

Content is available at: CRDEEP Journals
Journal homepage: <http://www.crdeepjournal.org/category/journals/ijes/>

International Journal of Environmental Sciences
(ISSN: 2277-1948) (Scientific Journal Impact Factor: 6.043)

UGC Approved-A Peer Reviewed Quarterly Journal



Full Length Research Paper

Seasonal Variation of Fish Diversity in Narmada River at Maheshwer District Khargone, Madhya Pradesh, India.

Khichi Yogesh*

Assistant Professor, Department of Zoology, Kasturba Gram Rural Institute Kasturba Gram, Indore, Madhya Pradesh, India.

ARTICLE DETAILS

ABSTRACT

Corresponding Author:
Khichi Yogesh

Key words:

Regenerational analysis,
Quercus forest,
Temperate Himalayan
Forest, Vegetational
ecology

The fishes are one of the most important vertebrate, provided rich protein sources for human and several animals and important elements in the economy of many countries. Fish diversity of river essentially represents the fish faunal diversity. The present study has been conducted to assess the fish diversity in Maheshwer Narmada River in Nimar area, Madhya Pradesh. The aim of the study was to explore the fish fauna of Narmada River. This study extends from October 2020 to September 2021. Four sampling spots were selected viz . Arti Ghat, Dam Ghat, Badi Tikariya Ghat and Chota Ghat. The present study deals freshwater fish diversity of Narmada River Maheshwer District Khargone during 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 Physio chemical parameters that affect the productivity of water body. Majority of fishes are exploited for human consumption. The survey indicated that 37 species of fish were found in this area of the Narmada 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 on decline on the basis of seasonal changes.

1. Introduction

Study of biodiversity of fish fauna and their identification is one of the interesting fields of biological research, which gives us an idea about the morphological variations and population diversity of fauna in polluted and non-polluted site of any particular habitat (Mukesh Kumar Napit, 2013). Rich biodiversity of any ecosystem is absolutely essential in order to maintain their stability for proper function of their food chains (Siddiqui *et.al.* 2014). The Narmada is a river in Central India and fifth largest river in subcontinent. It forms the traditional boundary between North India and South India. Narmada "the backbone of Madhya Pradesh" is the largest westward flowing river of India. It is also referred as 'lifeline of Madhya Pradesh'. It is considered holy by Hindus. It originates from Maikal Hill, Amarkantak in Shahdol district of Madhya Pradesh. It is situated at longitude 72 32' and 81 45'E and latitude 21 20' and 23 45'N. Total length of River Narmada is 1312 km which after traveling through three states namely Madhya Pradesh, Maharashtra and Gujarat for a distance of 1,077 km, 74 km and 161 km, respectively joins the Gulf of Cambay, near the District of Bharuch, Gujarat. (Pathak T. *et.al.* 2014). Fishes are the important element in the economy of many nations as they have been as table in the diet of many people (Shukla Pallavi *et.al.*

* Author can be contacted at: Department of Zoology, Kasturba Gram Rural Institute Kasturba Gram, Indore, Madhya Pradesh, India.

Received: 03-December 2023; Sent for Review on: 06-December 2023; Draft sent to Author for corrections: 24-December 2023; Accepted on: 02-01-2024

Online Available from 04 January 2024

DOI: <http://dx.doi.org/10.13140/RG.2.2.16547.84001>

IJES-9899/© 2024 CRDEEP Journals. All Rights Reserved.

2013). Ichthyofaunal documentation is important to analyze status of fish species and also helps us for future planning to improve and conserve the biodiversity (Bose A.K. *et al.* 2013). Present study is based on the fish diversity of Narmada river at Nimar region.

2. Material and Methods

The present studies are carried out from Maheswer Narmada river in four different sampling stations arti ghat, Dam ghat, badi Tikariya ghat and chota ghat of Pre monsoon, monsoon and Post monsoon season of Maheshwer river Narmada at District Khargone (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 2020 to September 2021. The specimen was preserved with identify. 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). 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. Study Area and Sampling stations Maheshwer district Khargone

Maheshwer has been a centre of handloom weaving since the 5th century. Maheshwer is the home of one of India's finest handloom fabric traditions. It is noted as a centre for weaving colourful Maheshwari sarees. It rose to popularity under the rule of strong Maratha leader Queen Devi Ahilya Bai Holkar. The town is situated near the left bank of the Narmada river. Latitude (DMS) 22° 10', 60"N and Longitude (DMS) 74° 54', 0 " E.

