

Diversity and Distribution of Fish in Some Selected Stretches of River Narmada, Madhya Pradesh

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Abstract

The fish diversity of Narmada River from some selected stretch was studied by taking seasonal samples from 2015 to 2017. The Narmada River is one of the important rivers of India, with the total length of 1312 km. largest Westward flowing starting from Amarkantak to Baruch. It is also referred to as the life line of Madhya Pradesh. Present study was aimed to generate information on the fishes of Hoshangabad region of river Narmada. The present study has been conducted to assess the fish diversity in a stretch of Narmada River in Madhya Pradesh. The water samples were collected from five sampling sites of selected stretches of river Narmada. During entire study period, a total of 50 species were found in all five sampling stations. Among these, Cyprinidae are dominating group and comprise of 28 species (52%), Bagridae comprises of 4 species (8%), Cobitidae of 3 species (6%), Ophiocephalidae of 3 species (6%), Ambassidae of 2 species (5%), Mastacembelidae of 2 (5%), Siluridae of 2 species (5%), Clariidae of 1 species (2%), Saccobranchidae of 1 species (2%), Schilbeidae of 1 species (2%), Notopteridae 1 species (2%) and Belonidae of 1 species (2%). We tried to document fish diversity composition, physical habitats characteristics as well as identification of Carps, Catfishes, Loaches, Murrels, Glass, Gobi, Eels, Feather backs, Gar species in the river. This study resulted in the collection of a total of 50 species belonging to 30 Genera, 13 Families and 6 orders. The study aims to assess the diversity and distribution of fishes in River Narmada.

Narmada river ecosystem is said to be one of the most important river ecosystems in India and life line of Madhya Pradesh. It flows from Amarkantak hills to Gulf of Cambay. It supports the local economic activities such as agriculture, fishery, ecotourism, irrigation and water supply for domestic and

industrial use. Now a days water quality of river ecosystem degradation by various sources becomes an important issue around the world. Usage of more land for agricultural purposes, soil, salinization and increase in the use of agricultural fertilizers, pesticides and erosion have become problems threatening

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natural water sources.

Indian fishes, a book was published as early as 1983 by Qureshi and Qureshi⁸.

Vyas and his associates¹⁴ published a paper on fish biodiversity and preferential habitats in some stretches of Narmada river. Bakwale and Kanhere investigated fish species diversity in western zone of the river Narmada. Vishwakarma *et al.*,¹³ assessed fish assemblage and distribution in Barna stream network in Narmada basin.

Siddiqui *et al.*,¹² reported biodiversity of fish fauna of Narmada river in Mandleshwar region. Pathak *et al.*,⁷ probed the fish fauna of Western region of Narmada river. The physicochemical parameters of Narmada River water at Dindori was investigated by Kushram⁴. Saini & Dubey⁹ reported the fish diversity of Narmada river from Jabalpur region.

The seventh edition of the book entitled, 'Fishes of U.P. and Bihar' was brought out by Shrivastava¹⁰ in 1998. Nait⁶ studied the fish fauna of Bundelkhand region with special reference to District Damoh of M.P.

Shukla and Singh¹¹ investigated the distribution and diversity of fresh water fishes of Aami River in District Gorakhpur of U.P., India. Present study is based on the fish diversity of Narmada River at Hoshangabad.

