



STUDY OF AVIFAUNAL DIVERSITY OF GADCHIROLI LAKE, GADCHIROLI, MAHARASHTRA

G.N. Bhaisare¹ and N.V. Harney²

¹Department of Zoology, S.J.S.P.M Arts, Commerce & Science College, Dhanora, Dist-Gadchiroli (M.S.) India

²Department of Zoology, Nilkanthrao Shinde Science and Arts College, Bhadrawati Dist-Chandrapur (M.S.) India.

Corresponding Email: geeta.bhaisare93@gmail.com

Communicated : 12.01.2023

Revision : 16.02.2023 & 23.02.2023

Published : 30.05.2023

Accepted : 22.03.2023

ABSTRACT:

The objective of the present study was to investigate the avifaunal biodiversity in and around the Gadchiroli lake in the Gadchiroli town of Maharashtra State. The avifaunal diversity of Gadchiroli lake was studied from January 2022 to December 2022. The investigation is based on visual encounter surveys. The Gadchiroli lake is situated in the centre of the town and has aquatic vegetation that harbours a variety of birds. Nowadays, increased anthropogenic activities and environmental changes have affected the biodiversity of this lake. During the investigation total 64 species of birds including water and land birds were recorded. These belonging to 11 orders and 33 families. Out of the total 53% species were residential, 31% species were winter visitors, 11% of them were summer visitors, and 5% species were passage visitors. The maximum species were sighted during the winter season followed by the summer and monsoon seasons respectively. However, increased human interference and urban activities at the lake is definitely a proven threat to the biodiversity of the birds. Urgent steps must be taken to regulate such destructive activities for the conservation of avifaunal biodiversity.

Keywords :- Biodiversity, Avifauna, Gadchiroli lake, Human Interference, Conservation.

INTRODUCTION :

Birds are often common denizens of the ecosystem and they have been considered as indicator species of inhabited areas (Blair, 1999). Aquatic birds are very good indicators of human impact on the freshwater ecosystem. Activities of waterbirds are considered indicators of the quality of the lake ecosystem and form the terminal links in many aquatic food chains, and as a result, they reflect changes originating in several different ecosystem components (Custer and Osborne, 1977). The various lakes in any city serve as a balancing reservoir for sustaining native flora and fauna (Grimmett and Inskipp, 2007). The aquatic bird communities of any lake area are one of the important bioindicators of that lake ecosystem, which should be protected to conserve the biodiversity and environment. It should be an ideal habitat for

local and migratory bird species. Species interactions are considered important in the process of understanding the overall ecology of that waterbody. In any given habitat, there are a number of biotic and abiotic factors, which may influence the distribution, abundance, and interactions among species (McParland and Paszkowski, 2007). Lake ecosystems are essential to human civilization (Ramachandra and Ahalya, 2004).

Urbanization is a universal phenomenon and its negative effects on biodiversity, especially in terms of irrecoverable habitat fragmentation and loss, and extermination of native and migratory species are slowly being understood by the urban populace (Mckinney, 2002). The natural aquatic environment has been affected severely by anthropogenic activities. Water pollution adversely affects the aquatic flora and fauna in

rivers, lakes, streams, and ponds. A highly degraded water body represents a typical urban wetland polluted by direct entry of domestic sewage. In India, there are numerous natural and artificial ponds, reservoirs, and lakes (Rao, 1975). It is estimated that 50 to 70% of the pollutant that leads to rivers, lakes, and streams is from domestic sewage in India. The literature survey indicates that various aspects of study concerning aquatic birds have been conducted in various regions of the world. However, the ecology of aquatic birds and the effects of aquatic vegetation on them have been less dealt with.

Gadchiroli lake has played an important role as a source of drinking water in history. But nowadays, it is surrounded by battlements due to which heavy of solid waste is seen. Information on the aquatic bird communities of this lake and their relationship with physical parameters/ habitat factors are totally unavailable. And most of therecent studies focused on Physico-chemical parameters. In view of the present lack of information on the aquatic bird population of this lake, it was proposed to conduct detailed studies on the aquatic bird communities to record the occurrence, biodiversity, and seasonal abundance and to investigate the relationship among aquatic bird communities, physical parameters and habitat factors of this lake to investigate the proper management and conservation methods for both the lake environment and aquatic bird species in this region.

MATERIALS AND METHODS :

STUDY AREA :

The study area i.e., Gadchiroli Lake is a perennial lake located inthe Gadchiroli district headquarters on the easternmost part of the Maharashtra State. The lake is easily accessible by tar roads throughout the year.

