

# Seasonal Variation of Fish Diversity in Narmada River at Dindori District, Madhya Pradesh, India

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## Abstract

The present study deals freshwater fish diversity of Narmada River in Dindori District during period October 2021 to September 2022 in pre monsoon, monsoon and post monsoon season. Narmada River is a life line of Madhya Pradesh. The fish diversity is correlated with biological and PhysioChemical parameters that affect the productivity of water body. Majority of fishes are exploited for human consumption. The present study strives have made to collect, classify and identify fish of river Narmada in Dindori District. The study operated on a stretch of the river approximately 30 km from October 2021 to September 2022. The survey indicated that 37 species of fish were found in this area of the river. The major fish abundance was noticed viz Major carps, Minor carps and Cat fishes. The several species of fish belong to order Cypriniformes, Siluriformes, Beloniformes, Anabantiformes, Perciformes, Synbranchiformes and Gobiformes in which maximum 20 species belonging to the order Cypriniformes. Fish diversity was decline on the basis of seasonal changes. The present study has been conducted to assess the fish diversity in Narmada River in Madhya Pradesh.

## 1. Introduction

Water is one of the most precious natural resources, without it there would be no life on the Earth. Water is essential for all living organism and any change in water quality may leads to matter of survival for these organisms. The river Narmada is third holy and fifth longest westward flowing river of central India. It originates from the Maikal ranges at Amarkantak in Madhya Pradesh near about 100 km far away from our study area. The climate of Dindori is humid, subtropical that favors species richness. Riverine ecosystem has suffered from intensive human intervention which results many fish species become endangered.

The aquatic ecosystem is important for economically fish capturing, which is an important source of protein in food. India occupies the ninth position in having biodiversity, about 877 species of fresh water fishes. Fisheries is an economic activity that involves harvesting or capture fishes from river. Rich biodiversity of any ecosystem is essential in order to maintain proper function of food web (Siddique et al, 2014). Survey was undertaken to study the fish diversity of Narmada River in Dindori District, Madhya Pradesh. The objective of study was to give recent data regarding fish diversity of river.

## 2. Material and Method

The present studies are carried out from in four different sampling stations sati ghat, Dam ghat, Jogi Tikariya ghat and shiv ghat of Pre monsoon, monsoon and Post monsoon season of river Narmada at Dindori (M.P.) These sampling sites are situated at the bank of river Narmada, ritual performances can be seen here frequently. The fish were collected by hand net, cast net with the help of local fisherman and

from the local fish market. Survey was conducted from October 2021 to September 2022. The specimen was not preserved. The collection of fishes was done with the help of local fisherman and also by interviewing and showing different color photograph of fisherman communities. On the basis of identification by local fisherman communities check list was prepared. Fishes were identified with the help of taxonomic key, Day, F (1994) and other literature. Fish base website was also referred for fish fauna ([www.fishbase.org](http://www.fishbase.org)). Fish diversity was measured by the Simpson's Index method. Ecologist calculate diversity by this method which account richness and evenness of species.

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

n = The total number of Organism of a particular species (order)

N= The total number of Organism of all species

### 3. Results and Discussion

During the study period different fish species have observed in the River Narmada at Dindori District. The results showed that the area was rich in fish diversity.

Data collected during the study period from at the sampling site on different seasons was utilized to estimate the fish diversity in the river Narmada. 37 species of fishes belong to 7 order and included under 10 families were collected from Narmada River. (Table 1)

Most species were belongs to order Cypriniformes contributed by 20 species in which *Cirrhinus reba*, *Lebeo calbasu*, *L. fimbriatus*, *Cyprinus carpio*, *Puntius ticto*, *Tor putitora*, *Mystus seenghala*, *M. aor* most abundant and other species like *Rita rita*, *Catla catla* and *Cirrhinus mrigala* were less abundant followed by Siluriformes and Anabantiformes by 4 species, Synbranchiformes by 4 species, Beloniformes 2 species, Perciformes 2 species and Gobiformes, 1 species *Glassogobius giuri* which was rarely found. *Glassogobius giuri* was not reported at Chandan Ghat Dindori (Namdeo and Singh 2021) but reported in our study at sampling site, Dam Ghat. Among family Channidae, *Channa punetatus* was less common and other Channa species like *C. gaucha*, *C. sriata* and *C. marulius* were commonly found. Family Cichlidae, Gobiidae, Anabantidae, Nandidae and Siluridae were less abundant. Species diversity was calculated by Simpson's Index formula and then mean value was calculated according to season. The species diversity is peak in post monsoon 0.92 due to favorable conditions like sufficient water and ample food resources. The diversity was low in pre monsoon season 0.54 probably due to low water level in the river (Table 2). Various workers have done work on Narmada River. Pathak et al (2014) recorded 58 species of fishes from western zone of Narmada River at Jabalpur. Bakawale et al. (2013) recorded 51 species of fish belongs to 7 orders and 15 families from the western region of River Narmada. Kakodiya and Mehra (2018) reported 50 species belongs to 30 Genera and 13 families and 6 orders of Narmada River at Hoshangabad. Some fishes like *Labeo gonius*, *L. bata*, *L. rohita* and *Notopterus* are indicators of industrial waste present in water body but in our study these species were rare or not reported which indicate that water quality of Narmada River at Dindori District is pollution free or less polluted Karode and Khan (2022)