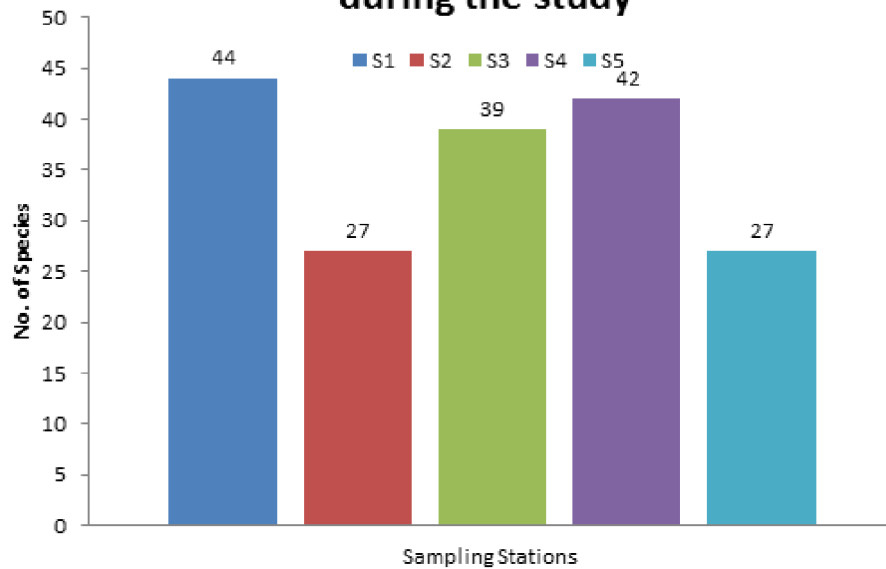
The river is highly exploited for its water resource, for irrigation projects, navigation and fisheries etc. However rivers

have remained source of water for consumption and utilization, in return human beings have not maintained their purity. The work highlights the condition of this river water in various seasons with respect to the physico-chemical parameters⁴. The study aims to assess the diversity and distribution of fishes in River Narmada.

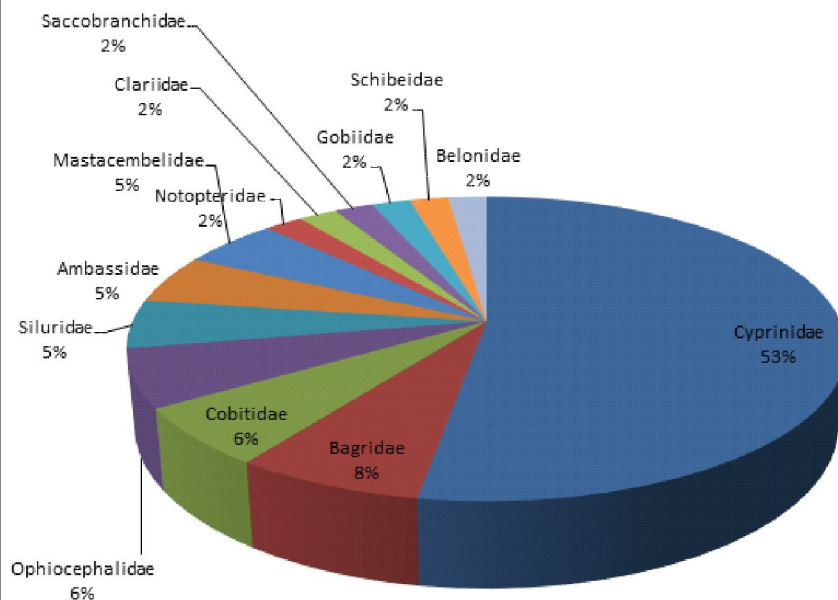
The river Narmada is the largest west flowing river of the country which originates from an elevation of 1051 m in Maikal highlands near Amarkantak under Anuppur district (M.P) at 22° 40'N latitude and 81° 45'E longitude. The Narmada river flows through the main districts of Shahdol, Dindori, Mandla, Jabalpur, Narsinghpur, Hoshangabad, Khandwa and Khargone and covers 1077 km in M.P. Subsequently, it forms common boundary between states of Maharashtra and M.P. and Maharashtra and Gujarat for the following 35 and 39 km respectively. The last leg of 161 km is exclusively in the state of Gujarat. The river loses its altitude by 996.5 m and enters Gujarat State at an elevation of 54.5 m.

