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International Journal of Environmental Biology

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ISSN 2277-386X

Original Article

A STUDY ON THE FISH BIODIVERSITY OF LOHALIA RIVER OF BANGLADESH

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Received 09 January 2016; accepted 15 February 2016

Abstract

Lohalia River is one of the largest and important river of southern part of Bangladesh. As it is a coastal river of Bangladesh, It has great fish biodiversity of both fresh water and estuarine species. A study was conducted from July to December 2014 to know the biodiversity of fishes in this river. The study was conducted on the basis of the present fish biodiversity and their status in the biodiversity in terms of vulnerable, endangered and critically endangered. A total of 30 species of fishes were recorded belonging to the 16 orders and 7 families. Rubel et.al. (2013) recorded 43 species of fish and crustaceans in Lohalia River. Majority of the fishes belonged to the family Perciformes (12) followed by Siluriformes (7), Cypriniformes (6) and other families were very rare. The fish species were facing threat to sustain in the biodiversity. Among the total fish biodiversity of Lohalia river, highest species belonged to the order perciformes (40%) followed by Siluriformes (24%), Cypriniformes (20%), Pleuronectiformes (4%) and Synbranchiformes, Tetraodontiformes, Beloniformes and Clupiformes encountered 3% each in the biodiversity. The fishes were found to belong to 18 families among which almost 20% species belonged to the family cyprinidae followed by channidae (10%), gobiidae (10%), bagridae (10%), Siluridae (7%) and other comprised 3% from each family. Almost 60% species were found to face threat at different degree among which almost 37% of species were found vulnerable, 17% species were endangered and 6% species were critically endangered in the fish biodiversity of Lohalia River. Another 40% species were found not threatened during the study. The negative human intervention and some natural causes were found responsible for the degradation of the fish biodiversity of the Lohalia River.

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Keywords: - Biodiversity, River, Coastal, Endangered, Critically endangered.

1 INTRODUCTION

Bangladesh is a riverine country. Thousands of rivers crisscrossed the country and each of the river has its own fish biodiversity according to its environment and hydrographic parameters. Bangladesh is rich in her fish faunas supporting at least 265 freshwater fin fish species (Mohsin et al, 2013). Lohalia River is one of the important river of southern part of Bangladesh which has been flowing over Patuakhali district. The river is actively tidal influenced and has a great fish biodiversity of both fresh water and estuarine species. As being an estuarine habitat, the river is a great choice of many species of fishes as their breeding ground.

As because of different natural and human intervention, the rivers of Bangladesh have been losing their fish biodiversity gradually (Khan *et al.*, 2013) and Lohalia river

is not exceptional. This is alarming to the fisheries of Bangladesh as well as the world. So the actual available fish species of the river should be known to conserve its natural biodiversity and the study was conducted based on this motto.

The natural cause of biodiversity loss include siltation, sea level rise due to global warming, changing the direction of water flow, changing season rotation etc. The human intervention include overfishing, under fishing, catching brood fishes during breeding season, making barrier on the way of movement of fishes by nets and traps and so on.

However, a total of 54 fish species of Bangladesh have been declared threatened by IUCN (IUCN Bangladesh, 2000) but majority of the wild populations have seriously declined in rivers and streams of Bangladesh due to over exploitation, various ecological changes and degradation of

