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Fish diversity of Damak and lower Terai region of Ratuwa River of Jhapa district, Nepal

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Abstract

Fish samples were collected from twenty five sampling stations of Damak and lower Terai region of Ratuwa River from August, 2018 to October, 2018 by using Cast net, Hapa net, and mosquito nets. We collected 27 fish species of Cypriniformes in two families: Cyprinidae with 12 species and Cobitidae with three species. While order Anguilliformes (Anguillidae), Clupeiformes (Clupeidae), and Synbranchiformes (Synbranchidae) got the single family with single fish species. Siluriformes with three families: Schelbeidae with single species, Pangasidae with single species and Claridae with two species. Similarly, Order Perciformes with two families: Belontiidae with three species and Channidae with two species were recorded. Some fish of Damak, and Ratuwa River has been plummeting. It is due to over population, over fishing practices, illegal electro-fishing, use of stupefied poison herbs, and use of fry nets. There might be some other reasons for plummeting fish species. This is due to the lack of Knowledge of harmful effects of throwing non degradable things in the water. The common species of Damak and Ratuwa River were *Barilius barila*, *Barilius bendelesis*, *Guducia chapra* *Puntius chola*, *Puntius phutunio*, *Puntius sophore*, *Channa punctatus*, *Channa barca*, *Esomos danricus*, *Lepidocephalus guntae*, *Brachidanio deria*, and *colisa fasciatus*.

Keywords: Fish diversity, Damak, Jhapa, Ratuwa, Terai region

Introduction

Fishes constitute slightly more than one – half the total number of approximately 54,711 valid vertebrate species. There are descriptions of an estimated 27,977 valid species of fishes. Of 54,711 vertebrate species recognized the world over 27,977, under 515 families, and 4494 genera are valid species of fish of which 11952 are of freshwater and 12457 species using freshwater (Nelson, 2006) ^[1]. Nepal is a staple for freshwater fishes only because of its geographical structure. For any student of Nepalese ichthyology the very first source of reference and basal information, the Publications of Shrestha (1981, 2013) ^[2], and Shrestha (2008) ^[3] are very indispensable. Many Nepalese ichthyologists redound to the fish diversity of Nepal but, there is not any commanded data regarding the fish diversity profile of Nepal after the year of 2013. However, Shrestha (1995) ^[4] enumerated 185 fish species to occur in Nepal. Rajbanshi (2005) ^[5] reported 187 fish species. Saund, and Shrestha (2007) ^[6] recorded 199 fish species from Nepal. Shrestha (2008) ^[3] has reported 217 indigenous fish species from Nepal. Shrestha (2013) ^[7] recorded 228 indigenous fish species. Some researchers have conducted their research work on fish diversity and listed fish species of different rivers, streams, lakes, and rivulets. Limbu *et al.*, (2018) ^[8] recorded 9 fish species from Bakraha river of Morang district. Limbu *et al.*, (2016) ^[9] enumerated 16 fish species from Dewmai Khola of Ilam district. Shrestha *et al.*, (2009) ^[10] have recorded 30 fish species from Tamor river etc.

The Damak, and Ratuwa River are situated in Jhapa district. Jhapa district lies in far eastern Nepal of Terai region. Its eastern, and western parts are connected with India while northern and southern parts are connected with Ilam, and Morang district. Damak is rich in seasonal water resources, and the Ratuwa River has got perennial and torrential water resources which originates from Banjho, Ilam. But, there is scanty of detailed information on the fishes. Therefore, the present study aims to survey on fish diversity of Damak, and lower Terai region of Ratuwa River of Jhapa district.

2. Materials and methods

2.1 Study area

The present study area, Damak and the Ratuwa River of Jhapa district of eastern Nepal was selected for the study.

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Altogether twenty five sampling stations (fig.1) were chosen except the fish market for the fish collection. Some fishes were collected from local fish market. Most of the fishes were collected from drainage, rice field, canal, reservoirs, Ratuwa Khola (stream), pools, ditches, and stagnant water. The field

survey was started on 10 August, 2018 and ended on 29 October, 2018. The survey was taken three months of time period only because after the end of the October water of the drainage, rice field, pools, and ditches to grow dry.