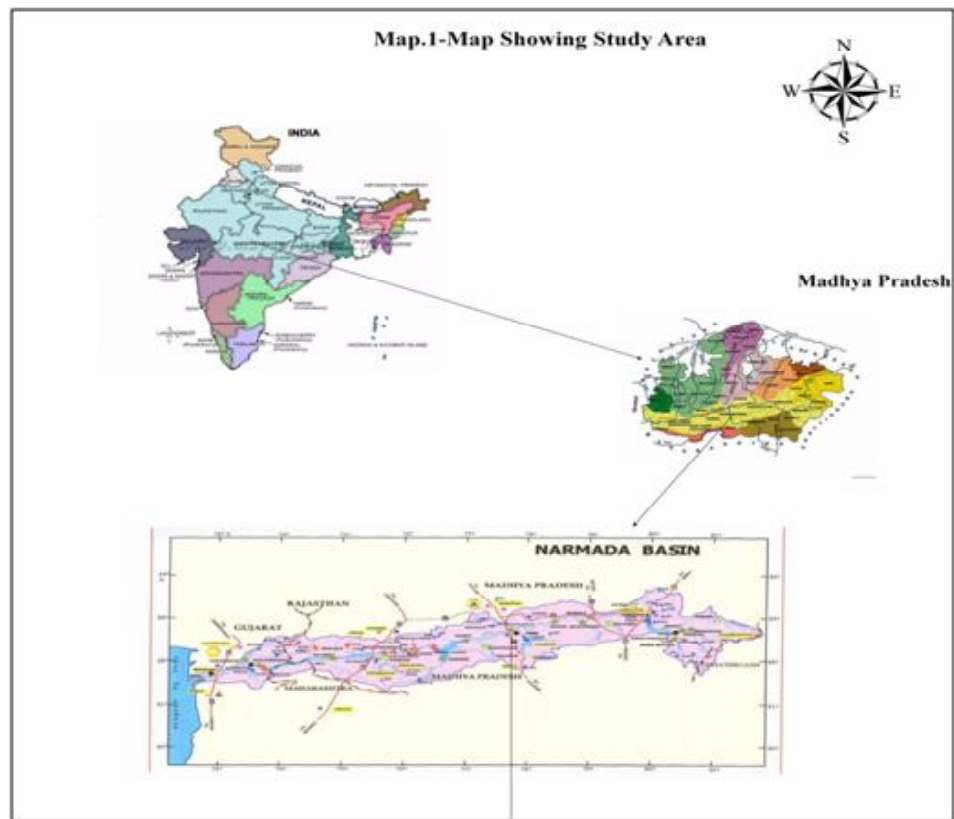
During the study we have selected study area covered into two districts (Hoshangabad and Sehore) of Madhya Pradesh showing in the **(Map-1)**. Samples were collected from five locations between Sakatpur to Anvalighat (Sakatpur, Bandrabhan, Sethanighat, Dongarwada and Anvalighat) covering an approximate 50 kms central stretch of River Narmada. The study has been carried out over a period from 2015 to 2017. The sampling was carried out season wise covering pre-monsoon, monsoon, post-monsoon and winter season.

Graph 1 : Fish diversity of River Narmada during the study



Graph 2 : Fish family groupwise in during the study





1.Sakatpur, 2.Bandraban, 3.Sethanighat, 4.Dongarwada, 5.Anvalighat

The fishes were collected through experimental netting using monofilamentous gillnets of different mesh sizes of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 mm and quantified⁵. Gill nets were mostly fixed in the evening and hauled up next morning. The duration of operation varied between 10-12 hrs. In the morning the entire catch was brought to the landing centres. Fish samples were collected in fresh condition from the fisherman in the morning from 6.00 am – 8.00 am. Fish samples were also collected with the help of cast net efforts. Data was collected by interacting with the fisherman living adjacent to the landing sites and market survey was also done.

While collecting the fishes maximum care was taken to keep their external morphology intact for taxonomic studies. The sampling work was standardized to a constant time and number of fishing nets employed at each site. The gill nets were left submerged from the early evening to the following morning. The specimens retrieved from the nets were then placed in plastic containers containing 4 % formalin. Each container was

labeled with the date and sampling site number. The fishes were identified using the standard keys of Qureshi & Qureshi⁸ and Shrivastava¹⁰.

During entire study period, a total of 50 species were found in all five sampling stations. Among species, family Cyprinidae was the most dominant with 28 species and the percentage composition is 56% of fishes followed by Bagridae 8% with 4 species, Cobitidae and Ophiocephalidae 6% with 3 species, Siluridae, Ambassidae, and Mastacembelidae 4% with 2 species, Notopteridae, Schilbeidae, Clariidae, Saccobranchidae, Gobiidae and Belonidae 2% of each species details is showing in (**Graph 1**).

