



Diversity of Four Major Groups in Angoori Barrage Datia, M.P., India

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Abstract: Aquatic biodiversity is the rich and wonderful variety of plants and animals. Wide animal diversity found in Angoori barrage and make a great aquatic ecosystem with the help of flora and fauna. The present paper deals with four major groups of animals were recorded in this reservoir during study period. Various indigenous and commercial fishes of importance were found in this reservoir. Abundance of fresh water fishes of the reservoir presence of 27 fish species belonging to 6 order 10 families and 16 genera was recorded. Among the collected species, order Cypriniformes was most dominant and followed by order Siluriformes and Ophiocephaliformes. While the Community of zooplankton in Angoori reservoir consists of Cladocera, Rotifera, Copepoda, Protozoa and Ostracoda in order were dominance. Various species of benthic animals were found in this reservoir. Total 28 genera, 20 family, 15 order, 9 class and 4 phyla were recorded in study area. Phylum Arthropoda was dominant phylum followed phylum Mollusca, while the phylum Annelida and phylum Rotifera were represent after that. While in the Angoori reservoir Mollusca animal found with three class four order seven family and 12 genus and species is recorded during study period Class Gastroda is dominant with the two order five family and 10 genus and Species.

Key Words- Aquatic Biodiversity, Fishes, Zooplankton, Benthic Animals, Mollusca, Angoori Reservoir

1. INTRODUCTION

Freshwater specialist species complete all or part of their life cycle in fresh or brackish water ecosystems and have physiological and behavioural adaptations to the freshwater environment. Freshwater associated species have a strong association with freshwater ecosystems, for example, for food or habitat freshwater habitats can be divided into two broad categories, Lentic freshwater: still water (ponds and lakes), Lotic freshwater moving water (streams and rivers). Various indigenous and commercial animal of importance were found in Angoori reservoir. Fish is very important group of animals for the nutritional and Medicinal value of fishes has already been recognized (Hora & Pillay 1962, David 1969, Mishra 1952, Jhingaran 1982.), Fish diversity of India and various Indian states has been described by Jerdan (1849), Dutta & Majumdar (1970), Meshram & Meshram (2005), Hiware (2006). Formal study of fish fauna in Madhya Pradesh starts with the work of Hora (1940) has listed the fish of Mahanadi; Dwivedi *et al.* (2000) studied the production dynamics and fisheries development in Naktara reservoir in Madhya Pradesh. Fish fauna of Gwalior division was described by Agrwal & Saksena (1977) who recorded fish species from Chambal division. The zooplankton are a community of microscopic animals that are found attached to underwater plants, its sediments or suspended in the open water zone of lakes and reservoirs. The biggest zooplankton is only five millimetres long and the smallest are just one thousandth of this size. They float, drift or weakly swim in the water. In fact, the name plankton comes from the Greek word 'planktons' which means 'wanderer' or 'drifter'. Zoo benthos fauna are organisms that live on or inside the deposit at the bottom of a water body. Odum (1971), dowu E.O. *et. all.* (2005) large benthic animals are collectively referred to as macro- zoo benthos or macro- invertebrates. These animals of size 200-500 μm . Hynes (1961) reported

that the density of benthos in a water body is a useful index of water quality, though; density may fluctuate widely with changes in seasons and space. Benthic macro invertebrates are best indicators for bio-assessment (Kumar 2003). Benthic fauna is especially of great significance for fisheries that they themselves act as food of bottom feeder fishes (Sharma et. all. 2013).

In the freshwater environment, molluscs are an important group and their abundance plays important role in freshwater ecosystem functioning (Vaughn et al., 2004). Fresh water molluscs are common in ponds, lakes, paddy fields, quiet water pools, and flowing waters like lower section of perennial rivers, irrigation canals etc. Freshwater gastropods are generally found attached to submerged vegetation, rocks, sticks, bricks etc, but bivalves live partly buried in the sand or mud.

