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Research Paper

Ichthyofaunal diversity of Adhartal pond and Robertson Lake of Jabalpur, Madhya Pradesh

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Abstract: The present study was conducted to assess Ichthyofaunal diversity of two lentic water bodies namely Adhattal and Robertson Lake of Jabalpur during September 2022 to February 2023 to. Total 16 fish species belonging to 16 genera, 09 families and 06 orders recorded from Adhartal Pond. The order Cypriniformes was dominant with 06 fish species, followed by the order Siluriformes 04 fish species, Perciformes 02 fish species, Channiformes 02 fish species, Osteoglossiformes 01 fish species and Anguilliformes with 01 fish species. On the other hand, in Robertson Lake 20 fish species belonging to 20 genera, 09 families and 6 orders were recorded. The order Cypriniformes was the dominant with 09 fish species, followed by the order Siluriformes 05 fish species, Perciformes 02 fish species, Chranniformes 02 fish species, Osteoglossiformes 01 and Angulliformes with 01 fish species. Maximum fish diversity of Simpson's Diversity Index and Shannon-wiener Index were recorded in Robertson Lake (0.939) and (2.824) respectively. Presence of carp like Catla-*catla*, *Labeo rohita*, Cirrihina *mrigala* and Silver carp showed good productive grounds for fish culture practice in Robertson Lake.

Keywords: Ichthyofaunal, Fish fauna and Fish culture.

Introduction:

Biodiversity is essential for the stabilization of ecosystems, the protection of overall environmental quality and understanding the intrinsic worth of all species on the earth (Ehrlich and Wilson, 1991). Fish constitute half of the total number of vertebrates in the world. They live in almost all conceivable aquatic habitats; 21,723 living species of fish have been recorded out of 39,900 species of vertebrates out of these 8,411 are freshwater species and 11,650 are marine. India is one of the mega biodiversity countries in the world and occupies the

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ninth position in terms of freshwater mega biodiversity (Mittermeier et al., 1999).

Fishes are not only important indicators of ecological health and abundance but also maintain a balance in the food chain by consuming plankton and small animals and providing food for many animals. This balance in the food chain may be affected due to pollution in the aquatic system. In India, 2,500 species of fish have been recognized in the Indian subcontinent, out of which 930 are categorized as Freshwater species (Jayaram, 1999) and 1570 are Marine (Kar, 2003; Vijaykumar et al., 2008). Diversity of Lentic Freshwater Catfish at Chhatarpur City Madhya Pradesh reported by Dubey, A. K. (2012) and Ichthyo-Diversity of Banisagar Dam at Chhatarpur reported by Dubey et al., 2012.

Materials and Methods:

Study Site: Fishes were collected from two sites viz., Adhartal Pond and Robertson Lake of Jabalpur. Adhartal Pond is situated between 23.2079° N. latitude and 79.9507°E longitude near Jawaharlal Nehru Krishi Vishwa Vidyalaya, Adhartal, Jabalpur, Madhya Pradesh. Robertson Lake is situated between 23.2005° N. latitude and 79.9850°E longitude near the Jabalpur Engineering College, Jabalpur.

Collection of Fishes: Fishes were collected from both sites with the help of local fishermen by using cast and drag nets. Fish sample were collected fortnightly intervals (15 days). All fish were caught identifying to species level using by standard taxonomic method viz. Day (1889); Jhingran (1991) and Jayaram (1999).

Results and Discussion:

The fish species density, abundance and distribution recorded from the "Adhartal Pond" are shown in Table 01. The present study revealed the occurrence 01 of 16 freshwater fish species belonging to 16 genera, 09 families and 06 orders. The order Cypriniformes was dominant with 06 fish species, followed by the order Siluriformes 04 fish species, Perciformes 02 fish species, Channiformes 02 fish species, Osteoglossiformes 01 fish species and Anguilliformes with 01 fish species. Diversity of fish species of Robertson Lake shown in Table 02. Total 20 freshwater fish species belonging to 20 genera, 09 families, and 6 orders were recorded. The order Cypriniformes is dominant with 09 fish species, followed by the order Siluriformes with 05 fish species, Perciformes with 02 fish species, Channiformes with 02 fish species, Osteoglossiformes with 01 and Angulliformes with 01 fish species.

Estimation of diversity of Fish species.

The diversity of fish was calculated by the Simpson's and Shannon-wiener diversity index of Adhartal Pond and Robertson Lake, Jabalpur. Monthly fish species richness Simpson's diversity index (SDI) of Adhartal Pond was recorded maximum in January (0.822) and minimum in November (0.688) and for Robertson Lake recorded maximum in October (0.943) and minimum in September (0.923), respectively. The Shannon-Wiener diversity index (SWDI) is presented in Adhartal Pond. The maximum in February (2.208) and minimum in November (1.882) and Robertson Lake was recorded as the maximum value in October (2.890) and minimum in September (2.667), respectively. The overall SDI of Adhartal Pond and Robertson Lake was recorded at 0.765 and 0.939 respectively. The overall

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SWDI of fish species of Adhartal Pond and Robertson Lake was recorded at 2.113 and 2.884 respectively. Simpson's and Shannon-Wiener diversity index of fish diversity showed a higher of Robertson Lake as compared to the Adhartal Pond.

