



# International Journal of Fauna and Biological Studies

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International  
Journal of  
Fauna And  
Biological  
Studies

ISSN 2347-2677

IJFBS 2017; 4(3): 26-31

Received: 05-03-2017

Accepted: 06-04-2017

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## Present status of fish biodiversity in Jamunashwori river under Mithapukur upazilla Rangpur, Bangladesh

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### Abstract

The present study was continued to measure present status of fish biodiversity in Jamunashwori River under Mithapukur upazilla, Rangpur, Bangladesh for a period three months from January to March 2017. The survey was done by questionnaire interviews of fishermen, focus group discussions (FGD), key informant interviews (KII) and secondary data collection. The present study had revealed the presence of 46 species under 18 family of fish from the Jamunashwori River. Among the recorded 46 species; 18 species were abundant (39.13%), 11 species common (23.91%), 11 species less common (23.91%) and 6 species were rare (13.04%) respectively. Catfishes (21.74%) were the most dominant group followed by Carps (19.56%), Barbs and Minnows (15.22%), Perches (10.87%), Snakeheads (8.70%), Eels (6.52%) and Miscellaneous (17.39%) respectively. According to IUCN (2015a, b) 46 species were recorded that 73.91% were least concern, 4.38% vulnerable, 10.87% near threat and 10.87% endanger respectively. This study will be very helpful to identify areas of high fish biodiversity and to select nature reserves to mitigate the loss of fish biodiversity in the Jamunashwori River.

**Keywords:** Fish Biodiversity, Jamunashwori River, Mitigation of biodiversity loss

### 1. Introduction

Bangladesh is exclusively endowed with extremely rich and extensive inland and marine water resources [11]. Bangladesh ranked third in Asia, with approximately 260 indigenous fresh water species with 143 small indigenous species [18]. The inland aquatic habitats of Bangladesh are rich in faunal biodiversity containing at least 265 species of finfish, 63 species of prawn, several species of turtles, tortoises, freshwater mussels and other living aquatic organisms [17]. Among 260 species of freshwater fishes, 143 may be considered as small indigenous species (SIS). Small indigenous species of fish grow to a maximum length of 25 cm and can multiply rapidly in any freshwaters and also in captivity. Fish biodiversity in Bangladesh including SIS are Indian major carps, minor carps, large and small catfishes, river shads, snakeheads, freshwater eels, perches, loaches, anchovies, gobies, feather backs, rays, glassfishes, mullets, minnows, barbs and pomprates. Above these species play an important role as a source of animal protein for billions of people worldwide and support the livelihoods of 10-12 % inhabitants in the world. In 2011, global aquaculture production was increased to 62.7 from 59 million tons in 2010 of which 89% came from Asia where Bangladesh achieved 5th position [8] which was replaced by 4th position through advancement in 2013 [9]. Demand for fish is leaping with the population increase in Bangladesh for the last three decades [8] which has increased the land use competition between agricultural crop production and fish farming [2]. About 6 million peoples are directly or indirectly engage in this sector [6]. The area of inland open water capture fisheries is 3.91 million hector which contribute in the total fish production of the country is 995805 MT [6] and rivers are the most principal source of inland capture fisheries. About 700 river flows through the country with their tributaries and distributaries, the total length of which is about 24,140 kilometers [22]. Janunashawori River originated from Beel areas of Domar Upazilla (Nilphamari) that flows through Domar, Jaldhaka, Taraganj, Badargonj, Mithapukur and Nawabganj Upazilla and finally discharged in Korotoya river at Nawabganj Upazilla. Length of this river is 163 km. Width is 50 meters and catchment size is 750 sq. km. The river is an important and well-known river in north Bengal of Bangladesh in terms of fish production and source of income for many fishermen adjacent area of this river. But, at present time, reduction in the abundance and fish species from the inland waters of Bangladesh is a burning issue in the country [10, 15].