The location of the Lake is 20° 11' 12.0" N and 79° 5'46.2", and it is situated about 670 feet

MSL. The lake is surrounded by urban settlements. The Gadchiroli district is bounded by the Bhandara district in the North, Chandrapur district in the West, Adilabad and Karimnagar districts of Andhra Pradesh in the West and South, respectively, and Rajnandgaon and Baster districts of the Chhattisgarh State border in the East.

The total watershed area of the Gadchiroli Lake is about 10 sq. km. The highest temperature is usually reached up to 46° C in the months of May and June. The Gadchiroli district receives maximum rainfall during the monsoon months of June, July, August, and September excluding the summer months, when extremely hot weather prevails with very scanty rainfall consequential to the recurrent water storage.

The maximum, minimum and average rainfall received by the Gadchiroli Taluka from 2004 to 2015 was 2005.6mm, 846.2mm, and 1366.32mm, respectively (gadchiroli.gov.in-enmraingad8). The climate of the study area follows a seasonal monsoon weather pattern with dry tropical weather.

METHODOLOGY :

The bird survey was conducted from January 2022 - December 2022 to examine the avifauna of Gadchiroli lake. A visual encounter survey was conducted (Crump and Scott, 1994; Manley et al., 2005; Joshi, 2014) for a direct count of the birds by walking along the bank of the lake (Rajashekara and Venkatesha, 2010). Weekly visits to the site were made for one year and an average of 4 weeks was accounted for a month (Wanjari, 2012). The observation of the birds was carried out inthe early morning and evening hours by using field binoculars (Olympus 8×40) during the daytime depending on the light conditions (Namgail et al., 2009). The stationary and double counting methods were also adopted wherever necessary (Gregory et al., 2004). After detection, specimens were photographed by Canon EOS 200D DSLR camera, (Lens 55-

250mm) and identified with the help of keys and methods suggested by Ali (2002), Grimmett et al. (2011), and Manakadan et al. (2011). The residential status of the waterbirds was assigned with reference to each study lake on the basis of the presence or absence method followed by Ali (1996). The scientific names, common names, family sequence, and IUCN status were ascertained by BirdLife International (2009) and Grimmett et al. (2011). The residential local status of the bird species was categorized on the basis of the observations and have been assigned strictly with reference to the study area on the basis of presence or absence method as followed by Thakur et al. (2010); Koli (2014); Shekhawat and Bhatnagar (2014) as (R – Resident, WV – Winter Visitor, SV – Summer Visitor, PV – Passage Visitor).

The data recorded in each survey were analyzed for assessing the abundance status of the bird species on the basis of the percent frequency (encounter rates) of sightings as followed by the techniques developed by Kasambe and Wadatkar (2007), Kasambe and Sani (2009), <http://jbsd.in> 142 ISSN: 2229-3469 (Print) Bioscience Discovery, 7(2):140-146, July - 2016 Tak et al. (2010) and Priyanka (2012). (Vc – Very Common: 75-100%, C – Common: 50-74%, Uc – Uncommon: 25-49%, O – Occasional: 5-24%, and Rr – Rare:<5%.

OBSERVATION:

During the present investigation total 64 species of birds were recorded. Table no. 1 given bellow enumerates the list of bird species with Scientific name, Common name, Order, Family and their Residential and Abundance status.

RESULT & DISCUSSION :

During the present investigation, 64 species of birds were recorded belonging to 11 orders and 34 families. Among the recorded species of birds, 26 species belong to order Passeriformes, 07 species belong to Coraciiformes and Charadriiformes each, 06 species belong to

Ciconiiformes, 04 species belong to Pelecaniformes, 03 species belong to Cuculiformes, Columbiformes, Accipitriformes and Gruiformes each, 01 species belong to Psittaciformes and Apodiformes each.

Among the recorded species of birds, 01 species belongs to families Corvidae Hirundinidae and Dicruridae each, 3 species belong to Laniidae, 2 species belongs to Motacillidae, 4 species belong to Muscicapidae, 1 species belong to Nectariniidae, Oriolidae Passeridae, and Pynonotidae each, 3 species belong to Sturnidae, 1 species belongs to Leiothrichidae, 2 species of Estrildidae, 3 species of Cisticolidae, 1 species of Paradoxornithidae, 1 species of Bucerotidae and Coraciidae, 2 species of Meropidae, 3 species of Alcedinidae, 2 species of Jacanidae, Charadriidae and Scolopacidae each, 1 species of Recurvirostridae, 5 species of Ardeidae and 1 species of Ciconiidae, 1 species of Anhingidae and Phalacrocoracidae, 2 species of Threskiornithidae, 1 species of Cuculidae, 3 species of Columbidae, 3 species of Accipitriformes, and Rallidae, 1 species of Psittaculadae and 1 species of Apodadae.

