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Ichthyo-faunal diversity of Tengapani River, Namsai, Arunachal Pradesh, India

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Abstract

A case study was undertaken from June 2017 to May 2018 recently in the river Tengapani of Lathao, Namsai district, Arunachal Pradesh. The sampling of fish was done from two sites of the river time to time using fishing devices and techniques practiced by local fishermen. A total of 38 species of fishes belonging to 12 families were taxonomically confirmed with 19 species under Cyprinidae followed by 3 species within Balitoridae, 2 species within Amblycipitidae and 1 species each within Mesonoemacheilus, Clariidae, Sisoridae, Olyridae, Siluridae, Badidae, Channidae, Anguillidae and Mastacembelidae. According to IUCN (2018-1), out of the 38 fish species 27 fall in Least Concerned (LC) category with 71%; 6 species in Not Evaluated (NE) with 16%; 2 species in endangered (EN) with 5%; 1 species in Near Threatened (NT) with 3%; 1 species in Data Deficient (DD) with 3%; 1 species in Vulnerable (VU) with 3%.

Keywords: Ichthyodiversity, Tengapani, Arunachal Pradesh, fish, river, Northeast India

1. Introduction

The Fish occupies important trophic level in the food chain and are also good ecological indicators of health of the water bodies. They also have aesthetic and recreational values and most importantly fish constitutes one of the main food items for millions of people especially in developing countries like India. North eastern region of India is endowed with rich flora and faunal bio-resources. The pioneering work on the fresh water fishes of Indian sub-continent was started with Hamilton (1822) [7] who described about 1400 species from the river Ganga and its tributaries. Later, McClelland (1839) [12] conducted the exploratory survey on the fishes of Indian region where he described a total of 138 fish species from north eastern states of India. Arunachal Pradesh is located between 26.28° N and 29.30° N latitude and 91.20° E and 97.30° E longitude with 83,743 square km area. It is the largest in geographical as well as in river drainage area in North-Eastern India. Many studies have been done on the ichthyofauna of Arunachal Pradesh. Several investigators attempted dealing with the ichthyofauna inhabiting the water bodies of the region in the past.

Nath and Dey (2000) [14] reported a total of about 131 species of fishes of Arunachal Pradesh. Daimari *et al.* (2005) [4] accounted a total of 52 fish species of Subansiri river. Tamang *et al.* (2007) [20] recorded 47 species in Sinkhi river. Bagra *et al.* (2009) [2] reported a total of about 213 species from lotic and lentic water bodies of Arunachal Pradesh. Bagra and Das (2010) [1] reported a total of 44 species from Siyom river of West Siang district. New species and genus are still being described from the water bodies of the state as evident from some publications viz. Psilorhynchoides Nebeshwar *et al.* (2007) [15], *Garra arupi* Nebeshwar *et al.* (2009) [16], *Barilius arunachalensis* Nath *et al.* (2010) [13], *Glyptothorax dikrongenesis* Tamang and Choudhry (2011) [19], *Oreoglanis majusculus*. Linthoingambi and Vishwanath (2011) [11], *Badis singemensis* Geetakumari and Kadu (2011) [6].

However, there has not been much work done on this river except some few like 'Notes on collection of fishes from Lohit, Tirap and Changlang districts of Arunachal Pradesh' by Nibedita Sen (1999) [17] and 'Biodiversity and present status of freshwater fishes in Lohit river basin of India' by Kansal and Arora (2012) [10] in which some of the fish species from Tengapani river of Namsai district were also described. Therefore, this study is an attempt to explore the ichthyofauna of this river.



Fig 1: View of Tengapani River

2. Materials and Methods

Namsai is an administrative district in the state of Arunachal Pradesh located at 27°40'05"N and 95°51'29"E. The "Tengapani" river is situated in Lathao, Namsai district. Study was done at two sites. Tengapani river is a tributary on the right bank of river Nao Dihing. The river is the principal economy source for the fishermen of the concerned area to meet their daily needs.

