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Study on the fish species diversity and macro invertebrates of the river Narmada in Nimar Region of M.P.

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Abstract

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. Rivers conserve a rich variety of fish species which supports the from the period August 2009 to July 2010. The aim of the study was to explore the fish fauna of Narmada River. In the course of investigation, four sampling spots were selected *Viz.* Omkareshwar, Mandleshwar, Maheshwar and Barwani of Narmada River. The total 43 fish species were recorded under four orders, nine families and 16 genera. 21 species of commercial fisheries. The country is rich in diversity of such important group of animals keeping in the view, the diversity of fish fauna of the Narmada River in Omkareshwar to Barwani, Madhya Pradesh, Central India has been studied Cypriniformes, three species of Ophiocephaliformes, two species. The Cyprinidae family is dominant and sub dominant family is of Perciformes and one species of Mastacembeliformes have been recorded Ophiocephalidae. Recently, the Tor fish species commonly called 'Mahasheer' has been declared state Fish of Madhya Pradesh. The over fishing and pollution are the major threat for fish diversity of the Narmada River.

Keywords: Fish diversity, fresh water fishes, Narmada River, conservation

Introduction

Study of biodiversity of fish fauna and their identification is one of the interesting field 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) ^[4]. 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) ^[8]. 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 Reffered 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) ^[5]. 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.* 2013) ^[7]. 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) ^[2]. Present study is based on the fish diversity of Narmada River at Nimar region.

Material and Method

Description of Study Area the Narmada River is considered as the life line of Madhya Pradesh. The catchment area of the river exists in the States of Madhya Pradesh (86.18%), Gujarat (11.6%), Maharashtra (1.5%), and Chhattisgarh (0.72%). During its course, the river drops from an elevation of 1051 m to sea level, and flows through narrow gorges in the head reaches.

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The basin is bounded on the north by the Vindhya ranges, on the east by the Maikal range, on the south by the Satpura ranges and on the west by the Arabian Sea. Deep black soil covers the major portion of the basin. The river has 41 tributaries, of which 22 are on the left bank and 19 are on the right bank. The Barna, Tawa, Kolar, and Sukta dams have been constructed on the tributaries. The Bargi is constructed on the mainstream, while the Indirasagar, Omkareshwar, Maheshwar and Sardar Sarovar dams are under construction. The sampling was carried out seasonally covering pre-monsoon, monsoon, post-monsoon and winter season. Experimental fishing was carried out with the help of local fishers. After obtaining the fish from the site photographs were taken. The specimens were taken to the laboratory for

identification. Morphometric measurements were taken and meristic characters were observed and the fin formula was completed. The fish samples were preserved in 5-10% formalin according to the size of the fishes. Smaller fishes were directly placed in the formalin solution, while larger fishes were given an incision on the abdomen before they were fixed. Plastic jar were used for the collection and preservation. Fishes were labeled based on the serial number, common name, scientific name, locality and date of collection. Fishes were identified with the help of taxonomic key, Days fauna (2013) [4] and Talwar and Jhingran 1991. Fish Base website was also referred for various aspects of fish fauna (www.fishbase.org). Specific identifying characters on the body was observed and noted.