As per the observation, out of the total 53% species were residential, 31% species were winter visitors, 11% of them were summer visitors, and 5% species were passage visitors. Out of Sixty four species, 02 species were abundant, 55 species were common, 06 species were uncommon, 20 species were winter visitors, 07 species were summer visitors, 03 species were passage visitors and 01 species was rare for this site. During this study period, Order Passeriformes has seen the most dominantly with a number of 26 species.

CONCLUSION :

The avifaunal diversity of Gadchiroli lake confirms the lake as a suitable habitat for residential and common birds in Gadchiroli city. The lake and its surrounding area provide a

roosting ground for the residential birds. However, human interference is a major threat to this lake and the flora, and fauna in and around the lake. One third area of lake is surrounded by city so people who reside nearby it contaminate the water of the lake by throwing polythene bags and garbage in and around the lake. In the festival season, immersion of God idols made of harmful chemicals and colours has spoilt the water resulting in declining the quality of water and also destruction of the habitat of birds.

Since the water depth, water quality and trophic structure are the important habitat characteristics that influence the abundance and diversity of aquatic birds in lakes, the proper and regular maintenance of this lake would further increase the aquatic bird population. The results of this study will help to conserve waterbird population in the urban region of Gadchiroli. Therefore, regulation of these anthropogenic activities is need of an hour for the conservation of avifaunal biodiversity.

REFERENCES:

- Ali, S. (2002). The book of Indian birds, Thirteenth Revised Edition, Bombay Natural History Society Oxford University Press, Mumbai.
- Grimmet, R., Carol, I. & Inskipp, T. (1999). A pictorial guide to the birds of the Indian Subcontinent, Oxford University Press, Mumbai.
- G.T. Kedar & G.P. Patil (2012). Study of Avifaunal Diversity of Gandhi Sagar Lake, Nagpur, Maharashtra, Vidyabharati International Interdisciplinary Research Journal 1(2) 40-46 ISSN2319-4979.
- Harney NV, Dhamani AA and Andrew RJ (2013) Avifaunal diversity of Kanhala lake near Bhadrawati, Dist-Chandrapur (MS), with reference to food preference and feeding habits, India. *ISRJ, Special Issue*: 57-59.
- Harney NV (2014) Avifaunal diversity of Ghotnimbala lake near Bhadrawati, Chandrapur, Maharashtra, India, *International Journal of Life Sciences*, 2 (1): 79-83.
- Harney, N.V.1 and K.B. Bhute (2014) Diversity of Avifauna in and around Chalbardi (Rai) Lake Near Bhadrawati, District Chandrapur (M.S.), India. *Journal of Global Biosciences* ISSN 2320-1355 Vol. 3(2), 2014, pp. 399-405 <http://mutagens.co.in>
- Kasambe R and Wadatkar J (2007) Birds of PoharaMalkhed reserve forest, Amravati, Maharashtra – An updated annotated checklist. *Zoo's Print Journal*, 22(7): 2768-2770.
- Puri SD (2015). Avifaunal Diversity of Malguzari Lake at Zaliya near Amgaon in Gondia district (M.S.) India. *Int. J. of Life Sciences*, 2015, Vol. 3(3): 219-224 ISSN: 2320-7817 | ISSN: 2320-964X.
- Puri SD and Virani RS, (2016). Avifaunal diversity from Khairbandha Lake in Gondia district, Maharashtra State, India. *Bioscience Discovery*, 7(2):140-146, July – 2016.
- Puri SD and Virani RS (2016). Diversity and status of Avifauna from Bodalkasa lake in Gondia district, Maharashtra, India. *Int. J. of Life Sciences*, 2016, Vol. 4 (2): 256-262 ISSN: 2320-7817 | eISSN: 2320-964X
- P. M. Telkhade and S. H. Jambhule. (2017). Avifaunal Diversity Of Padmapur Area, Dist- Chandrapur Maharashtra, India. *I J R B A T*, Vol. V, Issue (1), Jan.- 2017 ISSN 2347 – 517X
- Rahmani, A., Islam, Z., Kasambe, R. and Wadatkar, J. (2013). Important Bird Areas of Maharashtra: priority sites for conservation. *Indian Bird Conservation Network, Bombay Natural History*

Society, Wildlife & Environment Conservation Society, Royal Society for the Protection of Birds, and Birdlife International. Oxford University Press, Mumbai.

