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ICHTHYOFAUNAL DIVERSITY OF SHAHDOL REGION WITH SPECIAL REFERENCE TO EXOTIC FISHES AND THEIR EFFECT ON INDIGINOUS FISH FAUNA

Zoology

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ABSTRACT

The Ichthyofaunal study was undertaken during 2012 to 2014, in the lentic and lotic water bodies of Shahdol region. Samples were collected from pond, rivers and different fish markets also with the help of fisheries department and irrigation department. Data were analyzed for different morphometric features of fish species and Identification done in laboratory. The result of present investigation reveals the occurrence of 68 fish species belonging to 41 different genera, 15 families and 05 orders were recorded from different water bodies of Shahdol region. The members of Cypriniformes were found dominant with 53 fish species followed by Clupiformes, Ophiocephaliformes, Perciformes and Mastacembeliformes. Among these fishes 16 fishes are exotic and among these exotic fishes *Clarius gariepinus* and *Tilapia massambica* are cultured abundantly in this region because of its fast growing nature, much tolerance towards diseases, omnivorous feeding behavior, no need to proper care, good market value. But due to fast growing and highly carnivorous and voracious predatory nature of these fishes are dangerous for our indigenous species because these exotic fishes destroy their ecosystem and giving strong competition for food and habitat. In study we found that *Bagarius bagarius, Wallago attu, Tor tor (State fish of Madhya Pradesh), Nandus nandus*, *Labeo calbasu*, *Chanda ranga, and Clarius batrachus* are in threatened condition and need to take appropriate step for their conservation for future generation.

KEYWORDS

Ichthyofaunal diversity, Exotic Species, Indigenous Fish Fauna

INTRODUCTION

The Aquatic Biodiversity of the world is changing and getting depleted alarmingly fast as a result of extinctions caused by habitat loss, pollution, introduction of exotic species, over exploitation and other anthropogenic activities (Moyle & Moyle,1995).The loss of aquatic biodiversity is sever in freshwater ecosystem, which represent a meager 0.1 percent of earth's water wealth, yet they habour 40 percent of the fish species so far recorded (Nelson,1994).Fishes are the Keystone species which determine the distribution and abundance of other organisms in the ecosystem they represent and are good indicators of the water quality and the health of the ecosystem. Nearly 20 percent of the world's freshwater fish fauna is already extinct or is on the verge of extinction (Moyle & Leidy, 1992).

In the long run introduction of exotic species may turn out to be a deleterious problem as habitat loss. According to Nyman (1991) this could also lead to irreversible changes in the aquatic ecosystems and result in extinction of species. An introduced species (exotic) is any species intentionally or accidentally transported and released by man outside its present range (Kottelat & Whitten, 1996).Exotic Species of fishes were introduced in many parts of the world for Improving local fishery potential and for broadening species diversity in aquaculture programmes, Sport fishing, For aquarium keeping and Controlling of unwanted organism as mosquitoes. Further, there are accidental or unauthorized introductions.

The indiscriminate transfer of aquatic organisms, particularly fishes, brought about a worldwide concern as it resulted in a wide array of problems including extirpation of indigenous species. The exotics are a competition to indigenous fishes for food and habitat. They may prey upon native fishes, introduce new diseases and parasites, result in the production of hybrids and cause genetic erosion of indigenous species and degradation of the physic-chemical nature of aquatic ecosystems. All this will subsequently lead to loss of biodiversity (Nyman, 1991).

The introduction of sports fishes has been considered so far as non-problematic in Indian waters (Shetty *et al*., 1989).However, trouts are reported to compete with native stocks, leading to their elimination and may even hybridize with genetically similar indigenous species (Rinne, 1995).Introduced sport fishes such as Rainbow trout are found to be a major predator on the eggs and young ones of native species (Blinn *et al*., 1993).These repots beg further investigations on the impact of introduced Carnivorous and voracious feeders such as the Bighead Carp (*Aristichthys nobilis)* and the African Catfish (*Clarias gariepinus*) were reported to India illegally. If these exotic fishes establish themselves in natural water bodies, they may become a very serious threat to the smaller indigenous fish species as well as invertebrates (Frey, 1961).

Considering the threats posed by the African Catfish and Piranhas, the union agriculture ministry has ordered killing of these fishes *en masse*. The government order did not have any impact as it lacked any specific guidelines to be adopted for destroying the fish. In Shahdol region also this fish are cultured in abundance. Same as Tilapia (*O.mossambicus)* may compete with indigenous cyprinid fishes such as Labeo because of similar ecological requirements (Pethiyagoda, 1994).

MATERIALS AND METHODS

The Ichthyofaunal study was undertaken during 2012 to 2014, in the lentic and lotic water bodies of Shahdol region. Samples were collected from pond, rivers and different fish markets also with the help of fisheries department and irrigation department. The fish specimens collected were directly fixed in 4-5 % formaldehyde solution. The large sized specimen was injected with 10% formaldehyde and given incision on its belly. While identifying the fish specimens, stress was mainly given on stable characters both meristics and morphometeric. The shape of the snout, presence or absence of barbells, number of dorsal fin rays, number of scales in lateral line, scale in transverse lines, predorsal scale etc. The identification was done according to Day (1958); and Gopalgi shrivastava, (2006).

