Research Journal of Animal, Veterinary and Fishery Sciences _____ISSN 2320 – 6535
Vol. **4(4),** 5-9, April **(2016)** *Res. J. Animal, Veterinary and Fishery Sci.*

Fish Biodiversity of Alwara lake of District Kaushambi, Uttar Pradesh, India

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Available online at: www.isca.in, www.isca.me
Received 18th March 2016, revised 9th April 2016, accepted 21st April 2016

Abstract

An attempt has been made to study the fish fauna naturally occurring in Alwara lake of district Kaushambi, Uttar Pradesh. The survey was focussed mainly on fish biodiversity and undertaken during all the 12 months of year 2014. A total of 89 species of fishes belonging to 45 genera, 21 families and 9 orders were identified. Cyprinidae were found most dominant family represented by 41 species followed by Bagridae with 8 species, Anabantidae with 5 species, Ophiocephalidae with 4 species, Schilbeidae with 4 species and Mastacembeleidae with 4 species. Rest other families were represented by 3 or 2 or 1 species. This was the first ever systematic survey on the fish diversity of this lake.

Keywords: Fish diversity, Fish fauna, Indian sarus crane, Conservation, Alwara lake.

Introduction

Fishes are cold blooded, aquatic vertebrates having cartilaginous or bony vertebral column, tubular nerve chord, ventral muscular 2- chambered heart, fins as paired appendages and gills for breathing. They constitute about half of the total number of vertebrates in the world.

The lake studied has good biodiversity as it is rich both in flora and fauna including fishes and vulnerable sarus crane and the occurrence of good bio-diversity is an index of healthy, growing, dynamic and economically efficient water body. The fishes are used not only as food, medicine but also as bio-indicators, research models, active links between ecosystems, entertainment and to mitigate vector borne diseases.

The lake under exploration is situated in the Yamuna basin of district Kaushambi, Uttar Pradesh which is a part of Gangetic Plain of India (northern region). In this lake, the water level falls during summer and winter but rises during rainy season. The lake has derived its name from village Alwara. Locally it is called Alwara Taal. The Alwara lake is surrounded by Paur Kashi Rampur in east, Tikara in the north, Shahpur in the south and the river Yamuna in the west.

The annual floods of adjacent river Yamuna bring about the vast openness of agricultural land after rainy season during winter and summer around the lake. It also turned out into an open land form and many irregular shapes of marshy wetland during non-flooding periods. The climatic change therefore influences to its vast openness, landscape ecology and biodiversity. The lake is a marshy riparian type perennial wetland, covering an area of several hundred hectares.

The vast openness around Alwara lake provides habitat for vulnerable Indian sarus crane[1-3] while local flora are used as fabricating material for the nest of this bird[4] and phytoplankton are used as food by aquatic birds.

Authors, through a detailed review of literature found that only a few researchers like Prakash *et al*[5-7] and Verma *et al*[8,9] studied the limnological, zooplanktonic and phytoplanktonic properties of the said lake however this lake was studied by Prakash *et al*[1,10,11] and Verma *et al*[2,3,12] for different aspects of Indian sarus crane on large scale. A huge number of studies have been made by different researchers on fish bio-diversity of various fresh water bodies in India during the last few decades such as Jayaram K.C.[13], Jhingran V.G.[14], Bhat A.[15], Shukla *et al.*[16], Bhat *et al*[17] and Gowda *et al*[18] but detailed information about fish diversity in and around Alwara lake is yet not available as such. Our study was therefore first ever systematic survey on the fish diversity of this lake.

Study Area: The Alwara lake is a part of village Alwara, which is located in Sarsawan block of Manjhanpur tahsil of Kaushambi district of Uttar Pradesh (Figure-1,2). The lake is more than 75 km away from Allahabad, 25 km from Manjhanpur (headquarter of district Kaushambi) and 290 km from Lucknow by road. Its nearest railway station is Bharwari at a distance of 35 km and nearest airport Bamrauli (Allahabad) is at a distance of 70 km. It is situated between the latitude $25^0$24'05.84"S – $25^0$25'10.63"N and longitude $81^0$11'39.49"E-$81^0$12'57.95"W with altitude MSL – 81.08 meter.

