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Ichthyodiversity of Sujara Dam, Tikamgarh district (M.P.)

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Abstract
Sujara dam is situated 24°-37'-32.87" N and 79°-08'-22.91" E. The command area proposed to be irrigated for the project is 54,000 ha. The command area is plain and traversed by a number of small and big nallahs which form natural drainage of the area. Most of the stream and nallahs are non-perennial or seasonal in nature. Dhasan river is also a seasonal river. The command has good slopes and drainage capacity. Mainly the water of this dam is used for irrigation and fish culturing. Hence, it has been thought worthwhile to investigate the Ichthyodiversity of Sujara dam. The purpose of the dam is irrigation. The survey was conducted from June 2020 to June 2022 during which about the fish species diversity of Sujara dam Tikamgarh is very rich. Distribution richness abundance and dominance status of fish species have been observed during the study period in Sujara dam Tikamgarh. There are 11 family, 23 genera and 32 species have been observed in Sujara dam.

Keywords: Ichthyodiversity, fishes, Sujara dam, Tikamgarh

1. Introductions
Fish are cold-blooded vertebrates, gills for breathing underwater, and paired fins for swimming. They live underwater and are dependent on water for dissolved oxygen, support, food, reproduction and shelter. Fish influences human life in a number of ways. It is a rich source of food and playing a predominant role in overcoming the nutritional difficulties including Proteins, fat and vitamins. It also provides several by products like fish meal, fish glue and fish oil etc. (Shaikh, *et al.* 2011) [10]. Fish not only provide food but boost up the economy of many countries of the world as well (Khan and Hasan, 2011) [5]. Fisheries sector is providing employment opportunities to a number of people (Nagabhushan and Hosetti, 2010) [9]. Moreover it plays a major role in second trophic level of aquatic systems (Ullah, *et al.* 2014) [12]. Fishes are the keystone species which determine the distribution and abundance of other organisms in the ecosystem they represent and are good indicators of water quality and aquatic ecosystem. Nearly 20% of the world's freshwater fish fauna is already extinct or is on the verge of extinction (Moyle, 1992) [7]. The main factor that threatens marine fish biodiversity globally is fishing (Dulvy, *et al.* 2003) [2]. The aquatic biodiversity of 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, 1995) [8]. A number of reviews have shown that habitat loss and degradation, water withdrawal, overexploitation and pollution, and the introduction of non-native species are the leading causes of freshwater species decline and ecosystem degradation (Abramovitz, 1996) [1]. According to Jayaram (1999) [4], of the total 40,000 species of vertebrates, 21, 723 are fishes. Of these, about 58 percent are marine, 41 percent are freshwater species, and 1 percent move back and forth between salt and fresh water. The aim of the research work was to find out the Ichthyodiversity of Sujara dam.

2. Material and Methods
2.1 Study area
The coordinates of the dam site are 24°-37'-32.87" N and 79°-08'-22.91" E. The command area proposed to be irrigated for the project is 54,000 ha. The command area is plain and traversed by a number of small and big nallahs which form natural drainage of the area. Most of the stream and nallahs are non-perennial or seasonal in nature. Dhasan river is also a seasonal river. The command has good slopes and drainage capacity.

The Dam comprises of a masonry over flow gated structure located across Dhasan river flanked by earth dam in the main river Dhasan at Ban and Sujara village site. The maximum height of earthen dam is 21.33 m.

The research work comprises of the following main components:-

- Construction of a homogenous earth dam with concrete gated spillway of height 21.33 m.
- Length of dam shall be 1158.2 m
- Construction of a central gated spillway in 195 m length which will consist of 16 nos. of 12.2 m x 9.15 m size vertical gates.
- Water spread at FRL shall be 5201.71 ha with a gross storage capacity of 313.10 Mm^3.
- About 935.11 ha of cultivable area, 57.49 ha of forest land and 4209.118 ha of other land including road, streams, river, etc. will be affected.
- Construction of left bank canal of 90 km in length with 22.35 km of distributaries

The total land required for various project components is of about 5886.97 ha. About 2935.11 ha of revenue/government land and 2894.37 ha of private land is to be acquired. In addition, about 57.49 ha of forest land is also to be acquired.

