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Ichthyofaunal diversity from Sonkosh river, Assam, India

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Abstract

The ichthyological field survey was undertaken from April 2012 to March 2013 in the river Sonkosh of Kokrajhar district, B.T.C., Assam. The river is an important tributary of the mighty river Brahmaputra in the northern bank. It portrayed 83 species of fishes belonging to 10 major orders and 26 families. Of these the Cyprinidae family with 31 species dominating the fish diversity in the river and followed by Anguillidae (1), Balitoridae (2), Cobitidae (4), Amblyceptidae (2), Bagridae (5), Siluridae (2), Schilbeidae (3), Sisoridae (5), Oliridae (2), Chacidae (1), Belonidae (1), Mastacembelidae (3), Nandidae (2), Badidae (2), Chaudhuriidae (1), Chandidae (2), Osphronemidae (1), Anabantidae (1), Belontidae (1), Channidae (6), Gobiidae (1), Aplochelidae (1), Mugilidae (1) and Tetradontidae (1). The collection contains overlapping species of true hill stream, semi torrential and migratory forms.

Keywords: Fish diversity, IUCN, Sonkosh river, Kokrajhar.

1. Introduction

Rivers in India constitute the backbone of capture fisheries. There are 113 major and minor rivers in India along with their principal tributaries, having a combined length of 45,000 km. (approx.) of which 80% of the total length is contributed by 14 major rivers. River basins of 7,20,000 sq.km. (approx.) catchment area characterise the major rivers. River consists of a complex mixture of distinctive habitats, which make it among the most productive and valuable ecosystem on the earth (Das and Sharma, 2012). A number of endemic fish species are known to North East as well as Assam. Therefore North East India is known as 'global hotspot' for fish faunal diversity. According to ICAR (2006), the region has about 19,150 km. of rivers, 23,792 ha of reservoirs, 1,43,740 ha of wetlands and lakes, 40,809 ha of ponds mini barrages suitable for fisheries development and 2,780 ha of area suitable for paddy-cum fish culture. Out of which Bodoland Territorial Council (B.T.C.) Area holds about 1,558 ha area of registered beels, 900 ha unregistered beels and swamps, 2,334 ha ponds and tanks and 671 ha area of waste lands (Statistical Report, Fishery Dept. BTC, 2009). The North East India is drained by the Ganga river system in the north and north eastern part of Bengal, the Brahmaputra system in Assam, Meghalaya, Tripura and some parts of Mizoram, Manipur and Nagaland. The Eastern part of Manipur including the central plain is drained by the Chindwin river system while some part of Mizoram is drained by the Kaladan (Koladyne) river system (Goswami *et al.*, 2007). The mighty Brahmaputra (730kms.) flowing east to west has 27 numbers of tributaries in the north bank. The important tributaries are Jiadhol, Subansiri, Ranganadi, Dibrong, Burai, Jhiabharali, Dhansiri, Pulhamari, Pagladia, Aie,

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Manas, Champaboti, Sonkosh and Gongadhar. The Brahmaputra river system harbours a large variety of fishes of both Indo-Gangatic and Indo-Malayan origin. Assam alone has 5,050 km. of rivers including all the tributaries of Brahmaputra and Barak (Gurumayum and Choudhuri, 2009).

There has been extensive survey and studies on freshwater fishes of India, notably by Hamilton (1822), Hora (1921), Shaw and Shebbeare (1937), Menon (1989), Dey (1973), Jhingran and Sehgal (1978), Sen (1985), Nautiyal and Singh (1989), Talwar and Jhingran (1991), Jhingran (1999), Jayaram (1999), Vishwanath (2000), Nath and Dey (2000), Srivastava *et al.*, (2002), Uniyal *et al.*, (2002), Sen (2003), Goswami (2000 and 2005), Kar (2007), Tesia and Bordoloi (2012) and Sharma *et al.*, (2012). The fresh water fish diversity of Assam was reported by Dey (1973), Joshi (1994), Roy (1994), Kar *et al.*, (*et al.*, 2006), Gupta and Gupta (2008), Acherjee and Barat (2009), Saha and Bordoloi (2009), Das and Sharma (2012), Das and Bordoloi (2012) and Das and Kar (2012).

Although the investigation on Ichthyofaunal diversity of this region has been carried out by a few workers, but in Kokrajhar district yet there is no record of proper scientific information regarding the fish diversity, riverine capture fishery potentiality, abundance of food as well as the ornamental fishes and their conservation measures from river Sonkosh. The fish and fishery survey from Kokrajhar district is reported only by Baro (2007). At present it is a challenge and become necessary to survey and analyse the fishery potential as well as the conservation of the biodiversity, particularly the ichthyofauna of river Sonkosh.