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Fish biodiversity of this has been degraded due to many reasons such as overfishing, aquaculture practice, exotic species, habitat loss and degradation, segmentation, pollution, alterations to hydrology, dredging etc. Thus the availability of our indigenous freshwater fish species have been declined to a great extent over the years and many of them are either rare or at the verge of extinction. Among the 260 freshwater fish species 54 are threatened in Bangladesh [14]. This river plays a very important role in the alleviation of rural poverty and supplying food to the poor fishermen. Considering the above fact, the present study was carried out to know the present status of fish biodiversity.

**2. Materials and Methods**

The study was carried out in Jamunashwori River under Mithapukur upazilla in Rangpur district during period of January to March 2017. In the study, a total of 75 fishermen (both professional and subsistence) were randomly selected from three union (Khoragachh, Mayanpur and Balua Masumpur) surrounding the river. The river is located in between 25°26' and 25°41' north latitudes and in between 89°06' and 89°27' east longitudes. At first, primary information was collected from Senior Upazila Fisheries Officer, Mithapukur regarding the fish biodiversity and fish availability in Jamunashwori River.

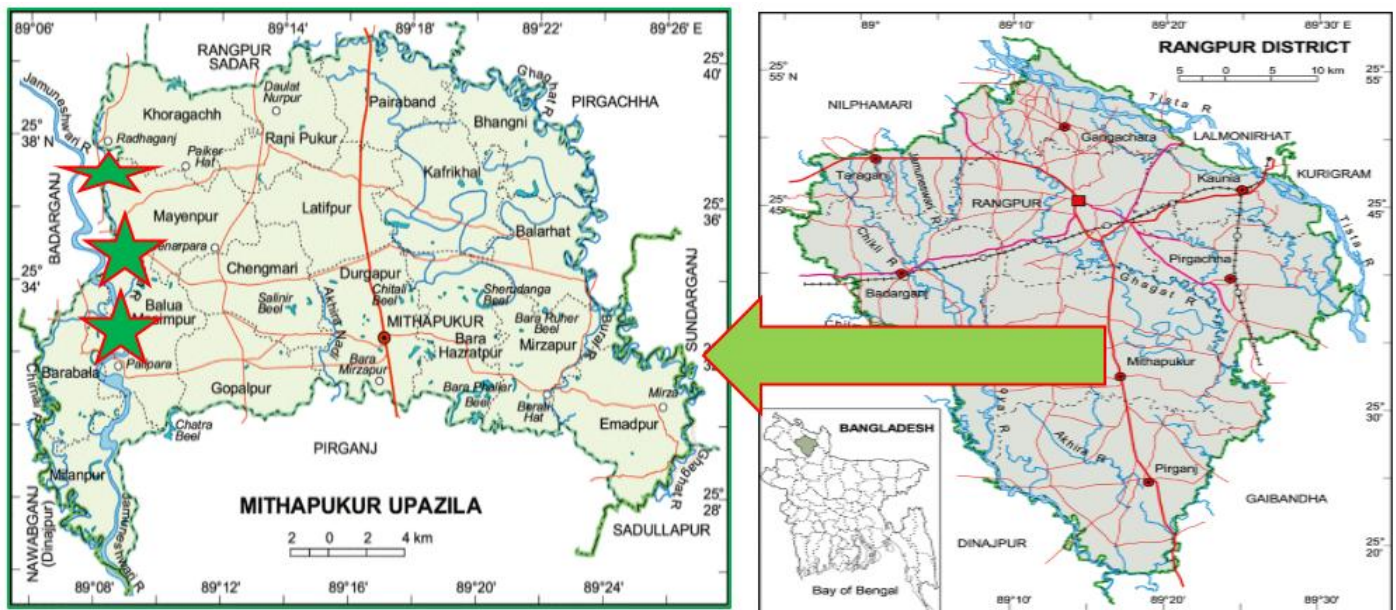


Fig 1: Map of Study area

During collection of data, both primary and secondary sources were considered. For the study a combination of interview schedule, participatory rural appraisal (PRA) tool such as, focus group discussion (FGD), social mapping and cross interviews with key informants were used for fishermen. The collected data were summarized and processed for analysis by using MS Excel and SPSS-20 version. Tables, graph, pie-chart etc. had been used for data presentation.

