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ORIGINAL ARTICLE

**A Checklist of ichthyofaunal diversity of Khowai River, Tripura, North-East India**

Sudipta Mandal<sup>1,2</sup>

1Department of Zoology, Dasaratha Deb Memorial College, Khowai, Tripura-799201, India

2Bangabasi College, 19, RajkumarChakrabortySarani, Kolkata-700009, West Bengal, India

E-mail: [smzoology@gmail.com](mailto:smzoology@gmail.com) ; Mob. 9436471023

ABSTRACT

*Sampling of fish were done from different parts of Khowai River, Tripura, North-East India from July 2015 to June 2016 to assess the ichthyofaunal diversity of this important river of Tripura. A total of 59 fish species belonging to 10 orders, 23 families and 41 genera were recorded during the present study. Cypriniformes was the most dominate orders with 26 species followed by Perciformes and Siluriformes. 8 species of fish recorded during the present study are placed under near threatened (NT) category in the IUCN (2016) check list. Decreasing trend in both diversity and abundance of fish in the Khowai River were noticed during the present study due to malpractices like poisoning of river and indiscriminate use of pesticides which strongly suggests immediate conservative measures to protect the ichthyofaunal diversity of this River.*

**Keywords:** Khowai River, Tripura, North East India, Fish diversity

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**INTRODUCTION**

Biodiversity represents the range of life describing the number and variability in relation to ecosystem in which they occur. The study of biological diversity comprehends both the inherent and anthropogenic values associated with it. Biological diversity is the base for maintaining the ecosystems and the functional aspects of the species that provide goods and services for human well-being.

Fish constitutes almost half of the total number of vertebrates in the world. Freshwater biodiversity constitutes a vitally important component of the planet, with a species richness that is relatively higher compared to both terrestrial and marine ecosystems [1]. Fish are invariable living components of water bodies. These organisms are important food resources and good indicators of the ecological health of the waters they inhabit.

South and Southeast Asia is one of the most species rich areas on the planet containing 20% of all known freshwater vertebrate species and 25% of known aquatic plants [2]. India is one of the mega-biodiversity countries in the World[3]. The North-eastern region of India has been identified as a hotspot of biodiversity by the World Conservation Monitoring Centre[4]. The hills and the undulating valleys of this area gives rise to a large number of torrential hill streams, which lead to big rivers that finally become part of the Ganga-Brahmaputra-Barak-Chindwin-Kolodyne-Gomati-Meghna system [5].

River is one of the most valuable resources, which supports human health, economic development and ecological diversity. The unique topography of North-East India and watershed pattern is an attractive field for Ichthyological studies. This region has already been recognized as a global spot of freshwater fish diversity and considered to be one of the hotspots of freshwater fish biodiversity in the world [6-7].

Tripura province of North-eastern India is situated in the western fringe of Indo-Myanmar global hotspot [8-9]. Tripura province is unique due to its location at the confluence of Indo-Myanmar, Indo-Malayan and parts of Indo-China geographical regions with close proximity to Bangladesh.

The province of Tripura is flanked by both hills and plains with four principal rivers, viz., Monu, Khowai, Gomati and Feni. In addition to the above, there are other smaller rivers, namely, Howrah, Deo and

Muhuri. Of these, the river Khowai originates from the Atharamura hill ranges and forms the Khowai basin in its way to Bangladesh [10].

India has about 11.72% of total global fish biodiversity. A great number of fish species have been reported from the North-eastern region [11]. Out of 806 fish species found in the freshwaters of India [12], 284 species belonging to 111 genera have been reported from this region [13]. However, a very less number of fish species were reported from Tripura.

In earlier works from North-East India, [14] reported 185 species from Assam while [15] enlisted 267 species from North Eastern region. 390 fish species were included from the North Eastern region by [16]. Based on literature survey, [17] enlisted 422 fish species from North East India, inclusive of the Himalayan and Indo Burma biodiversity hotspots.