The river Sonkosh which is an important tributary of the Brahmaputra river system in the north bank originates from the Eastern Himalayan region. It flows down through Bhutan (known as Punatsang chhu in Bhutan) entered Assam at Jamduar ($26^0 43' 59.8''$ N and $89^0 51' 39.4''$ E), Indo-Bhutan border pillar no. 118 India. It extends up to the Feshimari-Jaldhuaghat ($26^0 21' 39''$ N and $89^0 47' 26''$E), West Bengal, where another river called Raidak joins with Sonkosh. From here it is known as Gongadhar river which flows through Dhubri district of Assam and joins with Brahmaputra river at Patamari village.

2. Survey of Sonkosh river

The river Sonkosh, from Jamduar to Feshimari-Jaldhuaghat (Latitude $26^0 43'$ N - $26^o 21'$ N, Longitude $89^0 47'$ E - $89^o 51'$ E and altitude 35m. - 101m.) flows from downstream of Himalayan mountain of Bhutan by touching the two states, the Assam in the east and the West Bengal in the western part and it never dries up in any season. The river Sonkosh shows a total catchment area of 650 km. and watershed area of 87 km (77 km. stretch confluence with Gongadhor river, Das, 1992). Survey of the area was conducted in four selected catchment areas, as well as, the landing sites in the river banks. The surveyed areas are (i) Jamduar ($26^o 43' 59.8''$ N and $89^0 51' 39.4''$ E), (ii) Chaudhuri ghat ($26^0 39' 04.9''$ N and $89^o 53' 24.8''$ E), (iii) Surendrapur ($26^0 32' 26.1''$ N and $89^0 53' 28.7''$ E) and (iv) Pakriguri ($26^0 27' 03.5''$ N and $89^0 51' 38.1''$ E).

3. Methodology

Sampling design, collection of data and analysis

To collect various data on captured fishes, investigations were conducted twice in a month from April 2012 to March 2013 and the annual cycle was divided into three seasons as (a) pre-monsoon (March-June), (b) Monsoon (July-October) and (c) post monsoon (November-February). Investigations of fishes were conducted in four selected catchment areas (Jamduar, Chaudhurighat, Surendrapur and Pakriguri) with the help of fishermen during the time of fishing. The above mentioned catchment areas are approximately 106 km, 88 km, 70 km and 60 km respectively away towards north-west from district head quarter Kokrajhar. Fishing gears applied were mostly gill net, lift net, cast net, hooks and lines, entangling gear, encircling gear, bamboo traps, etc. The market survey was conducted in the morning during 7-10am and evening during 3-6pm at the nearest markets of the river site. Secondary data were also collected through observation and interaction with local people and fishermen communities of embankment areas. The specimens were photographed and morphological characters were recorded. Fishes were fixed individually in 6% formalin solution. For identification and classification literatures of Talwar and Jhingran (1991), Jayaram (1999), Vishwanath (2000) and Nath and Dey (2000) were followed.

Nomenclature is based on fishbase (www.fishbase.org.in). The conservation status of recorded species was based on IUCN (www.iucnredlist.org).

4. Results and Discussion

Altogether, 83 species belonging to 58 genera, 26 families and 10 orders have been recorded from the four stations of Sonkosh river during the study period. The ichthyospecies of the tributary belongs to the following orders- Clupeiformes, Anguilliformes, Cypriniformes, Siluriformes, Beloniformes, Symbranchiformes, Perciformes, Cyprinodontiformes, Mugiliformes and Tetradontiformes. Out of these 83 species, 1 belong to family Notopteridae followed by Anguillidae (1), Cyprinidae (31), Balitoridae (2), Cobitidae (4), Amblyceptidae (2), Bagridae (5), Siluridae (2), Schilbeidae (3), Sisoridae (5), Oliridae (2), Chacidae (1), Belonidae (1), Mastacembelidae (3), Nandidae (2), Badidae (2), Chaudhuriiade (1), Chandidae (2), Osphronemidae (1), Anabantidae (1), Belontidae (1), Channidae (6), Gobidae (1), Aplochelidae (1), Mugilidae (1) and Tetradontidae (1). The collected fish species from the four different stations are depicted in the Table-1.

Out of this survey, the species recorded from Sonkosh river, 7 species were found to be near threatened (NT) criteria, 3 considered as endangered (EN), 2 vulnerable (VU), 60 least concern (LC), 4 data deficient (DD) and 7 not evaluated (NE) as per IUCN (Table- 1).

