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Research Article

ICHTHYOFAUNAL DIVERSITY OF THE RIVER NARMADA IN JABALPUR REGION: AN OVERVIEW

Reeta Solanki

Department of Zoology Govt. M.H.College of Home Science and Science for Women, Jabalpur (M.P.)

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ABSTRACT

Fish diversity has enormous economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health. The study of fish diversity is not merely a topic of economic and aesthetic quest as it has great cultural and scientific significance thereby having relevance to survival and livelihood of millions of people. As a part of Indian culture fish occupies an important place in mythology, fine arts and traditions. Fish diversity of River Narmada was studied during March 2017 to March 2018. Total 25 species are discussed herein. The present study attempts to revise study and status of fish diversity for better conservation action plans and their modern management.

Key Words:

Edible, fish diversity, economy, conservation.

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INTRODUCTION

Narmada River, a mighty westward flowing and overall fifth largest river of India and largest of Central-western India (Amritage, 2012). Fish is one of the most important aquatic vertebrate provide itself as a rich protein source in human diet as an important culturable animal in the economy of majority of countries. The Indian fish fauna comprise of 2662 native fin fishes species belonging to 1019 genera, 246 families under 42 orders and 291 exotic fishes. Ichthyofaunal diversity refers to the variety of fish species or allele or genotype within species of life form within a community or in Piscean population (Burton *et al.*, 1992). Fish exhibits enormous diversity in size, shape, biology and habitat they occur. The species diversity of an ecosystem is more or less depends on the amount of living and nonliving organic matter present in it. However species diversity depends less on the characteristics of a single ecosystem than on the interaction between ecosystems. The genetic imprinting of various populations of Lentic fish species is essential since the freshwater ecosystems constitute crucial parts of their life-support systems by providing nursing grounds and feeding areas (Hammer *et al.*, 1993). Further, species diversity is a property at the population level while the

functional diversity concept is more strongly related to ecosystem stability and stress, physical and chemical factors for determining population dynamics in the lentic ecosystem (Kar and Barbhuiya, 2004).

Due to habitat alteration/modification, climatic change, pollution, disturbed rainfall the life cycle of these fish species appears to be disrupted. Moreover introduced exotic species like, the Grass Carp and the Silver Carp proved catastrophic for native species due to competition for territory and tropic demands. The present analysis is an attempt to throw some light on the current status of Ichthyofaunal diversity of studied area.

Aquatic Sources of Madhya Pradesh

The State of Madhya Pradesh with the existence of six major river basins viz. Ganga, Narmada, Tapti, Mahanadi, Mahi and Godavari has one of the finest watersheds in the country. The total length of rivers, including the tributaries, rivulets and streams, has been estimated at 12, 000 km, which accounts for more than 40% of the total length of rivers in India (29, 000 km). Barring the fertile valleys of Narmada and Tapti, Madhya Pradesh is mainly a plateau, intercepted with mountains of the Vindhya and Satpura ranges, which makes the state highly

*Corresponding author: **Reeta Solanki**

Department of Zoology Govt. M.H.College of Home Science and Science for Women, Jabalpur (M.P.)

divers in terms of natural resources, including its aquatic biodiversity. In addition to various river systems, Madhya Pradesh also has sizeable area under man-made reservoirs. The data generated at CIFRI, through remote sensing images, indicates the availability at 2, 95, 920.56 ha (>05 ha) of total water area in Madhya Pradesh and in combination with small ponds the area is estimated to be around 3.38 lakh ha.

MATERIAL AND METHODS

Location of Study Site

The Narmada basin lie in the central India between 70° 20” E to 81°45” E longitude and 21°20” N to 23°45” N latitude with a drainage area of 98,796 sq. km and mean elevation of 760 meters. The present study was carried out during the year March 2017 to March 2018. Four study sites namely Bargi dam, Gwarighat, Tilwaraghat and Bhedaghat of Jabalpur were selected for the sampling. Sampling was done at 15 days interval by using standard methods which includes gill nets, cast nets, hooks and line and some other local nets of different mess sizes. The collected fish samples were subsequently fixed in 5-10% formaldehyde depending upon the size of sample. All fishes were identified with the help of available taxonomy based literature mainly including Qureshi and Qureshi (1983), Talwar and Jhingran (1991) and Jayaram (1991).

RESULT AND DISCUSSION

The identified species are listed against the assigned families and orders followed by feeding habit/habitat and their economic value. A total of 25 species belonging to 10 families of 6 orders were found in river Narmada at Jabalpur region. The dominant order was *Cypriniformes* (minnows and carps) comprising 44 percent of all the number of species recorded. Next to *Cypriniformes*, other dominant orders were *Siluriformes* comprising of 24 percent of species.