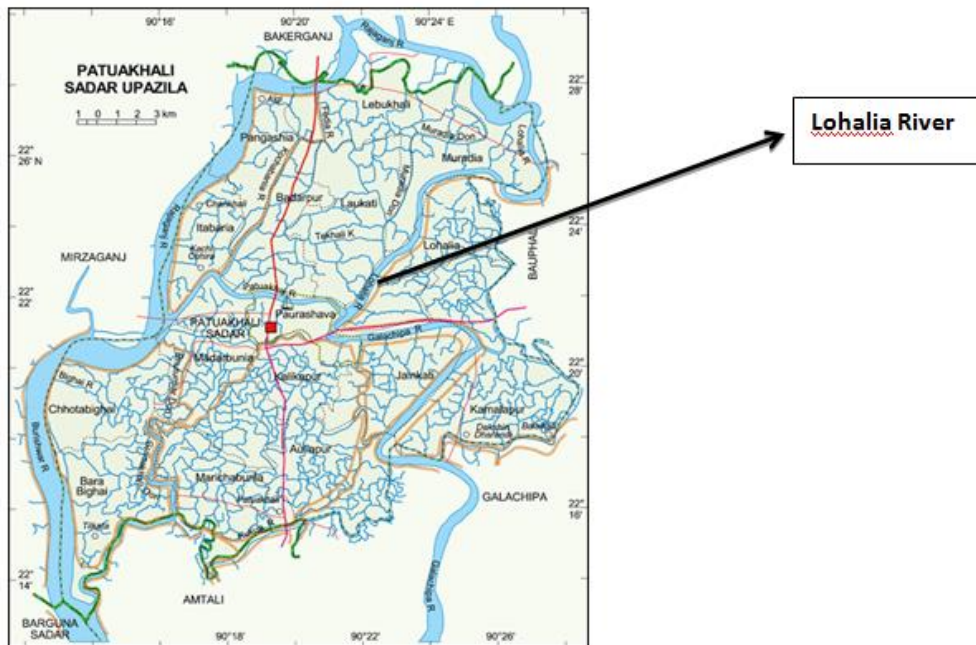


Figure1. Map Showing Study area

the natural habitats (Hossain *et al.*, 2012).

The southern parts of Bangladesh contributes the major proportion of natural fish production and the Lohalia river is one of the important contributor of this sector producing a great amount of fresh water and estuarine species.

2 MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Lohalia river which is just beside the patuakhali town (Approximately 22° 22' N latitude and 90° 22' longitude). The river has connected to Patuakhali River and Galachipa River near patuakhali town and fallen to Bay of Bengal separately (Figure 1).

2.2 Study Period

The study had been conducted for 6 months from July-December, 2013.

2.3 Data Collection procedure

The data had been collected for a period of 6 months. Data were collected from five fishing points where the fishing intensity was high. Data were collected after 15 days interval, twice a month from 10 selected fishermen by asking questions from a field trialed organized questionnaire. Jhaki jal (Cast net), Moia jal (pull net), Thella jal (Push net), Behundi jal (set bag net), Sain jal (gill net), Current jal (current net), Ber jal (Trap net) and Tana jal (Sein net) are maily operated by the fishermen of the Lohalia river (Khan *et al.*, 2013). The data were collected from the catches of those nets twice a day during high tide and low tide.

2.4 Separation of species among total catch

After collection of fish species it was separated species wise and counted as percent of total catch and the data were recorded accordingly. The collected fish specimen was identified according to their morphometric and meristic characteristics following Galib *et al.* (2013) and Rahman *et al.* (2005). Fish specimen was classified systematically after identification according to Nelson (2006).

2.5 Biodiversity parameters

To know the status of a particular fish species in the fish biodiversity of Lohalia river, following formula was used Shannon-Weaver diversity index, $H = - \sum P_i \ln P_i$ (Shannon and Weaver, 1949)

Margalef's richness index, $D = s-1/\ln N$ (Margalef, 1968)

Evenness index, $e = H/\ln s$ (Pielou, 1966)

Where H is the diversity index, P_i is the relative abundance (s/N), s is the number of individual for each species, N is total number of individuals, D is the richness index, S is the total number of species, e is the similarity or evenness index and ln is the natural logarithm.

3 RESULTS

The fish species available in Lohalia River with their common name, local name, scientific name, family and order and their status in the biodiversity were given in the table 1.

