FISH BIODIVERSITY IN RELATION TO PHYSICO-CHEMICAL CHARACTERS OF GOPI KRISHNA SAGAR DAM, RUTHAI, DISTRICT GUNA, MADHYA PRADESH

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Abstract*: In the present study, the ichthyofauna diversity was recorded and its relation was studied seasonally to physico-chemical parameters of River Chopan (Gopi Krishna Sagar Dam), district Guna,Madhya Pradesh has been studied. Three stations were selected for study, S I-Paanj (Centre line of dam), S II Dahaye (2 Km from SI) and S III Bajrangarh(5 Km from S I).*

Fishes were collected by the help of local fishermen. These were identified and their local names were noted. Scientific identification was done in laboratory and fishes were classified accordingly. Physico-chemical parameters as temperature (ºC), pH, Turbidity, dissolved oxygen (DO2), Alkalinity, Hardness, Free CO2,Biochemical oxygen demand , Chemical oxygen demand, Total dissolved salts and Chlorinity were tested. Effect of these parameters with fish diversity was related.

In the present study till now 23 species of fishes have been recorded which belongs to nine families and six orders of which maximum fishes belonged to family Cyprinidae. Protection of biodiversity has become an important concern.Due to increased intervention of man on various freshwater aquatic bodies have brought extinction of a number of fish species.

Index Terms*:Icthyofaunadiversity, Gopi Krishna Sagar Dam,Biochemical oxygen demand (BOD), Chemical oxygen demand (COD), Dissolved Oxygen (DO), Total Dissolved Salts (TDS).*

I. INTRODUCTION

Fishes are one of the most important and precious fresh water aquatic fauna. Biodiversity study of fishes is such parameters which provide us various information and actual status of any ecosystem about the fish species present in it. It is necessary to know the abundance of fish species for establishment of aquatic body.Due to anthropogenic activities, climatic changes threat is posed on biodiversity of fishes mainly in any freshwater ecosystem.Many species are dominant whereas others are vanishing. Local fishes are affected by exotic fishes.Construction of dam on the river has significant value but on other hand effects on fresh water ecosystem isdue to altering of regular flow of water. Thus studies are needed for the development and conservation of water bodies. Regular watch on quantity of fish species is necessary which provide significance on developing scientific basis of identification of fishes present in that ecosystem.Thus transdisciplinarity approach should be developed for the integrated study on biodiversity and role of studying fish species richness contributes need to examine biodiversity of that aquatic ecosystem. Madhya Pradesh is mega diverse in the icthyofauna. Many workers have studied the icthyofauna in Madhya Pradesh (Tiwari 2006, Thilak 2011, Negi et.al; 2012, Parwana et.al; 2014) in different water bodies. Since dam water is calm so it overall changes water temperature. Due to adverse effect of climatic changes high effects are observed in physico chemical parameters of fresh water (Sharma et. al; 2017, Jaiswal et.al; 2010 &Gautam& Sharma 2018).

Fish diversity study is used as bioindicator which helps in assessing the quality of water. River is such aquatic body which is more highly threatened and its one of the main cause is dam construction. Water diversion creates parts of habitat. Thus all factors industrialization, pollution,physico-chemical character changes of water effect fish community. The main aim of present study is to relate the physico-chemical changes and their effect on fish diversity of Gopi Krishna Sagar Dam, Ruthai, Guna and two stations more nearby it to conclude the results of investigations which will make conservation and management of fishes easier.

II MATERIAL AND METHOD

Study Area-

Gopi Krishna Sagar Dam is situated near Ruthai village at 24.5478ºN and 77.2320ºE latitude and longitude in Gunadistrict, Madhya Pradesh. It is an earthen dam whose length is 670m and height is 20.50m built on Chopan River since 1985. Catchment area of the dam is 294 Sq. Km. This dam is a good source of drinking water, irrigation and fish development.