Information about fish diversity of Tripura is relatively scanty compared to other states of North-East India. The River in Tripura reflected 28 species belonging to 8 families in Manu, 22 species belonging to 6 families in Khowai, 53 species belonging to 19 families in Gomati, and 22 species belonging to 8 families in Feni [18]. [17] reported 199 fresh water fish species from Tripura based on available literature as well as their survey work.

Although Khowai River is the principal river of Khowai district of Tripura and many fishermen depend on this river for their livelihood, information regarding piscine diversity and physiochemical parameters of this river is very scanty. During review of literature very little information was found regarding recent ichthyofaunal diversity of this river. [18] reported only 22 fish species from Khowai River.

The present study was carried out to access the fish diversity of a selected portion of the Khowai River running through the plain land of Khowai district along with some basic physiochemical parameters of the river water which are important for survival of the aquatic organisms.

## MATERIALS AND METHODS

### Sampling sites

Fish survey and sampling was done at five sampling sites distributed at a stretch of about 40 kilometres situated in between Teliamura town and Khowai town of Tripura (Fig. 1). Name of the sampling sites are Teliamura (23051.045°N, 91038.026°E), Muharchara (23053.105°N, 91037.723°E), Kalyanpur (23097.017°N, 91061.127°E), Ramchandra ghat (24001.445°N, 91061.261°E), Khowai town (24002.785°N, 91048.170°E). The sampling sites had varied water levels depending on the seasons.

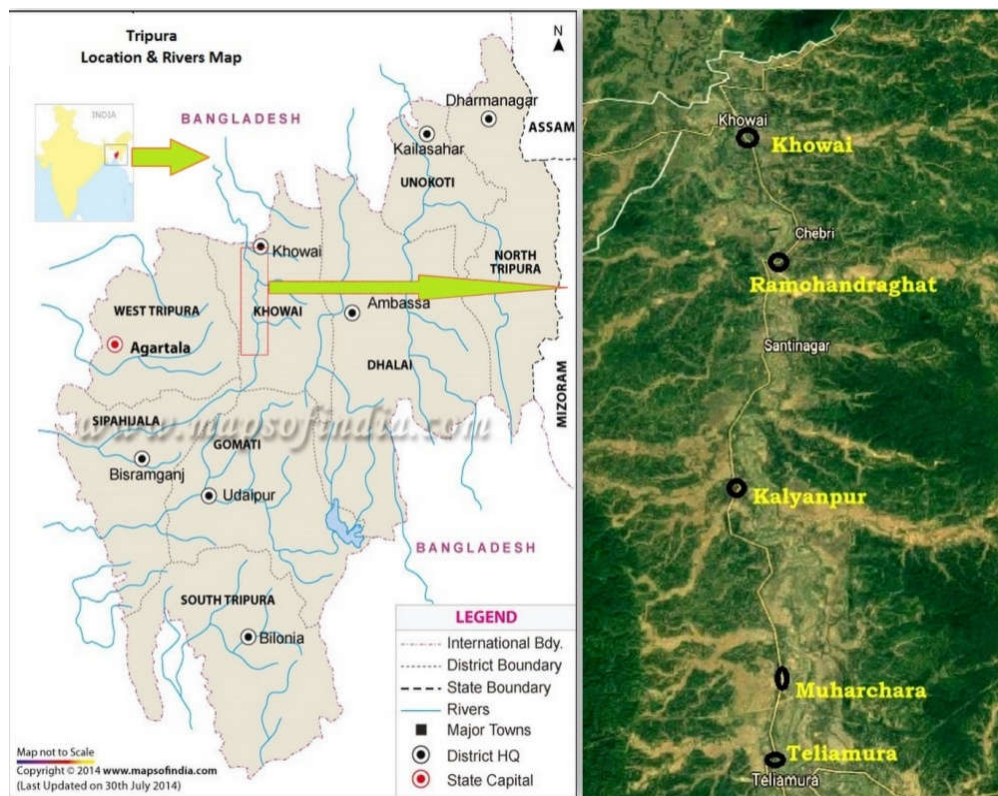


Figure 1: Fish sampling sites on Khowai River, Tripura, India.