A total of 30 species of fishes were recorded belonging to the 16 orders and 7 families in the Lohalia River. A total of 80 species of fish under 9 orders of 24 families were recorded from the Padma River during study period, Khan *et al.* (2013)

3.1 Fish biodiversity of Lohalia River

During the study period 30 species of fishes were found in Lohalia River among which a great number of species were under threat of extinction. Among the total fish biodiversity of Lohalia river, highest species belonged to the order perciformes (40%) followed by Siluriformes (24%), Cypriniformes (20%), Pleuronectiformes (4%) and Synbranchiformes, Tetraodontiformes, Beloniformes and Clupiformes encountered 3% each (Figure 2). Galib *et al.* (2013) studied of the river Choto Jamuna found that the dominant order was Cypriniformes (minnows and carps) comprising 34.92%, Siluriformes, Perciformes and Synbranchiformes constituting 28.57%, 19.05% and 6.35% of species recorded, respectively. The fishes of Lohalia rive

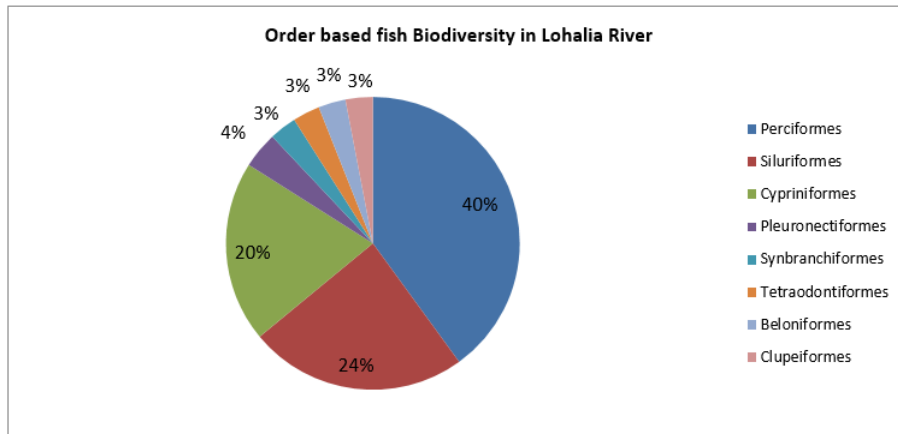


Figure 2: Order based Fish Biodiversity of Lohalia River

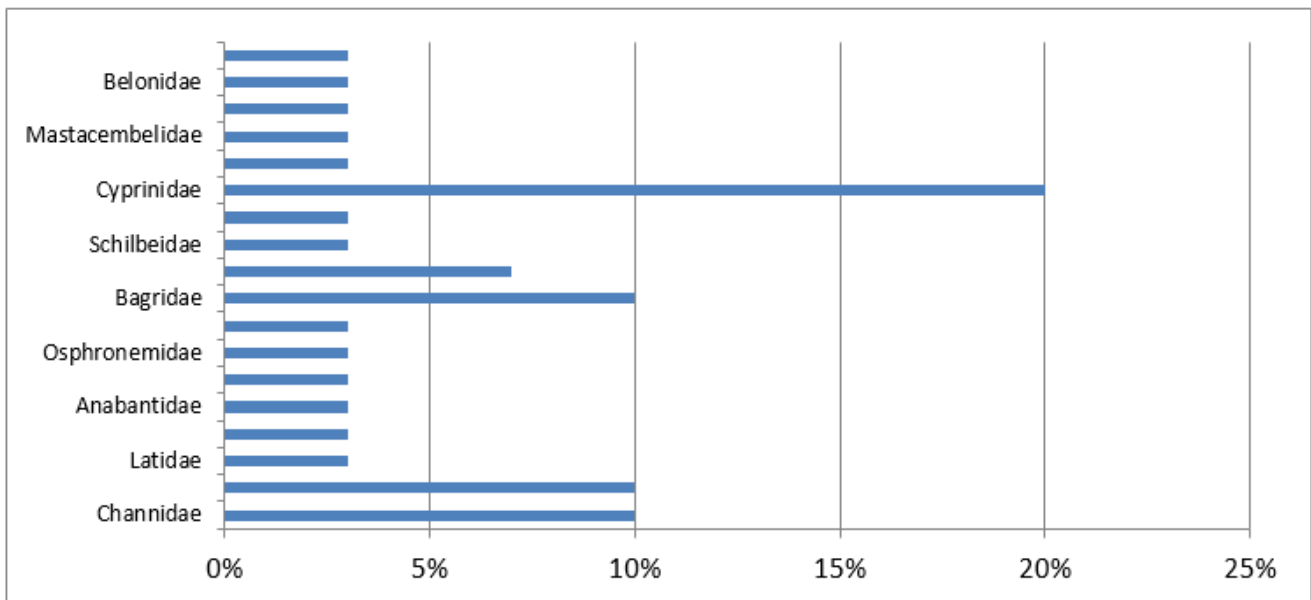


Figure 3: Family Based Fish Biodiversity of Lohalia River

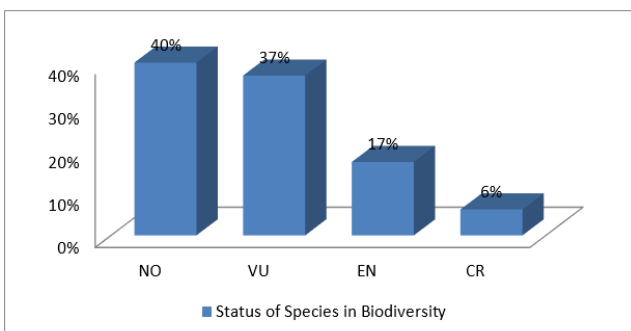


Figure 4: Status of Fish species in biodiversity of Lohalia River (Where NO stands for Not Threatened, VU stands for Vulnerable, EN stands for Endangered and CR stands for Critically Endangered)

