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Freshwater fishes of Sugandha River

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Abstract

The Sugandha is a coastal river under Jhalakathi district of Bangladesh. An observation was taken to know the existing freshwater fish status for a period of 10 months from January, 2015 to October, 2015. In total, 49 species under 9 orders, 23 families were identified. Perciformes was found to be the most dominant order consisting 35% of the total fish population. Fifteen (15) common groups were recorded in the studied areas. Among the total identified fish species 13 threatened fish species were recorded from the River Sugandha in which 7 species (15%) were found as Vulnerable (VU), 5 species (10%) as Endangered (EN) and 1 species (2%) as Critically Endangered (CR). Lack of ecological management initiatives are the major threats to fish biodiversity of Sugandha River. Banning indiscriminate killing of fish fry and fingerling with destructive fishing gears and raising awareness among the people are much needed for the conservation of threatened fish species of Sugandha River from the risk of extinction.

Keywords: Sugandha river, freshwater fish, catch composition, conservation, Bangladesh

1. Introduction

Bangladesh is a country of hundreds of rivers and well enriched with fish biodiversity. The total number of freshwater fish species occurring in Bangladesh compiled as a total of 250 to 266 freshwater fish species was compiled in Bangladesh [1]. The reported fresh water fish species are not limited to freshwater only, 62 species occupy the estuary, and many fish species migrate from the Bay of Bengal to tidal rivers [1].

The Sugandha river is a beautiful river of Bangladesh. It the Sugandha is a coastal river under Jhalakathi district of Bangladesh. The length of this river is 30km, the width is 1000m and the depth is 10m. It flows eastern near Shayestabd and falls into the Bay of Bengal after meeting with the Megna river at Sahbazpur in Bhola. Another offshoots of the Sugandha river flows south-southwest as the Kirtankhola upto Nalchity keeping the Barisal town on its west bank. The deltaic branches of the Sugandha river gradually disappeared making various Islands (in local language Chars) in many part of the greater Barisal district [2 & 3].

The river is the shelter of wide-ranging fish fauna. The rivers influence the lifestyle of vulnerable people living along with near the coast of the river. Many fishing crafts and gears are operated in the Sugandha River. Indiscriminate killing and over-exploitation, destructive fishing gear, water pollution and lack of proper management initiatives causes the fish diversity of Sugandha River to be in great danger. There is no complete list of existing fish species with updated conservation status. For this reason, it is very difficult to understand the present status of fishes in the River Sugandha. In-depth research work is much needed with updated list of fish species to take necessary management initiatives to conserve the biodiversity of fishes in the Sugandha River. The specific aims of the present study were to assess the fish biodiversity including threatened fishes in the River Sugandha and suggest recommendations to improve their present conservation status of threatened fishes in Bangladesh.

2. Materials and Methods

The present research area was Sugandha River located at Jhalakathi district under Barisal division of Bangladesh. To achieve the output of the existing research works, specific data were collected fortnightly basis, that is, twice a month for a period of 10 months from January, 2015 to October, 2015.

2.1 Data collection framework

The research data were collected from the local boat owners of commercial fishing vessels, retailers, fish traders, local people, riverside settlers, fishing gear market, fish landing center and local fishermen by interviews (FGD), personal communication (Face to face) and direct observation. All-over cross-check Interviews (CI) were conducted with key informants such as Upazila Fisheries Officer (UFO), District Fisheries Officers (DFO) and relevant GO and NGO officers and staffs.

2.2 Fish specimen collection and identification

Samples of different fish species were collected from the fisherman’s catch landed at different fish landing centers of the selected sampling stations and from fish bazar as well. The collected fish samples were identified by analyzing their morphometric and meristic characteristics following (Rahman 1989 [4] and 2005 [1]; Talwar and Jhingran 1991) [5]. Cross-check were ensured by checking catalogue of life [6].

2.3 Determination of conservation status

The global conservation was determined following the database of IUCN (2016) [7] whereas the local conservation status was based on IUCN Bangladesh (2015) [8].

2.4. Data analysis

Data were presented graphical Image. Collected data were analyzed by Microsoft Excel 2010.

