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A study on ichthyofaunal diversity of Sone River in Sidhi District, Madhya Pradesh (India)

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Abstract

Fishes are the most diversified group among all the recognized vertebrate species in the world and often known as the masters of aquatic domain. The fishes were maintained temporarily in according to established protocol. The Sone (Son) river is the second largest tributary of river Ganga, which originates near Amarkantak plateau in Madhya Pradesh (MP). In the present study 1000 individuals of fish specimens were collected between December 2021 to December 2022, from four different geographical locations of Sone River of Sidhi district region. The investigation revealed a total of 31 fish species identified those were belonging to 15 families and 7 orders. The Cyprinidae was the most dominant family (44.23%), followed by Barbinae (15%) and Siluridae (7.78%). The Sone River plays a vital role in fish diversity by providing diverse habitats, acting as a migration corridor, and contributing to the overall fish biodiversity of the region.

Keywords: fish biodiversity, Sone River, Sidhi district, Cyprinidae, Madhya Pradesh

Introduction

The earth's surface is generally covered by two-thirds of water in which fishes lead the most successful aquatic life. In almost all conceivable massive aquatic habitats nearly half of the vertebrate species in the world are fishes. Fishes are one of the most beautiful creations on earth with their diverse morphology and colouration (Sheikh and Goswami, 2014). Fishes are the first forms of higher evolutionary life to appear in the Devonian period, which is often referred to as the 'Age of Fishes'.

India is one of the 17 mega biodiversity hotspot (North East Region and Western Ghat) and occupies the ninth position on account of freshwater mega biodiversity (Sharma *et al*., 2021; Dubey, 2006; Shinde *et al.,*2009). Das and Pandey, (1998), proclaimed India represents more than 10% of world fish diversity including 930 fresh water species belonging to 326 genera, 99 families and 20 orders (Talwar and Jhingran, 1991, Ubarhande *et al.,* 2011). As per the FOA (2022) report, India ranks first globally for the first time with 1.8 million tonnes of inland capture fisheries production.

Material and Methods

Study site-

In present study we have selected Sone River of Sidhi district for the assessment of fish diversity (Figure 1). Sidhi is located in the northeastern part of the Madhya Pradesh and is known for its rich cultural heritage and natural beauty. The Sone River is a significant river in India, originates in the Maikal Hills of Amarkantak, Madhya Pradesh and flows for approximately 780 kilometers before joining the Ganges near Patna, Bihar. The river and its tributaries support diverse ecosystems, including wetlands, marshes, and floodplains, which provide habitats for a wide range of flora and fauna.

