

## Biodiversity Assessment of Balapur Pond of District Prayagraj (U.P.) with Special Reference to Vertebrates and Angiosperms

ASHOK KUMAR VERMA

Department of Zoology, Government Post Graduate College, Saidabad Prayagraj, Uttar Pradesh, India.

### Abstract

The present study was undertaken to record the diversity of Balapur pond of the Prayagraj district of Uttar Pradesh with special reference to vertebrates and angiosperms. The Balapur pond was surveyed in detail once in a month for a period of one year from January 2018 to December 2018. The survey reflects a rich and flourishing biodiversity of the pond studied including 40 chordate species and 38 species of angiosperms. The notable chordate diversity includes 12 species of fishes, 2 species of amphibians, 7 species of reptiles, 11 species of birds and 8 species of mammals. Besides, several species of annelids, crabs, butterflies, moths, grasshoppers, ants, termites, lobsters, snails, other gastropods, planktons, algae, bryophytes and pteridophytes have also been observed.



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Wetland.

### Introduction

A vertebrate has notochord during its embryonic development which is replaced by a cartilaginous or bony vertebral column or backbone in adults. The subphylum Vertebrata comprises seven classes of living animals *namely* Cyclostomata, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves and Mammalia. First four are popularly known as Anamniota and last three as Amniota (Verma and Praksh, 2020a). The angiosperms are well developed and highly evolved group of plants in


which there is seeds enclosed within the fruit. They have well differentiated root, stem and leaves and also have well developed vascular tissue.

India is a developing and agriculture dominating country. Most of its population depends upon agriculture. In India, a large number of ponds, lakes and reservoirs occur naturally but most of them are not being utilized properly due to their improper and insufficient hydrobiological studies. A proper and systematic hydrobiological study is very important

**CONTACT** Ashok Kumar Verma ✉ akv.gdcz@gmail.com 📍 Department of Zoology, Government Post Graduate College, Saidabad Prayagraj, Uttar Pradesh, India.



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to understand the metabolic activities in the aquatic ecosystem especially pond. The pond contains standing water that provides habitat for wetland biota i.e. plants and animals.

Wetlands constitute one of the most productive ecosystems and play a significant role in the regional ecological sustainability. They have been an essential part of human civilization meeting many crucial needs for life such as drinking water, food, fodder, energy supply, flood storage, transport, recreation, biodiversity, and climate stabilization. The cross cultural, economic and ecological values of wetlands provide a fine blend of past, present and future of human descend, existence, and future perspectives of sustainability.

Prakash *et al.*, (2015), Prakash and Verma (2015, 2016), Verma and Prakash (2016) performed the limnological and ichthyological studies of Alwara Lake of Kaushambi (U.P.). Verma (2016, 2017, 2019a, 2019b, 2020a), Verma and Prakash (2017, 2020b), Sugumaran *et al.*, (2020) and Bhagde *et al.*, (2020) studied the limnological parameters as well as distribution and conservation status of fishes in the various lentic fresh water bodies of Uttar Pradesh. The present exploration was undertaken to assess

the biodiversity of Balapur pond of the Prayagraj district of Uttar Pradesh with special reference to vertebrates and angiosperms. This study was conducted during a period of one year from January 2018 to December 2018. The pond studied has rich and flourished biodiversity.

#### Materials and Methods

The pond studied is natural and perennial, located on south side of the village Balapur. It is located in Koraon block and tahsil of Prayagraj district of Uttar Pradesh (image 1). The pond studied is situated at a distance of approximately 62 kilometers from Prayagraj district HQ. Balapur is a small village of about 800 population size, surrounded by Janakpur in east, Paitiha in south west, Banshipur in north east and Murlipur in south. Generally summer begins in the month of March and continues till mid July. In and around this Balapur village, monsoon begins mostly in last July and more or less continues till mid September. Winter season normally starts in mid November and continues till mid February. Minimum temperature was recorded as 14.2 in January and maximum in July as 35.5°C. This pond (photo 1) is extended in more than two hectares, not only used for irrigation, fish culture but also used as a source of drinking water for animals.



**Image 1. Location of study area in Prayagraj district.**

Balapur pond was surveyed and studied in detail to record the vertebrates and angiosperms diversity once for a month along the period of one year from January 2018 to December 2018. The fishes

and amphibians were caught and collected for the present survey by hand-nets, gill nets, cast nets, hooks, drag nets with the help of local people and animal catchers. The survey was conducted during

daytime from 7 am to 7 pm and all caught animals were released in to the pond after identification. Author did not need to collect the reptiles, birds and mammals as they were easily recognisable even from a long distance. People of local communities of adjoining areas also helped the author in several ways including hospitality; collection and identification of vertebrates and angiosperms.

