

A Comprehensive Study on the Availability of Fishes and Non-Fin Fishes in Atrai River of Naogaon District: A Case Study in Northern Part of Bangladesh

M.A.R. Joadder

Department of Fisheries, Faculty of Agriculture, University of Rajshahi, 6205 Rajshahi, Bangladesh

Abstract: The present study has been made on the existence of the fish fauna and non-fin fishes in the River Atrai of Naogaon district. The study area is located on the Eastern bank of the River Atrai and it includes the Chotkighasa to Casiabari hat under Atrai thana near the Naogaon town. Data were collected from the local place and monthly visits were made in the fish markets of Ahsangong and Casiabari hats during the study period. Visits to the fish-landing centers of Atrai station, Kumghat, Shahebgong and Chotkighasa areas were also made almost once in a week throughout the study period starting from August, 2005 to July, 2006. During the study period, a total number of 78 species of fishes belonging to 48 genera, 19 families, 9 orders and the class of osteichthyes, 11 species of non-fin fishes under the classes of Crustacea (Arthropoda), Gastropoda (Mollusca), Amphibia, Reptilia were detected and recorded.

Key words: Fish, non-fin fish, Atrai river basin, species, fauna, Bangladesh

INTRODUCTION

Bangladesh is a drainage outlet for a vast river basin complex made up of the Ganges-Brahmaputra-Meghna river system and rich in various fisheries resources such as ponds, ditches, beels, lakes, haors, baors, floodplains and canals covering an area of 5,433,900 ha. The total freshwater production in the year 2003-04 was 2,102,026 m (DOF, 2005). Total inland open freshwater area is 40,47,316 ha which is contributing 34.83% of total fish capture. Total fish production from inland closed water area in the year 2003-04 was 914,712 m as against 78.34 of the total production and fisheries sector accounts for 4.92 of GDP, 23% of the gross value added to agricultural products, >11% of earnings and employs >2 million people (DOF, 2005).

The inland water of Bangladesh provides 260 species of fishes (Rahman, 1989). In addition to a total of 475 marine fish species of which 65 commercially important fish species have been recorded (Hossain, 1970) and 12 culturable species of exotic fishes have been introduced in Bangladesh (DOF, 2005).

Munro (1955), Talwar and Jhingran (1991) and other researchers made many taxonomic researches on the freshwater fishes of India. Talwar and Jhingran (1991) reported that the Indian fish fauna is an assemblage of about 2500 species depicting diverse characteristics of which 930 species belonging to 326 genera inhabit the inland waters. In Bangladesh, Taxonomic study on freshwater fish is generally partial and fragmentary

compared to India. The present research has been carried out in order to explore the existing fish fauna of the River Atrai in Naogaon (Chotkighasa to Casiabari hat). During the study period, a total of 78 species of fishes, 11 species under the classes of Crustacea (Arthropoda), Gastropoda (Mollusca), Amphibia and Reptilia were found and recorded. The present research includes the description of seasonal availability, breeding season, status of 78 species of fishes under 48 genera, 19 families, 9 orders and one class.

MATERIALS AND METHODS

The study area is located on the Eastern bank of the River Atrai and it covered from Chotkighasa to Casiabari hat of Naogaon district. The fish species were collected and identified directly from the local place. Monthly visits were made in the fish markets of Ahsangong and Casiabari hat during the study period. Visits to the fish-landing centers of Atrai station, Kumghat, Shahebgong and Chotkighasa area were also made almost once in a week throughout the study period which started from August, 2005 to July, 2006. The specimens were identified with the help of books and systematically categorized. Identification was made following the key of Bhuiyan (1964), Rahman (1989), Talwar and Jhingran (1991) and Bhuiyan *et al.* (1992). A structured questionnaire was prepared to collect the data on the fishes and other fisheries items of the River Atrai in the local area.

The analysis of the collected data was done in the laboratory using different statistical methods.

