



Research Article

STUDY OF ICTHYOFAUNAL DIVERSITY OF PAKHANJOOR RESERVOIR

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ABSTRACT

Biodiversity indicates the potential of any aquatic system and also depicts its trophic status. It is important to have an adequate knowledge of the constituent biota especially for the purpose of conservation and management of the inland water resources such as rivers, reservoirs and ponds. Ichthyofaunal studies were undertaken during July-2009 to June-2010 in Pakhanjoor reservoir Kanker district, Chhattisgarh, India. The aim of the paper was to assess the variety and abundance of the important fish fauna inhabiting this region. 42 fish fauna identified during the study belongs to Cyprinidae 23 species, Bagridae 04, Cobitidae and Ophioccephalidae 03, Siluridae and Centropomidae 02, and a species each of Saccobranchidae, Claridae, Mugilidae, Nandidae and Gobiidae. The species diversity is peak in post monsoon and was low in premonsoon. To save this diversity and to develop a sustainable fishery practices and proper documentation, leading to diversity information system is an urgent need. The paper describes the detailed species composition their relative contribution and also some important points that may help to better understand the current scenario of ichthyofaunal diversity.

Keywords: Aquatic system, Trophic status, Ichthyofaunal diversity, Pakhanjoor reservoir, Conservation.

INTRODUCTION

Aquatic biodiversity encompasses freshwater ecosystem including lakes, ponds, and reservoirs, rivers and streams, groundwater, and wetlands. About 21,730 species of fishes have been recorded in the world; of which, about 11.7% are found in Indian waters. Valid scientific descriptions exist for about 24,600 living species of fishes in 482 families and 57 orders (Nelson 2006). Freshwater fishes are a poorly studied group. There is no proper documentation and most of the information available is from a few well-studied locations only. There is a fundamental need for taxonomists to describe unknown species in the study of biodiversity especially in these species-rich areas.

Chhattisgarh, state is situated in the heart of India, is endowed with a rich cultural heritage and attractive natural diversity. It is a land of ponds, reservoirs, rivers, wetlands and a long terrestrial belt and hilly areas. Most of these sites are untouched and unexplored. Kanker district of Chhattisgarh has its unique cultural and ecological identity with great diversity of

biological species. Kanker district of Bastar region (C.G.) has not been extensively surveyed for fish diversity. The fish diversity is not only the wealth of the district but it also has serious implications fisheries. The review of literature indicates that very limited information are available. Studies of available literature show that no attempt has been made to document the fish diversity along with their habitat, in this region.

MATERIAL AND METHODS

Study Area

This reservoir is located in Pakhanjoor town of Pakhanjoor block of Kanker district which is 116 km far from its district main city Kanker and 225 km far from its state main city Raipur (Figure 1). This water body is situated at 20°02'31, 33°N latitude and 80°38'05, 06'E longitude. This water body is situated at 20°02'31, 33°N latitude and 80°38' 05, 06'E longitude. Elevation of reservoir is 1042 ft. Length is 1660 m, Width is 360 m and maximum and minimum depth is 07 m and 1.5 m respectively.

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Maximum water spread area is about 59.117 ha. and minimum water spread area is 10.614 ha. Total catchment area is about 64.413 ha. Pakhanjor reservoir (Figure 2) is mainly used for irrigation and fishery purpose. Western bank of reservoir is protected by govt. Rest house. On its northern part govt. fish farm is located and the southern part is covered by village.



Figure 1. Index map of Kanker District (C.G.).



Figure 2. Location map of Pakhanjor Reservoir.

METHODS

For the purpose of presentation of this work "Study of Ichthyofaunal Diversity of Pakhanjor Reservoir," Fishes collected alive through fishing net. Fresh specimen were preserved and

identified. For this Cost net, Scoop net, Gill nets of varying mesh sizes, and a Circular net (with very small mesh size and sinkers around the edge) were used for fishing. The specimens were preserved in 10% formulation with maximum care to avoid disgorgement or defecation of fishes due to stress during immediate transfer to formalin.

