

The Study Of Ichthyofaunal Diversity In Dandia Pond And Mahurband Pond In Kanker City Of North Bastar Kanker District, C.G. ,India

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Abstract: Aquatic biodiversity has enormous economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health. Humans have long depended on aquatic resources for food, medicines, and materials. Present study deals with the Ichthyofaunal diversity of dandia pond and mahurband pond of kanker city district north bastar kanker ,C.G.,India. Dandia pond is situated in the heart of Kanker city of Kanker district while Mahurband pond is located in the mahurbandpara of Kanker city. Both ponds are well protected by all sides. These water bodies specially constructed for irrigation and fishery purpose. The fish community of the both ponds were studied by monthly samples taken from July 2009 to June 2010. During study 39 fish species belong to 5 orders, 20 genera and 11 families were recorded from Dandia pond and 42 fish species belong to 5 orders, 22 genera and 11 families were recorded from Mahurband pond. Fish collections were done with gillnets of standardized dimensions with several mesh sizes. At present the water bodies sustain the populations of rohu and catla as the major food fishes while *Puntius spp.*, *Chela spp.*, *Mystus spp.*, *Mastacembelus armatus*, *Macrornathus aculeatus* and *Channa spp.* as the other commonly available species. The Indian cat fish *Clarias batrachus* & *Heteropneustes fossilis* are at the verge of extinction in this area. Similarly *Notopterus notopterus* and *N. Chitala* are becoming very rare species.

Keywords: Aquatic biodiversity, aesthetic value, , Conservation, Dandia pond, Ichthyofaunal diversity, Mahurband pond.

I. 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 on fisheries. The review of literature indicates that very limited information are available. Studies of available literature show that no attempted has been made to document the fish diversity along with their habitat, in this region.

II. Material And Methods

2.1 Study Area - Kanker district covers an area of 5285.01 sq. km and lies between North latitudes 19°09' and 20°06' and East longitudes 80°30' to 81°15' with population of 651333 as per 2001 census. The District was earlier part of Bastar district.



Index Map Of Kanker Distt.



Dandia Pond



Satalite Imag

2.1.1 Dandia Pond - Dandia pond is situated in the heart of Kanker city of Kanker block. It is believed that pond is about 75 years old and was constructed by Dandia kings. It is natural in origin and mainly rain fed. This water body is situated at $20^{\circ}16'25,19''N$ latitude and $81^{\circ}29'31,04''E$ longitude. The total catchment area of pond is 12.034 ha. Maximum, minimum and average water spread area is about 8.1019ha, 4.013ha, and 6.236 ha, respectively. The pond is well protected by the houses, roads, garden and a stone fencing wall at northern, southern, eastern and western bank. National high way no. 43 passes along its eastern bank a Shiv mandir is also situated on same bank.

A large number of people are daily taking bath as well as washing the cloths. Emergent submerged and floating macrophytes are in bulk in the pond. The main aquatic macrophytes vegetation are commonest species *Hydrilla verticillata*, *ceratophyllum demersus*, *Naisa*, *graminae*, *Patamogeton crispus* etc.

2.1.2 Mahurband Pond - Mahurband pond is located in the mahurbandpara of Kanker city of Kanker block. It is well protected by all sides. This water body is situated at $20^{\circ}16'49,69''N$ latitude and $81^{\circ}29'34,85''E$ longitude. At the southern part of the pond district veterinary hospital and civil line is situated. Northern part of the pond is covered by Albelapara village, while in east it is covered by agriculture land. The total catchment area of pond is 13.416 ha. Maximum, minimum and average water spread area is about 9.749ha, 5.416ha, and 7.391ha respectively. The pond is being used for irrigation and fishery purpose. It is an earthen type pond. Emerged, submerged and floating macrophytes are in bulk.



Mahurband Pond



Satalite image

III. Methods

Two ponds located in the Kanker city, north Bastar Kanker, C.G., India were selected for present survey. Fresh specimen were preserved and identified. Fishes collected alive through fishing net. 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.

IV. Result And Discussion

In the present investigation of fish fauna diversity the fishes collected from Pakhanjoor Reservoir comprised of 22 genera and 42 species belonging to 12 different families viz., Cyprinidae, Cobitidae, Siluridae Bagridae, Saccobrachidae, Clariidae, Mugilidae, Ophiocephalid, Centropomidae, Nandidae and Gobidae of 4 orders (Table 1 & Table 2).

Table 1. List of fish species found in ponds of Kanker North Bastar Kanker District, C.G. India (July 2009 to June 2010).

Sr	Order	Family	Species
1	Clupeiformes	Notopteridae	<i>Notopterus notopterus(Pallas)</i>
2	Cypriniformes	Cyprinidae	<i>Amblypharayngdon microlepis (Bleeker)</i>
3			<i>Amblypharayngdon mola (Ham.)</i>
4			<i>Catla catla (Ham.)</i>
5			<i>Cirrhinus mrigala (Ham.)</i>
6			<i>Ctenopharyngodon idela (Valenciennes)</i>
7			<i>Cyprinus capio (Linnaeus.)</i>
8			<i>Esomus danricus(Ham.)</i>
9			<i>Labeo calbasu (Ham.)</i>
10			<i>Labeo gonius (Ham.)</i>
11			<i>Labeo rohita (Ham.)</i>
12			<i>Oxygaster bacalica (Ham.)</i>
13			<i>Puntius amphibius (Valenciennes)</i>
14			<i>P. chola (Hami.)</i>
15			<i>P.conchoniuis (Ham.)</i>
16			<i>P.punctatus (Ham.)</i>
17			<i>P.sarana (Ham.)</i>
18			<i>P.sophor (Ham.)</i>
19			<i>P.ticto (Ham.)</i>
20			<i>Rasbora daniconius (Ham.)</i>
21			<i>Rasbora elanga (Ham.)</i>
22		Cobitidae	<i>L. guntea (Ham.)</i>
23			<i>Lepidocephalichthys thermalis(Cuvier&Valenciennes)</i>
24		Bagridae	<i>M.bleekeri (Day)</i>
25			<i>Mystus cavasius (Ham.)</i>
26			<i>M. tengara (Ham.)</i>
27		Saccobrachidae	<i>Heteropneustus fossilis (Bloch)</i>
28		Clariidae	<i>Clarias batrachus (Linn.)</i>
29	Ophiocephaliformes	Ophiocephalidae	<i>Channa gachua (Ham.)</i>
30			<i>Channa punctatus(Ham.)</i>
31			<i>Channa striatus (Bl.)</i>
32	Perciformes	Centropomidae	<i>Chanda ranga (Ham.)</i>
33			<i>Chanda nama (Ham.)</i>
34		Cichidae	<i>Telapia mossambica (Peters)</i>
35		Anabantidae	<i>Anabas testudinus (Bloch.)</i>
36			<i>Anabas cobojius (Ham.)</i>

