



PRESENT STATUS OF FISH AVAILABILITY IN RUHUL *BEEL*, NORTHERN BANGLADESH

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Abstract

This study was conducted in Ruhul *Beel*, Pabna, northern area of Bangladesh to know the availability of different fish species. Samples were collected fortnightly from the fishermen catch captured in different points of the *Beel* during January to December, 2013. During this study a total of 37 fish species under 9 orders and 19 families were recorded from the study area. Cypriniformes was the most dominant order constituting 32.43% of the total fish populations followed by the Siluriformes (27.02%), Perciformes (21.62%), Channiformes (5.4%) and Clupeiformes (2.7%). On the contrary, Beloniformes, Cyprinodontiformes, Osteoglossiformes and Tetraodontiformes were the least numerous orders constituting only 2.71% each of the total fish populations. Among the available fish species, 37.84% were very rare, 35.14% were rare, and 21.61% were found throughout the year in a small amount while only 5.41% were available throughout the year in a large amount. About half of the fish species available in the Ruhul *Beel* is threatened to extinct according to IUCN Bangladesh. The results of this study will provide important baseline data on availability of fish species, which will be helpful for the sustainable management and conservation of fisheries diversity in the Ruhul *Beel* as well as in the open water-bodies of Bangladesh.

Key words: Bangladesh, fish availability, Ruhul *Beel*, threatened fish

Introduction

Freshwater fishes are the most diverse group of vertebrates, constitutes a vital component of the world, with a species richness compared to both terrestrial and marine ecosystems (Gleick 1996, Duncan and Lockwood 2001). Freshwater biodiversity has declined faster than either terrestrial or marine biodiversity over the years (Jenkins 2003). The major conservation problems of freshwater fish is the fact that the freshwater fish occupy comparatively limited space with much reduced ability for inter-basin movement (UNESCO 2003, Stoddard et al. 2006) contrary to the fairly free moving marine fish (Andrew and Pepperell 1992). Freshwater biodiversity is in a state of critically endangered due to the climate change and habitat destruction (Stoddard et al. 2006). In Bangladesh, human activities and annual environmental effects e.g., dry season and flooding continue to cause considerable damage to the production of inland freshwater ecosystems as well as some fishing methods also been criticized as being environmentally damaging (Andrew and Pepperell 1992). The collection of fish fry during pre-monsoon season, heavy siltation during rainy seasons negatively impacts the inland open water fisheries production as well as growth and development of fish species (Mondol et al. 2015). In 2000, a study by IUCN revealed that 54 of the major inland fish species in Bangladesh are threatened at varying degree (IUCN 2000). Among the commonly cited causes for the deterioration of the fishery resources is the loss of fish habitat, largely caused by the construction of roads, embankments, drainage, flood control and occurrences of natural siltation, along with over fishing (Hughes et al. 1994, Ali

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1997). Enactment of the existing legislations is required for initiating sustainable fisheries management program for conserving or developing the resources.

Knowledge of the existing resources and their condition are therefore essential for planning of any management program for conserving or developing the resources. Ruhul *Beel*, is an important freshwater fish habitat in northern Bangladesh. However, due to various anthropogenic and natural reasons water flow of this *beel* decreased significantly in recent years and results in threatening of the aquatic biodiversity. To the best of our knowledge, there is no previous scientific information on the availability of fish species in this *beel*. Therefore, this study was designed to investigate the fish species availability in the Ruhul *Beel*, Pabna, northern area of Bangladesh.

Materials and Methods

The present study was conducted in the Ruhul *Beel* (24°14'N and 89°24'E) at Bhangura upazila under Pabna district of northern area of Bangladesh. The *beel* covers about 100 hectare in area and is one of the prime habitat for fresh water fishes in Bangladesh. Fish samples were collected fortnightly from the fishermen catch captured in different points of the *beel* during January to December, 2013. Fish were caught using Bhesal jal (Khara jal), Ber jal, Moi jal, cast net and monofilament fixed fill net. Collected fish samples were fixed in 10% formalin at the site and identification was done upon arrival at the laboratory based on their morphometric and meristic characteristics according to Talwar and Jhingran (1991) and Froese and Pauly (2011). Fish availability, threats to fish diversity and conservation needs were determined because of fish abundance during sampling, market survey, interviewing fishermen and fish cognate personnel using pre-structured questionnaire (Rahman et al. 2012 a,b). Fish availability was classified as TY (throughout the year), TYS (throughout the year in small amount), TYL (throughout the year in large amount), SM (found in small amount during monsoon), LM (found in large amount during monsoon), R (rare), VR (very rare) and NE (not evaluated) (Mondol et al. 2015).