RESULTS AND DISCUSSION

During the study period, 78 species of Osteichthyes, 11 species other than fishes under the classes of Crustacea (Arthropoda), Gastropoda (Mollusca), Amphibia, Reptilia were found and recorded from the study area. Among the 78 species of Osteichthyes, 9 orders are recorded of which Cypriniformes contains 30 species belonging to 15 genera of 2 families. The Channiformes includes 4 species under a single genus of Channidae family. The Siluriformes order is represented by 23 species belonging to 16 genera of 5 families. The Clupiformes order is represented by 6 species belonging to 5 genera of 3 families. Order Perciformes includes 9 species under 6 genera of 5 families. The Mastacembiliformes order is represented by 3 species under single genus of Mastacembelidae family. The 1 species of fish is found to have been included in the Beloniformes, Cyprinodontiformes and Tetraodontiformes. The dominant order found is Cypriniformes from the study. A total number of 30 species of fishes are recorded from the order Cypriniformes of which 27 species from the family

Cyprinidae and 3 from the family Cobitidae. The next dominant order followed by Siluriformes of which 2 species have been recorded from the family Claridae, 3 from Siluridae, 7 from Schilbeidae, 10 from Bagridae and 1 from each Heteropneustidae family. The 9 species of fishes under the order perciformes is recorded of which 4 included under the family Anabantidae, 2 from Centropomidae and 1 species is under each family of Gobidae, Mugilidae and Nandidae. The 6 species of fishes are included from the Clupiformes order of which 3 species under the family Clupeidae and 1 from Engraulidae. The 4 species of fishes are recorded from the order Channiformes and under the family of Channidae. The 2 species of fishes are recorded from the order Mastacembeliformes and under the family of Mastacembelidae. The species of fish is recorded from each order of Beloniformes, Cyprinodontiformes and Tetraodontiformes (Table 1). For most of the fishes, breeding season is found in monsoon period (May to October).

Among non-fin fishes the phylum Chordata is represented by 2 species of Amphibians, *Rana tigrina* and *Rana hexadactyla* which are available throughout the year and breed during May to July. The 3 species of Reptilians are found which include *Trionyx gangeticus*, *Kachuga tectum* and *Natrix piscator* which are available

Table 1: Fish species observed of the River Atrai in Naogaon
Class-Osteichthyes

Order	Family	Scientific names	Genera	Species
Cypriniformes	Cyprinidae	<i>Oreochromis mossambica</i> , <i>Oreochromis niloticus</i> , <i>Catla catla</i> , <i>Hypophthalmichthys molitrix</i> , <i>C. tenopharyngodon idellus</i> , <i>Cyprinus carpio</i> var. communis, <i>Cyprinus carpio</i> var. <i>specularis</i> , <i>Cirrhinus mrigala</i> , <i>Cirrhinus reba</i> , <i>Labeo calbasu</i> , <i>Labeo rohita</i> , <i>Labeo bata</i> , <i>Labeo gonius</i> *, <i>Labeo boga</i> *, <i>Puntius sarana</i> , <i>Puntius sophore</i> , <i>Puntius terio</i> *, <i>Puntius gonionotus</i> , <i>Puntius ticto</i> , <i>Puntius stigma</i> , <i>Chela atpar</i> *, <i>Chela Phulo</i> , <i>Oxygaster gora</i> *, <i>Esomus daricus</i> , <i>Rasbora daniconius</i> , <i>Rasbora rasbora</i> *, <i>Amblypharyngodon mola</i>	13	27
		<i>Lepidocephalus guntea</i> *, <i>Lepidocephalus irrorata</i> *, <i>Botia dario</i> *	2	3
Channiformes	Cobitidae			
	Channidae	<i>Channa striatus</i> , <i>Channa marulius</i> , <i>Channa punctatus</i>	1	4
	Clariidae	<i>Channa orientalis</i> *, <i>Clarius batrachus</i> , <i>Clarius gariepinus</i>	1	2
Siluriformes	Siluridae	<i>Ompok pabda</i> , <i>Ompok bimaculatus</i> *, <i>Wallago attu</i> ,	2	3
	Heteropneustidae	<i>Heteropneustes fossilis</i> , <i>Clupisoma garua</i> *, <i>Eutropiichthys vacha</i> *, <i>Pseudotropius atherinoides</i>	1	1
	Schilbeidae	<i>Ailia coila</i> *, <i>Ailichthys punctata</i> *, <i>Pangasius pangasius</i> *, <i>Silonia silondia</i> *	7	7
	Bagridae	<i>Mystus aor</i> , <i>Mystus cavacius</i> , <i>Mystus tengra</i> , <i>Batasio batasio</i> , <i>Mystus seenghala</i> *, <i>Mystus bleekeri</i> , <i>Rita rita</i> *, <i>Chandramara</i> , <i>chandramara</i> , <i>Gagata youssoufi</i> *, <i>Bagarius bagarius</i> *	5	10
		<i>Notopterus chitala</i> *, <i>Notopterus notopterus</i>	1	2
Clupiformes	Engraulidae	<i>Setipinna phasa</i> *	1	1
	Clupeidae	<i>Corica soborna</i> , <i>Gudusia chapra</i> , <i>Goniolosa manminna</i>	3	3
Mastacembiliformes	Mastacembilidae	<i>Macrornathus aculeatus</i> *, <i>Macrornathus armatus</i> , <i>Mastacembelus pancalus</i> ,	1	3
	Anabantidae	<i>Anabas testudineus</i> , <i>Colisa fasciatus</i> , <i>Colisa lalius</i> , <i>Colisa sota</i>	2	4
Perciformes	Gobiidae	<i>Glossogobius giuris</i>	1	1
	Centropomidae	<i>Chanda ranga</i> , <i>Chanda nama</i>	1	2
	Mugilidae	<i>Rhinomugil corsula</i> *	1	1
	Nandidae	<i>Nandus nandus</i> *	1	1
Beloniformes	Belonidae	<i>Xenentodon cancila</i>	1	1
Cyprinodontiformes	Cyprinodontidae	<i>Aplocheilichthys panchax</i> *	1	1
Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i> *	1	1
Total = 9			48	78