2. MATERIALS AND METHODS

Angoori barragr reservoir is man-made reservoir located in District Datia Madhya Pradesh India. The catchment area of reservoir is 162 sq. Km. it is used for different purposes like drinking, irrigation & fisheries. Geographically the reservoir is located between 78°28 is longitude and 25°38 is latitude. The reservoir across the river Angoori the tributary of river Pahuj. This reservoir is constructed with the help of JBIC. The study was conducted during January 2022 to December 2022.



The samples of different animal were collected for the investigation in last Sunday in every month. The study period is January 2022 to December 2022 for this research. The fish specimens were collected using gill net drag net and cast net taking the help of local fishermen. The small fish specimens were preserved in 8% formalin, directly while large fish specimens were dissected for visceral preservation and were then preserved in 8% formalin. The fish specimens were identified up to species level by using the keys provided by Shrivastava (1980), Day (1889), Talwar and Jhingran (1991), and Jayaram (1999). 25 liter of water sample was filtered for zooplanktonic study through plankton net made up of bolting silk cloth and preserved with 5% formalin solution. After this, 10 drops of glycerin were also added to it. Counting of zooplankton was made by Sedgwick rafter cell and identification of zooplankton was done as per Sehgal (1983), Ward and Whipple (1959), and Garnett (1965).

The benthic specimens were collected using an Ekman grip with dimension of 15.2×15.2 × 15.2 cm. collected samples were preserved in 4% formalin (for specimen with exoskeleton) and soft bodies organism were preserved in 70% ethanol (Borror et. all. 1976). Organisms were sorted and enumerated under major taxa and preserved in small vials by using small brush or forceps, Binocular and dissecting microscope with digital camera was used to identified and capture the image of benthos. The identification of benthos was done up to genes level with the help of standard works of Wetzel and Likens (2000), and Ward (1992).

Molluscan fauna has been taken from the profundal zone by using Ekman dredge. The samples from littoral zone have been collected by scoop net. The samples have been washed and shifted through a grade 40 mesh size sieve. 3 samples were taken from each station to minimize the sampling error. The collected organisms were fixed in 5% formalin solution and enumerated group wise and preserved organisms were identified standard keys provided by Ward and Whipple (1959), Tonapi (1980) and Adoni et al. (1985).

3. RESULT AND DISCUSSION

The fish diversity was recorded in Angoori reservoir with 27 species belonging to 6 orders and 10 families was recorded is dominated by order Cypriniformis 55.55% with 15 species followed by Siluriformes 14.81% with 4 species order Ophiocephaliformes 14.81% is represented by 4 species and Osteoglossiformes 7.40% is represented by 2 species while Beloniformes and Anguilliformes 3.70% are represented with 1 species each. Sixteen species were identified as commercially important and fetch good market price and two species were identified as exotic fishes. Total abundance of fishes in the reservoir is shown in table No. 01 The fish caught from the reservoir are sold in Datia fish market and seldom transported to other places. Dubey & Verma (1965) studied fish fauna of M.P. and recorded 104 species out of which 50% belonged to the family Cyprinidae, Rao et.al. (1988) reported 41 species from Gandhi sagar reservoir with Cyprinids constituting 53.65%. In the present study Cyprinids constitute 55.55% of the fish diversity of Angoori reservoir Datia M.P.,

While the zooplanktons were recorded, at different sampling stations. Total five groups' nine order seven families and twenty-eight genus was found in this reservoir, they were Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda, out of which Cladocera and Rotifera were more in number in comparison to the other groups. Group Cladocera appear as dominant group in this reservoir the percent of group cladocera is 39.28% with 11 species 5 family and one order. Group Rorifera was found with 6 genus 3 family and one order, the contribution of this group is 21.42% while the contribution of group Protozoa and Copipoda is 17.85% with 5 genus and the group Ostracoda is represented with 1 genus and 1 family and the contribution of this group is 3.57% in zooplanktons. The diversity of zoolplankton of Angoori reservoir is shown in Table 02.