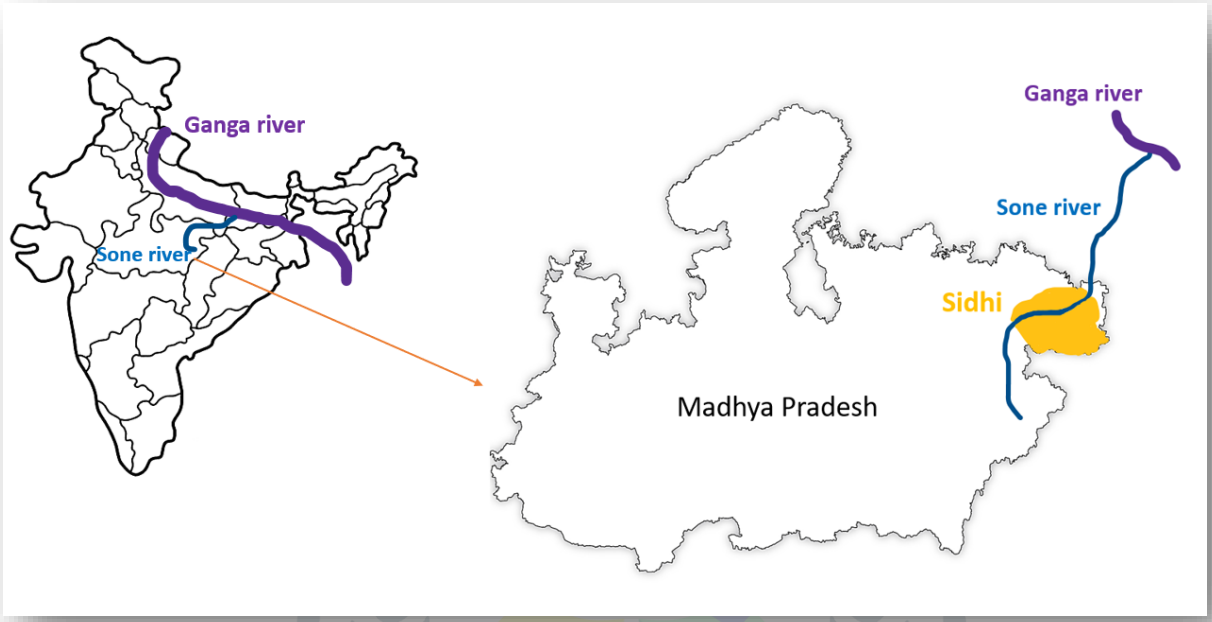


Figure 1: Map showing Sone River in Sidhi district of Madhya Pradesh, India

Sample Size and collection of fishes-

In the present study 1000 individuals of fish specimens were collected from five sampling sites including Churhat, Patpara, Dadhiya, and Taktaiya along the Sone River of Sidhi (M.P.) during each month at all three seasons between December 2021 to December 2022. Fishes were collected near shoreline with the help of local fisher man using several different fishing methods specifically trap net, cast nets, drag nets and hooks (Bain and Knight, 1996). Specimens were preserved in 10% formaldehyde solution and identified on the basis of morphometric or merimetric characters (Jayaram 1999, Day 1958, Talwar and Jhingaran, 1991).

Result and Discussion

The present study aimed to estimate the freshwater fish biodiversity in Sone River of Sidhi district, in which 31 fish species from 15 families and 7 orders were identified. Fishes from the Cyprinidae family were the most abundant and diverse, with seven commonly found species including *Catla catla*, *Cyprinus carpio*, *Cirrhinus mrigala*, *Labeo rohita*, *Labeo bata*, *Garra mullya* and *Tor* species (Table 1). Highest fish diversity was recorded from site 1 Churhat situated on the banks of the Sone River of Sidhi district. A similar type of analysis done by Bunkar and Tiwari (2017) on Barchar dam, Sidhi (M.P.), revealed that the predominant fish species were Cyprinidae (carps) and catla was a major contributing species among them.

The order Cypriniformes contributed 38% of the total number of species during the study period with 13 species, followed by Siluriformes with 8 species (28%), Perciformes (4 species 14%), Synbranchiformes (2 species with 7%), Clupeiformes (2 species with 7%), Beloniformes and Osteoglossiformes each with one species (3%) given in Figure 2. Additionally, *Puntius sophore*, *Puntius chola*, *Xenentodon cancila*, *Wallago attu, Chanda nama*, *Channa striatus*, *Notopterus notopterus*, and *Macrognathus pancalus* were also spotted in most seasons in Sone River (Figure 3).

Furthermore, many other reports given by Sharma *et al*., 2021, Shrotriy 2015, Bhagat and Sharma, 2022, were also suggest the similar results in which Cyprinidae family of Cypriniformes order has been described as the most dominant and diversifies species containing family.