*Endangered species

Table 2: Non-fin fish items observed in the River Atrai in Naogaon

Phylum	Class	Order	Genera	Species	Scientific names	Breeding season
Arthropoda	Crustacea	Decapoda	2	4	<i>Macrobrachium rosenbergii</i> , <i>M. dayanum</i> <i>Cancer pagurus</i> , <i>M. lamarrei</i>	Dec. to Feb. May to June
Mollusca	Gastropoda	Megagastropoda	1	1	<i>Pila globosa</i>	
		Eulamellibranchiata	1	1	<i>Unio</i> sp.	April to June
Chordata	Amphibia	Anura	1	2	<i>Rana hexadactyla</i> , <i>Rana tigrina</i>	May to July
	Reptilia	Chelonia	1	2	<i>Kachuga tectum</i> , <i>Trionyx gangeticus</i>	April to Sep.
		Squamata	1	1	<i>Natrix piscator</i>	

throughout the year and they breed during April to September. Phylum Arthropoda is represented by 4 species of Crustaceans which include *Macrobrachium rosenbergii*, *M. dayanum*, *Cancer pagurus* which are available in the whole year and breed during December to February and *M. lamarrei* is also available throughout the year and its breeding season is May to June. Phylum Mollusca is represented by 2 species which includes *Pila globosa*, *Unio* species which are available throughout the year and breed during April to June (Table 2). Qureshi (1965) in his monograph of common freshwater fishes of Pakistan included 133 species, most of which occurred in Bangladesh. Islam and Hossain (1983) provided an account of 110 species of fishes of the River Padma near Rajshahi. Bhuiyan *et al.* (1992) listed 133 species inhabiting the freshwater fishes of Rajshahi district. Mortuza (1997) recorded 126 fish from Barnai river project area. Doha (1973) published a list of 106 species from Mymensing and Tangail district. Agostinho (2003) conducted his research on the Parana river which is the length longest river in the world and drains most of central South America.

Kasyanov (2003) reported the Ichthyofauna of the observed river basin which includes 2 species of cyclostome and 51 species of fish belonging to orders, 18 families and 37 genera. Hasan (2007) recorded 33 species of fish and fisheries items in Chitra and Fatki rivers in his study period. Zafer *et al.* (2007) recorded a total of 75 species of fish and other organisms including crabs, prawn, mollusks and leeches in the investigated area of the Pagla river.

Declination of fishes from the River Atrai: The fish species found in the previous years has become rare in the study area. During the period of investigation a total number of 29 species are recorded as endangered (Table 1) which were available in yearly decades. In the study area, few causes are identified for this declination of fisheries resources from the River Atrai. Due to natural causes like siltation, course changes, shrinkage of genetic base and man made causes like water pollution through pesticides and agricultural wastage destroyed the spawning, nursing and feeding grounds of the fish

species of the River Atrai nearer the Naogaon town. Excessive use of ground water and reclamation of land for agricultural purpose (irrigation) has resulted shrinkage of spawning and feeding grounds of fish species. Siltation at the upstream of the river is a serious threat that caused reduction of water flow and as a result of spawning and nursing grounds, fish has been drastically affected in recent years. McNeely (1998) reported that roughly 56 freshwater fish species out of 260 species are critically endangered and 50 species of fishes have become rare which were found abundantly in last decades in their research covered areas in Bangladesh. Aguero (1989) described that over fishing, high population, sedimentation, flood and tidal control projects, excessive removal of surface water for irrigation, large scale reclamation of rivers, haors, beels and other depression areas for crop production caused severe problems for inland fisheries. Tsai and Ali (1985) stated that Farakka dam, embankments and sedimentation are the three major factors causing the decrease in the habitats available for major carps. Over fishing is the most important factors linked to declination of major carps in the inland open waters specially of the river system.

