



Ichthyofaunal diversity in Ansupa lake, Cuttack, Odisha, India

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ABSTRACT

Ansupa Lake is the largest freshwater lake of Odisha. An ichthyofaunal inventory was carried out in Ansupa Lake during January-September, 2015 to generate the present ichthyofaunal diversity. A total of 33 species belonging to 8 order, 18 families and 28 genera were recorded, where Perciformes was the most dominant order with 12 species. Cypriniformes was the second dominant order with 11 species, followed by Siluriformes (n=4), Osteoglossiformes (n=2), Beloniformes (n=1), Cyprinodontiformes (n=1), Synbranchiformes (n=1) and Tetradontiformes (n=1). Among the 33 recorded fishes, 29 species come under the least concern (LC) category, one species under data deficient (DD) and two species comes under near threatened (NT) category.

Key words: Ansupa lake, conservation status, diversity, fish

INTRODUCTION

The wellbeing of an aquatic ecosystem is assessed by its biodiversity. In aquatic ecosystems understanding of fish species diversity is complicated due to the existence of several factors and their combinations. Factors like the quality of fish resources, emigration, reproductive potential, physical and chemical characteristics of the aquatic environment are mainly responsible for the diversity and richness of species in aquatic systems. Fishes are the most diverse and abundant vertebrate in the world, which constitute about half of the total number of vertebrates in the world (Ghorbani et al., 2013). Fishes are regarded as the keystone species as their presence can determine the abundance and distribution of other organisms. They are also considered as excellent indicators of the water quality and presence of a particular species indicates about the habitat quality in which they occur. Being good source of food, protein value and significant

economic importance, they have great prominence in the life of humans in many nations.

There are 27997 species of fishes belonging to 4494 genera under 515 families found all over the world (Nelson, 2006). In the Indian region, 1570 species are known to be marine (Kar, 2003) and 1027 species are known to be freshwater inhabitants (Gopi et al., 2017). Odisha represents 186 species of freshwater fishes belonging to 11 orders, 33 families and 96 genera. Being the large freshwater lake of Odisha, Ansupa acts as a significant resource for the livelihood of villagers inhabited around the lake. Previous studies on the Ichthyofaunal diversity in Ansupa lake carried out by Sarkar et al. (2015) with record of 28 fish species belonging to 7 orders and by Das (2008), who reported a total of 24 fish species. To get a clear picture, the present study was carried out in Ansupa lake, to reveal the current status of Ichthyofaunal diversity.

MATERIALS AND METHODS

Ansupa Lake is the largest freshwater lake of Odisha spreading over an area of 382 acres. It is formed as a part of the river Mahanadi in the Banki block of Cuttack district lying in Athgarh Forest Division, within $20^{\circ} 26' 28.43''$ to $20^{\circ} 28' 34.44''$ latitude and $85^{\circ} 35' 56.74''$ to $85^{\circ} 36' 30.01''$ longitude. The surroundings of the lake is broadly undulating plain with isolated hill ranges such as Saranda (124 m) on the west, Bishnupur (65 m) on the East, Dhangarh (160 m) on the North and Betlapahara (105 m) on the Northwest and the dissected valleys. The lake is connected with Mahanadi in its Southern side with a channel known as Kabulana through which flood water of Mahanadi enters the lake. To the southwest lake is connected by another channel known as Huluhulana, which transverse through the borders of some of the village Kantapahara and Ghodabasa. The length of Ansupa lake is about 3 kilometres and breadth varies from 250 m to 500 m. The lake is surrounded by Malbiharpur, Ostia, Subarnapur and Anandapur villages. The lake has assumed international importance, as it is a home to several migratory as well as residential birds.

Das (2008) and Sarkar et al. (2015) revealed 24 and 28 species of fishes in Ansupa in their respective findings. There was considerable variation among the species reported. Thus, the present study was conducted to elucidate the ichthyofaunal diversity of Ansupa lake which may vary from time to time.

The present study was carried out from January to September, 2015. Information regarding the availability of fishes was collected through discussion with local fishermen, fish markets in nearby villages and by monthly survey in early morning (6 am to 7 am), when fishes were captured by the local fisherman community at the respective study area.

The fishes were collected by the fisherman and local people by operating various nets like gill

nets, cast nets, hook nets, drag nets, and locally used indigenous box traps. Fresh fish samples were photographed with the help of Nikon D3200 and Canon Camera. Some fish samples were preserved in 70% alcohol for further identification. Fishes were identified with the help of taxonomic keys from standard literature (Day, 1878; Talwar and Jhingran, 1991, 1992; Jayaram, 2013; Mohanty et al., 2015; Mogalekar and Canciyal, 2018).