Table- 1: List of fish species recorded from Sonkosh river with IUCN status.

Order	Family	Name of the species	IUCN status
Clupeiformes	Notopteridae	*Notopterus notopterus* (Pallas, 1769)	LC
Anguilliformes	Anguillidae	*Anguilla bengalensis bengalensis* (Gray, 1931)	EN
Cypriniformes	Cyprinidae	*Amblypharyngodon mola* (Hamilton-Buchanan, 1822)	LC
		Oreichthys crenuchoides (Schafer, 2009)	DD
		Labeo rohita (Hamilton, 1822)	LC
		L. bata (Hamilton-Buchanan, 1822)	LC
		L. dyocheilus (McClelland, 1839)	LC
		L. calbasu (Hamilton, 1822)	LC
		Tor putitora (Hamilton, 1822)	EN
		T. Progeneius (McClelland, 1839)	NT
		Danio dangila (Hamilton-Buchanan, 1822)	LC
		Neolissocheilus hexagonolepis (McClelland, 1839)	NE
		Puntius ticto (Hamilton, 1822)	LC
		P. sophore (Hamilton, 1822)	LC
		P. chola (Hamilton, 1822)	LC
		P. sarana sarana (Hamilton, 1822)	LC
		Aspidoparia jaya (Hamilton-Buchanan, 1822)	LC
		A. morar (Hamilton-Buchanan, 1822)	LC
		Bangana dero (Hamilton, 1822)	LC

		Barilius bendelisis (Hamilton-Buchanan, 1822)	NE
		B. barila (Hamilton-Buchanan, 1822)	LC
		B. vagra (Hamilton, 1822)	LC
		Catla catla (Hamilton, 1822)	LC
		Chela laubuca (Hamilton-Buchanan, 1822)	LC
		Cirrhinus reba (Hamilton, 1822)	LC
		Chagunius chagunio (Hamilton, 1822)	LC
		Crossocheilus latius latius (Hamilton, 1822)	LC
		C. buramanicus (Hora, 1936)	LC
		Cyprinion semiplotum (McClelland, 1839)	VU
		Danio devario (Hamilton-Buchanan, 1822)	LC
		D. rerio (Hamilton-Buchanan, 1822)	LC
		Ctenopharyngodon idellus (Valenciennes, 1844)	NE
		Raiamas bola (Hamilton, 1822)	LC
	Balitoridae	*Aborichthys elongates* (Hora, 1921)	NE
		Acanthocobitis botia (Hamilton, 1822)	LC
	Cobitidae	*Lepidocephalichthyes guntea* (Hamilton-Buchanan, 1822)	NE
		Botia daro (Hamilton, 1822)	LC
		Botia rostrata (Gunthur, 1868)	VU
		Somileptis gongota (Hamilton-Buchanan, 1822)	LC
Siluriformes	Amblyceptidae	*Amblyceps cerenium* (Ng-Wright, 2010)	NE
		A. mangois (Hamilton, 1822)	LC
	Bagridae	*Mystus cavasius* (Hamilton-Buchanan, 1822)	LC
		M. tengara (Hamilton, 1822)	LC
		M. vittatus (Bloch, 1794)	LC
		Aorichthys aor (Hamilton-Buchanan, 1822)	LC
		Rita rita (Hamilton, 1822)	LC
	Siluridae	*Ompok pabda* (Hamilton, 1822)	NT
		Wallago attu (Bloch-Schneider, 1801)	NT
	Schilbedae	*Ailia coila* (Hamilton, 1822)	NT
		Clupisoma garua (Hamilton, 1822)	LC
		Eutropiichthys vacha (Hamilton, 1822)	LC