The other diversified families were *Perciformes*, *Ophiocephaliformes*, *Clupiformes* and *Beloniformes* constitutes 12%, 8%, 8% and 4% respectively. Furthermore, order *Cypriniformes* was found as the most dominant fish group in terms of total number of individual observed (fig.1).

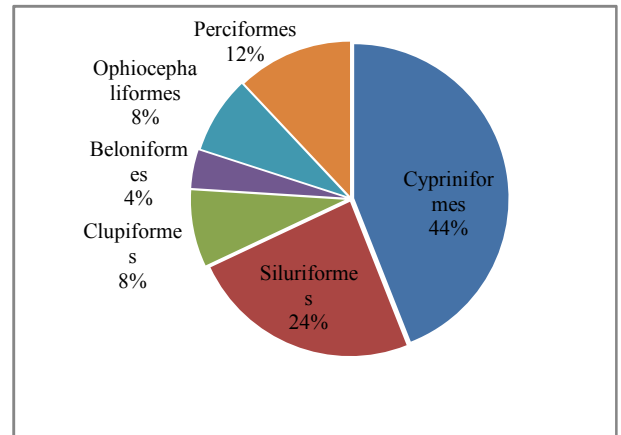


Fig 1 Order-based fish species diversity in River

The trophic structure of the fishes indicated dominance of omnivorous fishes such as *Catla catla*, *Cirrhinus mrigala*, *Cyprinus carpio*, *Mystus cavasius*, *Tor tor* etc. Moreover, the distribution of carnivorous, herbivorous and planktivorous fishes depicted similar patterns as per Fu *et al.*, 2003. The dominance of omnivorous fishes may be because of their tolerance to degradation or ecosystem dysfunction. Similar results were also found by Wichert and Rapport, (1998).

The list of fishes recorded from river Narmada with their families, habit, habitat and economic importance are presented in Table 1.

Table 1 List of fishes recorded in River Narmada.

S.No.	Order	Family	Species	Diet; Habit; Habitat	Economic importance
1.			<i>Hypothalmictichys molitrix</i>	H; BP; R, L	E
2.			<i>Cirrhinus mrigala</i>	O; BP; R, P, WL	E
3.			<i>Cirrhinus reba</i>	O; BP; R, P, WL	E
4.			<i>Ctenopharyngodon idellus</i>	H; D; R, Str, L, WL	E
5.	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	O; BP; R, P, L, WL	E
6.			<i>Catla catla</i>	O; BP; R,P,WL	E
7.			<i>Labeo rohita</i>	H; BP; R, L, P	E
8.			<i>Labeo calbasu</i>	H; D; R, L, WL	E
9.			<i>Labeo bata</i>	H; BP; R, L, P	E
10.			<i>Puntius chola</i>	C; BP; R, Str, L	E
11.			<i>Tor tor</i>	O; BP; R,Str	E
12.			<i>Mystus seenghala</i>	C; D; R, L, WL	E
13.			<i>Mystus aor</i>	C; D; R, L, WL	E
14.			Siluriformes	Bagridae	<i>Mystus cavasius</i>
15.	<i>Rita rita</i>	C; D; R, L			E
16.	<i>Clarius batrachus</i>	C; D; R, L, WL			E
17.	<i>Wallago attu</i>	C; D; R, L, WL			E
18.	Clupiformes	Notopteridae			<i>Notopterus notopterus</i>
19.			<i>Notopterus chitala</i>	O; D; R,WL	E
20.	Beloniformes	Belonidae	<i>Xenthodon cancila</i>	O; (P-N); R, Str	Or
21.	Ophiocephaliformes	Ophiocephalidae	<i>Channa punctatus</i>	O; BP; R, L, WL	E
22.			<i>Channa striatus</i>	O; BP; R, L, WL	E
23.			<i>Chanda nama</i>	O; BP; R, L, WL	E
24.	Perciformes	Gobioidae	<i>Glassogobius giuris</i>	O; BP; R, L, WL	E
25.		Nandidae	<i>Nandus nandus</i>	C; BP; R, Str	Or

Abbreviations used in Above table: E- Edible; Or- Ornamental fish; Str- Stream; P- Pond; R- River ; L- Lake; WL- Wetland; O-Omnivorous; C- Carnivorous; H- Herbivorous; BP- Benthopelagic, D- Demersal and (P-N)- Pelagic-Neritic.

CONCLUSION

It can be inferred from the present study that Narmada is very important river for fresh water fish diversity. Economically this is one of the most consumed sources of edible and ornamental fishes. With such vast and irreplaceable role Narmada should be given sensible attention to manage and conserve fish fauna. Sustainable consumption of edible fishes and application of legal protection in pollution and harvesting aspects will be key methods to ensure the healthy density of fishes for human and ecological use. The present analysis will provide a useful step for future studies in the same subject.

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