3. Results

A total 49 species under 9 orders and 23 families were recorded from the Sugandha River. List of existing fish species with their taxonomic position (Order and Family name), scientific name, local name, common group, habitat and their conservation status in Bangladesh and global aspects are presented in Table 1:

3.1 Percentage composition of Sugandha River Fish Species

The total identified fish species (49) of the River Sugandha is 18.49% of the total fresh water fish species (265) recorded by Rahman *et. al* (2005) [1].

3.2 Order wise percentage of Sugandha river fish species

Perciformes was found to be the most dominant order

consisting 35% of the total fish population followed by Siluriformes (23%), Cypriniformes (20%), Clupeiformes (8%) Osteoglossiformes (4%) and Synbranchiformes (4%). Anguiliformes, Beloniformes, channiformes comprised 2% each of the total species (Fig.1).

3.3 Family wise percentage of Sugandha River fish species

Cyprinidae was found to be the richest family (20%) followed by Gobiidae (10%), Bagridae (10%), Clupeidae (8%), Mugilidae (6%), Siluridae (4%), Ambssidae (4%), Notopteridae (4%) and Schibeidae (4%). On the other hand Plotosidae, Pangasidae, Polynemidae, Anabantidae, Osphronemidae, Centropomidae, Nandidae, Silaginidae, Ophichthi, Sciaenidae, Synbranchi and Mastacembelidae comprised 2% each (Fig.2).

3.4 Different common groups of Sugandha river fish species

Fifteen (15) common groups were recorded in the present study. Catfishes contributes the highest percentage (23%) followed by Mudskippers (10%), Barbs & Minnows (15%), Perches (12%), Carps (6%), Clupeids (6%), Eels (6%), Mulletts (4%) and Feather backs (4%). Anchovies Croakers, Threadfins, Gars, Snakeheads contribute 2% each (Fig.3).

3.5 Habitat percentage of Sugandha river fish species

The present study reveals that Estuary-River was found to be the habitat of fishes (41%) followed by River-Estuary and Estuary-River (35%). River- water habitat represents 24% habitat of the total fish population (Fig.4).

3.6 Local conservation status of Sugandha river fish species

According to the IUCN Bangladesh (2015) [8], 64 native freshwater fish species of Bangladesh have been declared as threatened species. Among them 13 fish, species were recorded from the River Sugandha. The threatened species of Sugandha River is 27% of the total identified species. Out of the 13 fish species, 7species (15%) were found as Vulnerable (VU), 5 species (10%) as Endangered (EN) and 1 species (2%) as Critically Endangered (CR). Local Conservation Status of Sugandha River Fish species showed that the highest percentage was recorded as Least Concern (63%) followed by Near Threatened (8%), Not Evaluated (2%) (Fig.5).