RESULTS AND DISCUSSION

The study revealed presence of 33 species belonging to 8 orders, 18 families and 28 genera (Table 1; Fig. 1-28). Among the 33 species, Perciformes was the most dominant order with 12 species belonging to 7 families (Table 1). Cypriniformes was the second dominant order with 11 species belonging to 2 families, whereas, Cyprinidae with 10 species was the dominant family in the study area. Siluriformes represented by 4 species belonging to 4 families, whereas, Beloniformes, Cyprinodontiformes, Synbranchiformes and Tetradontiformes orders were represented by 1 species and 1 family. In a related study, Pati (2008) recorded 43 fish species belonging to 21 families. He further reported that among major carps, rohu (*Labeo rohita*) showed the maximum representation in the drag net catch followed by *Catla catla*, *Cirrihinus mrigala* and *Labeo calbasu*. Overall species compositions revealed the dominance of predatory and weed fishes in the fish fauna (Pati, 2008).

Out of the 33 fish species recorded from Ansupa lake, 32 species come under the IUCN Red List of threatened category. Among them 29 species come under the *least concern* (LC) category, one species under *data deficient* (DD), namely *Anabas testudineus* (Bloch, 1792) and two species comes under *near threatened* (NT) category namely *Chitala chitala* (Hamilton, 1822) and *Wallagoattu* (Bloch and Schneider, 1801).

Table 1. Checklist of recorded fish species from Ansupa Lake during the present study

Sl.	Order name	Family and Scientific name	Vernacular name/ Local name	Conservation status
1	Beloniformes	Belonidae		
		<i>Xenentodon cancila</i> (Hamilton, 1822)	Freshwater gar fish	LC
2	Cypriniformes	Cyprinidae		
		<i>Catla catla</i> (Hamilton, 1822)	Catla	LC
		<i>Labeo rohita</i> (Hamilton, 1822)	Rohu	LC
		<i>Cirrhinus mrigala</i> (Hamilton, 1822)	Mrigal	LC
		<i>Labeo calbasu</i> (Hamilton, 1822)	Kalbasu/Orange Finlabeo	LC
		<i>Systemus sarana</i> (Hamilton, 1822)	Olive Barb	LC
		<i>Puntius sophore</i> (Hamilton, 1822)	Pool Barb	LC
		<i>Cirrhinus reba</i> (Hamilton, 1822)	Reba carp	LC
		<i>Pethia phutunio</i> (Hamilton, 1822)	Spotted sail barb	LC
		<i>Rasbora daniconius</i> (Hamilton, 1822)	Slender Barb, BlacklineRasbora	LC
		<i>Amblypharyngodon mola</i> (Hamilton, 1822)	Molacarplet	LC
		Cobitidae		
		<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	Guntea loach	LC
3	Cyprinodontiformes	Poeciliidae		
		<i>Gambusia affinis</i> (Baird and Girard, 1853)	Mosquitofish	LC
4	Osteoglossiformes	Notopteridae		
		<i>Notopterus notopterus</i> (Pallas, 1769)	Bronze feather back	LC
		<i>Chitala chitala</i> (Hamilton, 1822)	Clown knifefish	NT
5	Perciformes	Channidae		
		<i>Channa marulius</i> (Hamilton, 1822)	Great snakehead	LC
		<i>Channa orientalis</i> (Bloch and Schneider, 1801)	Walking snakehead	NE
		<i>Channa punctata</i> (Bloch, 1793)	Spotted snakehead	LC

	<i>Channa striata</i> (Bloch,1793)	Common snakehead/ Striped snakehead	LC
	Ambassidae		
	<i>Chanda nama</i> (Hamilton,1822)	Elongate glass-perchlet	LC
	<i>Parambassis ranga</i> (Hamilton,1822)	Indian Glassy fish	LC
	Osphronemidae		
	<i>Colisa fasciatus</i> (Bloch and Schneider,1801)	Giant gourami	LC
	<i>Trichogaster lalius</i> (Hamilton,1822)	Dwarf gourami	LC
	Gobiidae		
	<i>Glossogobius giuris</i> (Hamilton,1822)	Tank goby	LC
	Badidae		
	<i>Badis badis</i> (Hamilton,1822)	Badis/Dwarf chameleon fish	LC
	Nandidae		
	<i>Nandus nandus</i> (Hamilton,1822)	Gangetic leaf fish	LC
	Anabantidae		
	<i>Anabas testudineus</i> (Bloch, 1792)	Climbing Perch	DD
5	Siluriformes	Heteropneustidae	
		<i>Heteropneustes fossilis</i> (Bloch,1794)	Stinging catfish LC
	Clariidae		
		<i>Clarias batrachus</i> (Linnaeus, 1758)	Walking catfish LC
	Siluridae		
		<i>Walla goattu</i> (Bloch and Schneider,1801)	Wallago NT
	Bagridae		
		<i>Mystus tengara</i> (Hamilton,1822)	Tengara catfish LC
6	Synbranchiformes	Mastacembelidae	
		<i>Macrognathus pancalus</i> (Hamilton,1822)	Barred spiny eel LC
7	Tetraodontiformes	Tetraodontidae	
		<i>Tetraodon cutcutia</i> (Hamilton,1822)	Ocellated puffer fish LC

DD: data deficient; LC: least concern; NE: not evaluated; NT: near threatened.



