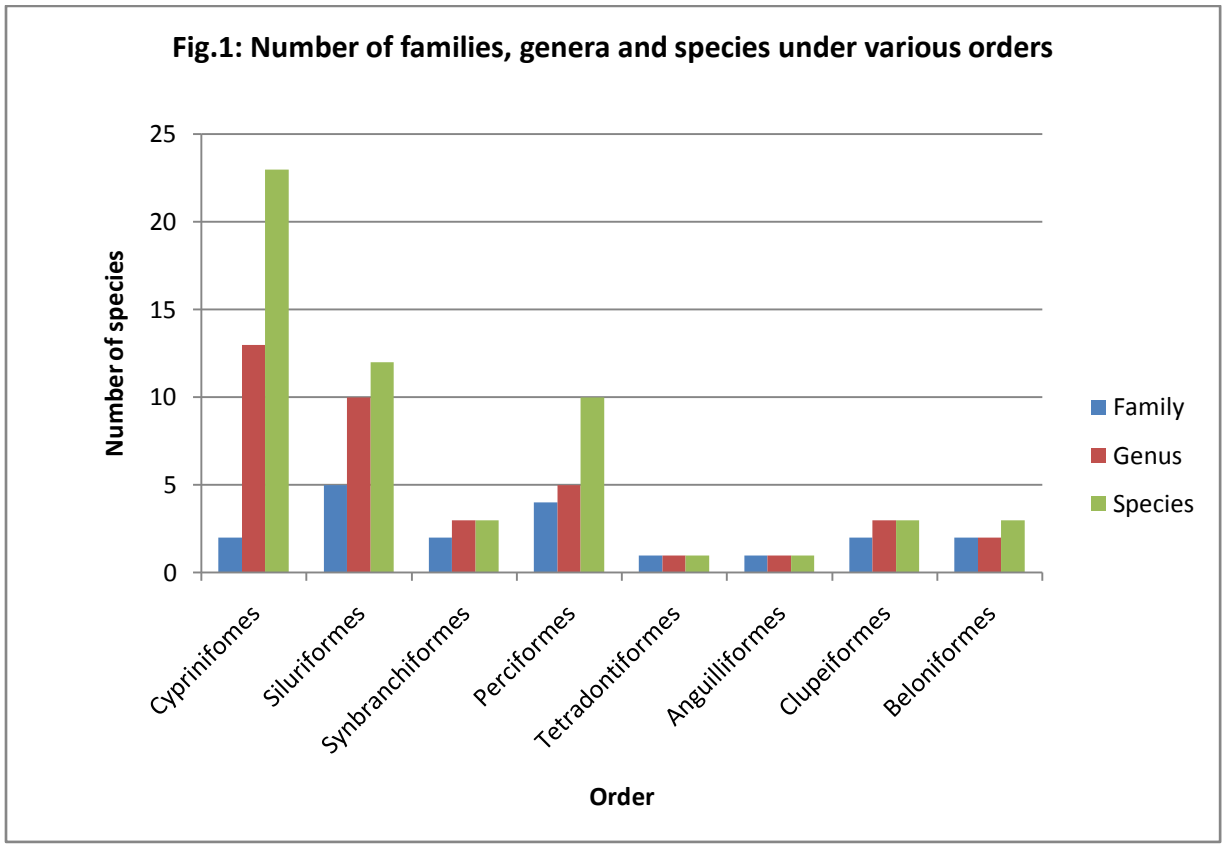
Abbreviation: EN-Endangered, VU-Vulnerable, NT- Near Threatened, LC- Least Concerned, DD- Data Deficient, NE- Not Evaluated