CONCLUSION

The present study is an attempt to identify the fishes and non-fin fishes available in the River Atrai near Naogaon region. As many as 78 fish species and 11 fisheries items were identified during the study period. The richness of the River Atrai with regard to fisheries resources have been greatly affected due to degradation of habitat through pollution, siltation, soil erosion, impact of barrage and flood control structures that have modified the natural route of the rivers and over fishing trend as well as the use of banned fishing gear endangering many fish species and also fisheries items. For conservation and propagation of the endangered fish species from further degradation now it is necessary to provide suitable habitat for food, shelter and breeding of endangered fish species more over standardization of spawn and fry collection method is necessary for further sustainability of the fisheries resources of the River Atrai.

REFERENCES

- Agostinho, A.A., 2003. Fisheries management in the upper Parana river basin, successes and failures. Proceedings of the 2nd International Symposium of Large Rivers for Fisheries: Sustaining Livelihoods and Biodiversity in the New Millenium, February 11-14, 2003, Cambodia, pp: 11-11.
- Agüero, M., 1989. Inland fishes of Bangladesh: Management options and national inventions. Proceedings of the ICLAM/DoF/BCAS Workshop on Experiments in New Approaches to the Improve Management of Open Water Fisheries in Bangladesh, (ICLAM'89), Dhaka, Bangladesh, pp: 1-13.
- Bhuiyan, A.L., 1964. Fishes of Dacca. Asiatic Society of Pakistan, Dacca, pp: 1-148.
- Bhuiyan, A.S., M.N. Islam and T. Hossain, 1992. A check list of the fishes of Rajshahi. Rajshahi Univ. Stud., 20: 287-306.
- DOF, 2005. Fish Fortnight Souvenir 2005. Department of Fisheries, Ministry of Fisheries and Livestock, Dhaka, Bangladesh, Pages: 152.
- Doha, S., 1973. Fishes of the districts of Mymensing and Tangail. Bangladesh J. Zool., 1: 1-10.
- Hasan, M., 2007. Fisheris problem and potential of the Chita and Fatki rivers. Bangladesh J. Fish. 30: 105-111.
- Hossain, M.A., 1970. Marine and freshwater fishes of the Northeast part of Bay of Bengal. Research, 7: 26-55.
- Islam, M.S. and M.A. Hossain, 1983. An account of the fishes of the Padma river near Rajshahi. Raj. Fish. Bull., 1: 1-31.
- Kasyanov, A.N., 2003. The ichthyofauna and fisheries of waterbodies of the Ob-Irtysh Basin. Proceedings of the 2nd International Symposium of Large Rivers for Fisheries: Sustaining Livelihoods and Biodiversity in the New Millennium, February 11-14, 2003, Cambodia, pp: 86-86.
- McNeely, J.A., 1998. Major Conservation Issues of the 1990s: Result of the World Conservation Congress Workshops. Island Press, Washington, DC, USA., Pages: 203.
- Mortuza, M.G., 1997. The fisheries status of the (FCD) Barnai project. M.Phil. Thesis, Department of Zoology, University of Rajshahi, Bangladesh.
- Munro, I.S.R., 1955. The Marine and Freshwater Fishes of Ceylone. Narendra Publishing House, Canberra, ISBN: 8185375062, pp: 351.
- Qureshi, M.R.I., 1965. Commom freshwater fishes of Pakistan. Karachi, pp: 61.
- Rahman, A.K.A., 1989. Freshwater Fishes of Bangladesh. Zoological Society of Bangladesh, Dhaka, Bangladesh, Pages: 364.
- Talwar, P.K. and A.G. Jhingran, 1991. Inland Fishes of India and Adjacent Countries. Vol. 1-2, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, Calcutta, India, Pages: 1158.
- Tsai, C. and L. Ali, 1985. Open water fisheries carp management programme in Bangladesh. Fish. Inform. Bull., 24: 51-51.
- Zafer, M.S., M.N. Amin and M.J. Iqbal, 2007. Biodiversity of fisheries organisms in the pagla river of Bangladesh. Bangladesh J. Fish., 30: 165-175.