Materials and Methods

Fishes were caught and collected for the present study from few sites of Alwara lake by hand-nets, gill nets, cast nets, hooks, drag nets with the help of local people and fisherman mainly during the time of fishing. Investigations regarding fish capture

and collection were conducted twice in a month for the period of one year from January 2014 to December 2014.

Fishes were identified by using the standard keys of Mishra K.S.[19], Day F.[20], Jhingran V.G.[21], Jayaram K.C.[22] and Srivastava G.J.[23]. Interaction with local people and fishermen communities of embankment areas also assisted the authors in various ways for data collection and identification.

Results and Discussion

During the study period, a total of 89 species of freshwater fishes belonging to 9 orders, 21 families and 45 genera were recorded from the sampling sites. The collected fish species including their order, family and zoological names are shown in the Table-1.

Fish fauna of the lake studied belong to 9 orders *namely* Cypriniformes, Siluriformes, Perciformes, Ophiocephaliformes, Mastacembeliformes, Clupeiformes, Mugiliformes, Synbranchiformes and Beloniformes.

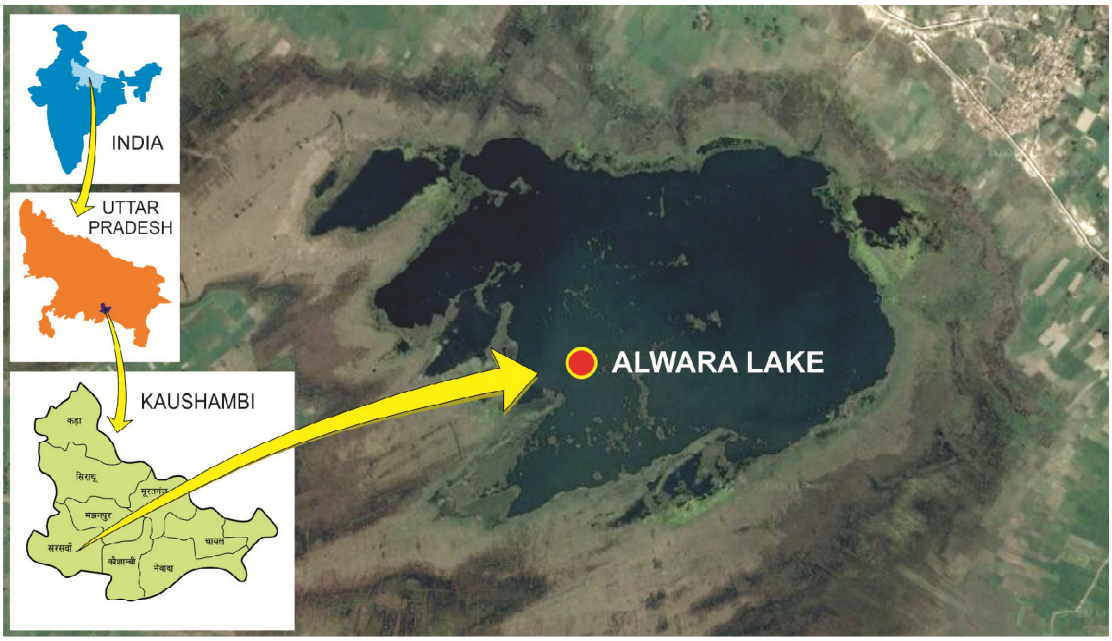

Figure-1
Study Area

Figure-2
Alwara lake

Table-1
Different fish species recorded from Alwara lake in 2014

Order	Family	Zoological name
Cypriniformes	Cyprinidae	*Catla catla*
		Labeo rohita
		Labeo calbasu
		Labeo bata
		Labeo boga
		Labeo dero
		Labeo gonius
		Labeo angra
		Labeo pangusia
		Cirrhinus mrigala
		Cirrhinus reba
		Cirrhinus chaudhryi
		Cyprinus carpio
		Aspidoparia morar
		Aspidoparia jaya
		Chela atpar
		Chela laubuca
		Amblypharyngodon mola
		Amblypharyngodon microlepis
		Tor tor
		Tor putitora
		Tor mussullah
		Tor ishudree
		Barilius bama
		Barilius modestus
		Barilius bendelisis
		Barilius bota
		Puntius sophore
		Puntius conchonius
		Puntius ticto
		Puntius sarana
		Puntius chola
		Rasbora elanga
		Rasbora daniconius
		Chaguius chagunio
		Danio devario
		Esomus danricus
		Garra gotyla
		Osteobrama cotio
		Oxygaster bacaila
		Oxygaster gora
	Cobitidae	*Lepidocephalichthys guntea*
	Botiidae	*Botia dario*
Siluriformes	Bagridae	Mystus seenghala
		Mystus cavasious
		Mystus bleekeri
		Mystus menoda
		Mystus tengara
		Mystus vittatus
		Mystus aor
		Rita rita
	Siluridae	*Wallago attu*
		Ompak pabda
	Sisoridae	*Bagarius bagarius*

Order	Family	Zoological name
	Clariidae	*Clarias batrachus*
		Clarias gareipinous
	Saccobranchidae	*Heteropneustes fossilis*
	Schilbeidae	*Ailia coila*
		Clupisoma garua
		Eutropiichthys murius
		Eutropiichthys vacha
Ophiocephaliformes	Ophiocephalidae	*Channa punctatus*
		Channa gachua
		Channa marulius
		Channa striatus
	Gobiidae	*Glossogobius giuris*
Perciformes	Centropomidae	*Chanda nama*