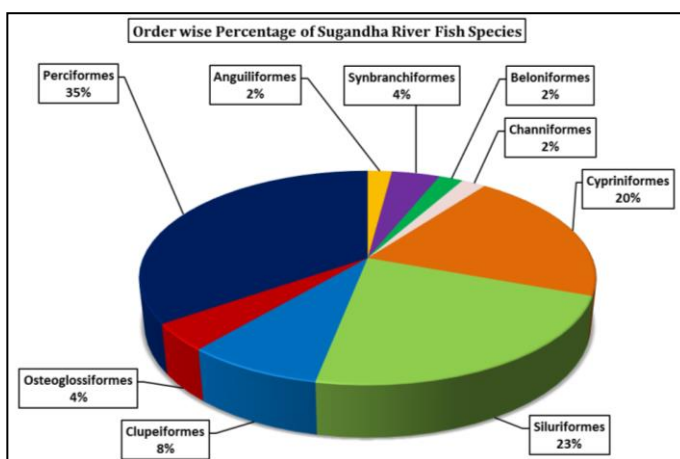


Fig 1: Order wise Percentage of Sugandha River Fish Species

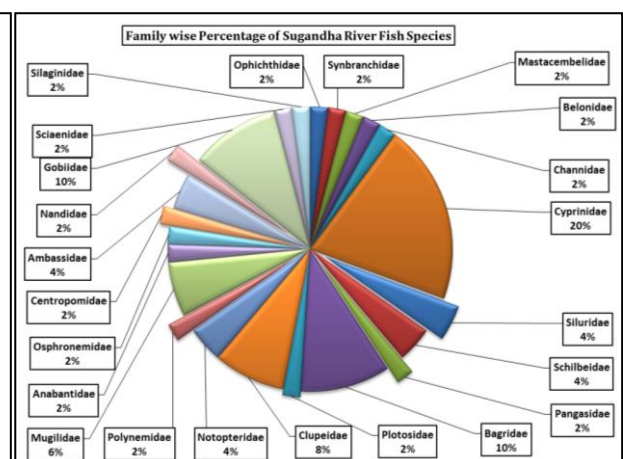


Fig 2: Family wise Percentage of Sugandha River Fish Species

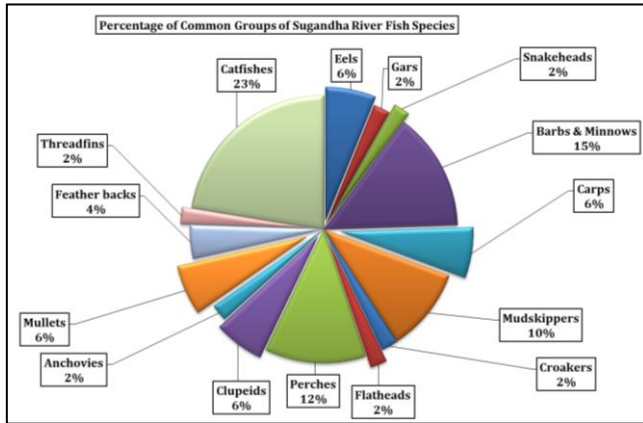


Fig 3: Percentage of common groups of Sugandha river fish species

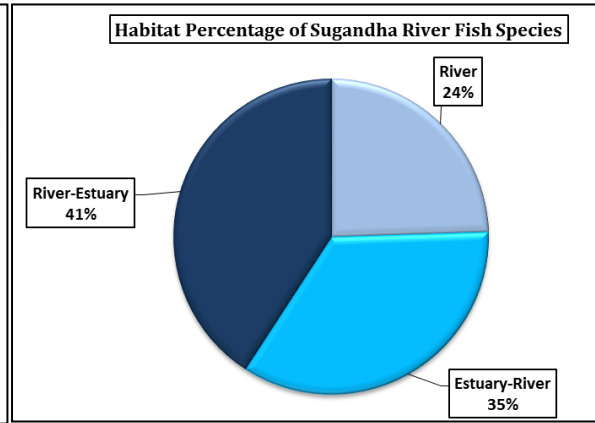


Fig 4: Habitat percentage of Sugandha river fish species

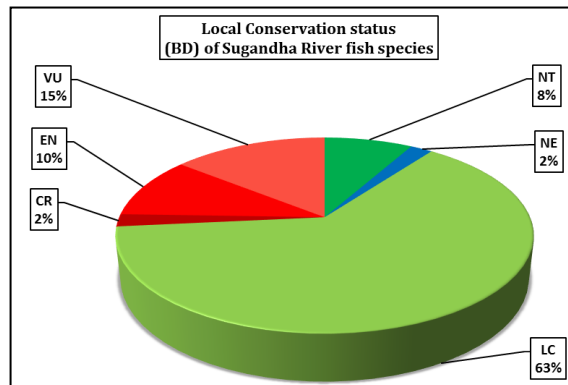


Fig 5: Local conservation status (BD) of Sugandha river fish species

Table 1: List of fish species collected from the River Sugandha

Order	Family	Scientific Name	Local Name	Group Name	Habitat	IUCN Conservation Status (BD)	IUCN Conservation Status (GB)		
Anguiliformes	Ophichthidae	<i>Pisodonophis boro</i>	Bamosh	Eels	E-R	LC	LC		
Synbranchiformes	Synbranchidae	<i>Monopterusuchia</i>	Kuchia	Eels	R-E	VU	LC		
	Mastacembelidae	<i>Mastacembelus armatus</i>	Baim	Eels	R-E	EN	LC		
Beloniformes	Belontiidae	<i>Xenentodon cancila</i>	Kakila	Gars	R-E	LC	LC		
Channiformes	Channidae	<i>Channa punctatus</i>	Taki	Snakeheads	E-R	LC	NE		
Cypriniformes	Cyprinidae	<i>Salmostoma acinaces</i>	Chela	Barbs & Minnows	R	LC	LC		
		<i>Esomus danricus</i>	Darkina	Barbs & Minnows	R-E	LC	LC		
		<i>Devario devario</i>	Banspata	Barbs & Minnows	R	LC	LC		
		<i>Amblypharyngodon mola</i>	Mola	Barbs & Minnows	R	LC	LC		
		<i>Puntius sarana</i>	Sarpunti	Barbs & Minnows	R-E	NT	LC		
		<i>Puntius ticto</i>	Tit punti	Barbs & Minnows	R	VU	LC		
		<i>Puntius sophore</i>	Bhadipunti	Barbs & Minnows	R	LC	LC		
		<i>Labeo calbasu</i>	Kalibaas	Carps	R	LC	LC		
		<i>Labeo rohita</i>	Rui	Carps	R-E	LC	LC		
		<i>Labeo bata</i>	Bata	Carps	R	LC	LC		
		Siluriformes	Siluridae	<i>Wallago attu</i>	Boal	Catfishes	R-E	VU	NT
				<i>Ompok pabda</i>	Modhupabda	Catfishes	R	EN	NT
			Schilbeidae	<i>Silonia silondia</i>	Shilong	Catfishes	R-E	LC	LC
