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Physico-chemical and fish diversity of Matiyari dam in Mandla district (M.P.)

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Abstract
The present study deals Physico-chemical and fish diversity of Matiyari Dam in Mandla District (M..) during period June 2017 to May 2018 to census and commercially important fishes in the Matiyari dam. The present paper highlights the variety and abundance of fresh water fishes in Matiyari dam, Dist. Mandla (M.P.) India. The results of present investigation reveal the occurrence of 42 fish species belonging to 6 orders, 15 families and 24 genera. Among the collected species, order Cypriniformes was most dominant constituting 47.62% followed by order Siluriformes constituting 11.90% order Perciformes constituting 21.43%, orders Osteoglossiformes 4.76% and Synbranchiformes constituting 9.52% and orders Beloniformes constituting 4.76% of the total fish species.

Keywords: fish diversity, economic value, nutritive value, Matiyari dam

Introduction
According to different surveys 70 to 80% of the Indian water sources are polluted and different enteric diseases affect millions of the people in every year. United Nations Organization report has indicated that mortality of world population lack reliable source of drinking water. Hence now a day's raw water body is being analyzed for its utility like drinking, aquaculture and industry and for irrigation purpose.

In India potential of fish culture is yet to be fully exploited. Fishes being rich source of proteins and have high nutritive value. Extensive development of aquaculture needs to be given priority after green revolution to feed ever growing population. Success of fish culture depends apart from other factors, on selection of suitable species. Secondly the country is rich in diversity of such important group of animals. Further, there is a need of a survey of diversity of fishes in different types of habitats of Reservoir all over the country.

Present investigation was undertaken to study the fish diversity of Matiyari dam Distt. Mandla (M.P.) India. the objective of study was to give recent data regarding fish diversity of the this reservoir, aiming to contribute a better knowledge of the fish diversity and a tool for conservation planning of aquatic environments in this region. It is the first effort made in this direction, various indigenous, commercially important and economically valuable fishes were found in the dam.

Material and methods
Water sample were collected for the study during Sept. 2017 to Aug. 2018 during morning hours at regular intervals of every month. Sample was analyzed in the laboratory by using standard methods described by Trivedi and Goel (1996) [2].

Fishes were collected from Matiyari dam Distt. Mandla (M.P.) India with the help of local fishermen using different type of nets namely gill nets, cast nets, dragnets and Bhor jal. Immediately photographs were taken with help of digital camera.

Fishes were brought to laboratory and preserved in 10% formalin solution in separate specimen jars according to the size of species. Small fishes were directly placed in the 10% formalin solution. While large fishes were given an incision in their abdomen and preserved.

Results and discussion
All animals depend on each other in order to maintain the metabolic process. They need energy for growth and respiration.

Table 1: Showing water analysis of water Samples from June 2017 to May 2018.

S. No.	Months	Temperature		pH	DO_2 (mg/L)	CO_2 (mg/L)	Alkalinity (mg/L)
		Air	Water				
1.	Sept. 2017	28.1	26.2	8.4	5.5	1.81	174
2.	Oct. 2017	26.6	25.1	8.5	5.85	1.52	106
3.	Nov. 2017	26.1	24.3	8.1	6.6	1.54	161
4.	Dec. 2017	25.4	24.6	8.0	7.2	1.22	157
5.	Jan. 2018	23.4	23.5	8.2	8.4	1.38	98
6.	Feb. 2018	23.1	22.1	8.3	8.5	1.51	84
7.	Mar. 2018	22.2	18.3	8.1	8.7	3.52	86
8.	Apr.2018	24.8	23.6	8.4	8.9	2.88	97
9.	May 2018	25.1	23.7	8.2	7.7	1.53	202
10.	Jun. 2018	29.8	26.1	8.3	7.3	1.61	210