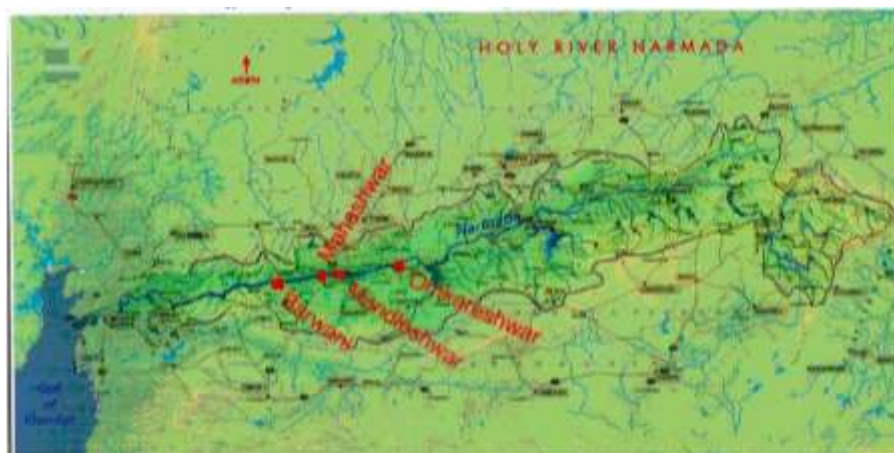


Figure 1. Study area

3.1 Sampling analysis

The fish samples were collected from the sampling station from Maheshwer, for the period of 12 months from period October 2020 to September 2021. In the analysis of the different fish species properties and physiology of different fishes, standard methods prescribed in limnological literature were used APHA (2005), Welch (1998), Golterman (1991). Fishes collect by Dip nets, Cast nets, Traps nets and Straight seines. The net is often 5-15 feet long but some time much longer, 5-6 feet deep, with a 1\16 to 1\8 mesh size.

3.2 Tools of fish analysis



Figure 2. Tools for fish analysis

4. Results and Discussion

During the study period different fish species have observed in the River Narmada at Maheshwer District Khargone . 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 *Gobiiformes* , 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. 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 Maheswer District Khargone is pollution free or less polluted.

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

S.no.	Order	Family	Scientific name	Local name	Status
1.	Cypriniformes	Cyprinidae	<i>Catla catla</i>	Catla	+
			<i>Cirrhinus mrigala</i>	Nareni	+
			<i>Cirrhinus reba</i>	Baren	+++
			<i>Labeo Calbasu</i>	Karri	+++
			<i>Labeo bata</i>	Baren	+
			<i>Labeo fimbriatus</i>	Karri	+++
			<i>Labeo rohita</i>	Rohu	+
			<i>Oxygaster bacaila</i>	Chahal	++
			<i>Cyprinus carpio</i>	Common carp	+++
			<i>Puntius ticto</i>	Kuttari	+++
			<i>Puntius amphibious</i>	Gardi	++
			<i>Puntius sophore</i>	Gardi	++
			<i>Rita rita</i>	Gigara	+
			<i>Tor putitora</i>	Karcha\Mahaseer	+++
			<i>Gara lamta</i>	Kusma	++
			<i>Rasbora rasbora</i>	Dandai	++

		Bagridae	<i>Mystus seenghala</i>	Tingra	+++
			<i>Mystus cavasius</i>	Tingra	++
			<i>Mystus aor</i>	Kattiya	+++
			<i>Mystus bleekeri</i>	Kattua	++
2.	Siluriformes	Siluridae	<i>Ompak</i>	Balai	+
			<i>bimaculatus</i>		
			<i>Ompak pabo</i>	Balai	+
			<i>Wallago attu</i>	Paddan	+
		Claridae	<i>Clarias batrachus</i>	Mangur	++
3.	Beloniformes	Belonidae	<i>Xanthodon cancila</i>	Sujna	+++
			<i>Gadusia chapta</i>	Barrpillai	+++
4.	Anabantiformes	Channidae	<i>Channa gaucha</i>	Jimeta	++
			<i>Channa punetatus</i>	Karraa	+
			<i>Channa striata</i>	Karraa	+++
			<i>Channa marulius</i>	Sour	+++
5.	Perciformes	Nandidae	<i>Nandus nandus</i>	Bhujua	+
		Anabantidae	<i>Anabas testudineus</i>	Koi	+
6.	Synbranchiformes	Mastacembelidae	<i>Mastacembelus</i>	Baam	+++
			<i>pancalus</i>		
			<i>Mastacembelus</i>	Baam	+++
			<i>Mastacembelus</i>	Baam	++
7.	Gobiiformes	Gobiidae	<i>Glassogobius giuri</i>	Pukko	+