Mollusca animal was recorded in angoori reservoir with three class, Gastropoda, Pelecypoda and Bivalvia class Gastropoda, was dominant class with two order Mesogastropoda, Basommatophora, and five family Melaniidae, Vivparidae, Subulinidae, Planorbidae and Lymnedae and ten Genus and species while the other class Pelecypoda and Bivalvia present with one order one family and one Genus and species. The diversity of Molluscan animal was shown in table 03.

The benthic animal diversity was recorded in Angoori reservoir 28 species belonging to 20 family, 15 order, 9 class and 4 phyla were recorded. The dominated phylum was Arthropoda with 14 species, 11 family, 8 order and 4 class; and the contribution of this phylum is 50% in benthic diversity, followed by phylum Mollusca with 7 species, 6 family, 4 order and 2 class were recorded their contribution in this group is 25% and phylum Annelida is still on 14.28% with 4 species, 2 family, 2 order, 2 class was present while the phylum Rotifera was still with 3 species, 1 family, 1 order and 1 class. composition of zoobenthos and its relative abundance are recorded in table-04

Table 1 Fish Diversity in Rngoori reservoir

S.N.	ORDERS	FAMILIES	GENUS	SPECIES ECONOMI	VALU	%of family	
1.	Cypriniformes	Cyprinidae	<i>Labeo</i>	<i>Labeo rohita</i> <i>Labeo calbasue</i> <i>Labeo bata</i> <i>Labeo gonius</i>	FD FD FD FD	55.55	
			<i>Catla</i>	<i>Catla catla</i>	FD		
			<i>Cirrhinus</i>	<i>Cirrhinus mrigala</i> <i>Cirrhinus reba</i>	FD FD		
			<i>Cyprinus</i>	<i>Cyprinus carpio</i>	FD		
				<i>Ctenopharyngodonidella</i>	FD		
			<i>Puntus</i>	<i>Puntius sarana</i> <i>Puntius sophore</i>	WF,LV WF,LV		
			<i>Rasbora</i>	<i>Rasbora danicanus</i>	LV		
		Bagridae	<i>Mystus</i>	<i>Mystus seenghala</i> <i>Mystus oar</i> <i>Mystus cavasius</i>	PF PF PF		
2.	Silouriformes	Siluridae	<i>Wallago</i>	<i>Wallago attu</i>	PF		14.81
			<i>Ompek</i>	<i>Ompek bimaculatis</i>	PF		
		Claridae	<i>Clarias</i>	<i>Clarias botrachus</i>	LV		
		Heteropneustidae	<i>Heteropneustes</i>	<i>Heteropneustes fossilis</i>	FD		
3.	Beloniformes	Belonidae	<i>Xenentodon</i>	<i>Xenentodon cancila</i>	WF		3.70
4.	Ophiocephaliformes	Ophiocephalidae	<i>Ophiocephalus</i>	<i>Ophiocephalus punctatus</i> <i>Ophiocephalus marulius</i> <i>Ophiocephalus struatus</i>	LV,PF LV,PF LV,PF	14.81	
		Chandidae	<i>Chanda</i>	<i>Chanda nama</i>	LV,PF		
5.	Osteoglossiformes	Notopteridae	<i>Notopterus</i>	<i>Notopterus notopterus</i> <i>Notopterus chitalla</i>	PF,MD MD	7.40	
6.	Anguilliformes	Anguillidae	<i>Anguilla</i>	<i>Anguilla bengalensis</i>	FD	3.70	

FD= Food Fish, **LV**= Larvivorous Fish, **PF**= Predatory Fish, **MD**= Medicinal Fish, **WF**= Weed Fish

