



# A study of Avifaunal Diversity of Sakhya Sagar and Madhav Lakes and its surrounding Areas of Madhav National Park, Shivpuri (M.P.), India

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## ABSTRACT

Birds are reliable and widely used indicators for conservation, planning and monitoring. In the present study, avifaunal diversity of Madhav National Park was studied to know the present status of the park from November 2018 to October 2019. Madhav National Park is located at the outskirts of Shivpuri, Madhya Pradesh (INDIA). The diversity was carried out at two different stations to determine various bird species in over the study period. A total 73 species of birds were enumerated. Depending on the frequency of sightings, birds were classified as: abundant, common, occasional and rare. Out of 73 species, 47 were winter migrant and 26 species were resident. This study will be helpful to prepare a list of species.

**Keywords:** Madhav National Park, Bird Diversity, Sakhya Sagar Lake, Madhav Lake.

## INTRODUCTION

Birds are one of the planet's most populous life types, and the biodiversity contributes to a wealth of life and beauty. The presence of birds indicates rich biodiversity in the place. They are often keystone species which play an important role in the maintenance of natural ecosystem and fundamental parts of food chain and food webs. Monitoring of the birds provides valuable information on the ecological health of environment. Birds are found everywhere throughout the world from grassland, forest wetland, deserts, jungles, city garden, and around homes. Madhav National Park is one of the famous and favorite tourist places of Madhya Pradesh state among the visitors. The Madhav National Park is located in Shivpuri district of Gwalior- Chambal division in northwest Madhya Pradesh, India. It lies between latitude 25°20'-25°38'N and longitude 77°38'-77°57'E. The Madhav National Park was established in 1956. The stunning natural beauty across the

national parks draws millions of tourists per year. The wetland is an important habitat and breeding ground for aquatic birds. According to Singh *et al.*, 2018, wetlands are vital areas throughout the world for Wildlife protection. The present study was planned with an objective to describe the bird population in different seasons in the study areas.

## MATERIAL AND METHOD

### Study Area

For conducting the survey, the study area was divided into two different sites: site- 1 (Sakhya Sagar lake) and site- 2 (Madhav lake). Sakhya Sagar lake is an artificial lake and has 12 landing sites. The lake has a boat club at one of its shores which is open for tourists. It is also called Chandpatha, locally because it is shaped like a semi-circular moon. It is a freshwater lake and provides a permanent source of drinking water for the people of Shivpuri town as it is situated just 4 km away from the Shivpuri town. Madhav lake is situated 2 km away from the Sakhya Sagar lake. It was built in the same period of time along with Sakhya Sagar lake from 1915 to 1918 on the Manier river. It is not as deep as Sakhya Sagar lake. It provides pollution-free habitation along with negligible human disturbance. Both the lakes are man-made and attract number of bird species for nestling, feeding and breeding. Both are the places of major tourist attraction at Madhav National Park. During winter season of every year a huge number of migratory water bird species aggregate in this lake from different parts of the world. The temperature varies from 10<sup>o</sup>c in winter (December-February) to 43<sup>o</sup>c in summer (April - June).

### Method

The avian survey data was collected over a twelve-month (November 2018- October 2019) study period. The observation of bird's diversity studies was conducted by two methods (i) Point Count method (Javed and Kaul 2002) and (ii) the Line transect method. The sampling was done from 6:00 am to 12:00 pm in the morning and 3:00 pm – 6:00 pm in the evening. Nikon D-3400 (with 70-300mm zoom lens and 80-105mm normal lens) digital camera was used for taking pictures and Olympus binocular was used for close observation of avian diversity. Photographs were identified by standard field guide books (Grimmett. *et al.*, (1999) and Ali (2006)<sup>(4)</sup>.

## RESULTS AND DISCUSSIONS

Total 73 bird species, belonging to 10 orders and 25 families were observed from both lakes. The observed bird species have been enlisted in Table 1. Residential status of the birds and Order-wise distribution of bird species at Sakhya Sagar lake and Madhav lakes have been shown in figure 1, 2 and 3 respectively.