Fig 1: Showing map Sujara dam.

2.2 Methodology

The fish collection was done thrice a month, on every 10th and 30th of the month from June 2020 to June 2022 with the help of hand nets, and simple hooks. The samples were fixed in 10 percent buffered commercial grade formalin directly or after Diversity of Edible Fishes at Sujara dam, Tikamgarh (M.P.). Intraperitoneal injection of 10 percent formalin (in case of specimens larger than 15 cm) and were then transferred into 70 percent alcohol. All possible efforts were made in order to collect maximum number of species. Identification was made after consulting several standard keys and literature such as Fishes of the Punjab (Mirza and Sandhu, 2007) [6], Freshwater fishes of the Indian Region (Jayaram, 1999) [4], Inland fishes of India and adjacent countries (Talwar and Jhingran, 1991) [11].

3. Results and Discussion

The study was performed on Sujara dam, situated in Tikamgarh (M.P.). The survey was conducted from June 2020 to June 2022 during the survey of Sujara dam about 32 species were identified upto species level which were *Notopterus notopterus, Notoptera chitala, Oxygaster bacaila, Oxygaster gora, Rasbora daniconius, Rasbora elonga, Puntius chola, Puntius sarana, Puntius sophore, Ambylopharyngodon mola, Catla catla, Cirrhinus mrigala, Cirrhinus reba, Labeo calbasu, Labeo rohita, Labeo gonius, Labeo boga, Labeo pungusia, Wallago attu, Heteropneustes fossilis, Clarius batrachus, Mystus bleekeri, Channa marulius, Channa punctatus*, and *Channa striatus.* In the present study Cyprinidae species may be found in rich in Sujara dam. The highest species are Cyprinidae were noted. These are represented in table no. 1.

Table 1: Distribution and abundance of Fishes in Sujara dam.

S. No.	Family	Name of fishes	Local Name	Status
01.	Notopteridae	*Notopterus notopterus*	पतोला	+
02.	Notopteridae	*N. chitala*	मोप	++
03.	Cyprinidae	*Chela untrahi*	चेलवा	+
04.	Cyprinidae	*Esomus danricus*	डेडुआ	+
05.	Cyprinidae	*Tor tor*	महाशेर या महाशीर	+R
06.	Cyprinidae	*Catla catla*	कतला	+++
07.	Cyprinidae	*Cirrhinus mrigala*	मिगल	+++
08.	Cyprinidae	*Labeo rohita*	रोहू	+++
09.	Cyprinidae	*L. calbasu*	करौछर	++
10.	Cyprinidae	*L. dero*	अरंगी, रइया.	+
11.	Cyprinidae	*L. gonius*	कुर्सी	+
12.	Cyprinidae	*L. potail*	कारी	+
13.	Cyprinidae	*L. bata*	पथरचटी या बाटा	++
14.	Cyprinidae	*Rasbora daniconius*	डेडुआ अथवा डरइली	+
15.	Siluridae	*Ompok pabda*	पावदा	++
16.	Siluridae	*Wallago attu*	पाड़िन	+
17.	Bagridae	*Mystus vittatus*	टेगरा	+
18.	Saccobranchidae	*Heteropneustes fossilis*	सिंघी	++
19.	Clariidae	*Clarias batrachus*	मागुर	++
20.	Belonidae	*Xenentodon cancila*	सुजना	+
21.	Ophiocephalidae	*Channa gachua*	सौर	+++
22.	Ophiocephalidae	*C. punctatus*	सौर	+
23.	Ophiocephalidae	*C. marulius*	सौर	+
24.	Centropomidae	*Chanda nema*	माया	+
25.	Centropomidae	*C. ranga*	खड्डी	+
26.	Nandidae	*Nandus nandus*	चकड़ी	+
27.	Mastacembelidae	*Mastacembelus armatus*	बाम	+
28.	Mastacembelidae	*M. pancalus*	बाम अथवा निदोह	+++
		Exotic fish		
29.	Cyprinidae	*Hypothalmichthys molitrix*	सिल्वर कार्प	++
30.	Cyprinidae	*Ctenopharygodon idella*	ग्रास कार्प	+++
31.	Cyprinidae	*Cyprinus carpio*	चाईनीज कार्प	++
32.	Cyprinidae	*Tilapia mossambica*	तिलपिया	+