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

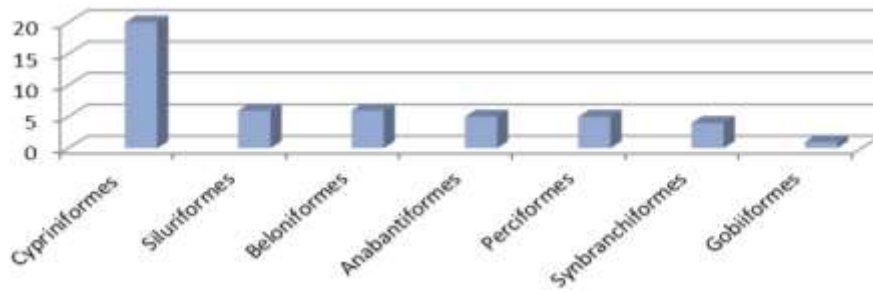


Figure 3. Number of fish species in various order

Table 2: Seasonal Variation of Fish Diversity

Season	Species Diversity
Pre monsoon	0.54
Monsoon	0.71
Post Monsoon	0.92

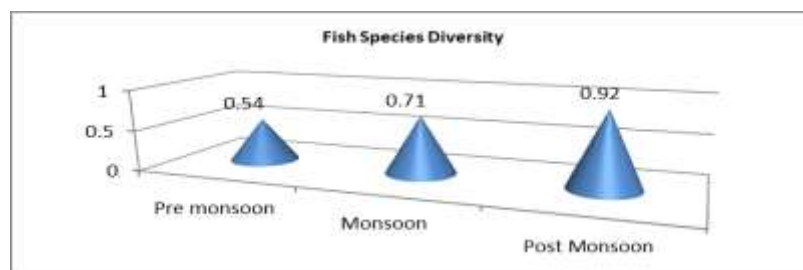


Figure 4. Fish Species Diversity

5. 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.

6. References

- Siddiqui, A., Chouhan, M., and Sharma, S., Biodiversity of Ichthyofauna of Narmada River of Mandleshwar Region, Madhya Pradesh, India, Science Secure Journal of Environmental Biology, 2014, 1(1), 21-25.
- Day, F., The fishes of India, Jagmander book agency, New Delhi, 1994, 1&2.
- www.fishbase.org
- Namdeo, A.K., and Singh, B.S., Fish Diversity of Narmada River at Chandan Ghat in Dindori District, Madhya Pradesh, 2021, 3(3), 275-278
- Pathak, T., Borana, K. and Zafar, T., Ichthyofauna of western region of Narmada River, Madhya Pradesh. International Journal of Research in Applied, Natural and Social Sciences, 2014, 2(4), 25- 28.
- Bakawale, S., and Kanhere, R.R., Study on the Fish Species Diversity of the River Narmada in Western Zone, Research Journal of Animal, Veterinary and Fishery Sciences, 2013, 1(6), 18-20.
- Kakodiya, S.K. and Mehra, S., Fish Diversity of Narmada River at Hoshangabad, Madhya Pradesh. International Journal of Research and Analytical Reviews, 2018, 5, 28-32.
- Karode, A. and Khan, B., A study of Physio Chemical Parameters of Narmada River in Dindori city. Madhya Pradesh. International Journal of Chemical Studies., 2022, 10(5), 30-34.
- Saini, D. and Dube, K.K., Exploring the Faunal Diversity of River Narmada Jabalpur Region, Madhya Pradesh, India. International Journal of Science and Research., 2018, 7 (1) 988-996.
- Vyas, V. et al., Limnological Studies of River Narmada. Journal of Chem, Bio, Phy, Sci., 2013, 3 (4) , 2722-2736.
- Shukla, A. and Sharma, S., Overview of Ichthyofaunal Diversity of River Narmada in Jabalpur region. Anusandhan , 2015, 9, 25-28.