Identification of fishes was done on the basis of Morphometric characters, Descriptive characters and Fin formula. Morphometric characters includes Total length of the body Standard, length of the body, Length and depth of the head, Position and diameter of the eye, Length of snout, Maximum and minimum girth, Length of Pre dorsal fin, Pre pectoral fin, Pre anal fin and Pre caudal fin. Descriptive Characters includes Profile and Shape of the body, Skin texture and coloration, Position and shape of the mouth, lips and snout, Barbels and jaws, Scales and lateral line system, Origin, shape, size and type of median, paired and caudal fins, Fin rays and fin formula, Tail and special marking.

Fishes are classified and arranged based on the work of Jhingran (1991), with slight modification as followed by Day's Fauna (1871), Menon (1999), and Jayaram (1999). A field kit, containing measuring tape, rope, buckets, preservative, enamel trays, digital camera etc. was prepared for regular use. A boat was engaged and the station was visited in the sequence, which was carefully followed throughout the investigation period.

RESULT AND DISCUSSION

In the present investigation of fish fauna diversity the fishes collected from Pakhanjor Reservoir comprised of 21 genera and 42 species belonging to 11 different families viz., Cyprinidae, Cobitidae, Siluridae Bagridae, Saccobranchidae, Clariidae, Mugilidae, Ophiocephalid, Centropomidae, Nandidae and Gobidae of 4 orders (Table 1).

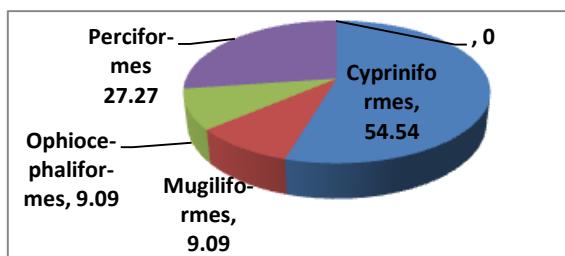
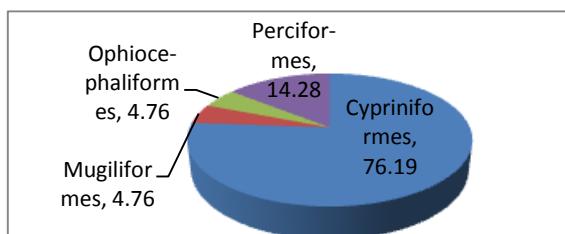
Table 1. Fish fauna diversity of Pakhanjoor Reservoir.

S.N.	Order	Families	Genera	Species
1	Cypriniformes	6	16	34
2	Mugiliformes	1	1	1
3	Ophiocephaliformes	1	1	3
4	Perciformes	3	3	4
Total		4	11	42

Percentage Contribution of Family, Genera and Species under 4 orders is given in the Table 2. As far as the genera and families to different orders are concerned order Cypriniformes consists of 16 genera under 6 families, Perciformes of 3 genera under 3 families, Mugiliformes, Ophiocephaliformes of single genus under single family each (Graph 1 and Graph 2).

Table 2. Number of Families, Genera and Species under various orders.

S.N.	Order	Families	Genera	Species
1	Cypriniformes	54.54	76.19	80.95
2	Mugiliformes	9.09	4.76	2.38
3	Ophiocephaliformes	9.09	4.76	7.14
4	Perciformes	27.27	14.28	9.52
Total		99.99	99.99	99.99

**Graph 1.** Showing percent contribution of families to the order.**Graph 2.** Showing percent contribution of genera to the order.

Order Cypriniformes has been found to be a major order with 34 species and percent contribution of 80.95%. Perciformes comes next with 4 species an percent contribution of 9.5 % Ophiocephaliformes with 3 species and percent contribution of 7.14 %, and Mugiliformes with 1 species and percent contribution of 2.38 %.

Sakhare (2001) reported 23 species from Jawalgaon reservoir Solapur district Maharashtra. Battul et al. (2007) reported 18 species from Ekruckh lake Solapur district, Khedkar and Gynanath (2005) reported 37 species from Issapur dam district. Ubarhande et al. (2011) observed 27 species from Ambadi dam district of Aurangabad (Maharashtra).

In present study among 42 species 34 species including 2 exotic species belonging to order Cypriniformes, 4 species belonging to order Perciformis, 3 species belonging to order Ophiocephaliformis 1 species belonging to order Mugiliformes Identified (Table 1).

