

ICHTHYOFAUNAL DIVERSITY OF JINARI RIVER IN GOALPARA, ASSAM, INDIA

Dhiraj Kumar Borah and *Jugabrat Das

Department of Zoology, Goalpara College, Goalpara, Assam, India,

**Author for Correspondence: dasjugabrat21@gmail.com*

ABSTRACT

The present study attempts to access the ichthyofaunal diversity of Jinari river in Goalpara district of Assam, India. There was no previous report on piscine diversity of this river in Assam. Survey was conducted in the lower stretch of the river in Goalpara district from April 2018 to March 2019. Fish specimens were collected from five pre-selected sites, preserved and identified adopting standard methods. A total of 74 fish species belonging to nine (9) orders, 26 families and 58 genera were recorded. Cypriniformes was the dominant order with 35 species followed by Siluriformes with 19 species. IUCN status shows two vulnerable, eight near threatened and 66 species under the least concern category. Prevalence of anthropogenic threats like garbage dispersal and agricultural pesticide flow to the river, setting of brick industries on the bank, poison fishing in the upper stretch etc. may affect the fish population in this river. In this regard, awareness is the need of the hour among the inhabitants of the surrounding villages.

Keywords: *Ichthyofauna, Jinari River, Goalpara, Brahmaputra River, Assam*

INTRODUCTION

The Northeastern region of India is considered to be one of the hotspots of freshwater fish biodiversity in the world (Ramanujam *et al.*, 2010). The region is blessed with two major river systems—Brahmaputra and Barak along with their tributaries. The hills and the undulating valleys of this area gives rise to large number of torrential hill streams, which leads to big rivers; and finally become part of the Ganga-Brahmaputra-Barak-Chindwin-Kolodyne-Gomati-Meghna system (Kar, 2003).

Brahmaputra and Barak river system harbours a large diversity of ichthyofauna, which is approximately 33.13% of the total Indian freshwater fish (Sen, 2000). So far, 267 fish species belonging to 114 genera under 38 families and 10 orders have already been reported from the region (Dutta *et al.*, 2018). In the earlier studies, Sinha (1994) reported 230 fish species, belonging to 103 genera and 36 families from the northeastern India. Goswami *et al.* (2012) listed a total of 422 fish species belonging to 39 families from northeast India including Himalayan and Indo Burma biodiversity hotspots.

Assam, one of the north eastern states is also very rich in ichthyofaunal diversity. A total of 217 fish species belonging to 104 genera 37 families and 10 orders have been recorded from the wetland and other water bodies of Assam (Bhattacharjya *et al.*, 2003). Moreover, various workers carried out numbers of studies on diversity of fish in different district of the state (Kar *et al.*, 2006; Sarma *et al.*, 2012; Koushik and Bordoloi, 2016; Nath and Deka, 2012; Baro *et al.*, 2014).

Goalpara district of Assam is situated on the south bank of river Brahmaputra, which covers an area of 1,8,31 square kilometers. The main tributaries of the river Brahmaputra in the district are—Dudhnoi, Krishnai, Jinjiram, Deosila and Jinari river. All these rivers are perennial in nature. However, studies on ichthyofaunal diversity in these rivers are very scanty (Saha and Bordoloi, 2009; Talukdar and Rajbongshi, 2017; Sarma and Dutta, 2012). There is no any checklist of fish fauna from Jinari river in Assam. The present paper reports for the first time on the ichthyofaunal diversity of this river in Goalpara district of Assam, India.

MATERIALS AND METHODS

Study area

Goalpara district of Assam lies between latitude 25°53'–26°30'N and longitude 90°07'–91°05'E. The Jinari river, a small tributary of river Brahmaputra lies on the Southern Bank of the Brahmaputra river in Goalpara district. It lies between 90°20'0"E–90°42'30"E longitude and 26°8'30"N–25°44'0"N latitude. The river covers an area of 432.9 km² and surrounded by Dudhnoi-Krishnai sub basin on the east and south and the Jinjiram river on the West and by the Brahmaputra to the north (Kalita *et al.*, 2018). Jinari river mainly originates from Nokrek peak (Meghalaya) located about 1412 m MSL, flows through certain areas of West Garohills and East-Garohills and finally reaches the plains of Assam at Goalpara district.