Table 2 Diversity of Zooplankton in Angoori reservoir

GROUP	ORDER	FAMILY	GENUS	%of Genusy	
PROTOZOA	Testacea	Diffugiidae	<i>Diffflugia sp.</i>	17.85	
	Peritrichida	Vorticellidae	<i>Vorticella sp.</i>		
	Testacea	Arcellidae	<i>Arcella sp.</i>		
		Euglyphidae	<i>Euglypha sp.</i>		
ROTIFERA	Trichostomina	Paramecidae	<i>Paramecium sp.</i>	21.42	
	Ploima	Brachionidae	<i>Brachionus sp.</i>		
			<i>Keratella sp.</i>		
			<i>Notholca sp.</i>		
		Lecanidae	<i>Lecane sp.</i>		
CLADOCERA	Cladocera	Synchaetidae	<i>Polyarthra sp.</i>	39.28	
		Chydoridae	<i>Alonella sp.</i>		
			<i>Alonopsis sp.</i>		
			<i>Leydigia sp.</i>		
			<i>Chydorus sp.</i>		
			Daphnidae		<i>Ceriodaphnia sp.</i>
					<i>Daphnia sp.</i>
					<i>Moina sp.</i>
					<i>Simocephalus sp.</i>
			Bosminidae		<i>Bosmina sp.</i>
OSTRACODA	Podocopa	Cypridae	<i>Cypris sp.</i>	3.57	
	COPEPODA	Calanoida	Diaptomidae	<i>Diaptomus sp.</i>	17.85
				<i>Neodiaptomus sp.</i>	
Cyclopoida		Cyclopidae	<i>Cyclops sp.</i>		
			<i>Mesocyclops sp.</i>		
		Nouplidae	<i>Nauplius sp.</i>		

Table 3 Molluscan Diversity in Angoori reservoir

Phylum	Class	Order	Family	Genus /Species	%of Genus &Species
Arthropoda	Branchiopoda	Diplostraca	Daphnidae	Daphnia sp.	50%
		Cladocera	Bosminidae	Bosmina sp.	
	Ostracoda	Podocopida	Cyprididae	Cypris sp.	
	Hexanauplia	Cyclopoida	Cyprididae	Cyclops sp.	
	Insecta	Lepidoptera	Nymphalidae	Nauplius sp.	
		Diptera	Chironomidae	Chironomus sp.	
				Tanypus sp.	
				Pentaneura sp.	
			Coretopogonidae	Culicodes sp.	
			Culicidae	Culex sp.	
		Hemiptera	Hebridae	Hebrus sp.	
			Belostomatidae	Belostoma sp.	
			Corixidae	Sigara sp.	
		Ephemeroptera	Caenidae	Caenis sp.	
Mollusca	Gastropoda	Neotaenioglossa	Thiaridae	Thiara sp	25%
				Melanoides sp.	
	Basommatophora	Lymnaeidae	Lymnaea sp.		
		Planorbidae	Gyrulus sp.		
			Physidae	Physa sp.	
		Architaenioglossa	Viviparidae	Bellamya sp.	
	Bivalvia	Veneroida	Corbiculidae	Corbicula sp.	
Annelida	Oligochaeta	Heplotaxida	Tubificidae	Tubifex-tubifex	14.28%
				Tubifex albicola	
	Clitellata	Haplotaxida	Naididae	Stylaria sp.	
				Dero digitata	
Rotifera	Monogononta	Ploima	Brachionidae	Beachionus sp.	10.71%
				Keratella sp.	
				Notholca sp.	

Table 4 Qualitative Abundance of Zoobenthos in Angoori reservoir

Class	Order	Family	Genus /Species	%of Genus &Species	
Gastropoda	Mesogastropoda	Melaniidae	Melania striatella (Muller)	84.61	
			Melania scabra ver elegans (Hutton)		
		Viviparidae	Vivipara dissimilis (Muller)		
			Bellamyia sp.		
		Basommatophora	Subulinidae		Zootecus chion
					Opeas gracile (Hutton)
		Planorbidae	Planorbis (Indoplanorbis)		Anisus (Gyraulus)
					Lymnaea (Pseudosuccinea)
		Lymnaeidae	Lymnaea luteola (Walker)		Lymnaea pinguis (walker)
Pelecypoda	Eulamellibranchia	Unionidae	Lamellidens corrianus	7.69	
Bivalvia	Veneroidea	Corbiculidae	Corbicula sp.	7.69	

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