



# A study of fish diversity of Pagara dam of Morena District, Madhya Pradesh

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## ABSTRACT

Pagara dam is situated on Asan river at about 15 Km from Jaura town of Morena District of Madhya Pradesh. The dam was constructed for irrigation of the nearby villages. But, at present, the water of the dam is also used for drinking purpose. The water of the dam is also used for fish culture by fishery department and local fishermen. Fish diversity of water bodies depends on various factors such as geographical position, varied aquatic ecological conditions and health of aquatic bodies. The present work was undertaken to study of fish diversity of Pagara reservoir. Total twenty one (21) fish species were recorded during the study. The identified fishes belonged to major carp, minor carp, cat fish and local fishes. All fish were fresh water fish. The order Cypriniformes was the most dominant one.

**Keywords:** Pagara Dam, Pisciculture, Asan River, Fish Diversity.

## INTRODUCTION

Water is the most productive resource for fish culture. Fish are the largest group of vertebrates. They are an important proteinous and palatable food for human beings and other animals. Fishes also provide fish meal, fish manure, medicines and several other products of commercially important value. For survival of fish, proper amount of dissolved oxygen, food, good breeding sites and specific characteristics such as pH and water temperature are very necessary. Many species of fishes are found in different reservoirs. Many workers have worked on the fish fauna of different reservoirs of Madhya Pradesh and various others parts of India (Jain *et al.*, 2002, Mohite 2006, Nambirajan and Ravikumar 2011 and Mahor *et al.*, 2014).

## MATERIALS AND METHODS

Fish samples were collected by using fish nets -cast nets and gill nets with the help of fishermen from two different sites (Fig 2). Collected fish species was instantly fixed in 9 to 10% percent formaldehyde. After 4-5

hours of fixation, sample were washed with water and then transferred in 70% alcohol. Fishes were identified with the help of Day (1889), Jayaram (1981), Talwar and Jhingran (1991), Shrivastava, (1999) and Shrivastava (2007).

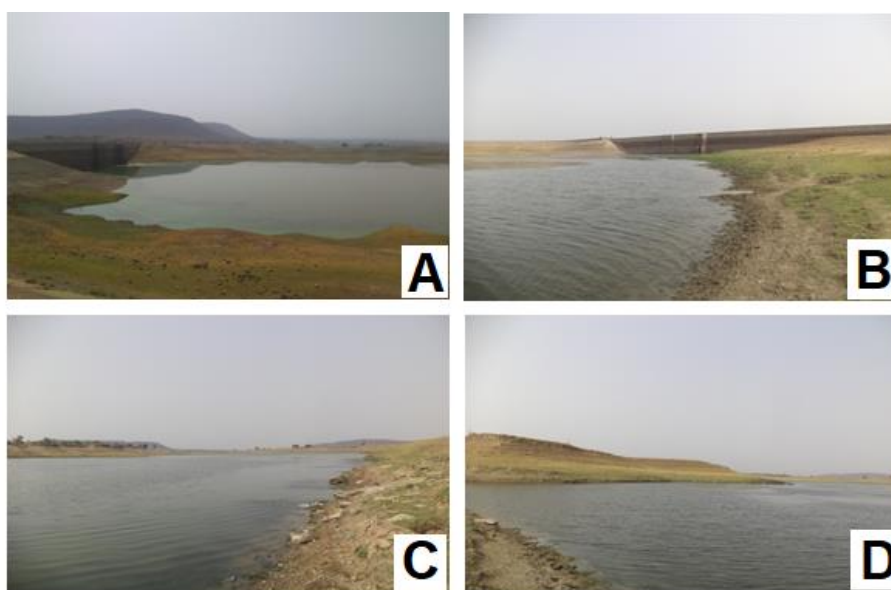
**Study area :**

Pagara Dam is situated at about 15 Km from Jaura town of Morena District of Madhya Pradesh. The dam is located on Aasan river (Figure 1). It is a masonry

dam which was constructed in 1911-1927. The dam is located at latitude 26°09'27.9"N and longitude 77°48'22.3"E. The FTL (Full tank Level) of the dam is 199.34m. The dam was constructed mainly for irrigation purpose. The water is used for irrigation of 870 acre land of the nearby villages. Pagara is the nearest village, after the name of which the dam is known as Pagara dam. Besides irrigation, the water is also used for drinking purpose and fish culture by local fishermen.