S. Rajashekara and M. G. Venkatesha (2010). Evaluation Of Waterbird Communities In Relation To Physical Parameters Of Urban Lakes Of Greater Bangalore Metropolitan City (Gbm), Karnataka, India. Lake 2010: Wetlands, Biodiversity and Climate Change

Table :- List of birds of Gadchiroli lake with their Status

Sr. No.	Scientific Name	Common Name	Residential Status	Abundance status
Order :- 1 Coraciiformes				
Family No.1 Bucerotidae				
1	Ocyeros birostris	Grey Hornbill	RM	C
Family No. 2 :- Coraciidae				
2	Coracious benghalensis	Indian Roller	R	A
Family No. 3 :- Meropidae				
3	Merops philippinus	Blue Tailed Bee Eater	R	C
4	Merops orientalis	Green Tailed Bee Eater	R	C
Family No. 4 :- Alce Dinidae				
5	Ceryle rudis	Pied Kingfisher	R	A
6	Halcyon smyrnensis	White Throated Kingfisher	RM	C
7	Alcedo atthis	Common Kingfisher	RM	C
Order :- 2 Cuculiformes				
Family No.1:- Cuculidae				
8	Hierococyx varius	Common Hawk-cuckoo	RM	UC
9	Edynamys scolopaceus	Asian Koel	R	C
10	Centropus sinensis	Greater Coucal	RM	C
Order :- 3 Psittaciformes				
Family No.1:- Psittaculadae				
11	Psittacula cynocephala	Plum Headed Parakeet	RM	C
Order :- 4 Apodiformes				
Family No.1:- Apodadae				
12	Apodinae	Swift	RM	C
Order :- 5 Columbiformes				
Family No.1:- Columbidae				
13	Spilopelia chinensis	Spotted Dove	R	C
14	Spilopelia Senegalensis	Loughing Dove	R	A
15	Columbidae	Pigeon	R	C

Order :- 6 Gruiformes				
Family No.1:- Rallidae				
16	Porphyrio porphyrio	Purple Swamphen	R	A
17	Porphyrio melanotus	Blue Swamphen	R	A
18	Gallinula chloropus	Common moorhen	RM	RA
Order :- 7 Passeriformes				
Family No.1:-Corvidae				
19	Corvus splendens	Crow	R	C
Family No.2 Dicruridae				
20	Corvus Balicassius	Drongo	R	C
Family No.3 Hirundinidae				
21	Hirundo rustica	Barn Swallow	M	UC
Family No.4 Laniidae				
22	Lanius vittatus	Bay Backed Shrike	RM	C
23	Lanius schach	Long Tailed Shrike	RM	C
24	Corvinella corvina	Western Yellow Shrike	M	C
Family No. 5 Motacillidae				
25	Motacilla Flava	Western Yellow Wagtail	M	C
26	Anthus campestris	Tawny Pipit	M	UC
Family No. 6 Muscapidae				
27	Oenanthe fusca	Brown Rockchat	RM	C
28	Saxicola caprata	Pied Bush Chat	RM	C
29	Copsychus fulicatus	Indian Robin	R	A
30	Copsychus saularis	Oriental Magpie Robin	R	C
Family No. 7 Nectariniidae				
31	Cinnyris asiaticus	Sunbird	R	A
Family No. 8 Oriolidae				
32	Oriolus xanthornus	Black Hooded Oriole	RM	C
Family No. 9 Passeridae				
33	Passer domesticus	House Sparrow	R	C
Family No. 10 Pycnonotidae				

34	<i>Pycnonotus cafer</i>	Red Vented Bulbul	R	C
Family No. 11 Sturnidae				
35	<i>Acridotheres tristis</i>	Common Myna	R	C
36	<i>Gracupica contra</i>	Indian Pied Myna	R	C
37	<i>Sturnia pagodrum</i>	Brahminy Myna	RM	C
Family No. 12 Leiotherichidae				
38	<i>Argya malcolmi</i>	Large Grey Babbler	RM	UC
Family No. 13 Estrildidae				
39	<i>Londrara punctulata</i>	Scaly Breasted Munia	RM	C
40	<i>Euodice Malabarica</i>	Indian Silver Bill	R	UC
Family No. 14 Cisticolidae				
41	<i>Prinia hodgsonii</i>	Grey Breasted Prinia	RM	C
42	<i>Prinia buchanani</i>	Rufos Fronted Prinia	RM	UC
43	<i>Prinia Socialis</i>	Ashy Prinia	RM	C
Family No. 15 Paradoxornithidae				
44	<i>Chrysomma sinense</i>	Yellow Eyed Babbler	M	RA
Order:- 8 Accipitriformes				
Family No. 1 Accipitridae				
45	<i>Elanus axillaris</i>	Black Shoulder Kite	R	C
46	<i>Accipiter badius</i>	Shikra	R	C
47	<i>Butastur teesa</i>	White Eyed Buzzard	RM	UC
Order:- 9 Charadriiformes				
Family No. 1 Jacanidae				
48	<i>Irediparra gallinacea</i>	Comb Crested Jacana	R	C
49	<i>Metopidius indicus</i>	Bronze Winged Jacana	R	C
Family No. 2 Scolopacidae				
50	<i>Actitis hypoleucos</i>	Common Sandpiper	RM	C
51	<i>Calidris temminckii</i>	Temminck'stint	RM	C
Family No. 3 Recurvirostridae				
52	<i>Himanotopus himanotopus</i>	Black Winged Stilt	R	A
Family No. 4 Charadriidae				

