



Threatened Ichthyofauna of the upper lake Bhopal (M.P)

Mukesh Kumar Napit

Department of Zoology, Swami Vivekanand Govt. College Berasia, Bhopal (M.P.),

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Abstract

The ichthyofauna of upper the lake Bhopal was dominated by cypriniformes (29 species) followed by ophiocephaliformes (5 species), perciformes (4 species) and others orders. The study indicates that many species in the lake are in decline or even have disappeared in comparison to the previously recorded data. The main reasons behind the decline of species are habitat destruction, introduction of exotic species, pollution and over-fishing. This disappearance of some of the highly conspicuous species must be a cause of concern to ichthyologists and there is an immediate need of their conservation.

Keywords: Ichthyofauna, fish, upper lake, threatened species, biodiversity and conservation.

Introduction

The upper lake of Bhopal along with its tributaries is considered, the lifeline of this capital city of Madhya Pradesh. The lake basin is proposed to undergo compound impounding, with weir, channels, and dams on the lakes. These dams and their reservoirs are bringing drastic changes in the lentic ecosystem. In the process of changes the biodiversity of lake is shifting from the predominant lentic community to a lotic assemblage. For categorizing the status of fish fauna (biodiversity) abundance of yesteryears as compared to present, may serve as a yardstick. The first information regarding the ichthyofaunal assemblage of lake is credited to Sahadevan and Shrivastava (2000), who recorded 43 species of fish. Kodarkar (2000) have recorded 42 species. Mishra (2007) recorded 43 species belonging to 19 genera. Joshi (1992), Shrivastava (1994), Valecha (1995) and Bisaria (2009) have also studied the fish fauna of upper lake Bhopal. In the present study an attempt has been made to identify the threatened species of the upper lake of Bhopal.

Material and Methods

The fish were caught by local fishermen by operating cast nets and drag nets during the study

and preserved in 8-10% formaldehyde and identified with the help of literature of Day (1958), Shrivastava et al., (1994) and Jayaram (1994).

Results and Discussion

The various fish species observed during the investigation have been tabulated in Table - 1. The Cypriniformes contributes maximum number (i.e., 29), of fish species in fish diversity of the lake and it counted almost 71.11% of the total. Ophiocephaliformes contributed by 5 species (8.88%), Perciformes while came third in contribution and counted 4 species (6.66%) and rest species were from Clupeiformes, Beloniformes, and Mastacembeleformes (2,1, and 2 species respectively). The last three orders contributed 13.13 percent. The detailed monitoring and thorough comparisons of old collection and observations data with more recent ones showed that many species of fish in the lake are declining and some have been disappeared. The present study reveals that at least 34 species, in comparison to the study of Sahadevan and Shrivastava (2000), are at decline and can be considered as threatened species or endangered species. Mishra (2007) confirm this study to a great extent as they have reported

Table - 1. List of encountered fishes recorded in lake during Oct. 2011 to Sept. 2012.

Order and Family	Genera	AB	Status IUCN-1990	Causes of threatened
Clupeiformes Clupeidae	1. <i>Gudusia chapra</i>	O	CR	Ur, Pl, Ind, Hd.
Notopteridae	2. <i>Notopterus notopterus</i>	C	LRnt	F, Cult, Ur, Pl, Hd.
Cypriniformes Cyprinidae	3. <i>Barilus bola</i>	O	EN	F, Ur, Pl, Hd.
	4. <i>Catla catla</i>	Vc	Vu	F, S, Cult, Ur, Pl, Ind, Hd.
	5. <i>Cirrhinus mrigala</i>	Vc	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
	6. <i>Cirrhinus reba</i>	Vc	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	7. <i>Garra gotyla</i>	R	Vu	F, Cult, Pl, Ind, Hd.
	8. <i>Escomus danricus</i>	R	EN	F, Cult, Ur, Pl, Ind, Hd.
	9. <i>Labeo bata</i>	Vc	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
	10. <i>Labeo calbasu</i>	C	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	11. <i>Labeo dussumeria</i>	O	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	12. <i>Labeo gonius</i>	C	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	13. <i>Labeo rohita</i>	Vc	Vu	F, S, Cult, Ur, Pl, Ind, Hd.
	14. <i>Osteobrama cotio</i>	O	CR	F, Cult, Pl, Ind, Hd.
	15. <i>Oxygaster bacaila</i>	O	CR	F, Ur, Pl, Ind, Hd.
	16. <i>Puntius sophore</i>	C	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	17. <i>Puntius ticto</i>	O	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	18. <i>Puntius Sarana</i>	C	LRnt	F, S, , Pl, Ind, Hd.
	19. <i>Rasbora daniconius</i>	R	EN	F, S, Pl, Ind, Hd.
	20. <i>Cyprinus carpio</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
	21. <i>Maccognathus aculeatum</i>	R	EN	F, S, Cult, Pl, Ind, Hd.
	22. <i>Lepulocephalichthyx</i>	R	EN	F, Ur, Pl, Ind, Hd.
	23. <i>Trichogaster fasciatus</i>	O	EN	F, S, Ur, Pl, Ind, Hd.
Cobitidae	24. <i>Nemacheilus botia</i>	R	LRnt	F, Cult, Pl, Ind, Hd.
Siluridae	25. <i>Ompok bimaculatus</i>	R	EN	F, Cult, Pl, Ind, Hd.
Bagridae	26. <i>Mystus bleekeri</i>	C	Vu	F, S, Cult, Ur, Pl, Ind, Hd.
	27. <i>Mystus aor</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
	28. <i>Mystus Seenghala</i>	Vc	Vu	F, S, Cult, Ur, Pl, Ind, Hd.
	29. <i>Mystus Cavasius</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
Saccobranchidae	30. <i>Heteropneustes fossilis</i>	C	Vu	F, Cult, Ur, Pl, Ind, Hd.
Clariidae	31. <i>Clarias batrachus</i>	O	EN	F, Cult, Ur, Pl, Ind, Hd.
Beloniformes Belonidae	32. <i>Xenentodon cancila</i>	C	Vu	F, S, Cult, Ur, Pl, Ind, Hd.
Ophiocephaliformes Ophiocephalidae	33. <i>Channa marulius</i>	C	LRnt	F, Cult, Ur, Pl, Ind, Hd.
	34. <i>Channa leucopunctatus</i>	O	EN	F, S, Ur, Pl, Ind, Hd.
	35. <i>Channa punctatus</i>	C	Vu	F, Cult, Pl, Ind, Hd.
	36. <i>Channa straitus</i>	C	Vu	F, Cult, Ur, Pl, Hd.
	37. <i>Channa gachua</i>	C	LRnt	F, Cult, Pl, Ind, Hd.