A standard survey method of Burbridge (1994) was followed for field work. Fishes were identified

by using the standard keys of Mishra (1959), Day (1989), Jhingran (1991), Jayaram (1999) and Srivastava (1998).

Dutta (1997) and Dinesh *et al.*, (2019) helped to identify amphibians while reptiles with the help of Aengals *et al.*, (2012). Birds were identified with the help of Ali (1988) while angiosperms were identified with the help of Sambamurty (2010).



**Photograph 1: A view of Balapur pond in Prayagraj district**

**Results and Discussion**

The author recorded (a) 40 species of vertebrates: 12 species of fishes (Verma 2019b), 2 species of

amphibians, 7 species of reptiles, 11 species of birds, 8 species of mammals and (b) 38 species of angiosperms from Balapur pond (table 1).

**Table1: List of Vertebrates and Angiosperms Recorded from Balapur Pond in the year 2018.**

FISHES			
S.No.	Biological name	Common name	Family
1.	<i>Catla catla</i>	Bhakur	Cyprinidae
2.	<i>Labeo rohita</i>	Rohita	Cyprinidae
3.	<i>Labeo calbasu</i>	Karaunchh	Cyprinidae
4.	<i>Cyprinus carpio</i>	Common carp	Cyprinidae
5.	<i>Cirrhinus mrigala</i>	Naini	Cyprinidae
6.	<i>Mystus seenghala</i>	Tengara	Bagridae
7.	<i>Rita rita</i>	Rita	Bagridae
8.	<i>Wallago attu</i>	Pardni	Siluridae
9.	<i>Clarias batrachus</i>	Mangur	Clariidae
10.	<i>Heteropneustes fossilis</i>	Singhi	Saccobanchidae

11.	<i>Channa punctatus</i>	Saura	Ophiocephalidae
12.	<i>Gudusia chapra</i>	Suhia	Clupeidae
		<b>AMPHIBIANS</b>	
13.	<i>Hoplobatrachus tigerinus</i>	Indian bullfrog	Dicroglossidae
14.	<i>Duttaphrynus melanostictus</i>	Common Indian toad	Bufoinidae
		<b>REPTILES</b>	
15.	<i>Calotes versicolor</i>	Garden lizard	Agamidae
16.	<i>Uromastix hardwickii</i>	Spiny tailed lizard	Agamidae
17.	<i>Hemidactylus flaviviridis</i>	House gecko	Gekkonide
18.	<i>Naja naja</i>	Indian Cobra	Elapidae
19.	<i>Bungarus caeruleus</i>	Krait	Elapidae
20.	<i>Eryx johnii</i>	Red Sand Boa	Boidae
21.	<i>Varanus bengalensis</i>	Indian Monitor lizard	Varanidae
		<b>BIRDS</b>	
22.	<i>Pavo cristatus</i>	Peacock	Phasianidae
23.	<i>Eudynamis scolopaceus</i>	Koel	Cuculidae
24.	<i>Acridotheres tristis</i>	Common myna	Sturnidae
25.	<i>Passer domesticus</i>	House Sparrow	Passeridae
26.	<i>Corvus splendens</i>	House Crow	Corvidae
27.	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Pycnonidae
28.	<i>Psittacula eupatria</i>	Parrot	Psittaculidae
29.	<i>Columba livia</i>	Common Rock Pigeon	Columbidae
30.	<i>Bubo bubo</i>	Owl	Strigidae
31.	<i>Gyps indicus</i>	Indian Vulture	Accipitridae
32.	<i>Egretta garzetta</i>	Indian Egret	Ardeidae
		<b>MAMMALS</b>	
33.	<i>Oryctolagus cuniculus</i>	Rabbit	Leporidae
34.	<i>Sorex araneus</i>	Shrew	Soricidae
35.	<i>Rattus rattus</i>	Rat	Muridae
36.	<i>Mus musculus</i>	House mouse	Muridae
37.	<i>Funambulus palmarum</i>	Squirrel	Sciuridae
38.	<i>Sus scrofa</i>	Pig	Suidae
39.	<i>Boselaphus tragocamelus</i>	Nilgai	Bovidae
40.	<i>Lutrogale perspicillata</i>	Smooth-coated Otter	Mustelidae
		<b>ANGIOSPERMS</b>	
41.	<i>Eichhornia crassipes</i>	Common water hyacinth	Pontederiaceae
42.	<i>Monochoria vaginalis</i>	Pickrel weed	Pontederiaceae
43.	<i>Hygroryza aristata</i>	Asian water grass	Poaceae
44.	<i>Vetiveria zizanioides</i>	Vetiver	Poaceae
45.	<i>Apluda mutica</i>	Mauritian grass	Poaceae
46.	<i>Pistia stratiotes</i>	Water cabbage	Araceae
47.	<i>Spirodela polyrhiza</i>	Common duckweed	Araceae
48.	<i>Wolffia arrhiza</i>	Rootless duckweed	Araceae
49.	<i>Lemna perpusilla</i>	Minute duckweed	Araceae
50.	<i>Ludwigia adscendens</i>	Water primrose	Onagraceae
51.	<i>Nelumbo nucifera</i>	Indian lotus	Nelumbonaceae
52.	<i>Nymphaea stillata</i>	Water lily	Nymphaeaceae
53.	<i>Hydrilla verticillata</i>	Water thyme	Hydrocharitaceae
54.	<i>Najas graminea</i>	Ricefield water-nymph	Najadaceae
55.	<i>Potamogeton crassipes</i>	Clasping leaf pondweed	Potamogetonaceae