37			<i>Colisa fasciata</i> (Bl.&Schn.)
38		Gobiidae	<i>Glossogobius giuris</i> (Ham.)
39	Mastacembeleform es	Mastacembelede	<i>Macrornathus aculeatus</i> (Bloch)
40			<i>M.armatus</i> (Lacepede)
41			<i>M.guntheri</i> (Day.)
42			<i>Mastacembelus panaculus</i> (Ham.)

Table – 2 Number and percent composition of families, genera and species under various order

	Order	Familis	Genera	Species	% of families in an order	% of genera in an order	% of species in an order
1	Clupeiformes	1	1	1	8.3	4.5	2.3
2	Cypriniformes	5	14	27	41.6	63.6	64.2
3	Ophiocephaliformes	1	1	3	8.3	4.5	7.1
4	Perciformes	4	5	7	33.3	22.7	16.6
5	Mastacembeleformes	1	1	4	8.3	4.5	9.5
	Total	12	22	42			

Percentage Contribution of Family, Genera and Species under 5 orders is given in the Table 2. As far as the genera and families to different orders are concerned order Cypriniformes consists of 14 genera under 5 families, Perciformes of 5 genera under 4 families, Clupeiformes and Ophiocephaliformes of single genus under single family each. while Mastacembeleformes found with 4 species under single family.(Fig. 1& Table 2).

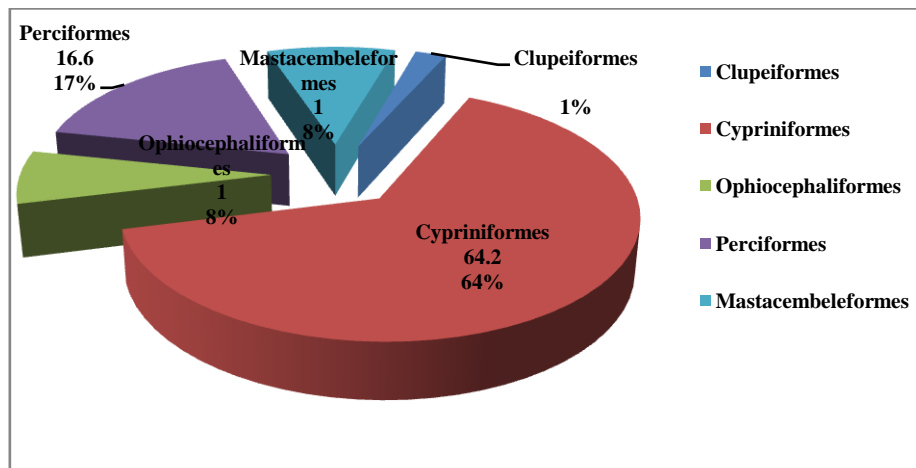


Fig. - Showing percent contribution of genera to the families

Order Cypriniformes has been found to be a major order with 27 species and percent contribution of 64.2%. Perciformes comes next with 7 species and percent contribution of 16.6 % Mastacembeleforme with 4 species and percent contribution of 9.5 % Ophiocephaliformes with 3 species and percent contribution of 7.1 %, and Clupeiformes with 1 species and percent contribution of 2.3 % . (Table –2) Sakhare (2001) reported 23 species from Jawalgaon reservoir Solapur district Maharashtra. Battul *et al.* (2007) reported 18 species from Ekrukch 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 34species 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 on 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*. 28 species among them 42 species were most popular as food fishes and posses high economical value.

V. Conclusion

During the period of investigation (July 2008 - 09 to June 2009-10) 42 fish species belonging to 12 families and 22 genera were recorded. The results of the present study revealed that, both ponds (Dandia and Mahurband) of Kanker city of North Bastar Kanker being a freshwater resource support a rich and diversified fish fauna. However, fish diversity of these ponds are 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 region.

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References

- [1]. 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.
- [2]. Day, F., 1871. Report on the fish and fisheries of the Freshwater of India, Govt. Central Press, Simla, p. 49.
- [3]. 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.
- [4]. Jayaram, K.C., 1999. The freshwater fishes of the Indian Region. Narendra Publishing House, Delhi, 6: 551.
- [5]. Jhingran, V.G., 1991. Fish and Fisheries of India Hindustan Publishing Corporation.
- [6]. 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.
- [7]. Nelson, J.S., 2006. Fishes of the World. Fourth Edition, John Wiley & Sons, Inc. p. 1-601.
- [8]. Sakhare, V.B., 2001. Ichthyofauna of Jawalgaon reservoir. Maharashtra, *Fishing Chimes*, 19 (8): 45-47.
- [9]. 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