Fig 1: Map of Nepal with sampling stations (Damak and Ratuwa River)

2.2 Fish sampling

Fishes were collected by using cast net, Bamboo fish trap, Hapa net, and mosquito nets. Cast net of 6 mm × 6 mm mesh size was used for the collection of fishes. Fish sampling was done at 7 am to 4 pm in every station. Habitat and morphological characters of fishes were recorded at the time of collection for the taxonomic confirmation. Before preservation, collected fishes were photographed with Nikon Digital Camera. Collected fishes were preserved in 10% formalin solution making their head upside for the protection of their caudal fin for further study and the specimens were taken to the laboratory of the Central Department of Zoology (CDZ) for identification. The identification was carried out with the help of taxonomic references Jhingran and Talwar (1991) [11], Shrestha (1981) [2], Jayaram (2010) [12], and Shrestha (2008) [3] the species level.

3. Results

A total of 27 fish species were collected, belonging to six orders, 10 families and 14 genera. Order Cypriniformes was

the dominant group (55.55% out of 27 fish species) whereas the least dominant Orders were the Anguilliformes (3.70% out of 27 fish species), Clupeiformes (3.70% out of 27 fish species), and Synbranchiformes (3.70% out of 27 fish species). Order Cypriniformes comprised of two families: Cprinidae, and Cobitidae with 15 species. Anguilliformes comprised of one family: Anguillidae and one species. Similarly, Synbranchidae also comprised of one family: Synbranchidae and one species. While Order Siluriformes comprised of three families: Schilbeidae, Pangasidae, and Claridae with four species whereas Order Perciformes comprised of two families with five species. According to the present study *Barilius barila*, *Barilius bendelesis*, *Guducia chapra*, *Puntius chola*, *Puntius phutunio*, *Puntius sophore*, *Channa punctata*, *Esomus danricus*, *Lepidocephalus guntae*, *Brachydanio deria*, and *colisa faciatu*s were the common fish species. Among them *Guducia chapra* was found to be most pre-eminent fish species. The following table showed the fish diversity of Damak and Ratuwa River.

Table 1: Fishes collected from Damak and Ratuwa River

S. N.	Order	Family	Scientific name	Vernacular name
1.	Anguilliformes	Anguillidae	<i>Anguilla bengalensis</i> (Hamilton, 1822)	Raj Bam
2.	Clupeiformes	Clupeidae	<i>Gudusia chapra</i> (Hamilton-Buchanan, 1822)	-
3.	Cypriniformes	Cyprinidae	<i>Ctenopharyngodon idellus</i> (Valenciennes, 1844)	-
			<i>Barilius baila</i> (Hamilton-Buchanan, 1822)	Faketa
			<i>Barilius bendelisis</i> (Hamilton-Buchanan, 1822)	Faketa
			<i>Puntius chola</i> (Hamilton-Buchanan, 1822)	Sidhre
			<i>Puntius gonionotus</i> (Bleeker, 1850)	Sidhre
			<i>Puntius phutunio</i> (Hmailton-Buchanan, 1822)	Sidhre
			<i>Puntius sarana</i> (Hamilton-Buchanan, 1822)	Sidhre
			<i>Puntius sophore</i> (Hamilton-Buchanan, 1822)	Sidhre
			<i>Danio devario</i> (Hamilton-Buchanan, 1822)	-
			<i>Parluciosoma daniconius</i> (Hamilton-Buchanan, 1822)	-
			<i>Brachydanio rerio</i> (Hamilton-Buchanan, 1822)	-
			<i>Esomus danricus</i> (Hamilton-Buchanan, 1822)	-