Table 1: The fish diversity In Narmada River at Dindori District (M.P.)

S.No.	Order	Family	Scientific Name	LocalName	Status
1	Cypriniformes	Cyprinidae	Catla catla	Catla	+
			Cirrhinus mrigala	Nareni	+
			Cirrhinus reba	Baren	+++
			Labeo Calbasu	Karri	+++
			Labeo bata	Baren	+
			Labeo fimbriatus	Karri	+++
			Labeo rohita	Rohu	+
			Oxygaster bacaila	Chahal	++
			Cyprinus carpio	Common Carp	+++
			Puntius ticto	Kuttari	+++
			Puntius amphibious	Gardi	++
			Puntius sophore	Gardi	++
			Rita rita	Gigara	+
			Tor putilora	Karcha/ Mahaseer	+++
		Garra lamta	Kusma	++	
		Rasbora rasbora	Dandai	++	
				Bagridae	Mystus seenghala
Mystus cavasius	Tigna				++
Mystus aor	Kattiya				+++
Mystus bleekeri	Kattua				++
2	Siluriformes	Siluridae	Ompak bimaculatus	Balai	+
			Ompak pabo	Balai	+
		Claridae	Wallago attu	Paddan	+
3	Beloniformes	Belonidae	Clarias batrachus	Mangur	++
			Xenthadon cancila	Sujna	+++
4	Anabantiformes	Channidae	Gadusia chapta	Barrpillai	+++
			Channa gaucha	Jimeta	++
5	Perciformes	Nandidae	Channa punetatus	Karraa	+
			Channa striata	Karraa	+++
		Anabantidae	Channa marulius	Sour	+++
			Nandus nandus	Bhujua	+
6	Synbranchiformes	Mastacembelidae	Anabas testudineus	Koi	+
			Mastacembelus pancalus	Baam	+++
		Cichlidae	M. armatus	Baam	+++
7	Gobiiformes	Gobiidae	M. aculeatus	Lamchura Baam	++
			Tilapia mossambica	Telapi	+
			Glassogobius giuri	Pukko	+