The fish species recorded from water body, the following are considered as economically important and cultivable fishes including, *Cyprinus carpio*, *Cirrhinus mrigala*, *Catla catla*, *Mystus cavasius* *M.vittatus* *Channa striatus* and *Channa punctatus*. The current study has also shown that the reservoir inhabit the ornamental fishes like *Puntius sophore*, *Puntius amphibius* and *Puntius chola*. At present the natural water bodies sustain the populations of rohu and catla as the major food fishes while *Puntius* spp., *Chela* spp., *Mystus* spp. and *Channa* spp. are the other commonly available species. The Indian cat fish *Clarias batrachus* and *Heteropneustes fossilis* are at the verge of extinction.

The species diversity was at its peak in post monsoon coinciding with the favourable post monsoon conditions such as sufficient water and ample food resources. The diversity was low in pre monsoon probably due to the shrinkage of water spread of the reservoir. Species richness was at its best in the month of July while species evenness was highest in late monsoon indicating an evenly distributed and rich fauna in the monsoon and post monsoon, respectively. The present paper reveals that among the total 42 fish species caught over the complete stretch, 08 species fall under carp fish group, 08 species fall under cat fish group and 26 species are categorized under miscellaneous group.

In present observation the fish species recorded from water bodies, the following are considered as economically important and cultivable fishes including *Cyprinus carpio*, *Labeo rohita*, *Cirrhinus mrigala*, *Catla catla*, *Mystus seenghala*, *Mystus oar*, *Channa striatus* and *Channa punctatus*. The current study has also shown that the reservoir inhabit the ornamental fishes like *Puntius sophore*, *Puntius chola* and *Puntius ticto*. 42 species among them 28 species were most popular as food fishes and posses' high economical value.

CONCLUSION

During the period of investigation (July 2008 - 09 to June 2009-10) 42 fish species belonging to 11 families and 21 genera were recorded. The results of the present study revealed that, Pakhanjoor reservoir being a freshwater resource supports a rich and diversified fish fauna. However, fish diversity of this reservoir is in declining mode due to several anthropogenic threats. Decline of fish population is also marked due to pollution, urbanization, scarcity of food, shelter and habitat destructions and progressive eutrophication of the water body.

In order to conserve these valuable resources, a holistic approach, integrating the concept of sustainable development and conservation measures should be adopted. Present study provides a comprehensive data on biodiversity, conservation status of ichthyofauna of this reservoir.

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REFERENCES

- Battul, P.N., Rao, R.A., Navale, K.R., Bagale, M.B. and Shah, N.V. 2007. Fish Diversity from Ekrukh Lake Near Solapur Maharashtra. *J. Aqua. Biol.*, 22 (2): 68-72.
- Day, F., 1871. Report on the fish and fisheries of the Freshwater of India, Govt. Central Press, Simla, p. 49.
- Khedkar, G.D. and Gynanath, G. 2005. Biodiversity and distribution of the fishes from the back waters of Issapur reservoir dist Yeotmal, Maharashtra State India. *Trends Life Sci. (India)*, 20(2): 117-126.
- Jayaram, K.C., 1999. The freshwater fishes of the Indian Region. Narendra Publishing House, Delhi, 6: 551.
- Jhingran, V.G., 1991. Fish and Fisheries of India Hindustan Publishing Corporation.
- Menon, A.G.K., 1999. Check List - Fresh Water Fishes of India. Occasional Paper No. 175. Records of the Zoological Survey of India, Kolkata, p. 366.
- Nelson, J.S., 2006. Fishes of the World. Fourth Edition, John Wiley & Sons, Inc. p. 1-601.
- Sakhare, V.B., 2001. Ichthyofauna of Jawalgoan reservoir. Maharastra, *Fishing Chimes*, 19 (8): 45-47.
- Ubarhande, S.B., Jagtap, J.T. and Sonawane, S.R., 2011. Ichthyofanal Diversity from Ambadi Dam, Taluka Kannad, District, Aurangabad (M.S.). *Recent Res. Sci. Technol.*, 3(6): 34-37.