**3. Results**

A list of 46 fish species were recorded at Jamunashwori river. These were catfishes, carps, snakehead, perch, eels, barbs and minnows and other miscellaneous species which are described below.

**3.1 Catfishes**

Ten species of catfish (21.74%) were recorded in study areas during the period of investigation (Table 1).

Table 1: A list of catfishes as recoded during the period of present study

SI No.	Family	Local name	Scientific name	As IUCN (2015a,b)	Remarks
1	Siluridae	Boal	<i>Wallago attu</i>	Vulnerable	Abundant
2	Heteropneustidae	Shing	<i>Heteropneustes fossilis</i>	Least Concern	Abundant
3	Bagridae	Tengra	<i>Mystus vittatus</i>	Least Concern	Common
4	Clariidae	Magur	<i>Clarius batrachus</i>	Least Concern	Common
5	Bagridae	Bujuri	<i>Mystus tengra</i>	Least Concern	Less common
6	Bagridae	Tengra	<i>Mystus vittatus</i>	Least Concern	Less common
7	Bagridae	Ritha	<i>Rita rita</i>	Endanger	Less common
8	Schilbeidae	Kajoli	<i>Ailia coilia</i>	Least Concern	Less common
9	Bagridae	Aair	<i>Mystus aor</i>	Least Concern	Rare
10	Schilbeidae	Bacha	<i>Eutropiichthys vacha</i>	Least Concern	Rare

**3.2 Carps**

During the study period 9 species of carps (19.56%) were recorded (Table 2).

**Table 2:** A list of carp species as recorded during the period of study

SI No.	Family	Local name	Scientific name	As IUCN (2015a, b)	Remarks
1	Cyprinidae	Rui	<i>Labeo rohita</i>	Least Concern	Abundant
2	Cyprinidae	Mrigal	<i>Cirrhinus cirrhosus</i>	Near Threat	Abundant
3	Cyprinidae	Catla	<i>Catla catla</i>	Least Concern	Abundant
4	Cyprinidae	Carpio	<i>Cyprinus carpio</i>	Least Concern	Common
5	Cyprinidae	Kalibaus	<i>Labeo calbasu</i>	Least Concern	Common
6	Cyprinidae	Silver carp	<i>Hypophthalmict-hys molitrix</i>	Least Concern	Common
7	Cyprinidae	Bata	<i>Labeo bata</i>	Near threat	Common
8	Cyprinidae	Goinna	<i>Labeo gonius</i>	Near threat	Rare
9	Cyprinidae	Bhagna	<i>Cirrhinus reba</i>	Near threat	Rare

### 3.3 Snakehead

Four species of snakehead (8.70%) were recorded during study period (Table 3).

**Table 3:** A list of snakeheads as recorded during the period of study

SI No.	Family	Local name	Scientific name	As IUCN (2015a, b)	Remarks
1	Channidae	Taki	<i>Channa punctatus</i>	Least Concern	Abundant
2	Channidae	Cheng	<i>Channa orientalis</i>	Least Concern	Common
3	Channidae	Shol	<i>Channa striatus</i>	Least Concern	Less Common
4	Channidae	Gojar	<i>Channa marulius</i>	Endanger	Rare

### 3.4 Perches

In case of perch, 5 species of perches (10.87%) were recorded (Table 4).

**Table 4:** A list of perch species as recorded during the period of study

SI No.	Family	Local name	Scientific name	As IUCN (2015a, b)	Remarks
1	Anabantidae	Koi	<i>Anabas testudineus</i>	Least Concern	Abundant
2	Centropomidae	Nama chanda	<i>Chanda nama</i>	Least Concern	Abundant
3	Anabantidae	Khalisha	<i>Colisa fasciatus</i>	Least Concern	Common
4	Anabantidae	Khalisha	<i>Colisa chuno</i>	Least Concern	Less common
5	Centropomidae	Lal chanda	<i>Chanda ranga</i>	Least Concern	Less common

### 3.5 Eels

Three species of eels (6.52%) were abundantly found (Table 5).