belonged to 18 families among which almost 20% species belonged to the family cyprinidae followed by channidae (10%), gobiidae (10%), bagridae (10%), Siluridae (7%) and other comprised 3% from each family (Figure 3). Galib *et al.* (2013) studied of the river Choto Jamuna found that the dominant family was Cyprinidae comprising 28.57% of the total number of species caught. Other diversified

families were Bagridae (9.52% species), Cobitidae, Channidae and Schilbeidae (6.35% species each). Lohalia River is a great source of freshwater and estuarine fish biodiversity. Although, the biodiversity is declining gradually due to natural and manmade intervention on its environment. The local fishermen claimed that once the river carried almost 100 fish species of freshwater and estuarine habitat. But the number has fallen with the flow of time.

3.2 Status of fish species in biodiversity of Lohalia River

Like the other rivers of Bangladesh, the fish species of Lohalia River is struggling to sustain in their biodiversity. Among the 30 species found in Lohalia River, almost 60% species were facing some degree of threats to sustain in their biodiversity in term of vulnerable, endangered and critically endangered. Although 40% species were found not threatened at all, but the percentage of threatened species were higher than that of the non-threatened species. Almost 37% of species were found vulnerable, 17% species were endangered and 6% species were critically endangered in the fish biodiversity of Lohalia River. Almost 41.27% species were threatened in Bangladesh including 15.87% vulnerable, 15.87% endangered and

Table 1. Available fish species in Lohalia River with their common name, local name, scientific name, family and order and their status in the biodiversity