### Sampling techniques

Sampling of fish was carried out from July 2015 to June 2016. Fish samples were collected through experimental fishing using cast nets (diameter 3.7m and 1.0m), gill nets (vertical height 1.0m-1.5m; length 100m-150m), drag nets (vertical height 2.0m), triangular scoop nets (vertical height 1.0m) and a variety of traps. Camouflaging technique was also used to catch the fishes. Fishes were preserved, at first, in concentrated formaldehyde in the field itself and then in 10% formalin. Fishes were identified following the guide book of [12], [19], [20] and [21] before preserving them in formaldehyde. For systematic list and classification, [19] was followed, while nomenclature was after [22]. Status of some of the fish species in the studied rivers was preliminarily ascertained after [23] and [24].

### RESULTS AND DISCUSSION

A complete check list of the fish species recorded during the present study is presented in Table 1.

The local names of the fish species was obtained from the fishermen who catch fish in this river and local people. Status of the fish is according to the latest available IUCN red list available at the time of writing this article [25]. Fish nomenclature is based on the website fishbase.org[22].

Present study recorded presence of 59 fish species that belong to 10 orders, 23 families and 41 genera. Cypriniformes was the most dominate among the 10 orders of fish recorded with 26 species followed by Perciformes and Siluriformes both represented by 11 fish species. Synbranchiformes and Osteoglossiformes were represented by 4 and 2 species respectively whereas orders Anguilliformes, Beloniformes, Cyprinodontiformes, Clupeiformes and Mugiliformes were represented by single species each (Fig. 2). Present finding complies with the results of previous works [17, 18, 26] from the same eco region where also Cypriniformes was found to be most dominate species. Cyprinidae dominated among the 23 families with 24 fish species and genus *Lebeo* was the most dominant with 6 fish species under it.

One very important finding of the present study was that among the 59 species recorded in this study 8 species of fish are placed under near threatened category in IUCN [25] check list (Table 2). *Puntiuschola*, *Mystusvittatus* and *Clariasbatrachus* are supposed to be vulnerable species as per available literature [24, 27]. *Botiadarario* have the potential to be used as ornamental fish [27] and it also have very high market value. Other economically important fish species recorded during the present study includes Indian major carps, *Anguilla bengalensis*, *Cyprinus carpio*, *Barilius barila*, *Gadusia chapra*, *Chitala chitala*, *Notopterus notopterus*, *Anabas testudineus*, *Mystus* sp., *Ompok* sp. and *Heteropneus tesfossilis*.

During the survey local fishermen stated that both diversity and abundance of fish in the Khowai river has decreased significantly during the last few decades. Malpractices like poisoning of river and blocking the passage of the river during dry season to catch fish may be the main reasons behind this which are very common in the stretch of the river under the present study. Indiscriminate use of pesticides in the riverside agricultural fields may also adversely affect the fish population as reported in some other studies [26]. Other recent studies from the same geographical region strongly suggests radical decrease in abundance of fresh water fish species due to river poisoning, habitat destruction, over fishing and other anthropogenic activities [6,27]. The present observation therefore strongly suggests further studies involving physiochemical parameters of Khowai River to find out the cause of decreasing fish biodiversity and to help prepare blue print of saving this river along with the ecosystem it supports.