Sampling Methods

Survey was conducted in the lower stretch of the Jinari river in Goalpara district, Assam. Fish specimens were collected monthly from April 2018 to March 2019. Survey was done in five pre-selected sites mostly in the morning hours (from 6.AM – 9 AM). Fishing nets of different mesh sizes (such as lift net, hand net, gill net etc.) were used by the fishermen for fishing. The collected specimens were immediately preserved in 10% formaldehyde solution and transported to the Zoology laboratory of Goalpara College for morphometric measurement and identification of each species. The specimens were identified following Talwar and Jhingran (1991); Vishwanath (2002) and Jayaram (2010). Current conservation status of each species was verified using the website: www.iucnredlist.org (IUCN, 2020). Nomenclature and classification of all the recorded species were validated using the website: www.fishbase.org (Froese and Pauly, 2019), www.calacademy.org/research/ichthyology and www.iucnredlist.org.

RESULTS AND DISCUSSION

The present study reveals the presence of 74 species of fishes belonging to nine (9) orders, 26 families and 58 genera from Jinari river in Goalpara district, Assam (table 1). The result indicates the occurrence of rich ichthyofaunal resources in the river. No previous literature is available on ichthyodiversity in this river. However, Saha and Bordoloi (2009) reported 59 fish species from two wetlands, Talukdar and Rajbongshi (2017) recorded 50 species from a wetland and Sarma and Dutta (2012) reported a total of 48 dominant fish species from two wetlands located in the Goalpara district of Assam.

Table 1: List of fish species recorded from Jinari river in Goalpara district, Assam

Order	Family	Scientific name	Conservation (IUCN, 2020)
Osteoglossiformes	Notopteridae	<i>Chitala chitala</i> (Hamilton, 1822)	Near Threatened
Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i> (Pallas, 1769)	Least Concern
Clupeiformes	Clupeidae	<i>Gudusia chapra</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Amblypharingodon mola</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Aspidoparia jaya</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Cabdio morar</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Barilius barna</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Laubuca laubuca</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Cirrhinus mrigala</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Cirrhinus reba</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Crossocheilus burmanicus</i> (Hora, 1936)	Least Concern
Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i> (Linnaeus, 1758)	Vulnerable
Cypriniformes	Cyprinidae	<i>Devario aequipinnatus</i> (McClelland, 1839)	Least Concern

Cypriniformes	Cyprinidae	<i>Devario devario</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Labeo bata</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Labeo calbasu</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Labeo gonius</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Labeo pangusia</i> (Hamilton, 1822)	Near Threatened
Cypriniformes	Cyprinidae	<i>Labeo rohita</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Puntius chola</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Pethia conchonius</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Barbonymus gonionotus</i> (Bleeker, 1849)	Least Concern
Cypriniformes	Cyprinidae	<i>Systemus sarana</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Puntius sophore</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Puntius terio</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Gibelion catla</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Rasbora daniconius</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Esomus danrica</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Rasbora rasbora</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Chela cachius</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Salmophasia bacaila</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cyprinidae	<i>Barilius bendelisis</i> (Hamilton, 1807)	Least Concern
Cypriniformes	Cyprinidae	<i>Crossocheilus burmanicus</i> (Hora, 1936)	Least Concern
Cypriniformes	Cyprinidae	<i>Chagunius chagunio</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Psilorhynchidae	<i>Psilorhynchus balitora</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Nemacheilidae	<i>Paracanthocobitis botia</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cobitidae	<i>Botia dario</i> (Hamilton, 1822)	Least Concern
Cypriniformes	Cobitidae	<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	Least Concern
Siluriformes	Bagridae	<i>Sperata aor</i> (Hamilton, 1822)	Least Concern
Siluriformes	Bagridae	<i>Mystus bleekeri</i> (Day, 1877)	Least Concern
Siluriformes	Bagridae	<i>Mystus cavasius</i> (Hamilton, 1822)	Least Concern
Siluriformes	Bagridae	<i>Mystus tengara</i> (Hamilton, 1822)	Least Concern
Siluriformes	Bagridae	<i>Mystus vittatus</i> (Bloch, 1794)	Least Concern
Siluriformes	Bagridae	<i>Rita rita</i> (Hamilton, 1822)	Least Concern
Siluriformes	Siluridae	<i>Ompok bimaculatus</i> (Bloch, 1794)	Near Threatened
Siluriformes	Siluridae	<i>Ompok pabda</i> (Hamilton, 1822)	Near Threatened
Siluriformes	Siluridae	<i>Ompok pabo</i> (Hamilton, 1822)	Near Threatened
Siluriformes	Siluridae	<i>Wallago attu</i> (Bloch & Schneider, 1801)	Vulnerable
Siluriformes	Schilbeidae	<i>Ailia coila</i> (Hamilton, 1822)	Near Threatened
Siluriformes	Schilbeidae	<i>Eutropiichthys vacha</i> (Hamilton, 1822)	Least Concern
Siluriformes	Schilbeidae	<i>Clupisoma garua</i> (Hamilton, 1822)	Least Concern
Siluriformes	Sisoridae	<i>Gagata cenia</i> (Hamilton, 1822)	Least Concern
Siluriformes	Sisoridae	<i>Sisor rabdophorus</i> (Hamilton, 1822)	Least Concern
Siluriformes	Sisoridae	<i>Glyptothorax telchitta</i> (Hamilton, 1822)	Least Concern
Siluriformes	Clariidae	<i>Clarias batrachus</i> (Linnaeus, 1758)	Least Concern
Siluriformes	Chacidae	<i>Chaca chaca</i> (Hamilton, 1822)	Least Concern