Order	Family	Scientific Name	Common name	Local Name	Status
Perciformes	Channidae	<i>Channa punctata</i>	Spotted snakehead	Taki	NO
Perciformes	Channidae	<i>Channa striata</i>	Striped snakehead	Shol	NO
Perciformes	Channidae	<i>Channa gachua</i>	Dwarf snakehead	Cheng	NO
Perciformes	Gobiidae	<i>Glossogobius giuris</i>	Tank goby	Bele	EN
Perciformes	Gobiidae	<i>Trypauchen vagina</i>	Burrowing goby	Sada chewa	VU
Perciformes	Gobiidae	<i>Taenioides cirratus</i>	Bearded worm goby	Dogri	VU
Perciformes	Latidae	<i>Lates calcarifer</i>	Barramundi	Vetki	EN
Perciformes	Nandidae	<i>Nandus nandus</i>	Gangetic leaffish	Veda	VU
Perciformes	Anabantidae	<i>Anabas testudineus</i>	Climbing perch	Koi	NO
Perciformes	Sciaenidae	<i>Otolithoides pama</i>	Pama croaker	Poa	VU
Perciformes	Osphronemidae	<i>Trichogaster fasciata</i>	Banded gourami	Kholisha	NO
Perciformes	Ambassidae	<i>Chanda nama</i>	Elongate glass-perchlet	Chanda	EN
<u>Siluriformes</u>	<u>Bagridae</u>	<i>Mystus vittatus</i>	Striped dwarf catfish	Gulsha	NO
Siluriformes	Bagridae	<i>Rita rita</i>	Rita	Rita	CR
Siluriformes	Bagridae	<i>Sperata seenghala</i>	Giant river-catfish	Air	EN
Siluriformes	Siluridae	<i>Wallago attu</i>	Wallago	Boal	NO
Siluriformes	Siluridae	<i>Ompok pabda</i>	Pabdah catfish	Pabda	VU
Siluriformes	Schilbeidae	<i>Neotropius atherinoides</i>	Indian potasi	Batasi	CR
Siluriformes	Pangasiidae	<i>Pangasius pangasius</i>	Pangasius catfish	Pangus	VU
Cypriniformes	Cyprinidae	<i>Salmophasia acinaces</i>	Silver minnow	Darkina	NO
Cypriniformes	Cyprinidae	<i>Amblypharyngodon mola</i>	Mola carplet	Mola	NO
Cypriniformes	Cyprinidae	<i>Labeo bata</i>	Bata	Bata	VU
Cypriniformes	Cyprinidae	<i>Labeo rohita</i>	Indian Major Carp	Rui	NO
Cypriniformes	Cyprinidae	<i>Osteobrama cotio</i>	Dhela	Dhela	VU
Cypriniformes	Cyprinidae	<i>Puntius sophore</i>	Pool barb	Jat puti	NO
Pleuronectiformes	Cynoglossidae	<i>Cynoglossus arel</i>	Largescale tonguesole	Kukurjib	NO
Synbranchiformes	Mastacembelidae	<i>Mastacembelus armatus</i>	Zig-zag eel	Tara Baim	EN
Tetraodontiformes	Tetraodontidae	<i>Tetraodon patoca</i>	spotted puffer	Potka	VU
Beloniformes	Belonidae	<i>Xenentodon cancila</i>	Freshwater garfish	Kakila	VU
Clupeiformes	Clupeidae	<i>Tenualosa ilisha</i>	Hilsha Sade	Illish	VU

(Where NO stands for Not Threatened, VU stands for Vulnerable, EN stands for Endangered and CR stands for Critically Endangered)

9.52% critically endangered, Galib et al. (2013). Almost 26 species of fishes have been considered threatened by IUCN Bangladesh. These fishes were belonging to the following categories, Vulnerable (13.04%), Endangered (13.04%) and Critically Endangered (8.70%) of the total fish species (Figure 4) (IUCN Bangladesh, 2000).

4 DISCUSSION

From the recent study it has been found that a gradual decline in the fish biodiversity of Lohalia River was clear. Although the fish biodiversity the river was very rich in the recent past, but due to some natural and manmade negative intervention on the environment of the river has been considered responsible for the present condition. This scenario was not only common for the Lohalia River, in other rivers of Bangladesh have been facing such threats on

the biodiversity of their own. The main cause of biodiversity reduction is excess fishing pressure, under fishing, catching brood fishes, construction of dam over the water bodies and destruction of natural habitats by other activities. Siltation and changing of the river route is another cause of biodiversity reduction. Bhuiyan *et al.* reported that 73 species of fish which also indicates that number of fish species decreasing in course of time in the Padma River.