			<i>Lepidocephalichthys menoni</i> (Pillai and Yazdani, 1976)	-
			<i>Schistura sovana</i> (Hamilton-Buchanan, 1822)	Gadela
4.	Siluriformes	Schilbeidae	<i>Clupisoma Montana</i> (Hora, 1937)	
		Pangasidae	<i>Pangasius pangasius</i> (Hamilton-Buchana, 1822)	
		Claridae	<i>Clarius gariepinus</i> (Burehell, 1822)	
			<i>Clarius batrachus</i> (Linnaeus, 1758)	
5.	Synbranchiformes	Synbranchidae	<i>Monopterusuchia</i> (Hamilton-Buchanan, 1822)	
6.	Perciformes	Belontidae	<i>Colisa faciatus</i> (Bloch and Schneider, 1801)	-
			<i>Colisa lalius</i> (Hamilton, 1822)	-
		Channidae	<i>Colisa sota</i> (Eddy Derijst, 1997)	-
			<i>Channa barca</i> (Hamilton-Buchanan, 1822)	Hile
			<i>Channa puntatus</i> (Bloch, 1793)	Hile

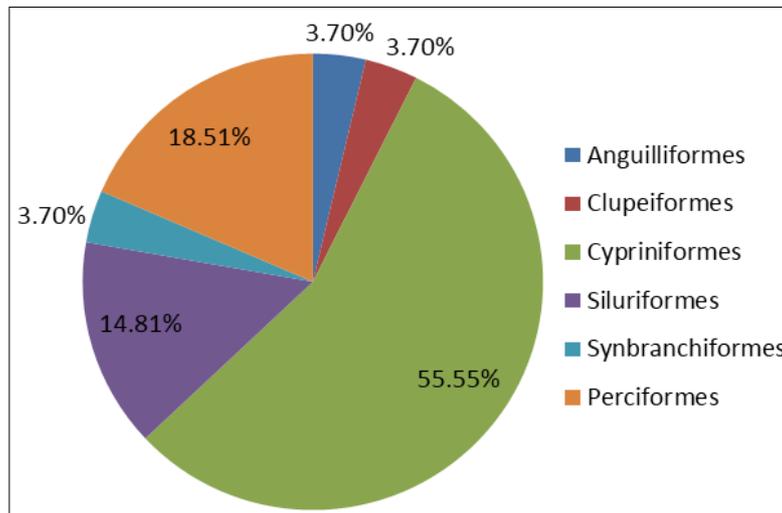


Fig 2: Order-wise percentage composition of fishes

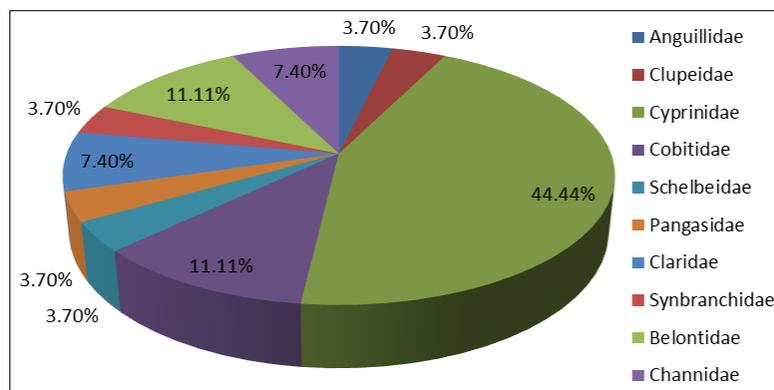


Fig 3: Family-wise percentage composition of fishes

4. Discussion

A total of 27 fish species were collected from different sampling stations of Damak and Ratuwa River belonging to six orders, 10 families and 14 genera. Order Cypriniformes was the dominant group (55.55% out of 27) fish species) whereas the least dominant Orders were the Anguilliformes (3.70% out of 27 fish species), Clupeiformes (3.70% out of 27 fish species), and Synbranchiformes (3.70% out of 27 fish species). Order Cypriniformes comprised of two families: Cprinidae, and Cobitidae with 14 species. Anguilliformes comprised of one family: Anguillidae and one species. Similarly, Synbranchidae also comprised of one family: Synbranchidae and one species. While Order Siluriformes comprised of three families: Schilbeidae, Pangasidae, and Claridae with four species whereas Order Perciformes comprised of two families with five species. According to the present study *Barilius barila*, *Barilius benedelesis*, *Puntius*