A short study to assess the fish diversity and water quality was carried at three stations:-

Station SI - Paanj (Centre line of dam)
Station SII -Dahaye
Station SIII - Bajrangarh

Collection of water samples-

Water from all the three stations was collected every month between 7AM to 11AM in two DO bottles (300 ml capacity) and one large PVC bottle (two litre capacity).Temperatures were noted by thermometers on the spot and pH were noted by digital pH meter .Remaining water samples were taken to laboratory immediately in ice box to avoid changes. Standard method (APHA, 1998) was used to determine the physico-chemical parameters.
Parameters studied were Alkalinity, Hardness, Dissolve Oxygen, BOD, COD, Turbidity, TDS and Chlorinity.

Collection of Fishes-Fish samples were collected with the help of local fishermen using different types of nets- gill net, cast net and boats. Total number of fishes was counted immediately on catch each time and species in them were recorded to calculate species abundance value. Collected fishes were photographed and then preserved in 10% formaldehyde solution. Labels of collected stations, serial number, date and local names were noted. Fishes were identified after bringing them in laboratory by family, order, genera and species by using key characters(Day 1888, Talwar& Jhingaran1991 and Jayaram1999)

III. RESULTS AND DISCUSSION

Till now 23 species which belong to 9 families,6 orders and 17 genera have been recorded for icthyofauna diversity of Gopi Krishna Sagar Dam (Table 1) and still now the research work is going on for regular observation.
Dominant fishes belonged to family Cyprinidae (52.18%) with 12 species followed by Ophicephaliadae (8.69%). Remaining fishes belonged to family Nandidae, Belonidae, Mastacembelidae,Sisoridae and Notopteridae which were 4.35%(Fig 1).Due to climatic changes such as increase in water temperature and reduce water level in summer season affected fish diversity and reduced their number which effected the

Table 1: Showing Genera,Species,Family, Order of Fishes of Gopi KrishnaSagar Dam, Guna.

S.NO.	Genera	Species	Family	Order
1.	Puntius	*sarana*	Cyprinidae	Cypriniformes
2.	Puntius	*conchonius*	Cyprinidae	Cypriniformes
3.	Puntius	*saphore*	Cyprinidae	Cypriniformes
4.	Ctenopharyngodon	*idella*	Cyprinidae	Cypriniformes
5.	Systomus	*sara*	Cyprinidae	Cypriniformes
6.	Gama	*lamta*	Cyprinidae	Cypriniformes
7.	Cirrhinus	*mrigala*	Cyprinidae	Cypriniformes
8.	Cirrhinus	*reba*	Cyprinidae	Cypriniformes
9.	Labeo	*rohita*	Cyprinidae	Cypriniformes
10.	Labeo	*pangusia*	Cyprinidae	Cypriniformes
11.	Labeo	*gonius*	Cyprinidae	Cypriniformes
12.	Osteobrama	*otio*	Cyprinidae	Cypriniformes
13.	Seperata	*seenghala*	Bagridae	Cyperiniformes
14.	Mystus	*cavasius*	Bagridae	Cypriniformes
15.	Wallago	*attu*	Siluridae	Cypriniformes
16.	Ompak	*bimaculatus*	Siluridae	Cypriniformes
17.	Bangarius	*bangarius*	Sisoridae	Cypriniformes
18.	Channa	*punctatus*	Ophiocephalidae	Ophiocephaliformes.
19..	Channa	*straitus*	Ophiocephalidae	Ophiocephaliformes.
20.	Nandus	*nandus*	Nandidae	Perciformes
21.	Xentodon	*cancila*	Belonidae	Beloniformes
22.	Mastacembelcus	*armatus*	Mastacembelidae	Mastacembeleformes
23.	Notopterus	*notopterus*	Notopteridae	Clupeiformes