		<i>Eutropiichthys vacha</i>	Bacha	Catfishes	R-E	LC	LC		
	Pangasidae	<i>Pangasius pangasius</i>	Pangas	Catfishes	R-E	EN	LC		
	Bagridae	<i>Rita rita</i>	Rita	Catfishes	R-E	EN	LC		
		<i>Sperata aor</i>	Air	Catfishes	R-E	VU	LC		
		<i>Mystus bleekeri</i>	Gulshatengra	Catfishes	R	LC	LC		
		<i>Mystus vittatus</i>	Tengra	Catfishes	R-E	LC	LC		

		<i>Bagarius Bagarius</i>	Baghair	Catfishes	R-E	CR	NT
	Plotosidae	<i>Plotosus canius</i>	Kainmagur	Catfishes	E-R	NT	NE
Clupeiformes	Clupeidae	<i>Tenualosa ilisha</i>	Ilish	Clupeids	E-R	LC	LC
		<i>Gudusia chapra</i>	Chapila	Clupeids	R	VU	LC
		<i>Corica soborna</i>	Kachki	Clupeids	R-E	LC	LC
		<i>Setipinna phasa</i>	Phasa	Anchovies	E-R	LC	LC
Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Foli	Feather backs	R-E	VU	LC
		<i>Chitala chitala</i>	Chitol	Feather backs	R-E	EN	NT
Perciformes	Polynemidae	<i>Polynemus paradiseus</i>	Tapasi	Threadfins	E-R	LC	NE
	Mugilidae	<i>Rhinomugil corsula</i>	Khorsula	Mulletts	E-R	LC	LC
		<i>Mugil cephalus</i>	Bhanganbata	Mulletts	E-R	LC	LC
		<i>Liza subviridis</i>	Bata	Mulletts	E-R	LC	NE
	Anabantidae	<i>Anabas testudineus</i>	Koi	Perches	R	LC	DD
	Osphronemidae	<i>Trichogaster lalius</i>	Lalkholosa	Perches	R	LC	LC
	Centropomidae	<i>Lates calcarifer</i>	Koral	Perches	E-R	NE	NE
	Ambassidae	<i>Chanda nama</i>	NamaChanda	Perches	R-E	LC	LC
		<i>Pseudambassis baculis</i>	Chanda	Perches	R-E	NT	LC
	Nandidae	<i>Nandus nandus</i>	Vheda	Perches	R-E	NT	LC
	Gobiidae	<i>Pseudapocryptes elongatus</i>	Chewa	Mudskippers	E-R	LC	LC
		<i>Awaous grammepomus</i>	Bele	Mudskippers	E-R	VU	LC
		<i>Glossogobius giuris</i>	Bele	Mudskippers	E-R	LC	LC
		<i>Odontamblyopus rubicundus</i>	Lalchewa	Mudskippers	E-R	LC	NE
		<i>Taenioides cirratus</i>	Chewa	Mudskippers	E-R	LC	DD
	Sciaenidae	<i>Otolithoides pama</i>	Poa	Croakers	E-R	LC	NE
	Silaginidae	<i>Sillaginopsis panijus</i>	Tulardandi	Flatheads	E-R	LC	NE