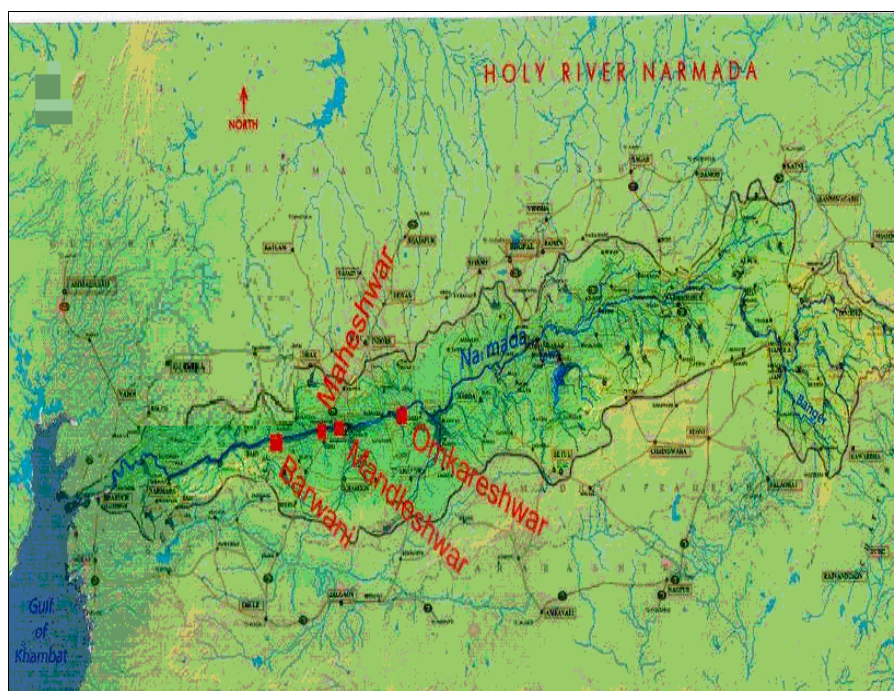
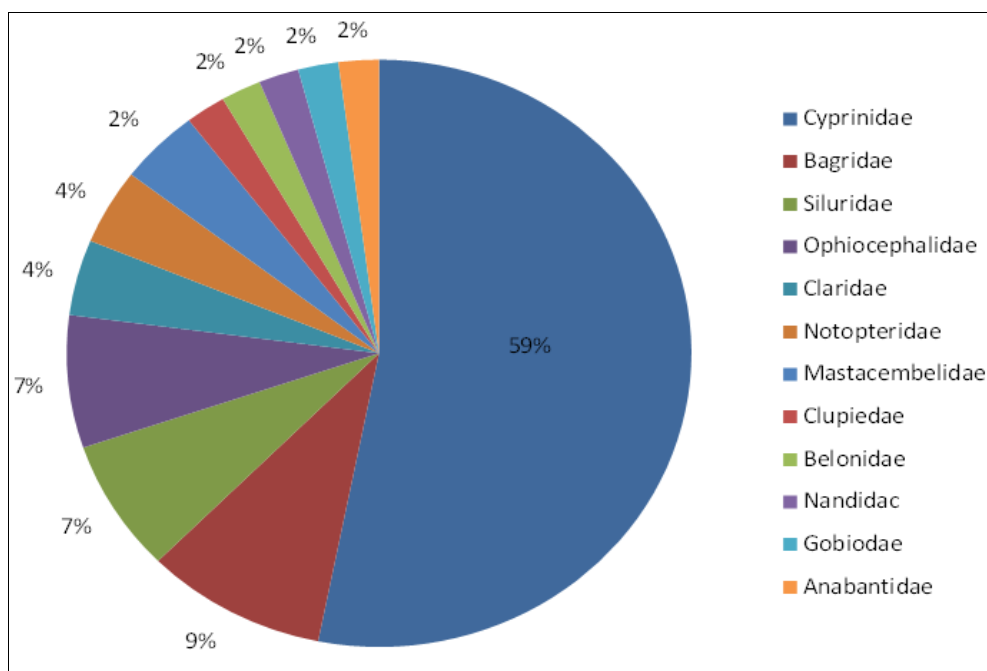


Fig 1: map of Narmada river showing sampling stations

Results and Discussion

A total 43 species of fishes recorded from selected sites of Narmada River at Nimar region belonging to 7 orders and 14 families. Among species, family Cyprinidae was the most dominant with 24 species and the percentage composition is 59% of fishes followed by Bagridae 9% with 4 species, Siluridae and Ophiocephalidae 7% with 3 species, Claridae, Notopteridae and Mastacembellidae 4% with 2 species and Schielbeidae, Clupeidae, Belonidae, Centropomidae, Nandidae, Gobioidae and Anabantidae represented with single species of fish in each family with 2% of each. 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 and mining and excessive fishing are the biggest threats to fish population. Various workers have done work on Narmada River. Vishwakarma *et al.* (2014) [11], recorded 33 fish species belonging to 5 orders, 9 families and 21 genera. Kumar *et al.* (2014) [13] studied the fish species diversity of river Narmada In Khedighat, Warwaha, Madhya Pradesh, and recorded 21 species of fish belonging to 4 orders and 6 families. Family cypriniformes

were dominated with 15 species of fish. Pathak *et al.* (2014) [5] recorded 58 species of fish from western region of Narmada river at Nimar region. Vyas *et al.* (2014) [11] recorded 27 species of fish from Jamner river, a Tributary of Narmada river. Siddiqui *et al.* (2014) [8] work done 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.* (2013) [2] recorded 57 species, belonging to 35 genera, 13 families, and 6 orders from middle stretch of river Tawa. Bakawale *et al.* (2013) [1] 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 49 fish species, belonging to 7 orders and 14 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.