Siluriformes	Heteropneustidae	<i>Heteropneustes fossilis</i> (Bloch, 1794)	Least Concern
Mugiliformes	Mugilidae	<i>Rhinomugil corsula</i> (Hamilton, 1822)	Least Concern
Beloniformes	Belonidae	<i>Xenentodon cancila</i> (Hamilton, 1822)	Least Concern
Perciformes	Ambassidae	<i>Chanda nama</i> (Hamilton, 1822)	Least Concern
Perciformes	Nandidae	<i>Nandus nandus</i> (Hamilton, 1822)	Least Concern
Perciformes	Badidae	<i>Badis badis</i> (Hamilton, 1822)	Least Concern
Perciformes	Gobiidae	<i>Glossogobius giuris</i> (Hamilton, 1822)	Least Concern
Perciformes	Anabantidae	<i>Anabas testudineus</i> (Bloch, 1792)	Least Concern
Perciformes	Osphronemidae	<i>Trichogaster fasciata</i> (Bloch & Schneider, 1801)	Least Concern
Perciformes	Osphronemidae	<i>Trichogaster lalius</i> (Hamilton, 1822)	Least Concern
Perciformes	Osphronemidae	<i>Ctenops nobilis</i> (McClelland, 1845)	Near Threatened
Perciformes	Channidae	<i>Channa gachua</i> (Hamilton, 1822)	Least Concern
Perciformes	Channidae	<i>Channa punctatus</i> (Bloch, 1793)	Least Concern
Perciformes	Channidae	<i>Channa striata</i> (Bloch, 1793)	Least Concern
Synbranchiformes	Synbranchidae	<i>Monopterus cuchia</i> (Hamilton, 1822)	Least Concern
Synbranchiformes	Mastacembelidae	<i>Macrogathus aral</i> (Bloch & Schneider, 1801)	Least Concern
Synbranchiformes	Mastacembelidae	<i>Macrogathus pancalus</i> (Hamilton, 1822)	Least Concern
Synbranchiformes	Mastacembelidae	<i>Mastacembelus armatus</i> (Lacepede, 1800)	Least Concern
Synbranchiformes	Chaudhuriidae	<i>Garo khajuriai</i> (Talwar, Yazdani & Kundu, 1977)	Near Threatened
Tetraodontiformes	Tetraodontidae	<i>Leiodon cutcutia</i> (Hamilton, 1822)	Least Concern

Family wise distribution of the recorded fish species are presented in the Figure 1. So far ichthyofauna of rivers in Assam is concern; Baishya *et al.* (2016) reported a total of 52 small indigenous fish species belonging to 15 families and 33 genera from upper reaches of Brahmaputra river in Assam. In Kokrajhar