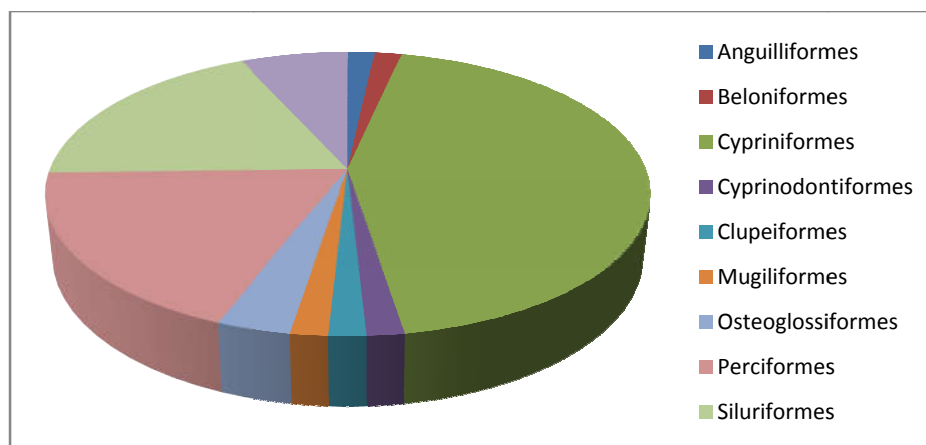


Figure 2: Abundance of different fish orders

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**Table 1:** Fish species recorded from Khowai River during the study with their local names and IUCN status

Order	Family	Sl No.	Fish species	Local name	IUCN Status (2016)		
Anguilliformes	Anguillidae	1	<i>Anguilla bengalensis</i>	Banehara	NT		
Beloniformes	Belonidae	2	<i>Xenentodoncancila</i>	Kakila	LC		
Cypriniformes	Cyprinidae	3	<i>Catlacatla</i>	Katal, Catla	LC		
		4	<i>Cirrhinusmrigala</i>	Mikra, Mrigal	LC		
		5	<i>Cirrhinusreba</i>	Bhagna	LC		
		6	<i>Labeobata</i>	Bata	LC		
		7	<i>Labeoboga</i>	Bogabata	LC		
		8	<i>Labeogonius</i>	Goinya	LC		
		9	<i>Labeonandina</i>	Nandina	NT		
		10	<i>Labeorohita</i>	Rui	LC		
		11	<i>Labeocalbasu</i>	Kali baush	LC		
		12	<i>Hypophthalmichthysmolitrix</i>	Silver carp	NT		
		13	<i>Hypophthalmichthysnobilis</i>	Big head	DD		
		14	<i>Ctenopharyngodonidella</i>	Grass carp	NE		
		15	<i>Cyprinuscarpio</i>	Carp	NE		
		16	<i>Chaguniuschagunio</i>	Lalpunti	LC		
		17	<i>Cystomussarana</i>	Sarpunti	LC		
		18	<i>Puntius sophore</i>	Jatpunti	LC		
		19	<i>Puntius ticto</i>	Tit punti	LC		
		20	<i>Puntius schola</i>	Tit puti	LC		
		21	<i>Chela cachius</i>	Chep chela	LC		
		22	<i>Salmostomabacaila</i>	Katari, Chela	LC		
		23	<i>Amblypharyngodonmola</i>	Mourola, Mola	LC		
		24	<i>Bariliusbarila</i>	Barali	LC		
		25	<i>Bariliustileo</i>	Patharchata	LC		
		26	<i>Rasboradaniconius</i>	Darikhana	LC		
			Psilorhynchidae	27	<i>Psilorhynchus balitora</i>	Gutum	LC
			Cobitidae	28	<i>Botia dario</i>	Rani mach	LC