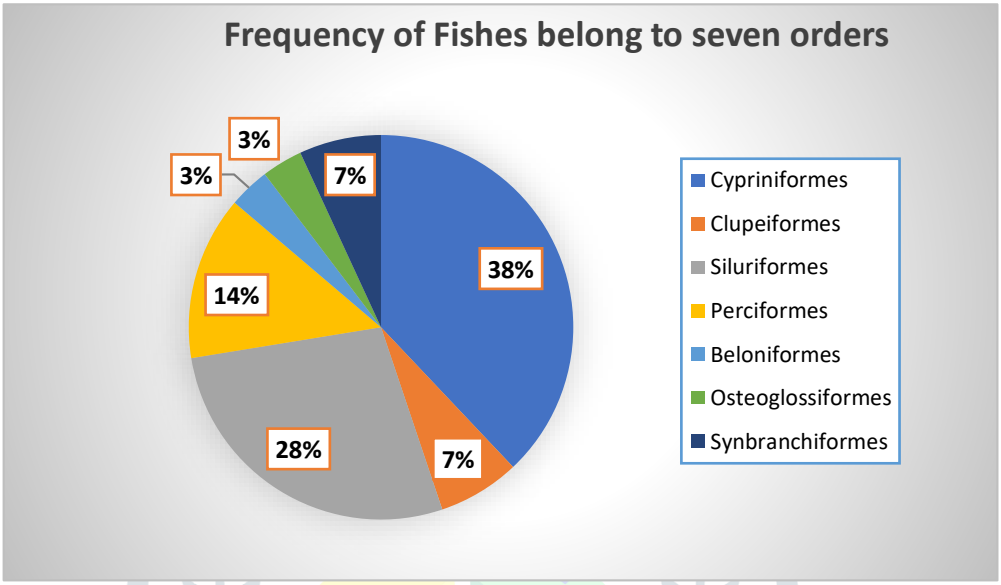
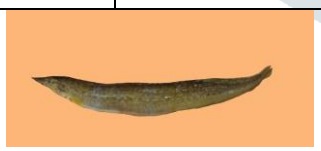


Figure 2: Percentage Distribution of fish species in different orders of the river Sone

Table1. Systematic fish diversity in four geographical sites along the sone river in Sidhi (M. P.)

Order	Family/Subfamily	Fish species	Site 1	Site 2	Site 3	Site 4
Cypriniformes	Cyprinidae	*Catla catla*	36	20	15	11
		Cyprinus carpio	22	14	9	6
		Cirrhinus mrigala	18	7	5	3
		Labeo rohita	32	16	10	8
		Labeo bata	17	6	2	3
		Garra mullya	12	1	4	0
		Tor spp	3	4	0	0
	Barbinae	*Puntius sophore*	14	10	7	3
		Puntius chola	17	5	3	2
		Esomus danricus	7	4	0	3
		Salmophasia bacaila	6	4	5	0
		Amblypharyngodon mola	3	0	4	1
	Cobitidae	*Lepodocephalichthys guntea*	7	3	2	0
Clupeiformes	Clupeidae	*Gudusia chapra*	7	1	0	3
		Gonialosa manmina	4	2	1	3
Siluriformes	Pangasiidae	*Pangasius pangasius*	2	0	3	1
	Bagridae	*Mystus tengara*	6	1	4	0
		Rita rita	5	3	1	0
	Schilbeidae	*Clupisoma garua*	3	2	0	1
	Siluridae	*Ailia coila*	2	0	1	0
		Eutropiichthys vacha	2	3	1	1
		Wallago attu	15	8	5	1
		Ompok bimaculatus	6	0	4	1
Perciformes	Ambassidae	*Chanda nama*	20	10	8	3
	Channidae	*Channa striatus*	15	8	2	2
	Cichlidae	*Oreochromis niloticus*	6	5	0	1
	Gobiidae	*Glossogobius giuris*	9	3	1	1
Beloniformes	Belonidae	*Xenentodon cancila*	8	2	4	0
Osteoglossiformes	Notopteridae	*Notopterus notopterus*	11	5	0	1
Synbranchiformes	Mastacembelidae	*Macrognathus pancalus*	7	1	4	0
		Mastacembelus armatus	4	2	0	1
		Total	326	150	104	60


Macrognathus pancalus


Puntius chola


Chanda nama


Ompok bimaculatus


Catla catla


Pangasius pangasius

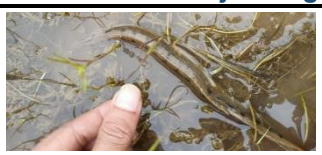

Xenentodon cancila


Cirrhinus mrigala


Wallago attu


Tor spp


Labeo rohita


Mastacembelus armatus


Cyprinus carpio


Esomus danricus


Channa striatus

Figure 3: Pictures of few fishes recorded from Sone River in Sidhi district, Madhya Pradesh

Conclusion

The Sone River in India is home to a diverse range of fish species that contribute to the ecological balance and support the livelihoods of local communities. However, the ongoing threats of pollution, habitat degradation, and overfishing require concerted efforts to ensure the long-term survival of these valuable fish populations. Therefore, Conservation measures and sustainable practices are crucial to preserving the fish biodiversity of the Sone River for future generations.

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