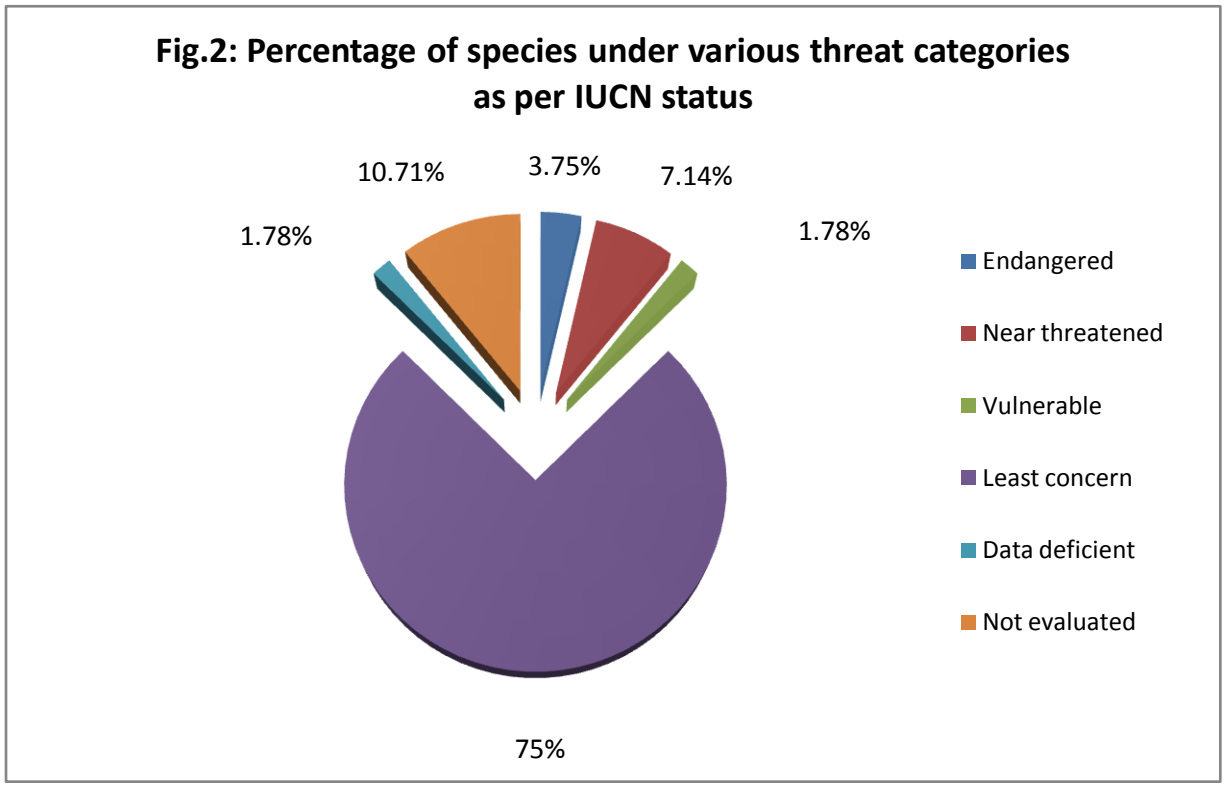
Table-2: Number and percent composition of families, genera and species under various orders

S.No.	Order	Families	Genera	Species	% of families in an order	% of genera in an order	% of species in an order
1	Cypriniformes	2	13	23	10.0	34.21	41.07
2	Siluriformes	5	10	12	26.0	26.31	21.42
3	Synbranchiformes	2	3	3	10.0	7.89	5.35
4	Perciformes	4	5	10	21.0	13.15	17.85
5	Tetradontiformes	1	1	1	5.26	2.63	1.78
6	Amguilliformes	1	1	1	5.26	2.63	1.78
7	Clupiformes	2	3	3	10.0	7.89	5.35
8	Beloniformes	2	2	3	10.0	5.26	5.35

Table-3: Percentage occurrence of fishes of Jia Bharali River under the conservation status- IUCN (2011)

	EN	VUL	NT	LC	NE	DD
Number of species	2	1	4	42	6	1
Percent contribution	3.57%	1.78%	7.14%	75%	10.71%	1.78%





CONCLUSION

The River Jia Bharali hosts a number of freshwater fish species including globally threatened species. The fish species of the river is under threat due to several anthropogenic factors including habitat degradation, pollution and irrational fishing. Fishing here is a tradition rather than commerce, considerable proportion of rural people are meeting their own requirement of fish by own catch. The river Jia-Bharali provides huge scope of fish production and local people depends on it for their livelihood. Over fishing occurs due to high fish prized species. Moreover; fisherman use small sized nets (1-3 mm) to catch the small fishes. In this locality community fishing is organised on the eve of Makar Sankranti (Magh bihu) and for this occasion fisherman using different indigenous fish capturing techniques to capture some prized species. Effective implementation on the regulation on mesh size and fishing gear is much needed to prevent over exploitation. Since the fish fauna in this region also supports the livelihood of several economic classes there is an urgent need to understand the conservation priorities and to design and implement conservation action plans.

Present study is the first ever documentation of fish fauna in the river Jia-Bharali from the Sonitpur district of Assam. Though the river is affected by different climatic hazards yet it has found abundance of fish population and diversity migrated from upstream. In spite of having

a huge fishery development potential the Sonitpur district is lagging behind compared to some other district in respect of production of fish. The concerned authorities as well as public should take adequate steps to modernise the fishery sector. It can boost up the economy of the nation. The river has two endangered species which have very rare occurrence in the natural habitat and receives a high demand in the market. Considering their potential, artificial breeding can be practiced which have manifold advantages like conservation state can be achieved and helps in employment generation. It can also save genetic resources of fish from the verge of extinction. Moreover; declaration of the river as "Fish sanctuary" could be the welcome step to conservation of threatened species.

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