Perciformes	38. <i>Chanda nama</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
Centropomidae	39. <i>Chanda ranga</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
Nandidae	40. <i>Nandus nandus</i>	R	CR	F, S, Cult, Ur, Pl, Ind, Hd.
Gobioidae	41. <i>Glossigobius giuris</i>	R	EN	F, S, Cult, Ur, Pl, Ind, Hd.
Mastacembeleformes	42. <i>Mastacembelus armatus</i>	C	LRnt	F, S, Cult, Ur, Pl, Ind, Hd.
Mastacembelidae	43. <i>Mastacembelus pancalus</i>	R	LRlc	F, S, Cult, Ur, Pl, Ind, Hd.

43 species of fish in this stretch of the lake. The reasons behind are:

Habitat destruction

It is probably a driving force in the loss of species. The Upper lake of Bhopal basin is proposed to undergo compound impounding, with as many dams on the main lake and the tributaries. The effects of dams and other such structures on fish population may be obstructional or ecological (Jhingran, 1988) The construction work of Bhadbhada and Ramsar is heading towards completion is now changing the ecology of this stretch of the lake. The dams as physical barriers are detrimental to the migration of fish impeding their accessibility to breeding, nursery and feeding grounds.

Introduction of exotic species

This can disrupt entire ecosystems and have a major impact on populations of native animals. The invaders can affect native species by eating, infecting, competing with or mating with them. *Cyprinus carpio* (an exotic species) was recorded from this stretch of lake. This invasion may be dangerous to the lives of endemic species of fish. Moreover the presence of *Clarias geriepinus* (an exotic cat fish) in the local fish market is the worst sign for fish fauna of Upper lake, Bhopal because the fingerlings of this voracious cat fish have every chance to reach to the river in rainy season through runoff water. Although the State Government has banned the culture of *Clarias geriepinus* but still it is being sold in local fish market.

Pollution

Human generate pollution and contamination like acid rains, human waste, over use of pesticides

can affect all levels of biodiversity. Various inputs in the form of fertilizers, pesticides and weedicides affect fisheries. Use of excessive fertilizers for enhancing agricultural yield may lead to eutrophication, whereas weedicides may prove toxic and endanger the fishery. Pesticides, like chlorinated hydrocarbons are also toxic to fish and their accumulation in tissues affect the health of fish consumer through food chain.

Over-fishing and use of hazardous techniques of fishing

Over-exploitation of a species can lead to its disappearance. Many of the world's natural resources are being used by humans faster than they can replace themselves. Over-exploitation has led to dwindling to fish stock which could not come up due to subsequent stresses including damming. The fishermen reported decline in catch which was attributed to over-fishing. In Bhopal district, there was a general assertion that due to over-fishing, the catches have dwindled. Even the indiscriminate fishing by the tribals using dynamites, poisons and electrocution has been reported. Sometimes fishermen got injuries due to dynamites in the form of detachments of palms from their hands. Deaths of fishermen have also reported due to electrocution. These hazardous fishing techniques kill millions of fry and fingerlings of fish, which if, would have survived would enriched the river with tons of adult fish. Fishing during breeding period in the Lake is another mistake by which thousands of brooders are killed. Unfortunately, these malpractices are being repeated for years causing drastic reduction in biodiversity of fish in the Lake.

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