**Photo- 1 General view of Pagara reservoir, Jaura, district Morena (M.P**



**SAMPLING SITES OF PAGARA DAM**

**RESULTS AND DISCUSSION**

Fish species recorded and identified during the present study are given in table no.1 and 2. Following were the main fishes collected during the study:

*Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Labeo calbasu*, *Wallago attu*, *Notopterus notopterus*, *Cyprinus carpio*, *Mastacembelus armatus*, *Clarias batrachus*, *Sperata aor*, *Sperata seenghala*, *Esomus ahil*, *Puntius sarana sarana*, *Xenentodon cancila*, *Labeo gonius*, *Labeo bata*, *Channa marulius*, *Mystus bleekeri*, *Ompok bimaculatus*, *Pseudambassis baculis* and *Parambassis c. ranga*. (Photo 2-22).

The fishes identified in Pagara reservoir, belonged to 9 families and 6 orders and 17 genera. According to IUCN out of 21 species of fishes one species is near threatened, two are vulnerable and rest of the species were least concern. As abundance of the individual species is concerned, *Puntius sarana sarana* was found to be the most abundant species and *Mastacembelus armatus* was found the moderate, and *Esomus ahil* was rare. Only a few individuals were recoded of these species. Seasonally, maximum numbers of fish species were collected during monsoon season from Pagara reservoir. Minimum numbers of fish species were collected during summer.

**Table 1: Fish diversity of Pagara Dam from June 2016 to May 2018**

S.No.	Species Name	Local Name	Order	Family	Genera	IUCN Status *
1.	<i>Cirrhinus mrigala</i>	Nain	Cypriniformes	Cyprinidae	Cirrhinus	***
2.	<i>Labeo rohita</i>	Rohu	Cypriniformes	Cyprinidae	Labeo	***
3.	<i>Catla catla</i>	Catla (Bhakur)	Cypriniformes	Cyprinidae	Catla	***
4.	<i>Cyprinus carpio</i>	Common carp	Cypriniformes	Cyprinidae	Cyprinus	***
5.	<i>Labeo calbasu</i>	Calbasu (Karaunchar)	Cypriniformes	Cyprinidae	Labeo	***
6.	<i>Labeo gonius</i>	Kuria	Cypriniformes	Cyprinidae	Labeo	***
7.	<i>Labeo bata</i>	Bata	Cypriniformes	Cyprinidae	Labeo	***
8.	<i>Puntius sarana</i>	Puthia	Cypriniformes	Cyprinidae	Puntius	*****
9.	<i>Esomus ahil</i>	Flying barb	Cypriniformes	Cyprinidae	Esomus	*
10.	<i>Mystus bleekeri</i>	Kirua	Siluriformes	Bagridae	Mystus	**
11.	<i>Sperata aor</i>	Tengra	Siluriformes	Bagridae	Sperata	**
12.	<i>Sperata seenghala</i>	Singhra	Siluriformes	Bagridae	Sperata	***
13.	<i>Ompok bimaculatus</i>	Butter catfish	Siluriformes	Siluridae	Ompok	**
14.	<i>Wallago attu</i>	Padhani (Barari)	Siluriformes	Siluridae	Wallago	**
15.	<i>Clarias batrachus</i>	Mangur	Siluriformes	Clariidae	Clarias	***
16.	<i>Notopterus notopterus</i>	Patola	Osteoglossiformes	Notopteridae	Notopterus	***
17.	<i>Mastacembelus armatus</i>	Baam	Synbranchiformes	Mastacembelidae	Mastacembelus	****
18.	<i>Xenentodon cancila</i>	Suja	Beloniformes	Belonidae	Xenentodon	***
19.	<i>Chanda nama</i>	Chanda	Perciformes	Ambassidae	Chanda	***
20.	<i>Pseudambassis baculis</i>	Chanda baculis	Perciformes	Ambassidae	Pseudambassis	**
21.	<i>Parambassis c. ranga</i>	Chanda	Perciformes	Ambassidae	Parambassis	**

<https://www.iucnredlist.org>

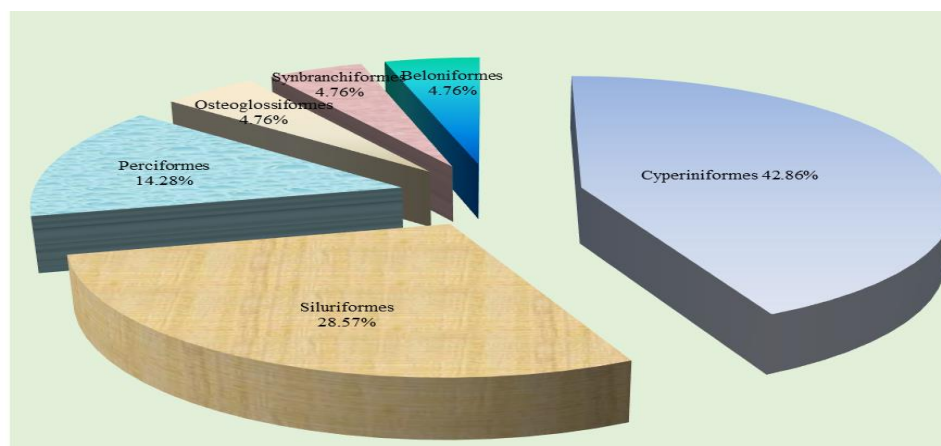
LC = Least Concern, VU= Vulnerable, NT = Near Threatened