A total of 50 fish species were identified. Out of this, maximum 44 species were recorded at sampling site S1, 42 Fish species at sampling site S4, 39 fish species at sampling site S3, 27 fish species at sampling site S2 and minimum number of 27 fish species was found at sampling site S5 are given in (Table-1).

Table-1. Fish Diversity at different sampling stations of Narmada River

S.No.	Species	Sampling Sites				
		S1	S2	S3	S4	S5
	Family- Cyprinidae					
1	<i>Amblypharogodon mola</i>	+	+	+	+	+
2	<i>Barilius barila</i>	+		+	+	
3	<i>Barilius bendelisis</i>	+	+	+	+	+
4	<i>Chela laubuca</i>	+	+	+	+	+
5	<i>Catla catla</i>	+		+	+	
6	<i>Cirrhinus mrigala</i>	+		+		+
7	<i>Cyprinus carpio</i>		+			
8	<i>Crossocheilus latius</i>		+			

9	<i>Ctenopharyngodon idella</i>				+	
10	<i>Danio davario</i>	+	+	+	+	+
11	<i>Garra gotyla</i>	+	+	+	+	+
12	<i>Puntius ticto</i>	+	+	+	+	+
13	<i>Puntius sarana</i>	+		+	+	+
14	<i>Puntius saphore</i>	+	+	+	+	+
15	<i>Puntius conchoni</i>	+	+	+	+	+
16	<i>Rasbora daniconius</i>	+	+	+	+	+
17	<i>Tor tor</i>	+		+	+	
18	<i>Oxygaster bacaila</i>	+	+	+	+	+
19	<i>Oxygaster gora</i>	+		+	+	
20	<i>Oxygaster clupeoides</i>		+		+	
21	<i>Osteobrama cotio</i>	+	+	+	+	+
22	<i>Labeo bata</i>	+		+	+	
23	<i>Labeo rohita</i>	+				
24	<i>Labeo gonius</i>	+	+	+	+	
25	<i>Labeo calbasu</i>	+		+	+	
26	<i>Labeo dyocheilus</i>	+				+
27	<i>Labeo fimbriatus</i>	+			+	
28	<i>Labeo angra</i>	+	+			
	Family- Clariidae					
29	<i>Clarius batriacus</i>	+				
	Family- Saccobranhidae					
30	<i>Heteropneustes fossilis</i>				+	
	Family- Siluridae					
31	<i>Ompok bimaculatus</i>	+	+	+	+	+
32	<i>Wallago attu</i>	+		+	+	+
	Family –Bagridae					
33	<i>Mystus cavasius</i>	+	+	+	+	+
34	<i>Mystus seenghala</i>	+		+	+	
35	<i>Mystus aor</i>	+		+	+	+
36	<i>Mystus bleekeri</i>	+	+	+	+	+
	Family- Schilbeidae					
37	<i>Clupisoma garua</i>	+		+	+	
	Family- Cobitidae					
38	<i>Nemacheilus botia</i>	+	+	+	+	+
39	<i>Lepidocephalichthys guntea</i>	+	+	+	+	+
40	<i>Nemacheilus evezardi</i>	+	+	+		

	Family- Ophiocephalidae					
41	<i>Channa marulius</i>	+		+	+	
42	<i>Channa gachua</i>	+		+	+	+
43	<i>Channa striatus</i>				+	+
	Family- Ambassidae					
44	<i>Chanda nama</i>	+	+	+	+	+
45	<i>Chanda ranga</i>	+	+	+	+	+
	Family –Gobiidae					
46	<i>Glossogobius giuris</i>	+	+	+	+	+
	Family –Mastacembelidae					
47	<i>Mastacembelus armatus</i>	+		+	+	
48	<i>Mastacembelus pancalus</i>	+	+	+	+	
	Family-Notopteridae					
49	<i>Notopterus notopterus</i>	+		+	+	
	Family- Belonidae					
50	<i>Xenotodon cancila</i>	+	+	+	+	+
	Total -	44	27	39	42	27

A total 50 species of fishes recorded from selected sites of Narmada river at Hoshangabad belonging to 6 orders and 13 families. The species diversity peak in post monsoon, coinciding with favorable conditions such as sufficient water and ample food resources. The diversity was low in pre monsoon probably due to the shrinkage of water. Information collected from fisherman communities displayed high decline of fish diversity. Deforestation, water scarcity, pollution, introduction of exotic species, sand mining and excessive fishing are the biggest threats to fish population.