**Table 5:** A list of eel species as recoded during the period of present study

SI No.	Family	Local name	Scientific name	As IUCN (2015a, b)	Remarks
1	Mastacembelidae	Guchi baim	<i>Macrogathus pancalus</i>	Least Concern	Abundant
2	Mastacembelidae	Tara baim	<i>Macrogathus aculeatus</i>	Near Threat	Abundant
3	Mastacembelidae	Lal baim	<i>Macrogathus armatus</i>	Endanger	Less common

### 3.6 Barbs and minnows

During study period seven species of barbs and minnows (15.22%) were found (Table 6).

**Table 6:** A list of barbs and minnows as recoded during the period of study

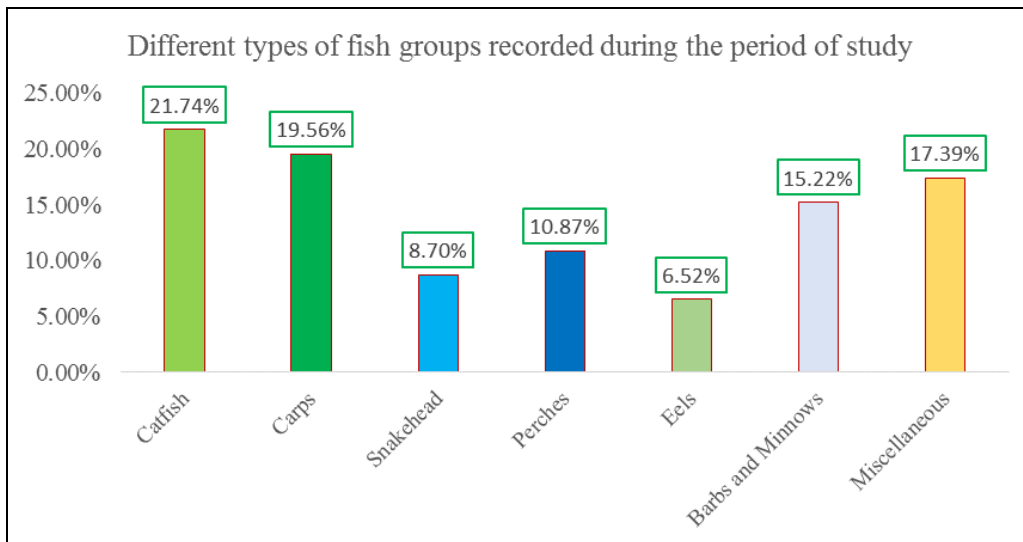
SI No.	Family	Local name	Scientific name	As IUCN (2015a,b)	Remarks
1	Cyprinidae	Mola	<i>Amblypharyngodon mola</i>	Least Concern	Abundant
2	Cyprinidae	Jatputi	<i>Puntius sophore</i>	Least Concern	Abundant
3	Cyprinidae	Titputi	<i>Puntius ticto</i>	Least Concern	Abundant
4	Cyprinodontidae	Darkina	<i>Esomus danricus</i>	Least Concern	Abundant
5	Cyprinodontidae	Pach chokha	<i>Aplocheilus panchas</i>	Least Concern	Abundant
6	Cyprinidae	Sharputi	<i>Puntius sarana</i>	Least Concern	Common
7	Cyprinidae	Dhela	<i>Rohtee cotio</i>	Least Concern	Less common

### 3.7 Miscellaneous

Eight other miscellaneous (17.39%) fish species (Table 7) were recorded during study period.