11.	Jul. 2018	33.1	30.2	8.5	6.8	1.73	206
12.	Aug. 2018	34.8	32.4	8.7	5.4	1.55	217
Max.		34.8	32.4	8.7	8.9	3.52	217
Min.		22.2	18.3	8	5.4	1.22	84
Mean		26.9	25.0	8.3	7.2	1.8	150
SD		3.76	3.47	0.19	1.19	0.65	50

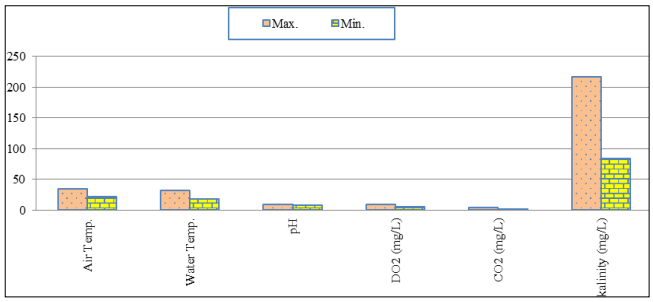

Fig 1: Graphics analysis of water analysis of water Samples.

Air temperature ranged between 22.2°C-34.8°C and water temperature ranged between 18.3°C-32.4°C. Sagunan (1995) [1].

Temperature is one of the important physical character which directly influences some chemical reactions of water current findings are in agreement with earlier reports of Wadia (1983) [4].

pH was ranged between 8 to 8.7. pH may vary due to high temperature it may also increase due to absence of low pollution, low CO_2 content, very high photosynthetic activities and rich algal diversity (Wekh, 1952) [5].

Dissolved oxygen play an important role in accelerating the biological activities of aquatic animals. Dissolved oxygen was ranged between 5.4 mg/L to 8.9 mg/L. (Tucker, 1958) [3]. Carbon dioxide is playing an important role in aquatic medium. It indicates the pollution status of water during present study. Free carbon dioxide was ranged between 1.22mg/L to 3.55.mg/L. alkalinity was ranged between 84 mg/L to 217 mg/L.

During the study period different fish varieties have been observed in the Matiyari dam Distt. Mandla (M.P.) India. The results showed that the area was rich in fish diversity. Fishes belonging to 6 orders and 15 families were collected during course of the study period. Many collected fishes having economic importance sold after collection in the local fish market. In the present fish diversity study 42 species of 24 different genera 15 families and 6 orders were recorded from the Matiyari dam number of catches carried out during June 2017 to May 2018. The members of Order Cypriniformes were dominated by 20 species followed by Siluriformes 5 species, Perciformes 9 species, Synbranchiformes 4 species and Osteoglossiforms and Beloniformes 2 species each.

15 fish families represented by 42 fish species, Family Cyprinidae was dominant group with 13 species in the assemblage composition in which *Garra Lamta, Rasbora daniconius* and *Puntius ticto* were found most abundant. *Catla-caltla, Puntius punctius, Puntius sarana sarana, Puntius sophore, Lebeo rohita, Cyprinus carpio, Hypothalmichthys molitrix, Chela bacaila, Cirrhinus mrigala* found abundant. *Cirrhinus reba, Labeo calbasu* and *Gambusia affinis* were found less abundant. Followed by Family Bagridae in which *Mystus cavasius* was found abundant. *Mystus aor* (*Aorichthys*), and *Mystus Seenghala* were found less abundant.

Among Family Channidae *Channa striatus* was found less abundant while *Channa punctatus* and *Channa gaucha* were found abundant. Followed by Family Notopteridae in which *Notopterus Notopterus* was found abundant. *Notopterus chitala* was found rare. Family Siluridae in which *Wallago attu* was found abundant. Family *Ompok bimaculatus* was found rare. Family Mastacembelidae in which *Mastacembelus armatus* and *Mastacembelus pancalus* were found less abundant. Followed by family nandidae in which *Nandus nandus* where found less abundant. Family Ambassidae in which *Chanda nama* and *Chanda ranga* are found less abundant. Family Claridae in which *Claris batrachus* found abundant.