**Table 2:** Seasonal variations in fish species identified in Pagara reservoir, from June 2016 - May 2018.

S.No.	Species Name	June 2016 - May 2017			June 2017 - May 2018		
		Summer	Monsoon	Winter	Summer	Monsoon	Winter
1.	<i>Cirrhinus mrigala</i>	+	+	+	-	-	+
2.	<i>Labeo rohita</i>	+	+	+	-	+	+
3.	<i>Catla catla</i>	+	+	-	+	+	-
4.	<i>Cyprinus carpio</i>	-	+	-	-	-	+
5.	<i>Labeo calbasu</i>	-	-	-	+	+	-
6.	<i>Labeo gonius</i>	+	+	+	-	+	-
7.	<i>Labeo bata</i>	+	+	+	+	+	+
8.	<i>Puntius sarana</i>	+	+	+	+	+	+
9.	<i>Esomus ahil</i>	-	+	-	-	-	-
10.	<i>Mystus bleekeri</i>	-	+	-	-	+	-
11.	<i>Sperata aor</i>	-	-	-	-	+	+
12.	<i>Sperata seenghala</i>	-	+	+	-	-	-
13.	<i>Ompok bimaculatus</i>	-	-	+	-	+	-
14.	<i>Wallago attu</i>	-	+	-	-	+	+
15.	<i>Clarias batrachus</i>	+	+	-	-	+	-
16.	<i>Notopterus notopterus</i>	-	+	+	-	+	-
17.	<i>Mastacembelus armatus</i>	-	+	+	+	+	+
18.	<i>Xenentodon cancila</i>	-	+	-	-	+	-
19.	<i>Channa marulius</i>	-	-	-	-	+	-
20.	<i>Pseudambassis baculis</i>	-	+	-	-	-	-
21.	<i>Parambassis c. ranga</i>	-	+	-	-	+	-
	<b>Total</b>	<b>7</b>	<b>17</b>	<b>9</b>	<b>5</b>	<b>16</b>	<b>8</b>

**Table 3:** Percentage wise contribution of orders in fish diversity of Pagara reservoir, from June 2016 – May 2018

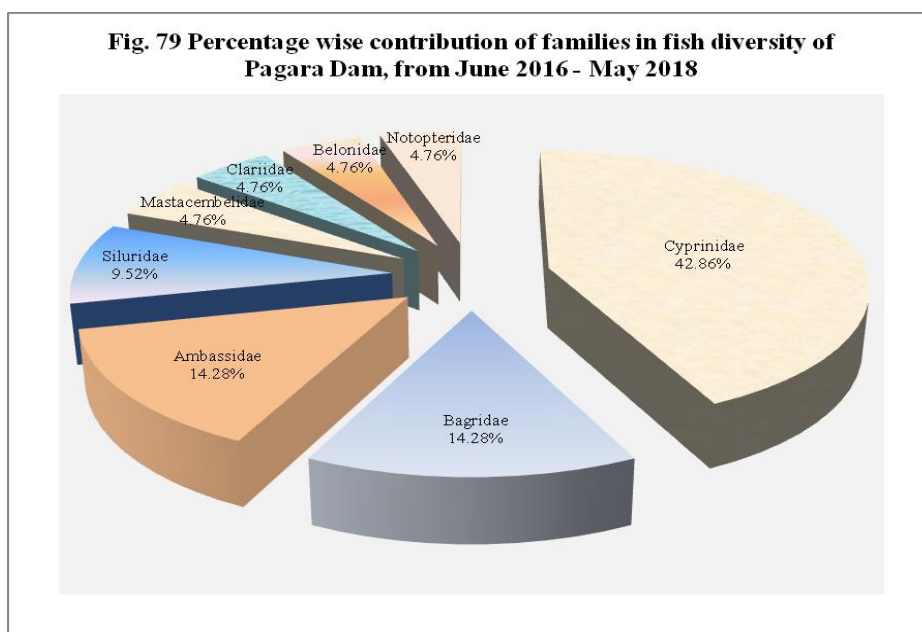
S. No.	Order	No. of species	% Contribution
1	Cypriniformes	9	42.86%
2	Siluriformes	6	28.57%
3	Perciformes	3	14.28%
4	Osteoglossiformes	1	4.76%
5	Synbranchiformes	1	4.76%
6	Beloniformes	1	4.76%