Samplings were conducted four times from June 2017 to May 2018 from two sites, site I ((27°44'24"N and 95°55'29"E) and

site II (27°45'16"N and 95°55'16"E) of the river using nets like cast net and gill net during different seasons. The fish, thus collected were preserved in 10% formalin as per the protocol of Jayaram (1999). Identification and taxonomical studies were carried out with the help of standard keys of Talwar and Jhingran (1991) [18], Nath and Dey (2000) [14] and Vishwanath *et al.* (2007) [21]. The conservation status of collected fishes were also examined (IUCN, 2018-1). Fishes collected are deposited in Rajiv Gandhi University Museum of Fishes, RGU, Rono Hills, Itanagar.

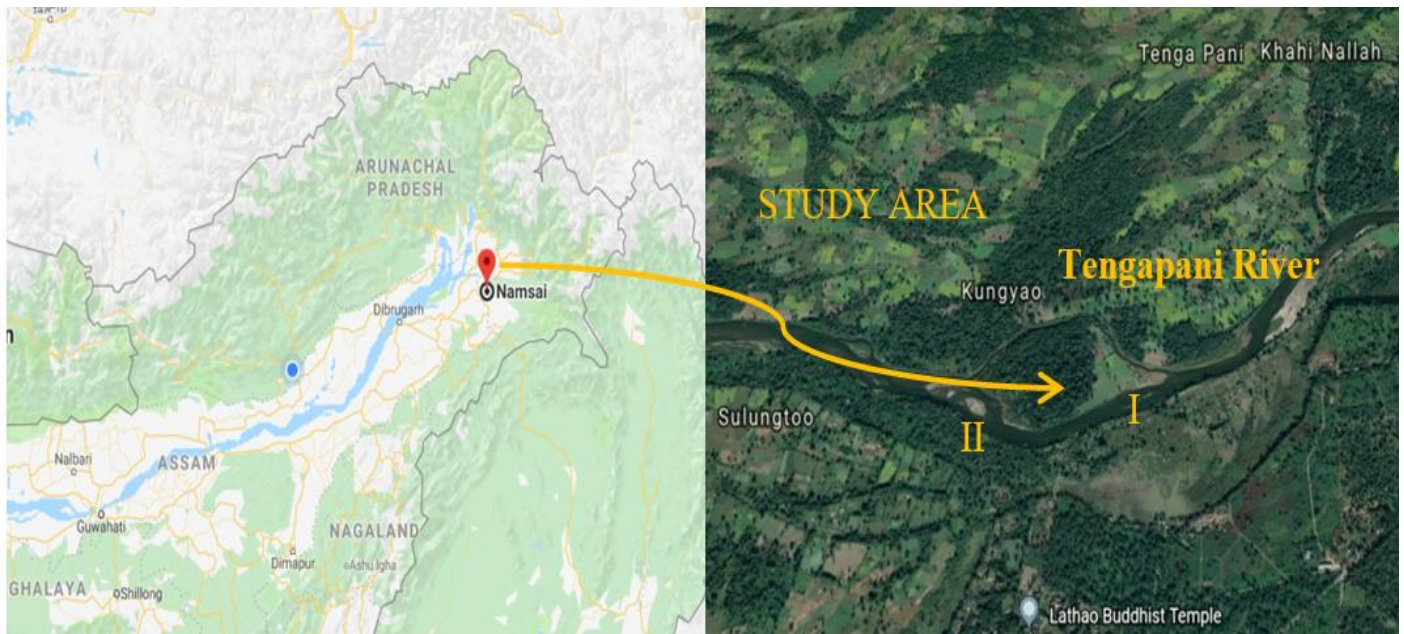


Fig 2: Satellite Image of Study Area

3. Result

A total of 38 species of fish belonging to the 6 orders, 15 families and 30 geneses was reported from the Tengapani River (Table 1). From the present study, it is evident that river Tengapani has a rich a considerable ichthyofaunal diversity. Cyprinidae family was found to be most dominant with 21 species and followed by Cobitidae, Bagridae and

Mastacembelidae (2 species each); Balitoridae, Badidae, Channidae, Gobiidae, Nandidae, Ambassidae, Osphronemidae, Clariidae, Siluridae, Tetraodontidae and Belonidae with 1 species each (Fig.3). As far as the species composition is concerned, the Cyprinidae was 55.5% followed by Cobitidae, Bagridae and Mastacembelidae (5.3%), and rest 2.6% each (Figure 4).