*Not Evaluated (NE), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR)

*River (R), River- Estuary (R-E), Estuary- River (E-R)

*BD=Bangladesh. GB=Global

4. Discussion

Very limited research works have been conducted on the fish biodiversity of Sugandha River.

Hossain *et al* (2012) ^[9] gave an account of 293 fresh water fish species including 13 orders and 61 families. Rahman (2005) ^[1] compiled a list of 265 species of freshwater fishes belonging to 154 genera and 55 families from Bangladesh.

Hossain *et al* (2012) ^[9] documented 53 fish species from the Meghna river estuary. Ali *et al* (2015) ^[10] documented 53 species under 9 orders and 26 families from Lohalia River of Patuakhali, which is not similar to present investigation.

Habib *et al* (2016) ^[11] found 82 species under 11 orders and 2 classes in Padda River near Rajshahi city. Almost similar study was found by Gain *et al* (2015) ^[12] who recorded 95 finfish species contributing to 14 orders, 45 families and 77 genera of the Passur River in Bangladesh.

Yeamin *et al* (2015) ^[13] documented 64 species under 11 orders and 30 families during their study in Rupsha River. Alam *et al* (2013) ^[14] recorded 63 species belongs to 9 orders, 24 families, 51 genera from the upper Halda River, Chittagong, Bangladesh.

Joadder *et al* (2015) ^[15] recorded 71 species constituting 10 orders, 26 families and 54 genera in the River Padma. Pramanik *et al* (2016) ^[17] recorded 107 fish species belonging to 13 orders and 26 families from the Meghna River Bangladesh.

Mohsin *et al* (2013) ^[16] found 69 species belonging to 10 orders, 25 families and 47 genera in the Padma River at Rajshahi district. In fresh water bodies of Bangladesh, these three groups (Perciformes, Siluriformes and Cypriniformes) are the most dominant groups ^[1, 10 & 13].

The most dominant family found in the present study was Cyprinidae. Joadder *et al* (2015) ^[15] Mohsin *et al* (2013) ^[16] and Alam *et al* (2013) ^[14] reported the domination of this family in the River Padma of Rajshahi district and Upper Halda River of Chittagong district respectively. Rahman

(2005) ^[1] showed that this family is dominant in the fresh water fishes of Bangladesh. Estuary-River was found to be the biggest habitat for the maximum number of fishes that differ with the study of Hossain *et al* (2012) ^[9] who recorded the highest number of fresh water fish habitat was River. To evaluate the extinction risk of many species the IUCN adopted Red List categories of animals and plants. The objective of IUCN Red List is to help the international community to try to reduce species extinction through suggesting the importance of conservation issues to the public and policy makers (Alam *et al*. 2013) ^[14]. More or less region-wise threatened fish species are shown about same in different river of Bangladesh. Such as Halda ^[14], River Padma ^[15], Meghna River ^[17] Passur River ^[12] and Rupsha River ^[13].

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5. Conclusion and Recommendations

The present study mainly focuses on documentation of existing fish biodiversity in the Sugandha River and their present conservation status in Bangladesh. Total number of species recorded during the study period has shown good indication of rich biodiversity in the Sugandha River which could be increased in further research.

The followings are recommended for policymaking, implementation, and fish biodiversity conservation in the Sugandha River: Banning or controlling destructive fishing gears and crafts, Banning indiscriminate killing of fish fry and fingerling, Controlling over fishing and illegal fishing, Establishing and maintaining fish sanctuaries, Minimizing the river water pollution, Regular dredging should be done for continuous river water flow to facilitate fish migration, Raising awareness among fisherman, fish retailers, fish traders and local people and National strategies should be

formulated for policy making, monitoring and implementation on the Sugandha River.

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