53	Vanellus indicus	Red Wattled Lapwing	RM	C
54	Vanellus malabaricus	Yellow Wattled Lapwing	R	C
Order:- 10 Pelecaniformes				
Family No. 1 Anhingidae				
55	Anhinga melanogaster	Oriental Darter	R	UC
Family No. 2 Phalacrocoracidae				
56	Phalacrocorax fuscicollis	Indian Cormorant	R	C
Family No. 3 Threskiornithidae				
57	Threskiornithidae melanocephalus	Black Headed Ibis	R	C
58	Pseudibis papillosa	Red Headed Ibis	RM	UC
Order :- 11 Ciconiiformes				
Family No. 1 Ardeidae				
59	Ardeola grayi	Indian Pond Heron	R	A
60	Bubulcus ibis	Cattle Egret	R	A
61	Egretta garzetta	Little Egret	R	C
62	Ardea cinerea	Grey Heron	RM	UC
63	Ardea purpuria	Purple Heron	R	C
Family No. 2 Ciconiidae				
64	Anastomus oscitans	Asian Open Bill	R	C
Residential Status: R - Resident, RM - Resident Migrant, M - Migrant				
Abundance Status: A - Abundant, C - Common, UC - Uncommon, Ra - Rare				



Fig.1: Location map of Gadchiroli District Fig.:2A view of Gadchiroli lake, Gadchiroli, Maharashtra

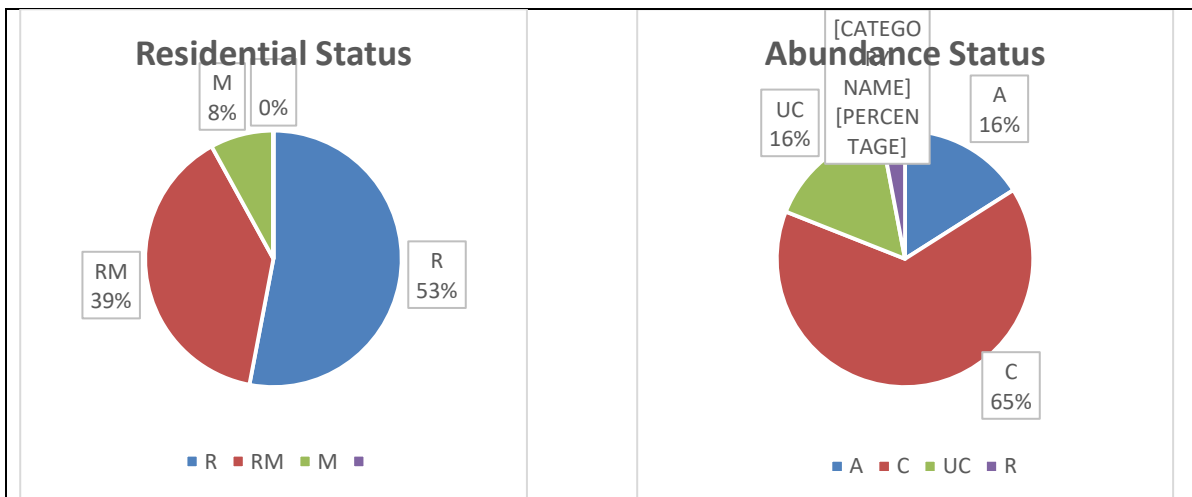


Fig. 3: Residential status of Bird species

Fig. 4: Abundance status of Bird species

Avifaunal Diversity of Gadchiroli Lake



Common moorhen Bay backed shrikeWesternyellow wagtail



Bronze Winged Jacana

Black Winged Stilt Purple swamphen



black headed Ibis

Grey HeronAnhinga melanogaster