A total 73 species of birds were observed at two different sites in the present study. Out of the two lakes 69 bird species, belonging to 10 orders and 23 families, were recorded at Sakhya Sagar lake, while 49 bird species belonging to 8 orders and 18 families were recorded at Madhav lake. As the area of the two lakes is concerned, Sakhya Sagar lake is comparatively bigger than Madhav lake. According to Chen *et al.*, (2020) the richness of birds increases with the increase of the lake-wetland area. The observations in the present study also indicate that bird species richness correlates with the area of lake-wetland. Passeriformes was found to be the most dominant order, represented by 17 species, followed by Ciconiiformes and Pelecaniformes (11 species each) and Charadriiformes and Anseriformes (9 species each) respectively. In both lakes, the migratory status showed that 47 bird species were winter migrant (WM) and 26 species were resident (R) out of 73 species. Similar results were also observed in other studies conducted by Dey *et al.*, (2013). They observed total 76 species of bird in which 12 species were winter migrants, 19 were resident migrants, 44 were residents and one was a local migrant in Tripura, North East India. Lodhi *et al.*, (2017) recorded 30 migrant, 16 residential migrant and 10 fully resident species in Tighra reservoir in Gwalior, M.P. Rai *et al.*, (2017) observed total 128 species, out of which 79 species were Resident (R), 45 species were winter migrant (WM) and 4 species were summer migrant (SM) in the Basai wetlands, Haryana. Surendra *et al.*, (2017) identified 9 winter visitors, 39 resident or local migrants on India's west coast. Singh *et al.*, (2018) observed 61 bird species, two of which were winter migrants, 58 were resident, and only one species (Jacobin Cuckoo) was a breeding migrant at Banda, Uttar Pradesh. Mahato *et al.*, (2021) found 36 winter migrants, 78 resident, and only one summer migrant in Purpulia Town, West Bengal, India.

**Table 1: List of Birds observed and identified at Sakhya Sagar and Madhav lakes in Madhav National Park Shivpuri, M.P. , India during November 2018- October 2019**

Sr. No.	English Name	Scientific Name	Common Name	Site 1	Site 2	Residential Status
<b>ORDER- ANSERIFORMES</b>						
<b>FAMILIES- ANATIDAE</b>						
1.	Bar-headed Goose	<i>Anserindicus</i>	Hans, Sawan, Birwa, Kareyee-hans, Sarpati swan	Y	Y	WM
2.	Indian Spot-billed Duck	<i>Anaspoecilorhyncha</i>	Gugral btakh, Ladhim, Garpai	Y	Y	WM
3.	Lesser Whistling-duck	<i>Dendrocygnajavanica</i>	Choti seelhi, Seelkahi	Y	Y	WM
4.	African comb Duck	<i>Sarkidiornismelanotos</i>	Nakta	Y	Y	WM
5.	Ruddy Shelduck	<i>Tadornaferruginea</i>	Surkhab, Chakwa, Chakwi	Y	Y	WM
6.	Garganey	<i>Spatulaquerquedula</i>	Chaita batkh, Khira	Y	N	WM
7.	Red-crested Pochard	<i>Nettarufina</i>	Lal-sir btakh, Lal-chonch	Y	N	WM
8.	Northern Shoveler	<i>Spatula clypeata</i>	Tidari, Punana, Ghirah, Tokarwala	Y	Y	WM
9.	Common Teal	<i>Anascrecca</i>	Choti murgabi, kerra, souchuruka	Y	N	WM
<b>ORDER- PODICIPEDIFORMES</b>						
<b>FAMILIES- PODICIPEDIDAE</b>						
10.	Little Grebe	<i>Tachybaptusruficollis</i>	Pandubi, Pantiri, Dubdubi, Churaka	Y	N	WM
<b>ORDER- GRUIFORMES</b>						
<b>FAMILIES- RALLIDAE</b>						
11.	Common Moorhen	<i>Gallinula chloropus</i>	Jal-murgi	Y	Y	R
12.	Eurasian Coot	<i>Fulicaatra</i>	Aari, Tikdi, Dasari, Dasarni, Khuskul	Y	Y	WM
13.	White-breasted Waterhen	<i>Amaurornisphoenicurus</i>	Dauk, Safed chati jalmurgi, Bansmurgi,	Y	N	R
<b>ORDER- CHARADRIIFORMES</b>						
<b>FAMILIES- JACANIDAE</b>						
14.	Bronze-winged Jacana	<i>Hydrophasianuschirurgus</i>	Jalmakhami, Dal or Jalpipi	N	Y	R
<b>FAMILIES- RECURVIROSTRIDAE</b>						
15.	Black-winged Stilt	<i>Himantopuslimantopus</i>	Gazpaon, Tinghur	Y	Y	R
<b>FAMILIES- CHARADRIIDAE</b>						
16.	Red-wattled Lapwing	<i>Vanellusindicus</i>	Srari Titeri, Titai, Titori	Y	Y	R
17.	White-tailed Lapwing	<i>Vanellusleucurus</i>		Y	N	WM
18.	Little Ringed Plover	<i>Charadriusdubius</i>	Zireya, Merwa	Y	Y	WM
19.	Kentish Plover	<i>Charadriusalexandrinus</i>		Y	N	WM
<b>FAMILIES- ROSTRATULIDAE</b>						
20.	Common Snipe	<i>Gallinagogallinago</i>	Samany Chaha	Y	N	WM
<b>FAMILIES- BURHINIDAE</b>						
21.	Great Thick-knee	<i>Esacusrecurvirostris</i>		Y	Y	WM
22.	Indian Thick-knee	<i>Burhinusindicus</i>	Karvanak, Barsiri	Y	N	WM