Note:
+ = Low Abundance, ++ = Medium Abundance, +++ = Rich in Species, R = Rarely

Table 2: Comparative values of monthly fish species distributions at Sujara dam from July 2020-June 2022.

S.No	Month	Station A		Station B		Station C		Station D	
		Total no. of sps.	Total no. of indi-vidual	Total no. of sps.	Total no. of indi-vidual	Total no. of sps.	Total no. of indi-vidual	Total no. of sps.	Total no. of indi-vidual
1	Jul.	-	-	-	-	-	-	-	-
2	Aug.	17	82	18	83	20	75	21	86
3	Sept.	21	124	22	108	22	89	26	95
4	Oct.	22	131	23	112	26	115	28	115
5	Nov.	22	142	20	126	20	113	20	118
6	Dec.	16	68	16	125	19	108	20	105
7	Jan.	19	78	20	159	14	79	14	73
8	Feb.	15	53	15	110	19	82	19	83
9	Mar.	19	76	18	109	19	77	22	78
10	Apr.	13	44	18	102	21	83	23	84
11	May	19	58	20	91	19	61	22	68
12	Jun.	14	36	14	47	21	49	26	49
Maximum		22	142	23	159	26	115	28	118
Minimum		13	36	14	47	14	49	14	49
Seasonal variations									
1	Rainy	20	112	21	101	23	93	25	98
2	Winter	18	85	18	130	18	95	18	95
3	Summer	16	54	17	87	20	68	23	70

During observation when the mean values of monthly fish species distribution at Sujara dam at station A no. of species were found to be more in September. While no. of individuals were max. (142) in November. When we looked at station B it was noticed that no. of species were more (23) in October where as total no. of individuals were more (159) in Jan. At station C max. no. of species (26) were present in Oct. and no. of individuals were more (115) in Oct. When we looked at station D it was noticed that no. of species were more (28) in October where as total no. of individuals were more (118) in Nov. (Table 2).