Results and Discussion

The present study recorded a total of 37 fish species under 9 orders and 19 families from the Ruhul *Beel* (Table 1). Cypriniformes was the foremost order constituting 32.43% of the total fish population followed by the Siluriformes (27.02%), Perciformes (21.62%), Channiformes (5.40%) and Clupeiformes (2.70%). On the contrary, Beloniformes, Cyprinodontiformes, Osteoglossiformes and Tetraodontiformes were the least numerous orders constituting only 2.71% each of the total fish population (Fig. 1). The dominance of the orders Cypriniformes, Siluriformes and Perciformes in freshwater fish population is common in Indian subcontinent (IUCN Bangladesh 2000, Shinde et al. 2009, Emmanuel and Modupe 2010, Khan and Hasan 2011, Nyant et al. 2012, Mondol et al. 2015). Cyprinidae was the most dominant family constituting 24.32% of the total fish population.

Among the available fish species, 37.84% were very rare while 35.14% were rare, 21.61% were found throughout the year in a small amount while only 5.41% were available throughout the year in a large amount (Fig. 2). 8.1% of the available species were critically endangered, 13.51% were endangered and 16.21% were vulnerable, 8.1% were data deficient, 51.35% were not threatened, 2.70% were not listed according to IUCN Bangladesh (2000).

Still to date previous studies on fish availability in the Ruhul *Beel* are unavailable in the literature. Therefore, this documentation on species availability will compose the foundation for further comprehensive studies. However, it is imperative that many of the threatened to extinction fish species be still dwelling in the Ruhul *Beel*. Our preliminary survey showed that, abstraction of water for irrigation, use of agro-chemicals in

surrounding crop fields besides the *beel*, over exploitation and indiscriminate use of gears are the main threat for fish species conservation in the Ruhul *Beel*. Besides, there is only one-way management policy is to make sanctuary in the deepest part of the *beel*, where fishing is completely banned. But this policy is not properly followed. The implementation of this sanctuary and some other *beel* management policy like, seed production, MACH (Management of aquatic resources through community husbandry), CBFM (Community based fisheries management), and integrated aquaculture technologies should be adopted to protect the species which are a degree of extinction and to recover sustainable production of the Ruhul *Beel*. For this purpose, the following immediate actions may be recommended such as prohibition on harvesting brood fish, stocking of fish fry and ban of fishing by illegal gears. Therefore, it is most urgent to take suitable step to protect fish fauna of Bangladeshi *beel*. In the light of the present study of Ruhul *Beel*, it is the time to make proper policies and necessary steps to implement so that the future generation can get the fishes lively on the earth rather than photographs in literature.

Table 1. Check-list of fish availability in the Ruhul *Beel*, northern Bangladesh.

Order	Family	Scientific name	Local name	Availability	Present status
Beloniformes	Belontiidae	<i>Xenentodon cancila</i>	Kaikka, Kakila	TYS	NT
Channiformes	Channidae	<i>Channa striatus</i>	Shol	R	NT
		<i>Channa punctatus</i>	Taki	TYL, LM	NT
Clupeiformes	Engraulidae	<i>Gudusia chapra</i>	Chapila, Khoira	R	DD
Cypriniformes	Cobitidae	<i>Botia dario</i>	Rani, Bau Mach	VR	EN
		<i>Botia lohachata</i>	Rani, Bau Mach	VR	EN
		<i>Lepidocephalus guntea</i>	Puiya, Gutum	R	NT
	Cyprinidae	<i>Ablypharyngodon mola</i>	Mola, Moa	TYS	NT
		<i>Esomus danricus</i>	Darkina	TYS	DD
		<i>Hypophthalmichthys molitrix</i>	Silver carp	R	NT
		<i>Labeo calbasu</i>	Kalibaus	R	EN
		<i>Labeo rohita</i>	Rui, Rohit	R	NT
		<i>Systemus sarana</i>	Sar-punti	VR	CR
		<i>Puntius sophore</i>	Jat punti, punti	TYS	NT
		<i>Pethia ticto</i>	Tit-punti	TYS	VU
		<i>Salmostoma phulo</i>	Chela	VR	NT
		Cyprinodontiformes	Cyprinodontidae	<i>Aplocheilichthys panchax</i>	Panchax
Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Foli, Kanla	VR	VU

Table 1 Contd.