RESULTS & DISCUSSION

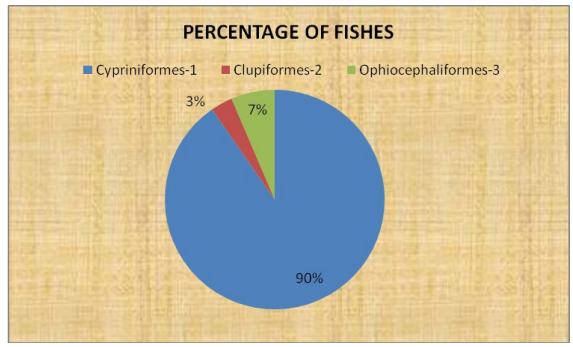
The result of present investigation reveals the occurrence of 68 fish species belonging to 41 different genera, 15 families and 05 orders were recorded from different water bodies of Shahdol region. The members of Cypriniformes were found dominant with 53 fish species followed by Clupiformes, Ophiocephaliformes, Perciformes and Mastacembeliformes. Among these 68 fishes 12 fishes are exotic fishes *Amblypharyngodon microlepis, Ctenopharyngodon idela (Grass carp)*, *Hypopthalmichthys molitrix (Silver carp)),Carassius auratus (Gold carp),Cyprinus carpio*, *Pseudeutropius sikesii,Eutropichthys murius*, *Silondia silondia,Eutropichthys vacha*,*Clarius gariepinus, Tilapia massambica (for mosquito control),Gambusia affinis (for mosquito control)* Among these exotic fishes *Clarius gariepinus* and *Tilapia massambica* are cultured abundantly in this region because of its fast growing nature, much tolerance towards diseases, omnivorous feeding behavior (main food items are aquatic and terrestrial insects and their larvae, plankton, invertebrates and small vertebrates including fishes and strongly cannibalistic in habit especially at fingerling stage) no need to proper care, good market value. But due to fast growing and highly carnivorous and voracious predatory nature of these fishes are dangerous for our indigenous species because these

exotic fishes destroy their ecosystem and giving strong competition for food and habitat, in this region now 07 species are in threatened condition (*Bagarius bagarius, Wallago attu*, *Tor tor, Nandus nandus, Labeo calbasu, Chanda ranga, Clarius batrachus*) and need to take appropriate step for their conservation for future generation.

S.N	Order	Family	Fish Name
01	Cypriniformes-1	Cyprinidae-1	*Catla catla*
02			*Labeo rohita*
03			*Labeo boga*
04			*Labeo calbasu*
05			*Labeo gonius*
06			*Labio bata*
07			*Cirrhinus mrigala*
08			*Cirrhinus reba*
09			*Cirrhinus chaudhryi*
10			*Cyprinus carpio*E*
11			*Chela laubuca*
12			*Chela untrahi*
13			*Amblypharyngodon microlepis*E*
14			*Ctenopharyngodon idela (Grass carp)*E*
15			*Hypopthalmichthys molitrix (Silver carp))*E*
16			*Carassius auratus (Gold carp)*E*
17			*Oxygaster bacaila*
18			*Oxygaster gora*
19			*Puntius ticto*
20			*Puntius sophore*
21			*Puntius conchonius*
22			*Puntius chrysopterus*
23			*Puntius muzaffarpurensis*
24			*Puntius amphibius*
25			*Puntius sarana*
26			*Puntius chola*
27			*Rasbora daniconius*
28			*Esomus danricus*
29			*Daneo aequipinnatus*
30			*Aspidoparia jaya*
31			*Chagunius chagunio*
32			*Barilus barna*
33			*Barilius tileo*
34			*Barilius bendelisis*
35			*Gambussia affinis*E*
36			*Discognathus modestus*
37			*Tor tor*
39		Bagridae-2	*Mystus aor*
40			*Mystus bleekeri*
41			*Mystus seenghala*
42			*Mystus tegra*
43		Sisoridae-3	*Bagarius bagarius*
44		Cobitidae-4	*Lepidocephalichthys guntea*
45			*Nemacheilus rupicola*
46		Siluroidae-5	*Ompak bimaculatus*
47			*Wallago attu*
48		Schilbeidae-6	*Ailia coila*
49			*Clupisoma garua*
50			*Eutropichthys vacha*E*
51			*Eutropichthys murius*E*
52			*Silondia silondia*E*
53			*Pseudeutropius sikesii*E*
54		Saccoranchidae-7	*Heteropneustes fossilis*
55		Claridae-8	*Clarius batrachus*
56			*Clarius gerripinnus*E*
57	Clupiformes-2	Notopteridae-9	*Notopterus notopteru*
58			*Notopterus chitala*
59	Ophiocephaliformes-3	Ophiocephalidae-10	*Channa gachua*
60			*Channa marulius*
61			*Channa Punctatus*
62			*Channa striatus*
63	Perciformes-4	Anabantidae-11	*Anabas testudineus*
64		Gobioidae-12	*Glossogobius giuris*
65		Nandidae-13	*Badis badis*
66			*Tilapia massambica*E*
67		Centropomidae-14	*Chanda nema*
68	Mastacembeliformes-5	Mastacembalidae-15	*Mastacembalus armatus*

ORDERS	NO. OF FISHES	PERCENTAGE OF FISHES IN TOTAL (%)
Cypriniformes-1	56	82.35
Clupiformes-2	02	2.94
Ophiocephaliformes-3	04	5.88
Perciformes-4	05	7.35
Mastacembeliformes-5	01	1.47

*E-Exotic fishes in Shahdol Region



Graph No.01: Order wise fish composition in Shahdol Region.

CONCLUSION

Existing indigenous fish diversity has the problem of its existence due to introduction of species like *Tilapia massambica and Clarius gariepinus* needs proper attention of authorities to control introduction of such species so that existing fish diversity may flourish properly.

SUGGESSIONS

According to survey we saw that fishermen are not much educated they haven't knowledge about fish species their feeding nature and they don't know, what is monoculture, polyculture and their merits and demerits which is key factors for fish culture. So according to us fisheries department should take interest and should held workshops for local fishermen so that they can identified fish seed which are being used by them for culture.

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