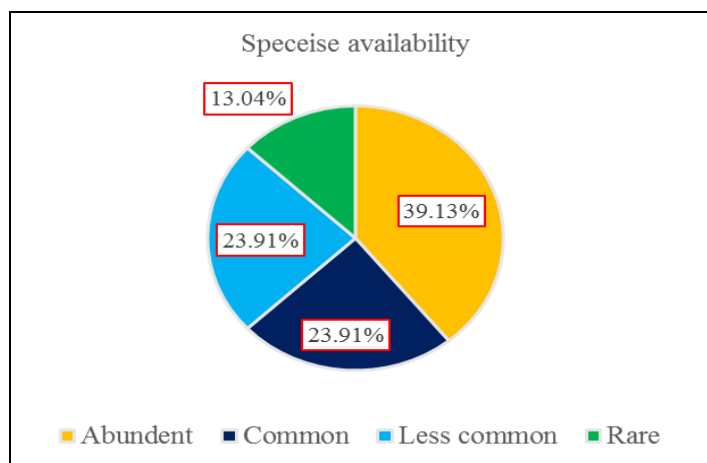
**Table 7:** A list of miscellaneous fish species as recorded during the period of study

SI No.	Family	Local name	Scientific name	As IUCN (2015a, b)	Remarks
1	Cobitidae	Gutum	<i>Lepidocephalus guntea</i>	Vulnerable	Abundant
2	Gobiidae	Bailla	<i>Glossogobius giuris</i>	Least Concern	Abundant
3	Palaemonidae	Gura chingri	<i>Macrobrachium lumarre</i>	Least Concern	Abundant
4	Belonidae	Kakila	<i>Xenentodon cancila</i>	Least Concern	Common
5	Palaemonidae	Beel chingri	<i>Macrobrachium daganum</i>	Least Concern	Common
6	Cobitidae	Rani	<i>Botia Dario</i>	Endanger	Less common
7	Notopteridae	Chitol	<i>Notopterus chitala</i>	Endanger	Less Common
8	Tetraodontidae	Choto tepa	<i>Tetraodon cutcuttia</i>	Least Concern	Rare



**Fig 2:** Different types of fish groups recorded during the period of study

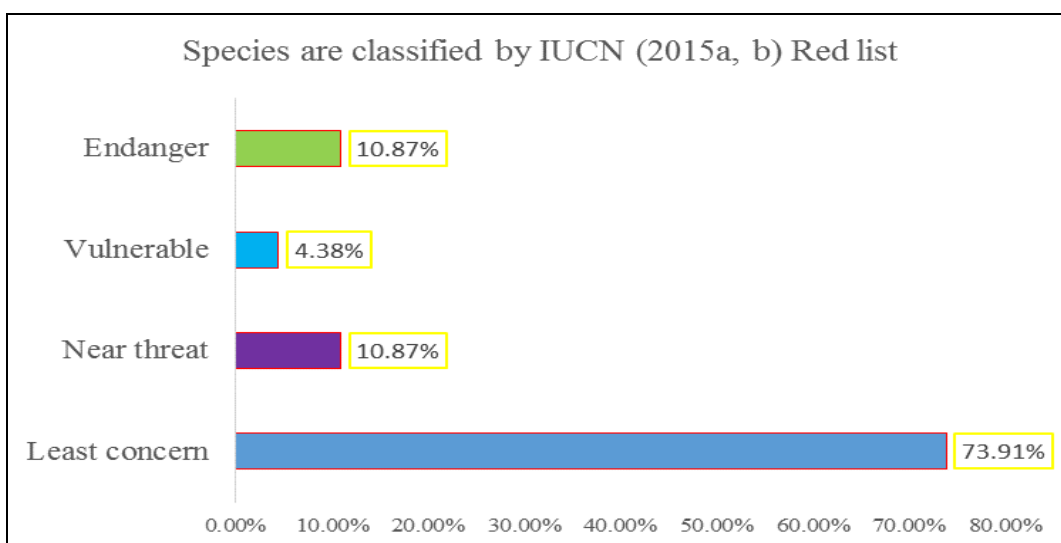
According to their availability fish were classified into four types such as abundant, common, less common and rare (Figure 3)