23.	Small Pratincole	<i>Glareolalactea</i>		Y	N	WM
<b>ORDER- CICONIIFORMES</b>						
<b>FAMILIES- SCOLOPACIDAE</b>						
24.	Wood Sandpiper	<i>Tringaglareola</i>		Y	Y	WM
25.	Common Sandpiper	<i>Actitis hypoleucos</i>	Panewa	Y	N	WM
26.	Green Sandpiper	<i>Tringaochropus</i>		Y	Y	WM
27.	Common Greenshank	<i>Tringanebularia</i>		Y	Y	WM
28.	Spotted Redshank	<i>Tringaerythropus</i>	Batan, Gatni, Surma	Y	N	WM
29.	Little Stint	<i>Calidrisminuta</i>	Chota panlowa	Y	N	WM
30.	Temminck's Stint	<i>Calidristemminckii</i>		Y	N	WM
<b>FAMILIES- CICONIIDAE</b>						
31.	Painted Stork	<i>Mycterialeucocephala</i>	Janghil, Kankari, Dokh	Y	Y	WM
32.	White Stork	<i>CiconiaCiconia</i>	Haji laglag, Ujli, Badaretwa	N	Y	WM
33.	Asian Openbill	<i>Anastomusoscitans</i>	Ghonghila, Gungla, Ghungil	Y	Y	WM
34.	Woolly-necked Stork	<i>Ciconiaepiscopus</i>	Haji Laglag	Y	Y	WM
35.	Eurasian Spoonbill	<i>Platalealeucorodia</i>	Chamcha, Dabil, Chamcha-baza	Y	Y	WM
<b>ORDER- SULIFORMES</b>						
<b>FAMILIES- PHALACROCORACIDAE</b>						
36.	Little Cormorant	<i>Microcarboniger</i>	Chota Pan-kowwa	Y	Y	WM
37.	Indian Cormorant	<i>Phalacrocoraxfuscicollis</i>	Pan-kowwa, Ganhill	Y	Y	WM
38.	Great Cormorant	<i>Phalacrocoraxcarbo</i>	Bada pan-kowwa	Y	Y	WM
<b>FAMILIES- ANHINGIDAE</b>						
39.	Oriental Darter/ Snake bird	<i>Anhinga melanogaster</i>	Panwa, pandubi	Y	Y	R
<b>ORDER- PELECANIFORMES</b>						
<b>FAMILIES- ARDEIDAE</b>						
40.	Indian Pond Heron	<i>Ardeolagravii</i>	Andha bagula, Chama, Khunch Bagla	Y	Y	R
41.	Grey Heron	<i>Ardeacinerea</i>	Anjan, Sleti bagla Nari-Bagla	Y	Y	WM
42.	Purple Heron	<i>Ardeapurplea</i>	Lal-anjan	N	Y	WM
43.	Black-crowned Night Heron	<i>Nycticoraxnycticorax</i>	Kwaak, Tal Bagla	Y	Y	WM
44.	Striated Heron	<i>Butoridesstriata</i>	Kancha Bagla	Y	Y	WM
45.	Little Egret	<i>Egrettaagarzetta</i>	Karchia, Kilchia Bagla	Y	Y	R
46.	Cattle Egret	<i>Bululcus ibis</i>	Surkhia Bagla, Gai or Doria Bagla	Y	Y	R
47.	Intermediate Egret	<i>Ardeaintermedia</i>	Madhayam or Manjhla Bagla	Y	Y	WM
48.	Great White Egret	<i>Ardea alba</i>	Bada-Bagla, Malang bagla	Y	Y	WM
<b>FAMILIES-THRESKIORNITHIDAE</b>						
49.	Red-naped Ibis	<i>Pseudibispapillosa</i>	Kala baza, Karan-kul	Y	Y	WM
50.	Black-headed Ibis	<i>Threskiornismelanocephalus</i>	Safedbaza, Didhar, Munda	Y	Y	WM
51.	Glossy Ibis	<i>Plegadisfalcinellus</i>	Koari buzza	Y	N	WM