		Chanda ranga
		Chanda baculis
	Nandidae	*Nandus nandus*
		Badis badis
	Anabantidae	*Anabas testudenius*
		Anabas scandens
		Colisa chuna
		Colisa fasciatus
		Colisa lalius
Mugiliformes	Mugilidae	*Rhinomugil corsula*
		Sicamugil cascasia
Synbranchiformes	Amphipnoidae	*Amphipnous(Monopterus) cuchia*
Clupeiformes	Notopteridae	*Notopterus notopterus*
		Notopterus chitala
	Clupeidae	*Gudusia chapra*
		Gonialosa manmina
	Engraulidae	*Setipinna phasa*
Beloniformes	Belonidae	*Xenentodon cancila*
Mastacembeliformes	Mastacembeleidae	*Mastacembelus pancalus*
		Mastacembelus unicolar
		Mastacembelus armatus
		Mastacembelus aculeatus

In present investigation Cyprinidae family was the most dominant group representing 41 species followed by Bagaridae family representing 8 species and then by Anabantidae family representing 5 species. Families Ophiocephalidae, Schilbeidae and Mastacembeleidae were represented by 4 species each while family Centropomidae was represented by 3 species. The families Siluridae, Clariidae, Nandidae, Mugilidae, Notopteridae, Clupeidae were represented by 2 species each. Moreover, only one species was recorded per family for Cobitidae, Botiidae, Sisoridae, Saccobranchidae, Gobiidae, Amphipnoidae, Engraulidae and Belonidae during our survey. In this way, authors recorded 89 different species.

Conclusion

Present study is the first ever documentation of fish fauna of Alwara lake located in Kaushambi district of Uttar Pradesh. Though the lake is affected by different climatic and anthropogenic hazards including pollution, habitat degradation, predation etc. yet it has fish population in abundance and its diversity is maintained from river Yamuna. Thus, it has a huge fishery development potential.

Since the ecological condition of this lake also supports the survival of several near threatened fish species and endangered species like Indian sacred lotus and Indian sarus crane, hence there is a compulsory need to understand the conservation priorities and to design and implement conservation action plan. It will save the genetic resources of fish as well as sarus crane from the danger of extinction. Moreover, authors recommend the declaration of the entire Alwara lake as "Fish Sanctuary" and “Sarus Safe Zone” for the conservation of these threatened species. Huge exploitation of natural resources of the Alwara lake should be reduced.

Acknowledgements

Authors are highly grateful to the Principal K.A.P.G. College, Allahabad for providing necessary laboratory facilities. We are

also obliged to local Gram Pradhans and authorities of district administration Kaushambi, Uttar Pradesh for their co-operation during entire survey programme**.**

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