	Sisoridae	*Gagata cenia* (Hamilton-Buchanan, 1822)	LC
		Bagarius bagarius (Hamilton, 1822)	NT
		Glyptothorax cavia (Hamilton, 1822)	LC
		Glyptothorax telchita (Hamilton, 1822)	LC
		Nangra assamensis (Sen-Biswas, 1994)	LC
	Oliridae	*Olyra longicaudata* (McClelland, 1842)	LC
		O. kempi (Chaudhuri, 1912)	LC
	Chacidae	*Chaca chaca* (Hamilton, 1822)	LC
Beloniformes	Belonidae	*Xenentodon cancila* (Hamilton-Buchanan, 1822)	LC
	Mastacembelidae	*Macrognathus aral* (Bloch-Schneider, 1801)	LC
		M. pancalus (Hamilton-Buchanan1822)	LC
		Mastacembalus armatus (Lacepede, 1800)	LC
Synbrabchiformes	Nandidae	*Badis badis* (Hamilton-Buchanan, 1822)	LC
		Nandus nandus (Hamilton, 1822)	LC
	Badidae	*Badis assamensis* (Ahl, 1937)	DD
		Dario dario (Hamilton, 1822)	DD
	Chaudhuriidae	*Pillaia indica* (Yazdani,1972)	EN
	Chandidae	*Chanda nama* (Hamilton-Buchanan, 1822)	LC
		Parambassis ranga (Hamilton-Buchanan, 1822)	LC
	Osphronemidae	*Ctenops nobilis* (McClelland, 1845)	NT
	Anabantidae	*Anabus testudenius* (Bloch, 1792)	DD
Perciformes	Belontidae	*Trichogaster fasciatus* (Bloch-Schneider, 1801)	LC
	Channidae	*Channa gachua* (Hamilton, 1822)	NE
		C. morulius(Hamilton, 1822)	LC
		C. punctatus (Bloch, 1793)	LC
		C. striatus (Bloch, 1793)	LC
		C. stewartii (Playfair, 1867)	LC
		C. bleheri (Vierke, 1991)	NT
	Gobiidae	*Glossogobius giuris* (Hamilton-Buchanan, 1822)	LC
Cyprinodontiformes	Aplocheilidae	*Aplocheilus panchax* (Hamilton, 1822)	LC
Mugiliformes	Mugilidae	*Rhinomugil corsula* (Hamilton,1822)	LC
Tetradontiformes	Tetradontidae	*Tetradon cutcutia* (Hamilton, 1822)	LC

5. Conclusion

Present study is the first ever documentation of ichthyofauna in the river Sonkosh from the Kokrajhar district, Bodoland Territorial Council (B.T.C.) area of Assam. Though the river is affected by different anthropogenic hazards yet it has found abundance of fish population and diversity migrated from upstream. Because, it is to be mentioned here that in Bhutan, Bhutanese people follow Buddhism and so fishing and killing of fishes are banned by the Government. The study resulted in recording of *Anguilla bengalensis*, *Tor putitora* and *Pillaia indica* with endangered status and some important fish species with threatened status like *Labeo dyocheilus, Tor Progeneius, Bagarius bagarius, Ailia coila, Channa bleheri, Ctenops nobilis, Aborichthys elongates.* The river has large potential for capture fisheries particularly the ornamental and food fishes. Among the collected species *Ctenops nobilis, Danio dangila, Oreichthys crenuchoides* have very high commercial value as aquarium fish. To conserve such ichthyofaunal diversity, a long term management and action plan should be adopted.

References

Acharjee, L.M. and Barat, S. 2010: Impact of fishing methods on conservation of ichthyofauna of river Relli in Darjeeling Himalaya of West Bengal. Journal of Environmental Biology. 31:431-434.

Baro, D.C. 2007: An intensive field study on fish and fisheries of wetlands of Gossaigaon sub-division under Kokrajhar district, Assam. M.Phil. Dissertation, PRIDE, Periyar University, Salem.

Das, B. and Kar, D. 2012: *Basic limnology and fish diversity.* Vi+192, Manglam Publishers and Distributors, Delhi.

Das, B. and Sharma, S. 2012: A comparison of fish diversity of Kopili and Jamuna rivers of Karbi Anglong District, Assam. The Science Probe. 1(1): 21-29.

Das, M.K. and Bordoloi, S. 2012: Ichthyofaunal resources of Inland water bodies of the river island Majuli, Assam, India. Asian J. Exp. Biol. Sci. Vol. 3(1): 51-58.

Dey, S. C. 1973: Studies on the distribution and taxonomy of the ichthyofauna of the hill streams of Kamrup Khashi Garo regions of Assam with special references to functional morphology of some rheophilic fishes. D.Sc. Thesis, University of Calcutta.

Goswami, U.C. 2000: *Establishment of exotic fishes in natural water bodies of North East India. Fish Biodiversity of North East India* edited by A.G. Ponniah and U.K. Sarkar. 150-154.

Goswami, U.C. 2005: Constrain analysis in propagation and conservation of fresh water fish germplasm resources of North East India. Nature Conservators, 9: 103-111.

Goswami, U.C.; Vishwanth, W.; Jayaram, K.C. and Datta Munshi, J.S. 2007: Fish fauna of North East India: Natural and Anthropogenic Hazards on Fish and Fisheries. 21-45. Narendra Publishing House, Delhi.