chola, *Puntius phutunio*, *Puntius sophore*, *Channa punctatus*, *Guducia chapra*, *Esomos danricus*, *Lepidocephalus guntae*, *Brachidanio deria*, and *Colisa faciatus* were the common fish species. Among them *Guducia chapra* was found to be most pre-eminence fish species. Limbu *et al.*, (2016) [10] have reported Cypriniformes as the dominant order carrying maximum number of species from Deumai Khola/River of Ilam district. Limbu *et al.*, (2018) [9] reported Cypriniformes constituted the highest species number from Bakraha River of Morang district. The findings of this study is also consistent with the findings of Pokheral (1999) [13], Edds (1986) [14], Sharma and Shrestha (2001) [15], Shrestha (2013) [7], Shrestha (2008) [3], Shrestha *et al.*, (2009) [10], Shrestha (2016) [16], and Subba (2017) [17]. Some fishes like *Barilius benedelesis*, *Barilius barila*, and *guducia chapra* were found to be most dominant fish species, collected from Ratuwa River. Among them, *Guducia chapra*

was the pre-eminence fish species which was mostly found from station I. Fishes like *Lepidocephalichthys guntae*, *Lepidocephalichthys menoni*, *Puntius sophore*, and *Puntius sarana* were found to be least common during the collection. According to the local fisherman some fishes of Ratuwa river has been plummeting. It is due to over population, over fishing practices, illegal electro-fishing, use of stupefied poison herbs, and use of fry nets. There might be some other reasons for plummeting fish species of Ratuwa River. This is due to the lack of Knowledge of harmful effects of throwing non degradable things in the water. Because local people thrown different plastic bags, bottles, clothes, water bottles, and improper management of dumping sites. For the conservation of fishes people should avoid the use of different stupefied poison herbs, illegal electro-fishing practices, use of fry nets, and we should have to conduct different awareness programs regarding the importance of fishes, harmful effects of throwing different non degradable things in the water, and its consequences.

Anguilla bengalensis, *Colisa faciatus*, *colisa lalius*, *Colisa sota*, *Esomus danricus*, *Puntius chola*, *Puntius phutunio*, *Puntius sophore*, *Channa punctatus*, *Channa barca*, *Monopterus cuchia*, *Esomus danricus*, *Lepidocephalus guntae*, *Brachidanio deria*, and *Danio devario*, are the fishes which were recorded from Damak. This fishes were collected from different water resources like drainage, rice field, canal, pools, ditches, reservoirs, and stagnant water. Of these water resources are decreasing due to the human settlement and it directly affects the fishes of Damak. Some fishes like *Clupisoma Montana*, *Pangasius pangasius*, *Ctenopharyngodon idellus*, *Clarius garipepinus*, and *Clarius batrachus* were recorded from Damak fish market.

5. Conclusion

A total of 27 fish species were collected, belonging to six orders, 10 families and 14 genera. Order Cypriniformes was the dominant group (55.55% out of 27 fish species) whereas the least dominant Orders were the Anguilliformes (3.70% out of 27 fish species), Clupeiformes (3.70% out of 27 fish species), and Synbranchiformes (3.70% out of 27 fish species). Some fishes of Ratuwa River have been plummeting. It is due to over population, over fishing practices, illegal electro-fishing, use of stupefied poison herbs, and use of fry nets. There might be some other reasons for plummeting fish species of Ratuwa River. This is due to the lack of Knowledge of harmful effects of throwing non degradable things in the water. Because local people thrown different plastic bags, bottles, clothes, water bottles, and improper management of dumping sites. For the conservation of fishes people should avoid the use of different stupefied poison herbs, illegal electro-fishing practices, use of fry nets, and we should have to conduct different awareness programs regarding the importance of fishes, harmful effects of throwing different non degradable things in the water, and its consequences.

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