Various researchers have done work on Narmada River. Vyas *et al.*,¹⁴ recorded 47 species belonging to 29 genera, 15 families and 6 orders. Vishwakarma *et al.*,¹³ recorded 33 fish species belonging to 5 orders, 9 families and 21 genera. Pathak *et al.*,⁷ recorded 58

species of fish from western region of Narmada River at Jabalpur. Vyas *et al.*,¹⁴ recorded 27 species of fish from Jamner river, a tributary of Narmada River. Siddiqui *et al.*,¹² worked on Biodiversity of Ichthyofauna of Narmada river of Mandleshwar region, Madhya Pradesh, India and recorded 48 species of fish belonging to 7 orders and 17 families. Bose *et al.*,² recorded 57 species, belonging to 35 genera, 13 families, and 6 orders from middle stretch of river Tawa. Bakawale and Kanhere¹ worked on the fish Species diversity of the River Narmada in western zone, and recorded total 51 species of fish belonging to 7 orders and 15 families.

In the present study 50 fish species, belonging to 6 orders and 13 families were recorded. Present investigation revealed that, Narmada River is a healthy water body providing a habitat for freshwater fishes of

diverse type. However, there is constant threat to fish population due to eutrophication and illegal fishing activities. The illegal fishing activities should be banned to prevent depletion of fresh water fish resources and further studies should be conducted to generate more details regarding seasonal production and ecology of fishes. *In situ* conservation is one of the several prominent and suggestive measures for the conservation of fish biodiversity.

The authors are thankful to the Principal and Head of the Department of Zoology Saifia Science P.G. College Bhopal for providing all necessary facilities for conducting this study. The first author is thankful to his guide Dr. Sudhir Mehra for his valuable support in this research work.

References :

1. Bakawale Sunita and R.R. Kanhere (2013). *Research Journal of Animal, Veterinary and Fishery Sciences*, 1(6): 18-20.
2. Bose A.K., et al., (2013). *Journal of Chemical, Biological and Physical Sciences*. 3(1): 706-716.
3. Jayaram, K. C. (1999). The freshwater fishes of the Indian Region. Narendra New Delhi: 551 pp.
4. Kushram, P. (2016). *International Journal of Applied Research* 2(2): 226-228.
5. Mheen, H.V. D. (1995). The use of multi mesh gillnets for sampling fish stocks in reservoirs in Southern Africa. FAO corporate Document Repository. 1-85.
6. Napit, Mukesh Kumar, (2013). *International Journal of advance research*. 1(4): 24-30.
7. Pathak Triguna, K. Borana & T. Zafar, (2014). *International Journal of Research in Applied, Natural and Social Sciences*, 2(4): 25-28.
8. Qureshi, T. A. and N. A. Qureshi (1983). Indian fishes. Brij Brothers, 209 pp.
9. Saini and K.K. Dubey (2017). *International Journal of Fisheries and Aquatic Studies* 5(5): 13-16.
10. Shrivastava, G. (1998). Fishes of UP and Bihar, Seventh Edition, Vishwavidyalaya Prakashan, Chowk Varanasi, 221001, India (Pub.).
11. Shukla, Pallavi and Ajay Singh (2013). *Advances in Biological Research* 7 (2): 26-31.
12. Siddiqui Anis, Meenakshi Chouhan, and Shailendra Sharma (2014). *Science Secure Journal of Environmental Biology*. 1(1): 21-25.
13. Vishwakarma, Kripal Singh, et al., (2014). *International Journal of Advanced Research*, 2(1): 888-897.
14. Vyas V., et al., (2009). *Journal of Nature Environment pollution and Technology*, 8(1).