Most abundant; +++, Abundant; ++, Less abundant; +

Figure 1: Number of Species in Various Order

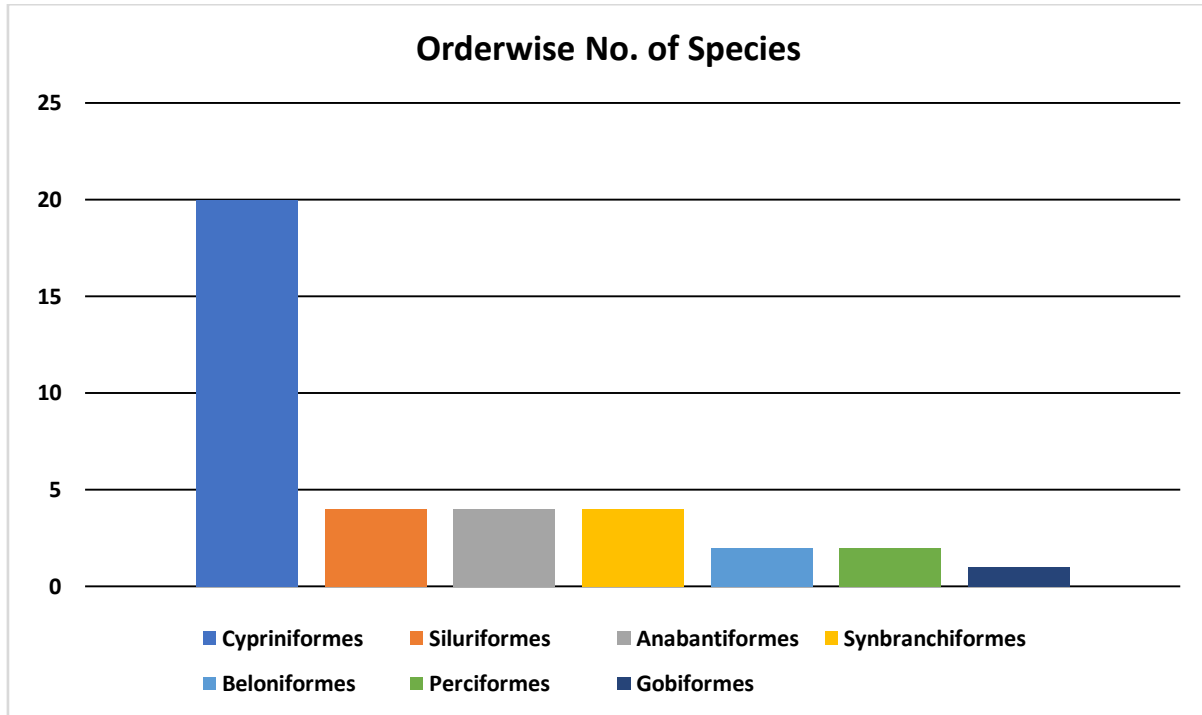


Table 2: Seasonal Variation of Fish Diversity

Season	Species Diversity
Pre monsoon	0.54
Monsoon	0.71
Post monsoon	0.92

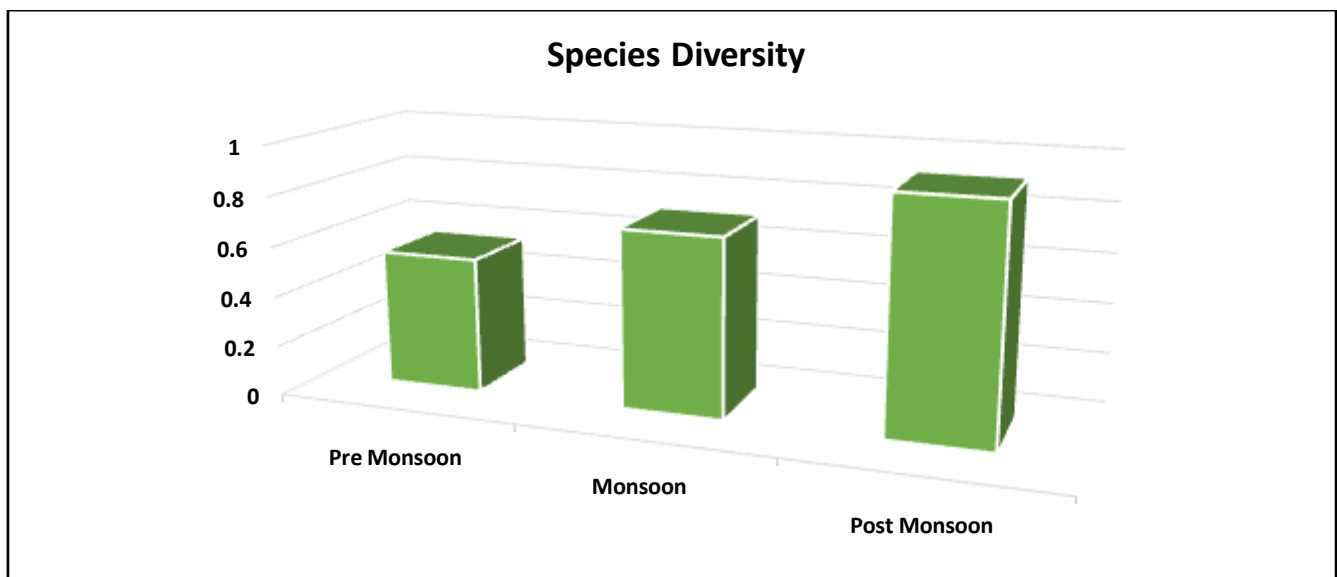


Figure 2: Seasonal Species Diversity in Narmada River at Dindori

#### 4. Conclusion

The results indicate that reduction in the abundance of fish diversity. Information collected from fisherman communities displayed decline of fish diversity. There is definitely some kind of disturbances in the river which is causing reduction in the abundance of fish fauna. The excessive fishing is the biggest threats of fish population. Fishing is prohibited by the government in monsoon season but it is not sufficient step for maintain and protect fish diversity. The illegal fishing activities should be banned to prevent depletion of fresh water fish resources.

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