Gupta, S.K. and Gupta, P.C. 2008: *General and Applied Ichthyology (fish and fisheries)*. S.Chand and Company Ltd. Ramnagar, New Delhi.

Gurumayum, S.D. and Choudhury, M. 2009: Fishing methods in rivers of Northeast India. Indian Journal of Traditional Knowledge. 8(2): 237-241.

Hamilton, F. 1822: *An account of fishes found in the river Ganges and its branches*, Edinburgh.

Hora, S.L. 1921: Fish and fisheries of Manipur with some observations on those of the Naga Hills. Rec. Ind. Mus. 22: 165-214.

ICAR, 2006: Central Inland Fisheries Research Institute (CIFRI), Barrackpore.

Jayaram, K.C. 1999: *The fresh water fishes of the Indian Region*. Narendra Publishing House, New Delhi, 1-322.

Jhingran, V.G. 1999: *Fish and fisheries of India*. Third edition. Hindusthan Publishing House, New Delhi, India.

Jhingran, V.G. and Sehgal, K.L. 1978: *Cold water fisheries of India*. Inland Fisheries Society of India, Barrackpore, West Bengal, India.

Joshi, C.B. 1994: *Conservation of Tor putitora: Aatcliery Practices. In: Mahaseer,* the Game fish (Ed.Nautiyal, P.). 15-25.

Kar, D.; Nagarathna, A.V.; Ramachandra, T.V. and Dey, S.C. 2006: Fish diversity and conservation aspects in an aquatic ecosystem in North-eastern India. Zoo's Print Journal. 21(7):2308-2315.

Kar. D. 2007: *Fundamentals of Limnology and Aquaculture Biotechnology,* xiv+609, Daya Publishing House, New Delhi.

Menon, A.G.K. 1989: Conservation of Ichthyofauna of India. In: Conservation and Management of Inland capture fisheries resources of India. (Ed. Jhingran, A.G.) 25-33.

Nath, P. and Dey, S.C. 2000: *Fish and Fisheries of North Eastern India, Vol. I:* Arunachal Pradesh, 217.

Nautiyal, P. And Singh, H.R. 1989: River projects and endangered Himalayan Mahaseer. *Tor putitora* in the Indian uplands of Garhwal region: A critical evaluation Him. J. Env. Zoo. 3:129-134.

Roy, T. 1994: Fishes of West Bengal which need immediate conservation or saving them from extinction. Threatened fishes of India. Natcom. Publ. 4: 37-43.

Saha, S. and Bordoloi, S. 2009: Ichthyofaunal diversity of two beels of Goalpara district, Assam, India. J. Threatened taxa. 1(4): 240-242.

Sarma, D.; Das, J.; Bhattacharyya, R.C. and Dutta, A. 2012: Ichthyofauna diversity of lower reaches of the Brahmaputra river, Assam. IJABPT. 3(2): 126-130.

Sen, N. 2003: Fish fauna of North East India with special reference to endemic and threatened species. Records of the Zoological Survey of India. 101(3-4): 81-99.

Sen. T.K. 1985: The fish fauna of Assam and the neighbouring North Eastern states of India. Records of Zoological Survey of India, Occasional paper no. 64: 1-216.

Shaw, G.E. and Shebbeare, E.O. 1937: The fishes of North Bengal. J. Royal Asiat. Soc. Beng., 1-137.

Srivastava, S.K.; Sarkar, U.K. and Patiyal, R.S. 2002: Fishing methods in streams of the Kumaon Himalayn region of India. Asian Fish. Sc., 15: 347-356.

Talwar, P.K. and Jhingran, A. 1991: *Inland fishes of India and adjacent countries*. Oxford and IBH Publishing House, Co. Pvt. Ltd., New Delhi 1 and 2: 115-116.

Tesia, C. and Bordoloi, S. 2012: Ichthyofauna diversity of Charju river, Tirap district, Arunachal Pradesh, India. Asian J. Exp. Bio. Sci. 3(1): 82-86.

Uniyal, D.U.; Bahuguna, S.N.; Kumar, A. and Uniyal, M.B. 2002: Fishing methods- an important tool for fish conservation and management: A case study in Doon Valley, Uttaranchal. In: Abstract Proceedings, National Seminar on Aquatic Resource Management in Hills, National Research Centre on Cold Water Fisheries (ICAR), Nainital, 68.

Statistical report, 2009 : Fishery Department, BTC, Assam.

Vishwanath, W. 2000 : *Fishes of North East India, ICAR Govt. of India*, New Delhi.