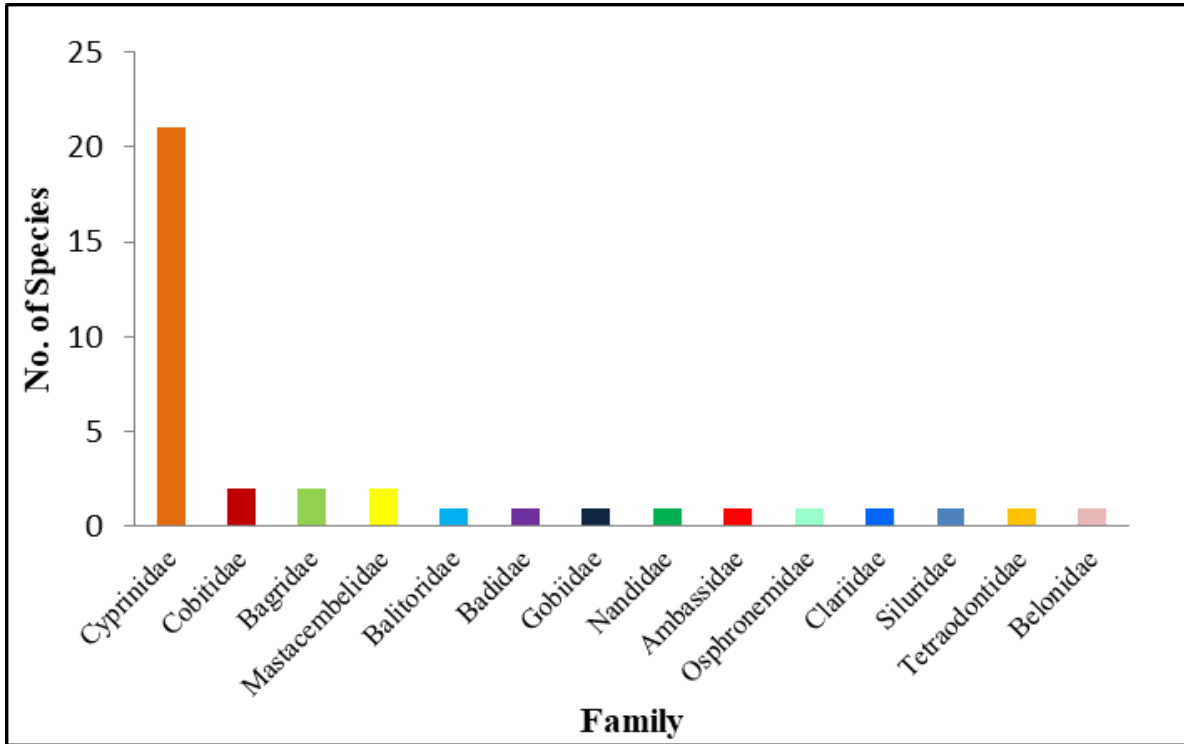


Fig 3: Species Distribution of Different Families

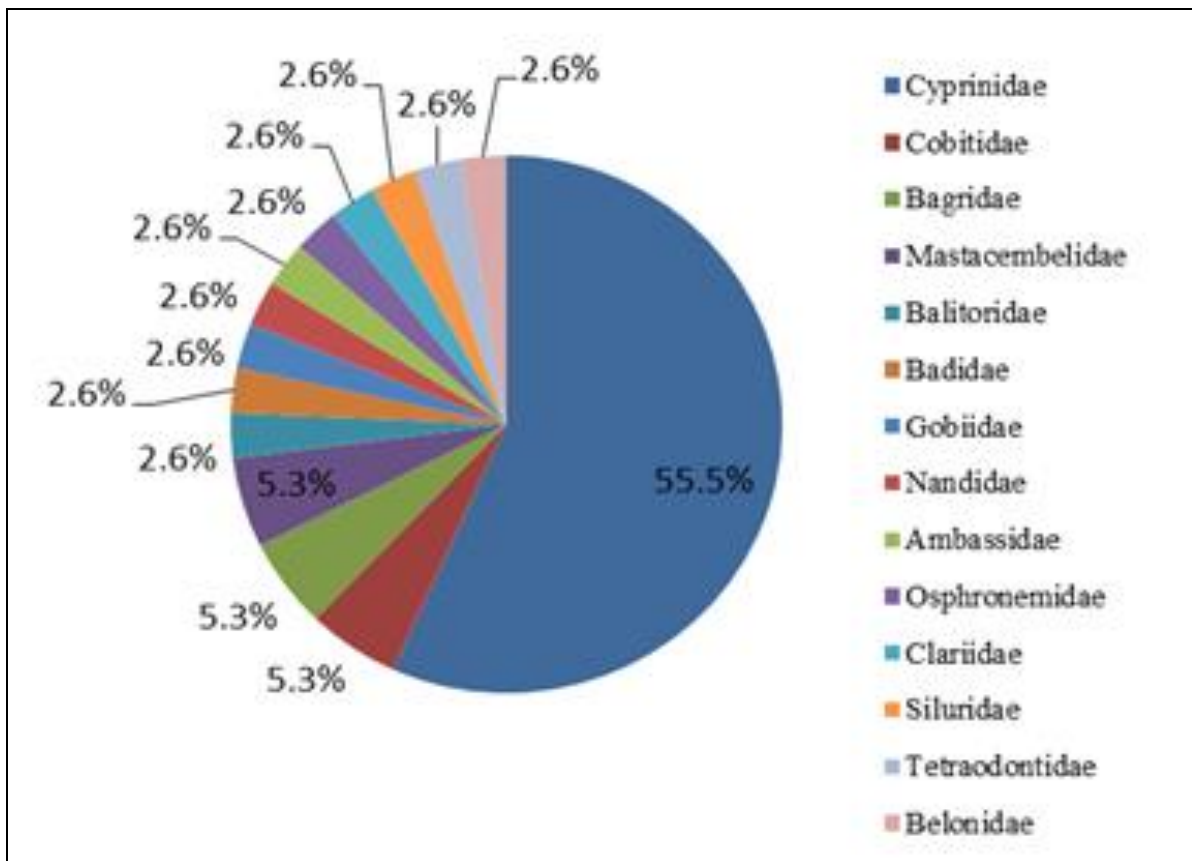


Fig 4: Percentage of Species Distribution of Different Families

According to IUCN (2018-1), out of the 38 fish species 27 fall in Least Concerned (LC) category with 71%; 6 species in Not Evaluated (NE) with 16%; 2 species in endangered (EN) with

5%; 1 species in Near Threatened (NT) with 3%; 1 species in Data Deficient (DD) with 3%; 1 species in Vulnerable (VU) with 3% (Fig. 5).