Family Mugilidae in which *Mugil cephalus* was found rare. Family Belonidae in which *Xenentodon cancila* was found rare. Family Cichlidae in which *Oreochromis mossambica* were found abundant. Family Anabantidae in which *Anabas testudineus* were found abundant. Family Gobiidae in which *Glassogobius giuris* were found rare.

Table 1: The fish diversity and Economic value of Matiyari dam (June 2017 to May 2018)

S. No.	Order	Family	Scientific name	Common name	Status
1.	Osteoglossiformes	Notopteridae	*Notopterus notopterus*	Feather back	+
			Notopterus chitala	Moy	-
2.	Cypriniformes	Cyprinidae	*Catla catla*	Catla	++
			Garra lamta	Garra	+++
			Rasbora daniconius	Black line Rasbora	+++
			Rasbora rasbora	-	++
			Cyprinus carpio	Common carp	++
			Puntius ticto	Ticto	+++
			Puntius amphibious	Khavli	++
			Puntius sarana sarana	Khavli	++
			Puntius sophore	Sophore	++
			Cirrhinus mrigala	Mrigala	++
			Cirrhinus reba	Reba	+
			Labeo rohita	Rohu	++
			Labeo calbasu	*Calbasu*	+
			Labeo bata	-	+

			Oxygaster bacaila	Indian glass barb	+
		Bagridae	*Mystus aor (Aorichthys)*	Aor	+
			Mystus cavasius	-	+
			Mystus seenghala	Seenghala	+
3.	Siluriformes	Siluridae	*Ompok bimaculatus*	Buter cat fish	-
			Wallago attu	Fresh water shark	+
		Claridae	*Claris batrachus*	Mangur	++
		Sisiridae	*Glyptothorax spp.*	-	-
		Heteropneustidae	*Heteropneustus fossillis*	Singhur	-
4.	Beloniformes	Belonidae	*Xenentodon cancila*	Kowa	
			Gadusia chapta	-	+
5.	Synbranchiformes	Mastacembelidae	*Mastacembelus armatus*	Baam	+
			Mastacembelus pancalus	Malga	+
			Mastacembelus aculeatus	-	+
		Cichlidae	*Tilapia mossambica*	Telapi	+
6.	Perciformes	Anabantidae	*Anabas testudineus*	Koi	+
		Gobiidae	*Glassogobius giuri*	Goby	-
		Nandidae	*Nandus nandus*	-	-
		Ambassidae	*Chanda ranga*	Glossyfish	++
			Chanda nama	-	-
		Channidae	*Channa striatus*	Banded snake head	+
			Channa punctatus	Spotted snake head	++
			Channa gaucha	Dhok	-
			Channa marulius	Maral	+

*Most abundant; +++, Abundant; ++, Less abundant; +, Rare

Sharma *et al.*, (2007) [6] reported 29 species of fishes belonging to six orders from Krishnapura lake, Indore and stated that Cypriniformes was dominant with 15 species followed by Siluriformes with 6 species. (Shinde *et al.* 2009) [7] Reported the lchthyofauna of Harsool-Savangi Dam Aurangabad (M.S.) India. Total 15 fish species belonging to 3 orders, 4 families and 12 genera. The order cypriniformes found dominant with 11 species, followed by perciformes 3 species and siluriformes with 1 species. Mahapatra, (2003) [8] recorded abundance of catfishes in Hirakund reservoir (India). Total 43 species were present in which 18 were commercially important.

The work has been concluded with future strategies for development of fish fauna conservation of Matiyari dam, Dist. Mandla (M.P.) India. Recent data regarding Fish diversity of the Mariyari dam, aiming to contribute a better knowledge of the fish diversity planning of aquatic environments in this region. To maintain fish biodiversity has an immense importance as it is not always possible to identify individual species critically to sustain aquatic ecosystem.

Conclusion

Water quality testing results shows that water can be used for fish culture activities.

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