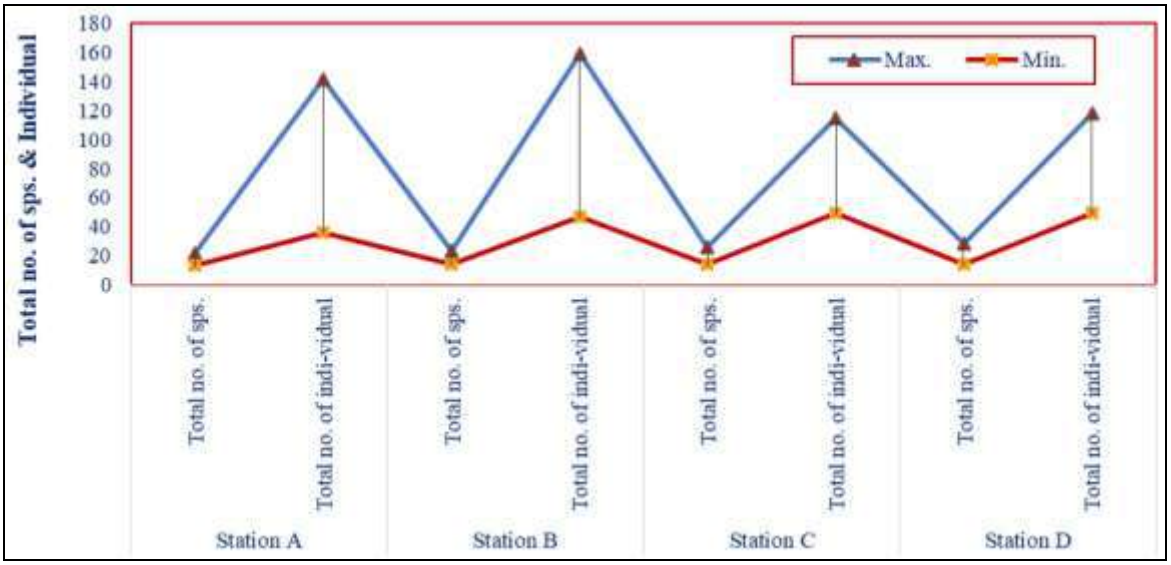

Fig 1: Comparative values of fish species distributions at Sujara dam from July 2020-June 2022

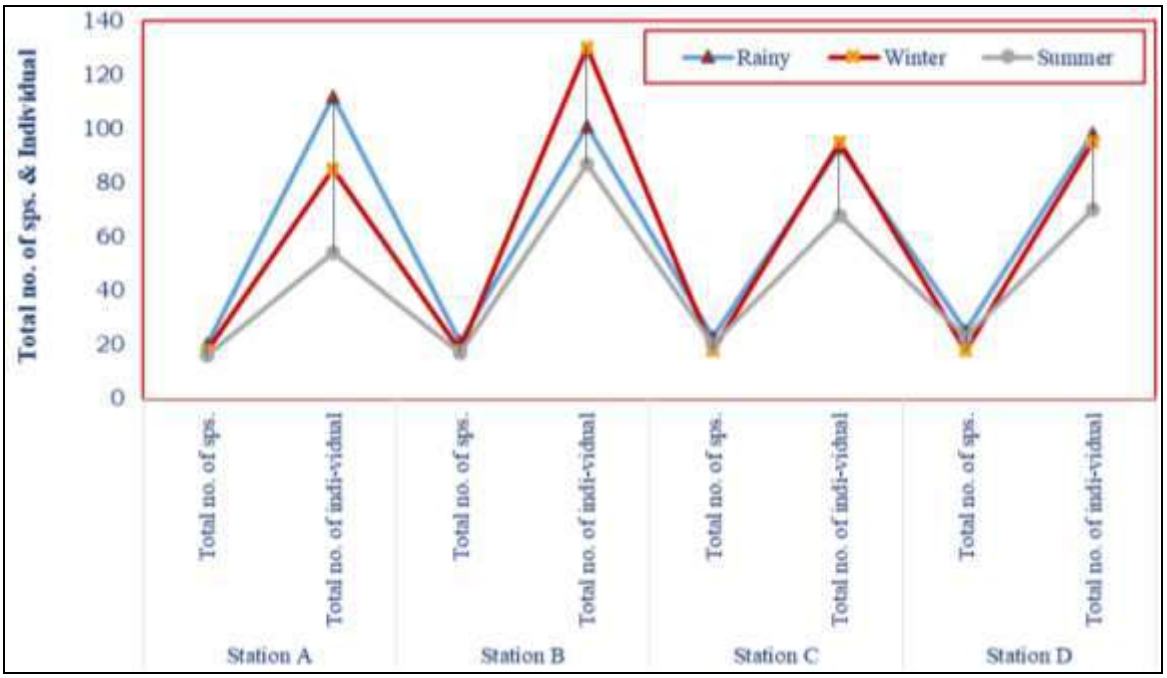

Fig 2: Comparative Seasonal variations fish species distributions at Sujara dam from July 2020-June 2022

4. Conclusion

From the current survey it may be concluded that Sujara dam of Tikamgarh district are suitable for Cyprinidae species. Seasonal variation of species showed that maximum no. of species (25) were found in rainy season, while max. no. of individuals where also found in rainy season (Table 2).

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