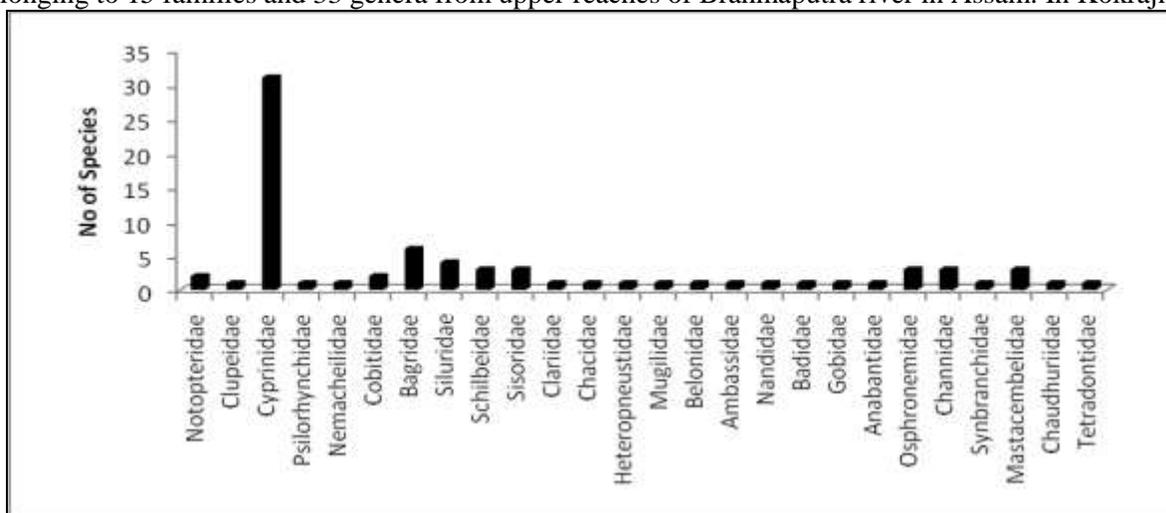


Figure 1: Family wise distribution of fish species of Jinari river in Goalpara district, Assam

District, Baro *et al.* (2014) reported a total of 49 ornamental fish species belonging to 34 genera, 18 families and 6 orders from the River Sonkosh (a tributary of Brahmaputra river). Sarma *et al.* (2012)

reported a total of 97 species under 26 families from the lower reaches of river Brahmaputra river in Goalpara district. In Lakhimpur district, Koushik and Bordoloi (2016) reported 61 species of fishes belonging to six orders, 17 families and 45 genera from the Ranganadi. Thus, comparing to these literatures, the number of fish genus (58 nos) and families (26 nos) recorded in this study is higher, which reveals the occurrence of diverse group of fishes in the river.

Highest numbers of species (35 nos.) belongs to the order Cypriniformes followed by Siluriformes with 19 fish species. Perciformes was represented by 11 species while Osteoglossiformes was represented by two species. Clupeiformes, Mugiliformes, Beloniformes and Tetradontiformes were represented by one each. Similar observation on dominant order was also made by Mandal (2018) in Khowai river (Tripura), Sarma *et al.* (2012) in Brahmaputra river (Assam), Acharjee *et al.* (2012) in Dhansiri river (Nagaland), Kaushik and Bordoloi (2016) in Ranganadi river (Assam) and Baishya *et al.* (2016) in Brahmaputra river (Assam).

This study records the presence of two vulnerable species (*Cyprinus carpio* and *Wallago attu*), eight near threatened species and other 66 species are under least concern category as per IUCN (2020). It indicates that the river is a suitable habitat for varieties of important fish species. However, the river has been experiencing many anthropogenic threats like garbage dispersal to the river, flow of pesticide used in the agricultural field to the river, setting of brick industries on the river bank, over fishing, poison fishing in the upper stretch etc. Besides, increasing clearance of the dense forest for other land use in the peripheral area has triggered soil erosion in the Jinari river basin (Kalita *et al.*, 2018). Pesticides (especially organophosphates) used in the bank side paddy fields can affect the fish population (Acharjee *et al.*, 2012). According to Kottelat and Whitten (1996), drastic reduction in abundance of the freshwater fishes in the northeastern region is due to destruction of the habitat, overexploitation and other anthropogenic effects. The fish diversity of the Jinari river might have decreased due to these threats. There is an urgent need of awareness among the local inhabitants surrounding the river area to minimize the risk of pollution in the river. The present study was carried out only within 12 Km lower stretch in Goalpara, Assam. Further research in this river particularly in the upper stretch in Meghalaya state may result more number of fish species.

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