Fig. 1. *Trichogaster lalius*



Fig. 2. *Amblypharyngodon mola*



Fig. 3. *Channa striata*



Fig. 4. *Channa marulius*



Fig. 5. *Labeo rohita*



Fig. 6. *Systemus sarana*



Fig. 7. *Heteropneustes fossilis*



Fig. 8. *Chanda nama*



Fig. 9. *Xenentodon cancila*



Fig. 10. *Wallago attu*



Fig. 11. *Glossogobius giuris*



Fig. 12. *Catla catla*



Fig. 13. *Cirrhinus reba*



Fig. 14. *Rasbora daniconius*



Fig. 15. *Labeo calbasu*



Fig. 16. *Mystus tengara*



Fig. 17. *Gambusia affinis*



Fig. 18. *Macrognathus pancalus*



Fig. 19. *Notopterus notopterus*



Fig. 20. *Cirrihinus mrigala*



Fig. 21. *Nandus nandus*



Fig. 22. *Puntius sophore*



Fig. 23. *Pethia phutunio*



Fig. 24. *Badis badis*



Fig. 25. *Tetraodon cutcutia*



Fig. 26. *Lepidocephalichthys guntea*



Fig. 27. Ansupa Lake

Ansupa lake exists as a natural resource, creating distinct economic opportunities to a range of lake users such as forest users in the upstream, irrigation water users in the valley floor, community drinking water users in the settlements both in the upstream and the valley floor, boat operators, tourism entrepreneurs operating hotels and restaurants in and around the lake shore. The lake continues to exist as a common pool resource (Pattanaik et al., 2004). However, because of various environmental degradations and anthropogenic activities, such as siltation due to exploitation of

vegetation from nearby hills, poor system in inlet and outlet mechanism of water flow and increasing eutrophication, the condition of the lake has been deteriorated day by day. Thus, the rich floral and faunal diversity of lake is in significant threat and in imminent danger of being diminished. From the present scenario, there is an immediate need to take significant conservation measures and long-term monitoring on floral and faunal composition of the lake, to conserve the glorified diversity of the Ansupa lake.

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REFERENCES

- Das, C.R. 2008. Integrated sustainable environmental conservation and restoration of largest fresh water Ansupa Lake, a famous wetland of Orissa. In: M. Sengupta and R. Dalwani (eds.), *Proceedings of the 12th World Lake Conference*, pp. 1571-1577.
- Day, F. 1878. The fishes of India, being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon. Dawson, London **1**: 778; 2:195 plates; reprint 1958.
- Ghorbani, R., Abbasi, F., Molaei, M. and Naeimi, A. 2013. Identification and distribution of fish fauna in Kaboodval Stream (Golestan Province, Iran). *World J. Fish Mar. Sci.* **5**(5): 467-473.
- Gopi, K.C., Mishra, S.S. and Kosygin, L. 2017. Pisces. Chapter 33. In: K. Chandra, K.C. Gopi, D.V. Rao, K. Valarmathi and J.R.B. Alfred (Eds.) *Current Status of Freshwater Faunal Diversity in India*. Zoological Survey of India, Kolkata, India, pp. 527–570.
- Jayaram, K.C. 2013. *The Freshwater Fishes of the Indian Region*. Narendra Publishing House, New Delhi, pp. 1-551.
- Kar, D. 2003. Fishes of barak drainage, Mizoram and Tripura. In: A. Kumar, C.P. Bohra and L.K. Singh (eds) *Environment, Pollution and Management*. APH Publishing Corporation, New Delhi, India, pp. 203–211.
- Mogalekar, H.S. and Canciyal, J. 2018. Freshwater fishes of Orissa. *Indian J. Fish.* **6**(1): 587–598.
- Mohanty, S.K., Mishra, S.S., Khan, M., Mohanty, R.K., Mohapatra, A. and Pattnaik, A.K. 2015. Ichthyofaunal diversity of Chilika Lake, Odisha, India: an inventory, assessment of biodiversity status and comprehensive systematic checklist (1916–2014). *Check List* **11**(6): 1817.
- Nelson, J.S. 2006. *Fishes of the World*, 4th edn. John Wiley and Sons Inc, p. 601.
- Pati, D.K. 2008. Present status of fish and fishery in Ansupa Lake, Orissa. *J. Inland Fish. Soc. India* **40**(2): 83-84.
- Pattanaik, C., Swain, D., Choudhury, S.B. and Das, R. 2004. Conservation and restoration of wetlands in India: A strategic approach for sustainable management. In: *International Conference on 'Conservation, Restoration and Management of Lakes and Coastal wetlands'*, Bhubaneswar).
- Sarkar, S.D., Ekka, A., Sahoo, A.K., Roshith, C.M., Lianthuamluaia, Roychowdhury, A. 2015. Role of flood plain wetlands in supporting livelihood: A case study of Ansupa Lake in Odisha. *J. Environ. Sci. Comp. Sci. Eng. Technol. Sec. A* **4**: 819-826.
- Talwar, P.K. and Jhingran, A.G. 1991. *Inland Fishes of India*. Oxford and IBH Publishing Co-Pvt. Ltd., New Delhi, p. 1158.
- Talwar, P.K. and Jhingran, A.G. 1992. *Inland Fishes of India and Adjacent Countries*, Vol. 2. A.A. Balkenma/Rotterdam, Calcutta, India.