	Cyprinodontiformes	Aplocheilidae	29	<i>Aplocheilus panchax</i>	Dhenochune	LC	
	Clupeiformes	Clupeidae	30	<i>Gadusia chapra</i>	Chapila	LC	
Mugiliformes	Mugilidae	31	<i>Rhinomugil corsula</i>	Khorsula	LC		
Osteoglossiformes	Notopteridae	32	<i>Chitala chitala</i>	Chital	NT		
		33	<i>Notopterus notopterus</i>	Fouli, Kalna	LC		
Perciformes	Ambassidae	34	<i>Chandanama</i>	Lombachanda	LC		
		35	<i>Pseudambassis baculis</i>	Phulchanda	LC		
		36	<i>Pseudambassis ranga</i>	Lalchanda	LC		
	Anabantidae	37	<i>Anabas testudineus</i>	Koi	DD		
	Badidae	38	<i>Badis badis</i>	Bot koi	LC		
	Channidae	39	<i>Channamarulius</i>	Gajal	LC		
		40	<i>Channa orientalis</i>	Cheng, Ukal	NE		
		41	<i>Channa punctatus</i>	Lata	LC		
		42	<i>Channa striata</i>	Shol	LC		
	Gobiidae	43	<i>Glossogobius giuris</i>	Bele	LC		
Nandidae	44	<i>Nandus nandus</i>	Bheda	LC			
Siluriformes	Bagridae	45	<i>Mystus bleekeri</i>	Tangra	LC		
		46	<i>Mystus cavasius</i>	Sadatangra	LC		
		47	<i>Mystus vittatus</i>	Laltangra	LC		
	Clariidae	48	<i>Clarias batrachus</i>	Magur	LC		
	Siluridae	49	<i>Ompok bimaculatus</i>	Kani Pabda	NT		
		50	<i>Ompok pabda</i>	Madhu Pabda	NT		
		51	<i>Wallago attu</i>	Boal	NT		
	Schilbeidae	52	<i>Ailia coila</i>	Kajuli, Baspati	NT		
		53	<i>Eutropiichthys vacha</i>	Bacha	LC		
	Heteropneustidae	54	<i>Heteropneustes fossilis</i>	Singhi	LC		
	Sisoridae	55	<i>Gagata cenia</i>	Gang Tangra	LC		
Synbranchiformes	Synbranchidae	56	<i>Monopterus albus</i>	Kuchia	LC		
	Mastacembelidae	57	<i>Macrognathus saral</i>	Tara Baim	LC		
		58	<i>Macrognathus pancalus</i>	Pankal Baim	LC		
		59	<i>Mastacembelus armatus</i>	Baim	LC		