In the present study 30 species of fishes were found among which 60% of fishes were facing some degree of threat to sustain in the biodiversity. Rubel *et al.* reported 43 species of fish and crustaceans in the Lohalia River. Although data on fishery of Lohalia is not available, but comparing to other rivers of Bangladesh, this river is facing a high

biodiversity risk due to some specific reasons. The river has lost its depth due to high siltation. The siltation was supposed to be caused by the establishment of brickfields on different points of the river. Almost 10 brickfields have been constructed on the bank of the Lohalia River. According to the local people, most of the brickfields did not obey the regulations of the ministry of environment and reclaimed the land from the poor villagers by creating pressure on them. Most of the owner of those brickfields were politically powerful and do not care of regulations. Just a few years ago a huge amount of Hilsha fishes used to come to the Lohalia river for breeding purpose, but due to siltation the river has become unsuitable for breeding and the availability of the fish was found very low during the study period.

5 CONCLUSION

Fish diversity is considered as plentiful aquatic resources for supporting food and income source. Present study was attempted to find out species diversity of the Lohalia river. This river acting as house and breeding ground of some threatened species. Though higher number of species counted from this river but abundance is gradually decreasing mismanagement and indiscriminate fishing. It is essential to take immediate action for habitat enhancement of Lohalia river of Bangladesh to save the fish biodiversity. Proper management strategies must be applied with an integrated approach of Government, researchers, NGOs and donors can save the fisheries diversity of Lohalia River of Bangladesh.

REFERENCES

1. Bhuiyan SS, Joadder MAR, Bhuiyan AS 2008 : Occurrence of fishes and non-fin fishes of the River Padma near Rajshahi, Bangladesh, *Journal of Zoology* 27 (2) 99-100.
2. Galib, S.M., S.M.A. Naser, A.B.M. Mohsin, N. Chaki and M.F.H. Fahad 2013: Fish diversity of the River Choto Jamuna, Bangladesh: Present status and conservation needs, *International Journal of Biodiversity and Conservation*, 5(6) 389-395.
3. Hossain MY, Rahman MM, Fulanda B, Jewel MAS, Ahamed F, Ohtomi J 2012: Length-weight and length-length relationships of the five threatened fishes from the Jamuna (Brahmaputra River distributary) River, Northern Bangladesh, *Journal of Applied Ichthyology* 28(2) 275-277.
4. IUCN Bangladesh 2000: Red book of threatened fishes of Bangladesh, IUCN- The world conservation union. pp 12-116.
5. Khan MAR, Miah MI, Hossain MB, Begum A, Minar MH and karim R 2013: Fish Biodiversity and Livelihood Status of Fishing Community of Tista River, Bangladesh. *Global Veterinaria* 10 (4) 417-423.
6. Mohsin ABM, Haque SMM, Galib SM, Fahad MFH, Chaki N, Islam MN and Rahman MM 2013: Seasonal Abundance of Fin Fishes in the Padma River at Rajshahi District, Bangladesh, *World Journal of Fish and Marine Sciences*, 5 (6) 680-685.
7. Nelson JS 2006: *Fishes of the World*, fourth edition. John Wiley & Sons, Inc, p.601.
8. Rahman AKA 2005: *Freshwater Fishes of Bangladesh*, second edition. Zoological Society of Bangladesh, University of Dhaka, Dhaka, Bangladesh, p. 263.
9. Rubel MRI, Hashem S, Hasan MR, Rahmatullah SM, Ferdousi K and Bornali JJ 2014: Catch composition of fishes by using different types of fishing gear in Lohalia river of Bangladesh. *International Journal of Research in Fisheries and Aquaculture*. 4(4) 161-170.

Source of support: Nil; Conflict of interest: None declared