Perciformes	Anabantidae	<i>Anabas testudineus</i>	Koi	R, SM	DD
	Osphronemidae	<i>Colisa fasciatus</i>	Kholsha	TYL, LM	NT
	Ambassidae	<i>Chanda nama</i>	Chanda	TYS, SM	VU
	Gobiidae	<i>Glossogobius giuris</i>	Baila, Bele	R	NT
	Mastacembelidae	<i>Macrogathus aculeatus</i>	Tara baim	R	VU
		<i>Mastacembelus armatus</i>	Tara baim	R	EN
<i>Mastacembelus punctatus</i>		Guchi	TYS	NT	
Nandidae	<i>Nandus nandus</i>	Bheda, Meni	VR	VU	
Siluriformes	Bagridae	<i>Mystus cavassius</i>	Kabshi tengra	VR	VU
		<i>Mystus tengara</i>	Tengra	R	NT
		<i>Mystus vittatus</i>	Taila air	R	NT
	Heteropneustidae	<i>Heteropneustes fossilis</i>	Shing	TYS	NT
	Schilbeidae	<i>Clupisoma garua</i>	Ghere, Gharua	VR	CR
		<i>Eutropichthys vacha</i>	Vacha	VR	CR
		<i>Pseudeutropius atherinoides</i>	Batasi	VR	NT
	Siluridae	<i>Ompok bimaculatus</i>	Kani pabda	VR	EN
		<i>Wallago attu</i>	Boal	VR	NT
	Sisoridae	<i>Gagata gagata</i>	Gun tengra	VR	NT
Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i>	Potka	VR	NT

TYS, throughout the year in small amount; TYL, throughout the year in large amount; SM, found in small amount during monsoon; LM, found in large amount during monsoon; R, rare; VR, very rare; Status in the IUCN Red List according to IUCN Bangladesh (2000), EN-Endangered, VU- Vulnerable, CR- Critically endangered DD-Data deficient, NT- Not threatened, NL- Not listed.

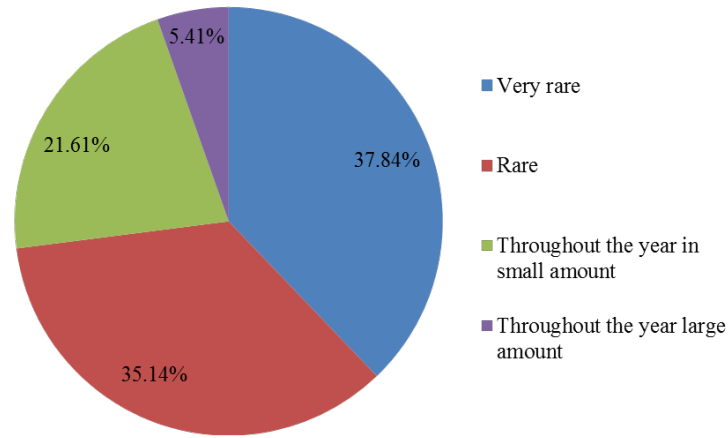


Fig. 1. Fish species availability (percentage) in Ruhul *Beel* during the study period.

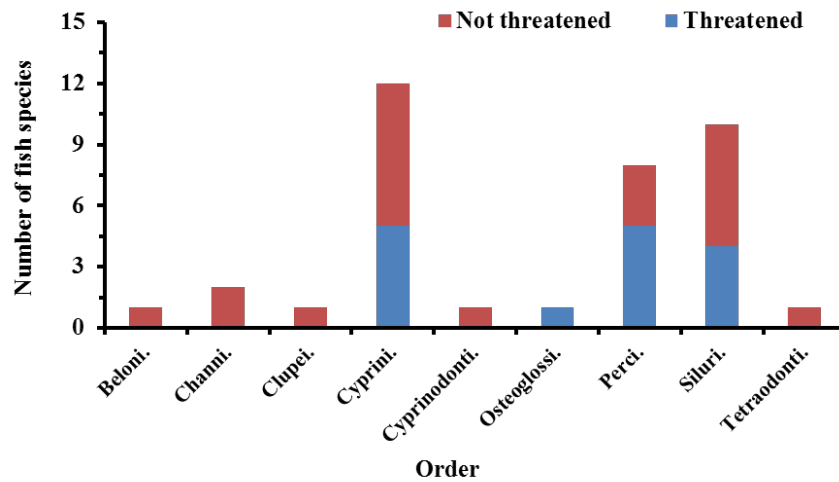


Fig. 2. Number of threatened to extinction and non-threatened fish species under different order in Ruhul *Beel* during the study period.

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