LC= Least concerned, NT= Near threatened, DD= Data deficient, NE= Not evaluated

**Table 2:** Fish species under near threatened (NT) category in IUCN (2016) check list recorded during the study

Sl No.	Fish species	Order
1	<i>Anguilla bengalensis</i>	Anguilliformes
2	<i>Labeonandina</i>	Cypriniformes
3	<i>Hypophthalmichthysmolitrix</i>	
4	<i>Chitalachitala</i>	Osteoglossiformes
5	<i>Ompokbimaculatus</i>	Siluriformes
6	<i>Ompokpabda</i>	
7	<i>Wallagoattu</i>	
8	<i>Ailiacoila</i>	

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**REFERENCES**

- Gleick, P.H. (1996). In: Schneider SH (Ed.) Encyclopedia of Climate and Weather. Oxford University Press, New York, USA, p.817–823.
- Balian, E.V., Segers, H., Leveque, C. & Martens, K. (2008). Hydrobiologia, 595: 627–637.
- Mittermeier, R.A. & Mittermeier, C.G. (1997). Mega diversity Earth's biologically wealthiest Nation. In: Allister, M.C., Lttamilton, D.E.A. & Harvery, B. (Eds). Global fresh water Biodiversity Sea wind Cemex, Mexico City, p.1-140.
- WCMC (1998). Freshwater Biodiversity: A Preliminary Global Assessment. A Document prepared for the 4th Meeting of the Conference of the Practices to the Convention of Biological Diversity, World Conservation Monitoring Centre.
- Kar, D (2003). Fishes of Barak drainage, Mizoram and Tripura. In: Kumar, A., Bohra, C. & Singh L.K. (Eds.). Environment, Pollution and Management, APH Publishing Corporation, New Delhi, p.203-211.
- Kottelat, M. & Whitten, T.(1996). Freshwater Biodiversity in Asia with special reference to Fish: World Bank Technical Paper No. 343. Washington DC: The World Bank, pp.59.
- Ramanujam, S.N., Monorama, M. & Dey, S. (2010). Ichthyodiversity of Meghalaya, India. Electron J Ichthyol, 6(2):15-26.
- Mittermeier, R.A., Gill, P.R., Hofman, M., Pilgrim, J., Brooks, T. & Mittermeier, C.G. (2005). Hotspots Revisited: Earth's Biologically Richest and most Endangered Terrestrial Ecoregions. Mexico: CEMEX, pp.392.
- Tordof, A.W., Baltzer, M.C., Fellowes, J.R., Pilgrim, J.D. & Langhammer, P.F. (2012). Key Biodiversity Areas in the Indo Myanmar Hotspot: Process, Progress and Future Directions. J. Threat. Taxa, 4(8): 2779–2787.
- Kar, D.(2006). Fundamentals of Limnology and Aquaculture Biotechnology. Daya Publishing House, New Delhi, p.xiv+ 609.
- Das, B.K., Boruah, P. & Kar, D. (2015). Fish diversity and drainage analysis of River Siang, East Siang District of Arunachal Pradesh. BiosciDiscov, 6(1-1) Special.
- Talwar, P.K. & Jhingran, A.G. (1991). Inland Fishes of India and Adjacent Countries, Vol. I & II. Oxford and IBH Co., Pvt. Ltd., New Delhi, pp.1158.
- Sinha, M. (2011). Fish and Fisheries of North-Eastern states of India. Narendra Publishing House, New Delhi, India, pp. 151.
- Sinha, M. (1994). Fish genetic resources of the North-Eastern region of India. Journal of Inland Fishery Society India, 26(1):1-19.
- Sen, N. (2000). In: Ponniah, A.G., Sarkar, U.K. (Eds). Fish Biodiversity of North East India. NBFGR. NATP Publication, p.31-48.
- Vishwanath, W., Lakra, W.S. & Sarkar, U.K. (2007). Fishes of North East India. NBFGR. Lucknow, U.P, India. pp.264.
- Goswami, U.C., Basistha, S.K., Bora, D., Shyamkumar, K., Saikia, B. & Changsan K. (2012). Fish diversity of North East India, inclusive of the Himalayan and Indo Burma biodiversity hotspots zones: A checklist on their taxonomic status, economic importance, geographical distribution, present status and prevailing threats. Int. J. Biodivers. Conserv., 4(15):592-613.
- Kar, D. & Sen, N. (2007). Systematic list and distribution of fishes in Mizoram, Tripura and Barak drainage of North-Eastern India. Zoo's Print Journal, 22(3):2599-2607.
- Jayaram, K.C. (1999). The Freshwater Fishes of the Indian Region. Narendra Publishing House, Delhi, p.xvii+551.
- Vishwanath, W. (2002). Fishes of North East India, A Field Guide to Species Identification. Manipur University and NATP, pp.198.
- Barman, R.P. (2002). Freshwater fishes. Fauna of Tripura (Part-1). Zoological survey of India. State fauna series, 7:191-320.
- www.fishbase.org, December, 2016.

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23. Menon, A.G.K. (1994). Criteria for determining the status of threatened categories of Indian freshwater fishes. 1-5. In: Threatened Fishes of India. Natcon Publication No. 4, UP, pp.384.
24. Molur, S, & Walker, S. (1998). Report of the workshop "Conservation Assessment and Management Plan for Freshwater Fishes of India". Zoo Outreach Organisation, CBSG India, Coimbatore, India, pp.156.
25. IUCN. IUCN Red List of Threatened Species. Version 2016. Electronic database accessible at <http://www.iucnredlist.org>. Captured on December, 2016.
26. Nath, M., Ngasepam, R.S., Das, B.K., Dutta, B., Das, U. & Das, P. (2015). A Preliminary Study on Fish Diversity of Kakri and Deo River around Dharmanagar in Tripura. *Int. J. TheorApplSci*, 7(2):6-13.
27. Acharjee, B.K., Das, M., Borah, P. & Purakayastha, J. (2012). Ichthyofaunal Diversity of Dhansiri River, Dimapur, Nagaland, India. *Check List*, 8(6):1163-1165.

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