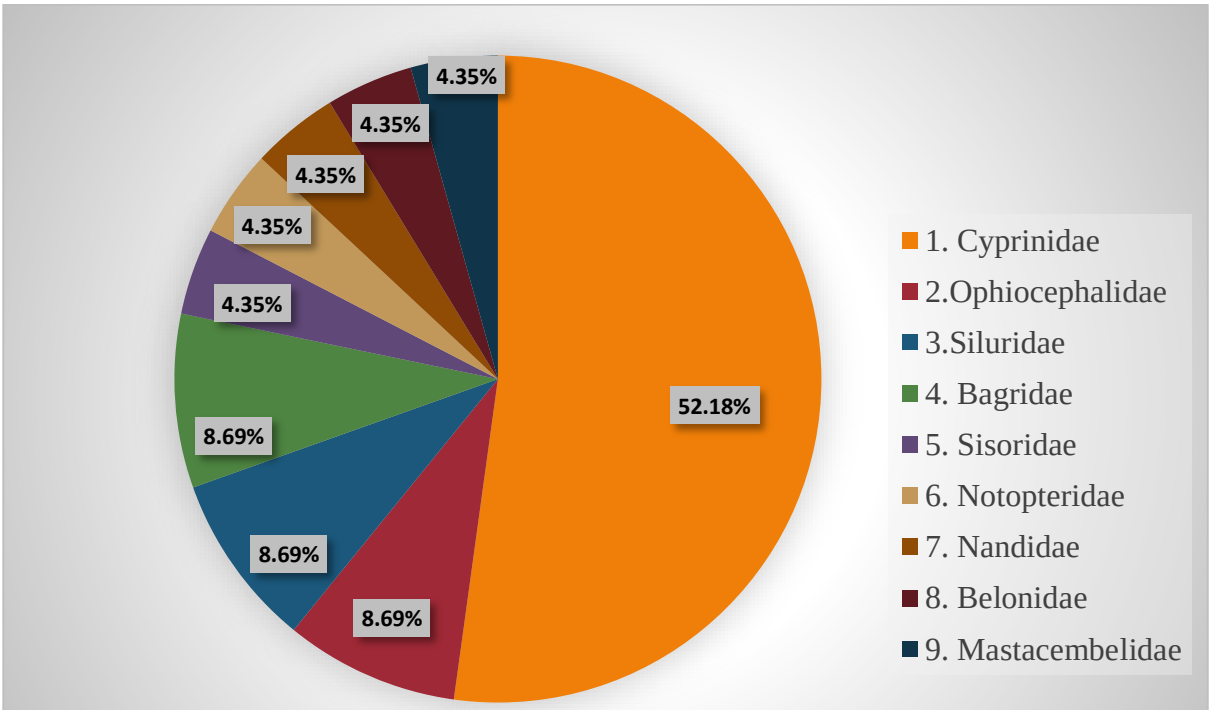

Figure 1: Percentage occurrence of fish families of Gopi Krishna Sagar Dam, Guna

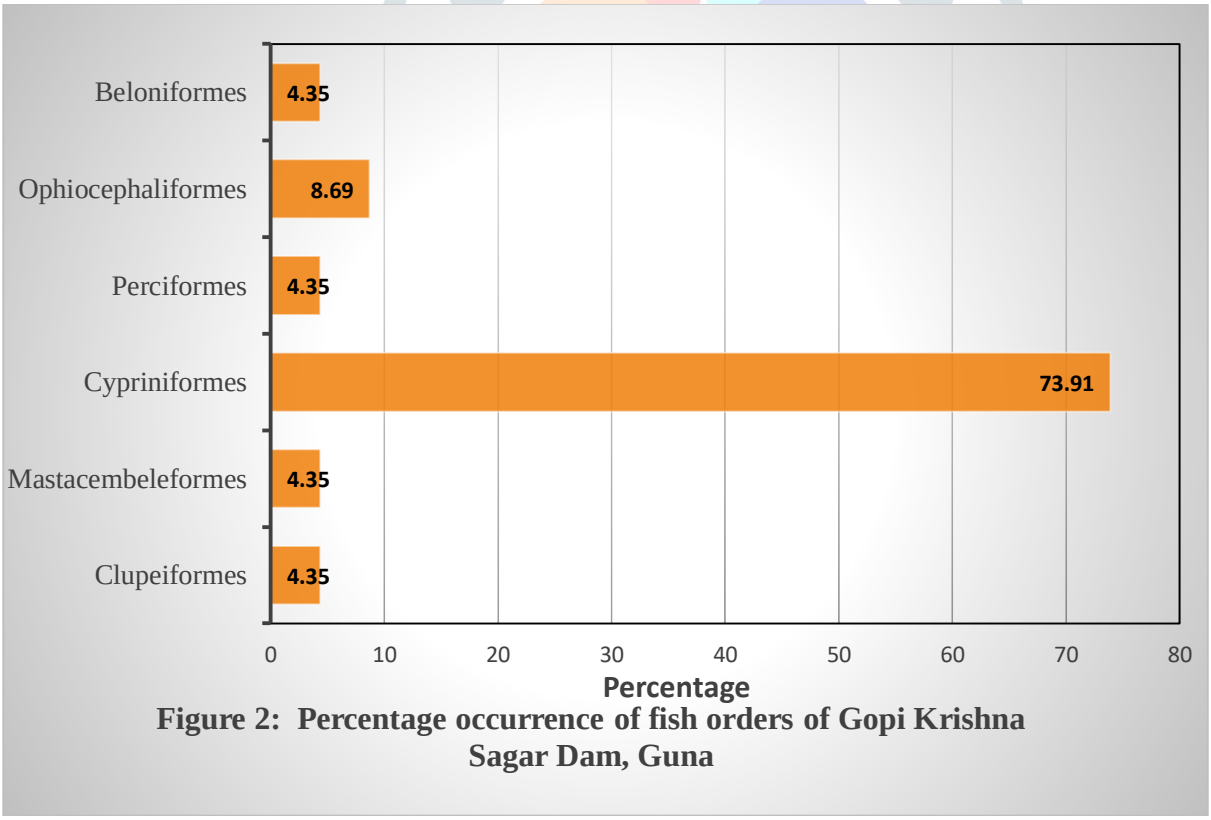

Figure 2: Percentage occurrence of fish orders of Gopi Krishna Sagar Dam, Guna

richness abundance value.Similar results were noted in freshwater river by many workers (Dubey et. al;1959, Y Kano et al ;2016). In the present investigation results reveals the species of orderCypriniformes>Ophiocephaliformes>Perciformes, Beloniformes, Mastacembeleformes ,Clupeiformes. The Clupeiformes 4.35%, Cypriniformes 73.19%, Perciformes 4.35%, Ophiocephaliformes 8.69% and Beloniformes 4.35% (Figure 2). Thus it was noted that Cyprinidae family and Cypriniformes order fishes were maximum present in Gopi Krishna Sagar Dam, Guna.

Fishes of Cyprinidae are maximum in Madhya Pradesh, (Dubey et.al ;1959) reported 70 fish species out of which 45.71%are of family Cyprinidae in the Chambal River. Gautam and Sharma, 2019 reported 57.15% Cypriniformes order fishes in

ParvatiRiver,Baran.Physico-chemical parameter in summer month of June showed maximum increase of temperature, BOD level whose effects were directly observed on the growth of fishes. COD at station III was higher more in May indicating contamination of water. Alkalinity was maximum in May and June at station II and III, due to increase of carbonates, calcium and magnesium contents.

IV. CONCLUSION

Fish diversity study shows fish production and its great scope for developing fisheries . Dams have direct impact on fish biodiversity due to fragments of river and fish habitat. Many fish species such as Labeo species, , Channa species, Catla catla ,Wallago attu which are found in Gopi Krishna Sagar Dam , Guna are of economic importance .The richness of Cyprinidae family fishes indicates that water of Chopan River is suitable for them.They have high food value. It is concluded that Gopi Krishna Sagar Dam has good fishdiversity. But the results of other families fish shows that diversity ,conservation and maintenance of fish diversity is needed and disturbance due to anthropogenic activities should be controlled.

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