56.	<i>Vallisneria spiralis</i>	Eel grass or tape grass	Hydrocharitaceae
57.	<i>Ceratophyllum demersum</i>	Hornwort or coontail	Ceratophyllaceae
58.	<i>Alternanthera sessilis</i>	Sessile joy weed	Amaranthaceae
59.	<i>Glinus lotoides</i>	Lotus sweetjuice	Molluginaceae
60.	<i>Boerhavia diffusa</i>	Red spiderling	Nyctaginaceae
61.	<i>Canscora decurrens</i>	Bhui neem or kilwar	Gentianaceae
62.	<i>Centella asiatica</i>	Indian pennywort	Apiaceae
63.	<i>Eleocharis dulcis</i>	Chinese water chestnut	Cyperaceae
64.	<i>Cyperus spp.</i>	Nutgrass	Cyperaceae
65.	<i>Fimbristylis littoralis</i>	Lesser fimbristylis	Cyperaceae
66.	<i>Ipomoea aquatica</i>	Swamp Morning Glory	Convolvulaceae
67.	<i>Evolvulus assenoides</i>	Slender dwarf morning glory	Convolvulaceae
68.	<i>Peristrophe bicalyculata</i>	Kali Anghedi	Acanthaceae
69.	<i>Hygrophila auriculata</i>	Kokilaksha	Acanthaceae
70.	<i>Juncus bufonius</i>	Toad rush	Juncaceae
71.	<i>Limnophila indica</i>	Indian Marshweed	Plantaginaceae
72.	<i>Nymphoides cristata</i>	Water snowflake	Menyanthaceae
73.	<i>Heliotropium spp.</i>	Indian heliotrope	Boraginaceae
74.	<i>Polygonum spp.</i>	Drooping knotweed	Polygonaceae
75.	<i>Sonchus arvensis</i>	Perennial sowthistle	Asteraceae
76.	<i>Tephrosia pumila</i>	Indigo sauvage	Fabaceae
77.	<i>Trianthema portulacastrum</i>	Horse Purslane	Aizoaceae
78.	<i>Typha angustifolia</i>	Lesser bulrush	Typhaceae

All the 12 species of fishes recorded are edible. People of the Balapur and adjoining areas hunt some birds and rabbit for flesh. Indian cobra and krait are poisonous reptiles. Most of the species of birds and few species of mammals are hunted for food. On the basis of rate of decline, population size, area of geographic distribution and degree of population, distribution fragmentation etc., most of the above species has already been evaluated by IUCN (International Union for Conservation of Nature) Red List. Most of the species recorded during exploration belong to least concern (LC) to critically endangered (CR) categories (Verma, 2020b, 2020c). Out of the 38 species of angiosperms recorded; 22 species are rooted amphibians, 7 free floating, 4 rooted floated, 4 rooted submerged and 1 suspended hydrophytes. Besides, pteridophytes, bryophytes, algae, several species of annelids, crabs, butterflies, moths, grasshoppers, ants, termites, lobsters, snails, other gastropods and a number of diatoms and planktons have also been observed in and around the pond.

### Conclusion

The author thus, recorded a total of 40 species of chordates including 12 species of fishes, 2 species

of amphibians, 7 species of reptiles, 11 species of birds, 8 species of mammals and 38 species of angiosperms in and around the Balapur pond. Moreover, a number of species of annelids, crabs, butterflies, moths, grasshoppers, ants, termites, lobsters, snails, other gastropods and pteridophytes, bryophytes, algae, planktons, diatoms have also been observed. Considering the importance of rich biodiversity and highly productive ecosystem, the author suggests and strongly recommends for a complete study of the said pond both for diversity of plants and animals on large scale so as to offer a natural abode to the animals, a beautiful habitat to the plants and ecological gift to the environment.

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**Conflict of Interest**

The authors do not have any conflict of interest.

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