**Figure 1 :** Percentage and Coposition of species in Order

**Table 4:** Percentage wise contribution of families in fish diversity of Pagara Dam, from June 2016 – May 2018.

S. No.	Family	No. of species	% Contribution
1	Cyprinidae	9	42.86%
2	Bagridae	3	14.28%
3	Ambassidae	3	14.28%
4	Siluridae	2	9.52%
5	Mastacembelidae	1	4.76%
6	Clariidae	1	4.76%
7	Belonidae	1	4.76%
8	Notopteridae	1	4.76%
1	Cyprinidae	9	42.86%
	<b>Total</b>	<b>21</b>	



**Figure 2:** Fish Diversity of Pagara reservoir from 2016-2018 (Percentage wise)



**Photo No. 2** *Clarias batrachus*



**Photo No. 3** *Mystus bleekeri*



**Photo No. 4** *Sperata aor*



**Photo No. 5** *Sperata seenghala*



Photo No. 6 *Ompok bimaculatus*



Photo No. 7 *Parambassis ranga*



Photo No. 8 *Cirrihinus mrigala*



Photo No. 9 *Pseudambassis baculis*



Photo No. 10 *Puntius sarana*



Photo No. 11 *Esomus ahil*



Photo No. 12 *Labeo rohita*



Photo No. 13 *Labeo bata*



Photo No. 14 *Catla catla*



Photo No. 15 *Labeo gonius*



Photo No. 16 *Labeo calbasu*



Photo No. 17 *Chanda nama*



Photo No. 18 *Cyprinus carpio*



Photo No. 19 *Notopterus notopterus*



Photo No. 20 *Mastacembelus armatus*



Photo No. 21 *Xenentodon cancila*



Photo No. 22 *Wallago attu*

Among the organisms, fishes are the best known species of aquatic organisms and are the only food source harvested from natural populations. They are the most studied group of species and the best indicators of geographical patterns (Abell *et al.*, 2008). They not only provide food but are a source of income and employment to many people. Fish also give a number of byproducts such as fish oil, fish manure, fish

glue, leather etc. which are utilized commercially. Uchchariya *et al.*, (2012) recorded 40 species of fishes, belonging to 23 genera, 12 families and 6 orders from Tighra reservoir. Reddy and Parameshwar (2015) identified total of 19 fish species belonging to 3 orders, 16 genera of 8 families in Chandrasagar and 32 species belonging to 6 orders, 21 genera of 11 families in Ramanpad reservoir in Mahabubnagar District,

Telangana. Wani and Gupta (2015) identified a total of 21 species of freshwater fishes belonging to 6 orders, 11 families and 17 genera. Among these 21 species, 2 were endangered, 5 were vulnerable, 10 were at lower risk- near threatened status, 1 was lower risk least concern and 3 were non evaluated, as per Conservation Assessment and Management Plan (CAMP). They also reported a tremendous decrease in the ichthyofaunal diversity of the Sagar lake during the last decade. Out of the 73 identified from Krishna river in Satara district, Maharashtra, Patil and Gujar (2015) found five endangered, seven near threatened, forty seven least concern, three vulnerable and nine not evaluated one was data deficient. Dange *et al.*, (2017) recorded 11 species of fishes from Benetura reservoir district Murum, Maharashtra. Out of which, 8 species of fishes were abundant, 1 was moderate and 2 were rare.

Bhat and Rao (2018) identified 40 fish species from Tighra reservoir, Gwalior, out of which one species were endangered, one was vulnerable, three were near-threatened, one was data deficient and rest species were least concern. Siva Kumar *et al.*, (2018) reported Cypriniformes was the most leading order to comprise about 63.3% of the total fish population from Lower Anicut Reservoir, Tamil Nadu.

Ghorai (2019) also reported Cyprinidae as the most dominant fish species in his studies on Rupnarayan river, Purba, West Bengal.

Recently, Hazarika and Kalita (2020) reported a total of 43 species of fishes belonging to 8 orders and 12 families during their studies on Tasek Lake of East Garo Hills, Meghalaya. They also observed a distinct relationship between monthly variation in physico-chemical parameters and fish diversity in. Dirat *et al.*, (2020) have reported 52 fish species belonging to 36 genus, 21 families and 10 orders, in their studies on four waterways of left bank of Alima River in Boundji district, Congo Brazzaville. Daniel *et al.*, (2020) observed fish diversity to be higher in the month of November 2017 with 29 fish species and lowest in June 2018 with only 12 fish species in their studies on Peretorugbene river, Ekeremor Local Government Area, Bayelsa State, Nigeria. Baliarsingh *et al.*, (2020) recorded a total of 71 species of fishes under 46 genera, 27 families and 9 orders in their study on the water bodies of Puri district, Odisha. Highest species diversity was observed in the Cyprinidae (28.1%) followed by Bagridae (12.6%).

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## Conflict of interest

The author declares that there is no conflict of interest.

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