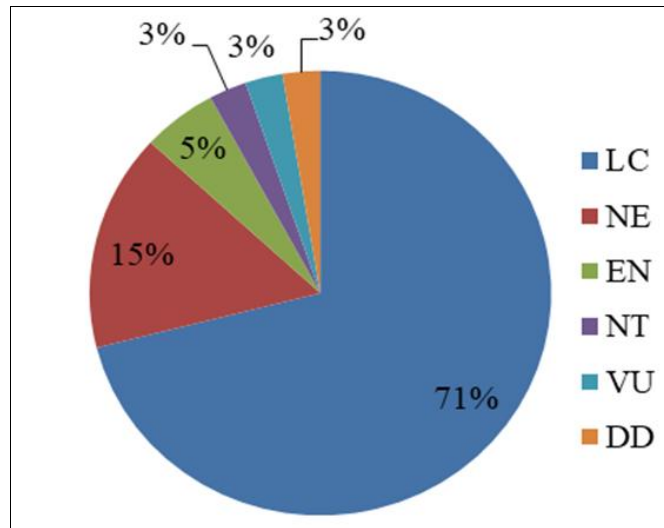


Fig 5: Percentage Distribution of Conservation Status of Recorded Fish Species

Table 1: Fishes of Tengapani River

Order	Family	Sl.no.	Species	Local name	Economic Value	IUCN Status	
Cypriniformes	Cyprinidae	1	<i>Amblypharyngodon mola</i>	Pa ep maan	F;O	LC	
		2	<i>Aspidoparia morar</i>	Pa kham ket hong	O	NE	
		3	<i>Bangana dero</i>	Pa mon	F	LC	
		4	<i>Barilius barna</i>	Pa khaam thaen	F;O	LC	
		5	<i>Barilius bendelisis</i>	Pa khaam thaen	F;O	LC	
		6	<i>Barilius bola</i>	Pa khaam thaen	F;O	NE	
		7	<i>Cabdio morar</i>	Pa kham ket hong	F;O	LC	
		8	<i>Cirrhinus mrigala</i>	Pa khaam	F	LC	
		9	<i>Cirrhinus reba</i>	Pa khaam	F	NE	
		10	<i>Crossocheilus latius</i>	Pa pon	F	LC	
		11	<i>Cyprinion semiplotum</i>	Pa khum	F	VU	
		12	<i>Danio dangila</i>	Pa seew	F;O	LC	
		13	<i>Danio rerio</i>	Pa seew	F;O	LC	
		14	<i>Devario acquipinnatus</i>	Pa seew	F;O	LC	
		15	<i>Devario devario</i>	Pa seew	F;O	LC	
		16	<i>Garra amadalei</i>	Pa mon	F;O	LC	
		17	<i>Labeo gonius</i>	Pa lai	F	LC	
		18	<i>Pethia conchonius</i>	Pa khoom	F;O	LC	
		19	<i>Pethia ticto</i>	Pa nen	F;O	LC	
		20	<i>Tor puitora</i>	Pa neng	F;S	EN	
		21	<i>Tor tor</i>	Pa neng	F;S	NT	
		Cobitidae	22	<i>Lepidocephalichthys guntea</i>	Pa khee	F;O	LC
			23	<i>Semileptus gongota</i>	Pa yack	F;O	NE
	Balitoridae	24	<i>Acanthocobitis botia</i>	Pa khee	F;O	LC	
Perciformes	Badidae	25	<i>Badis badis</i>	Pa tang mo	O	LC	
	Channidae	26	<i>Channa punctatus</i>	Pa khontok	F	NE	
	Gobiidae	27	<i>Glossogobius giuris</i>	Pa khee sae	F;O	LC	
	Nandidae	28	<i>Nandus nandus</i>	Pa mu	O	LC	
	Ambassidae	29	<i>Parambassis ranga</i>	Pa ep maan	F;O	LC	
	Osphronemidae	30	<i>Trichogaster fasciata</i>	Pa kep	O	LC	
Siluriformes	Bagridae	31	<i>Mystus bleekeri</i>	Pa nook mon	F;O	LC	
		32	<i>Mystus vittatus</i>	Pa nook	F;O	LC	
	Clariidae	33	<i>Clarias magur</i>	Pa magur	F	EN	
	Siluridae	34	<i>Pterocryptis indicus</i>	Pa ep maan	F	DD	
Synbranchiformes	Mastacembelidae	35	<i>Macragnathus pancalus</i>	Pa gnaw	F;S;O	NE	
		36	<i>Mastacembelus armatus</i>	Pa hatt	F;S;O	LC	
Tetraodontiformes	Tetraodontidae	37	<i>Tetraodon cutcutia</i>	Pa pong	O	LC	
Beloniformes	Belonidae	38	<i>Xenentodon cancila</i>	Pa teng	O	LC	

Abbreviation: F=Food, O=Ornamental, S=Sport, LC=Least Concern, NT= Nearly Threatened, EN=Endangered, NE=Not evaluated, VU=Vulnerable and DD=Data Deficient

Table 2: Number and percentage composition of genera and species under various families