Results of the present study correlated with other workers. Sharma *et al*., 2020 recorded 27 species of fishes belonging to 7 orders, 14 families and 21 genera from Dilawara reservoir, Dhar Tehsil, M.P.. Cypriniformes was the most dominant among the 7 orders of fish recorded with 11 species. Yousuf *et al*., 2012 investigated the 29 fish species belonging to 7 orders, 10 families and 15 genera from Halali Reservoir of Vidisha District, M.P. Cypriniformes was the most dominant order with 18 species. Niraj, 2012 reported 9 orders, 18 families, 27 genera and 40 species from Ox-bow Lake, Turkaulia Lake of East Champaran. Cyprinidae order was the most abundant of all, consisting of 14 species.

Sahu *et al*., 2023 reported the diversity of freshwater fish species in Mungeli District, Chhattisgarh. They recorded values of Shannon-wiener (2.77-3.24 and 2.63-3.10) and Simpson's Diversity (0.90-0.95 and 0.89-0.94) in their work. Naik et al., 2012 reported the diversity of freshwater fish species in the Tunga reservoir of Shivamogga district, Karnataka. They recorded values of Shannon-wiener (2.47–2.66) and Simpson's diversity index (0.8820.907) in their study. Sharma et al., 2020 reported the value of Simpson's and Shannonwiener diversity index 0.04-0.08 and 2.5-3.02, respectively of the Dilawara reservoir of Dhar, similar to this study.

Table 01: Fish species of the Adhartal Pond, Jabalpur

S. No	Order	Family	Genus	Species	Local name
1	Cypriniformes	Cyprinidae	*Catla*	*catla*	Catla
			Cirrhinus	*mrigala*	Nain
			Ctenopharyngodon	*idella*	Grass carp
			Cyprinus	*carpio*	Common carp
			Hypophthalmichthys	*molitrix*	Silver carp
			Labeo	*rohita*	Rohu
2	Siluriformes	Siluridae	*Ompak*	*bimaculatus*	Pabda
			Wallago	*attu*	Tengra
		Heteropneustidae	*Heteropneustes*	*fossilis*	Singhi
		Claridae	*Clarias*	*batrachus*	Mangur
3	Perciformes	Cichlidae	*Oreochromus*	*mossambica*	Tilapia
		Anabantidae	*Anabas*	*testudineus*	Kawai/ Sumha
4	Channiformes	Channidae	*Channa*	*panctatus*	Saur
			Channa	*striatus*	Saur
5.	Osteoglossiformes	Notopteridae	*Notopterus*	*notopterus*	Chitala
6.	Anguilliformes	Anguillidae	*Anguilla*	*bengalensis*	Eel/baam

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Table 02: Fish species of the Robertson Lake, Jabalpur

S.No.	Order	Family	Genus	Species	Local name
1	Cypriniformes	Cyprinidae	*Catla*	*catla*	Catla
			Cirrhinus	*mrigala*	Nain
			Ctenopharyngodon	*idella*	Grass carp
			Cyprinus	*carpio*	Common carp
			Hypophthalmichthys	*molitrix*	Silver carp
			Hypophthalmichthys	*nobilis*	Silver carp
			Labeo	*rohita*	Rohu
			Labeo	*bata*	*bata*
			Labeo	*calbasu*	karaunchar
2	Siluriformes	Siluridae	*Ompak*	*bimaculatus*	Pabda
			Wallago	*attu*	Tengra
		Heteropneustidae	*Heteropneustes*	*fossilis*	Singhi
		Claridae	*Clarias*	*batrachus*	Mangur
			Clarias	*gariepinus*	Mangur
3	Perciformes	Cichlidae	*Oreochromus*	*mossambica*	Tilapia
		Anabantidae	*Anabas*	*testudineus*	Kawai/ Sumha
4	Channiformes	Channidae	*Channa*	*panctatus*	Saur
			Channa	*striatus*	Saur
5.	Osteoglossiformes	Notopteridae	*Notopterus*	*notopterus*	Chitala
6.	Anguilliformes	Anguillidae	*Anguilla*	*bengalensis*	Eel/baam

Conclusions: The present study is conducted for the detailed documentation of Ichthyofaunal diversity of Adhartal and Robertson Lake of Jabalpur district in Madhya Pradesh. Ichthyofaunal diversity of Robertson Lake was recorded more as compared to Adhartal pond, Jabalpur.

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