**Fig 3:** Types of availability of species

According to IUCN (2015 a, b) Species are classified a. Extinct (EX), b. Extinct in the wild, c. Threatened (1. critically endanger, 2. endanger and 3. vulnerable), d. near threatened, e. least concern, f. data deficient and g. not

evaluate. In the study area species are classified into four types such as endanger (10.87%), vulnerable (4.38%), near threat (10.87%) and least concern (73.91) (Figure 4).



**Fig 4:** Species are classified by IUCN (2015a, b) Red list

#### 4. Discussion

Bangladesh having vast and diversified water resources of 4.34 million ha is unique in term of valuable wetland ecosystem and associated aquatic biodiversity ranking third in Asia with approximately 260 indigenous fresh water species [18]. During the period of study 46 species of the fish fauna were recorded. Among them, 10 catfishes, 9 species of carps, 4 species of snakeheads, 5 species of perches, 3 species of eels, 7 species of barbs and minnows and 8 species miscellaneous were found in varying level of abundance. According to the abundance of fish species, they were categorized into four groups like abundant (39.13%), common (23.91%), less common (23.91%) and rare (13.04%). Among 46 species the highest numbers of fishes were catfish (21.74%) and the lowest (3.70%) eel. A total of 68 species recorded of fish in water bodies of Itna, Kishoregonj [21]. About 260 species of freshwater fish recorded belonging to 55 families in Bangladesh [17]. This was because only the observed fishes were recorded. The regular presence of freshwater catfish recorded belonging to the family Siluridae in the beels, haor, baors, flooded water bodies, ponds, streams and rivers of Bangladesh [20]. A total of 92 species of fish and prawn identified from Sylhet-Mymensingh sub-basins [13]. A list of 106 fish species published belonging to 68 genera from the district of Mymensingh and Tangail [7]. Among 46 species 73.91% were least concern, 10.87% were near threat, 4.38% were vulnerable and 10.87% were endanger in Jamunashwori river. There were some rare species which were very incidentally or occasionally available, such as- *Botia dario*, *Clupisoma garua*, *Puntius ticto*, *Osteobrama cotio* etc. The species *Botia dario* is endangered, *Clupisoma garua* is critically endangered, *Osteobrama cotio* is endangered agreeing with the present findings [14]. Once upon a time, small fishes were abundant in the rivers, *beels*, *jheels*, canals, streams, ponds etc. in Bangladesh [1, 16, 19]. But now-a-days, these species of fish are going to be disappeared despite of their ability to reproduce naturally due to environmental degradation. Fish habitat destruction by roads, embankments, drainage and flood control, and natural siltation along with over-fishing, have been commonly cited as causes of the deterioration of the country's resources [3, 12]. All these findings clearly indicate the need for water body specific detailed biodiversity studies which is essential to assess the present status and for the sustainable management of a body of water [15].

#### 5. Conclusion

Nowadays the fish biodiversity of the Jamunashwori river is under great threat due to fishing pressure, overfishing, pollution, siltation, urbanization and human intervention. These have been created a great impact on this river ecology. As a result, the water quality is deteriorating day by day and the availability of fish species and another aquatic biodiversity is decreasing gradually. The complete drying up in many parts of this river is a common scenario during lean season, which is detrimental to fish populations and ecosystem. The findings of the study will be applicable to the management of this river. Our govt. should take proper steps to save fish biodiversity in this river. People in adjacent areas should awareness. Moreover, the findings will to be useful to students, researchers and policy makers.

#### 6. Acknowledgement

The authors express their sincere thanks to the fisherman in Mithapuku upazilla, Upazila Fisheries Officer (UFO), Local Government and Engineering Department (LGED) office and Statistical office at Mithapukur Upazila for providing valuable information to accomplish this study successfully.

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