Sl. No.	Families	Genera	% Contribution of genera to families	Species	% contribution of species to families
1	Cyprinidae	14	46.8	21	55.5
2	Cobitidae	2	6.8	2	5.3
3	Balitoridae	1	3.3	1	2.6
4	Badidae	1	3.3	1	2.6
5	Channidae	1	3.3	1	2.6
6	Gobiidae	1	3.3	1	2.6
7	Nandidae	1	3.3	1	2.6
8	Ambassidae	1	3.3	1	2.6
9	Osphronemidae	1	3.3	1	2.6
10	Bagridae	1	3.3	2	5.3
11	Clariidae	1	3.3	1	2.6
12	Siluridae	1	3.3	1	2.6
13	Mastacembelidae	2	6.8	2	5.3
14	Tetraodontidae	1	3.3	1	2.6
15	Belonidae	1	3.3	1	2.6

4. Discussion

Ichthyodiversity refers to a variety of fish species which could refer to alleles or genotypes within piscian population, to species of life forms within a fish community, and to species of life forms across aqwaregimes (Burton *et al.*, 1992) ^[3]. The most common species distributed in the study area were *Barilius sp.*, *Devario sp.*, and *Pethia sp.* Similarly, the rare species of the river were *Xenentodon cancila*, *Tetraodon cutcutia* and *Semileptus gongota*. Rest of the species were found at all field visits throughout the time period. The order Cypriniformes was dominant with 23 species followed by order Perciformes with 6 species while, the order Siluriformes was represented with 4 species, the order Synbranchiformes with 2 species and the remaining orders are Tetraodontiformes and Beloniformes were represented with one species respectively.

Among the fish families, Cyprinidae was dominant with 21 species followed by Cobitidae, Bagridae and Mastacembelidae with 2 species and rest of the families consists of single species. According to IUCN (2018-1), out of the 38 fish species 27 fall in Least Concerned (LC)

category with 71%; 6 species in Not Evaluated (NE) with 16%; 2 species in endangered (EN) with 5%; 1 species in Near Threatened (NT) with 3%; 1 species in Data Deficient (DD) with 3%; 1 species in Vulnerable (VU) with 3%. In the present study, the number and percentage composition of genera and species under different families are indicated (Table 2). Most of the species collected during the field survey have economic value as food, recreational and ornamental purposes. Fishes like *Bangana dero*, *Labeo gonius*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Clarias magur*, *etc.* have good food value while some of the fishes such as *Tor tor*, *Tor putitora*, *Macrognathus pancalus* and *Mastacembelus armatus* are extremely preferred for sports fishing/angling. Species like *Aspidoparia morar*, *Nandus nandus*, *Tetraodon cutcutia*, *Xenentodon cancila* and *Trichogaster fasciata* have high ornamental value. In the past, very little work has been done in fish diversity of Tengapani river. From the present study it has been revealed that the river has a rich potential in fishes of both ornamental and food value. Many rare species have also been reported in this study.

*Devario devario**Labeo dero**Mastacembelus armatus**Mystus bleekeri*



Fig 6: Some of the Ornamental and Edible fishes of Tengapani River



*Tetraodon cutcutia**Xenentodon cancila***Fig 7:** Some of the Ornamental and Edible fishes of Tengapani River

5. Conclusion

Arunachal Pradesh is endowed with massive water resources in the form of streams and rivers. These aquatic systems have high potential of ichthyofaunal resources as evident from the study. Maintaining fish diversity is important because it is not easy to identify the aquatic ecosystems sustainability of every species (Das *et al.*, 2015) [5]. Freshwater is more prone to habitat degradation and pollution, fisheries overexploitation, and water extraction due to broader human activities when comparing to seawater and according to the local fishermen, there has been drastic fall in the amount of catches in the last decade. This could be attributed to illegal and uncontrolled fishing, diversification of river for industrial and agricultural uses and other anthropogenic factors. However, enforcement of protective legislation and adopting pisciculture practices can conserve the fast declining ichthyofaunal population. Techniques like natural and artificial propagation can be adopted to replenish the depleted population of vulnerable ichthyofauna.

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