Cyprinidae (51%)>Bagridae (9%)>Siluridae (7%)>Ophiocephalidae (7%)>Claridae (4%)>Notopteridae (4%)> Mastacembelidae (4%)>Scheilbedae (2%), Clupiedae (2%), Belonidae (2%), Centropomidae (2%), Nandidae (2%), Gobiidae (2%), Anabantidae (2%).

Fig 1: % Composition of fish families in Narmada River during Aug 2009 to July, 2010

Table 1: Seasonal variations in fishes of Narmada River Station (2009-2010)

S. No	Name of fish	Seassion 2009-2010			
		Moonsoon	Post Moonsoon	Winter	Summer
1	Notopterus	-	+	-	++
2	<i>Rasbora daniconius</i>	+	+	++	+
3	<i>Puntius sarana</i>	-	+	++	-
4	<i>Puntius ticto</i>	+	-	+++	++
5	<i>Catla</i>	+	++	+++	++
6	<i>Cirrhinus mrigale</i>	-	+	+++	++
7	<i>Labeo rohita</i>	+	++	+++	+
8	<i>Labeo calbasu</i>	+	-	+++	-
9	<i>Labeo gonius</i>	+	++	++	-
10	<i>Cyprinus carpio</i>	-	-	-	+
11	<i>Wallago attu</i>	+	+	++	++
12	<i>Mystus seenghala</i>	+	+	+++	-
13	<i>Heteropneustes fossilis</i>	+	+++	++	+++
14	<i>Clarias batrachus</i>	-	+	++	-
15	<i>Chanda nama</i>	+	+	++	+
16	<i>Colisa fasciatus</i>	+	+	+	-
17	<i>Nandus</i>	-	+	-	-
18	<i>Channa punctatus</i>	-	-	-	+
19	<i>Channa striatus</i>	++	+++	++	+
20	<i>Channa Gachoka</i>	-	-	+	-
21	<i>Xenentodon cancila</i>	-	-	-	+
22	<i>Mastacembalus armatus</i>	-	+	+	-
23	<i>Hilsa hilsa</i>	+	+	-	+
24	<i>Labeo bata</i>	-	+	-	++
25	<i>Labeo fimbriatus</i>	+	+	++	+
26	<i>.Puntius guganio</i>	-	+	++	-
27	<i>Tor</i>	-	-	-	+
28	<i>Hypophthalmichthys Molitrix</i>	-	+	+++	++
29	<i>Mystus bleekari</i>	+	++	+++	+
30	<i>Mystus cavasius</i>	+	-	+++	-
31	<i>Mystus tangara</i>	+	++	++	-
32	<i>Ompok bimaculatus</i>	-	-	-	+
33	<i>Mastacembelus pancalus</i>	+	+++	++	+++
34	<i>Noemacheilus botia</i>	+	+	+++	++
35	<i>Cirrhinus cirrhosus</i>	-	+	-	-
36	<i>Cirrhinus reba</i>	-	+	++	-

37	<i>Danio devario.</i>	+	+	++	+
38	<i>Puntius dorsalis</i>	+	+	+++	++
39	<i>Puntius conchonius</i>	-	+	-	-
40	<i>Rita</i>	-	-	-	+
41	<i>Mystus vittatis</i>	++	+++	++	+
42	<i>Labeo dyocheilus</i>	-	+	++	+
43	<i>Garra mullya</i>	-	+	-	++

Index: +++Abundant, ++ Less Abundant, Always Visible, + Rare, Sometime Visible, - Absent.

Conclusion

Role of fishes has become significant in a way that considers the needs of a sustainable environment and balances with the need of community development. The fish fauna of Narmada river 43 species (2009-10) belonging to different families were observed. During the study period August 2009 to July 2010, in Narmada River each station Omkareshwar S-I, Mandleshwar S-II, Maheshwar S-III and Barwani S-IV are collected a several species of fishes. Most dominant species was family Cyprinidae (Labeorohita, catla, puntius bata, puntius dorsalis, Ctenopharyngdon idella, Hypothalmictchys molitrix) and very sentive fish species family is Gobiodae, Anabantidae, Mastacembeliformes (Mastacembelus armatus, Mastacembelus pancalus.

Recommendation

- A continuous monitoring of the physico-chemical, biological, and microbiological parameters of this river is needed for in -situ conservation of aquatic biodiversity.
- A definite impact on the water mass for increase in the development of submerged saprophytes and aquatic weeds which promote eutrophication must be prevented by taking advance precaution in this record.

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