ORDER- CORACIIFORMES						
FAMILIES- ALCEDINIDAE						
52.	Lesser Kingfisher	<i>Cerylerudis</i>	Koryala	Y	Y	R
53.	Common Kingfisher	<i>Alcedoatthis</i>	Chhota Kilkila	Y	Y	R
54.	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	Kilkila, Kourilla	Y	Y	R
ORDER- PASSERIFORMES						
FAMILIES- LANIIDAE						
55.	Bay-backed shrike	<i>Laniusvittatus</i>		Y	N	R
56.	Long-tailed Shrike	<i>Laniusschach</i>		Y	N	R
FAMILIES- ALAUDIDAE						
57.	Ashy-crowned Sparrow Lark	<i>Eremopterixgriseus</i>		Y	N	WM
FAMILIES- DICRURIDAE						
58.	Black drongo	<i>Dicrurusmacrocerus</i>	Bhujanga, Kotwal	Y	Y	R
FAMILIES- MUSCICAPIDAE						
59.	Oriental Magpie Robin	<i>Copsychussaularis</i>	Diyar, Diyya	Y	Y	R
60.	Indian Robin	<i>Saxicoloidesfulvicatus</i>	Kalchidi	Y	Y	R
61.	Brown Rock Chat	<i>CercomelaFusca</i>		Y	N	R
FAMILIES- TURDIDAE						
62.	Blue Rock Thrush	<i>Monticolasolitarius</i>		Y	N	R
FAMILIES- MOTACILLIDAE						
63.	Malabar Whistling Thrush	<i>Myophonushorsfieldii</i>		Y	N	R
64.	White Wagtail	<i>Motacilla alba</i>	Dhovan	Y	Y	WM
65.	White-browed Wagtail	<i>Motacillamaderaspatensis</i>	Badi Rangin khanjan, Dhoban	Y	Y	R
66.	Grey Wagtail	<i>Motacillacinerea</i>	Bhuri khanjan, Dhoban	Y	Y	WM
67.	Citrine Wagtail	<i>Motacillacitreola</i>		Y	N	WM
68.	Western Yellow Wagtail	<i>Motacillaflava</i>		Y	Y	WM
FAMILIES- ESTRILDIDAE						
69.	Red Avadavat	<i>Amandavaamandava</i>	Lal	N	Y	R
FAMILIES- HIRUNDINIDAE						
70.	Streak-throated Swallow302	<i>Petrochelidonfluvicola</i>	Chipak, Ababil	Y	N	R
FAMILIES- CISTICOLIDAE						
71.	Ashy Prinia	<i>Priniasocialis</i>		Y	Y	R
72.	Grey-breasted Prinia	<i>Priniahodgsonii</i>		Y	Y	R
ORDER- ACCIPITRIFORMES						
FAMILIES- ACCIPITRIDAE						
73.	Red-headed Vulture	<i>Sarcogypscaivus</i>		Y	N	R

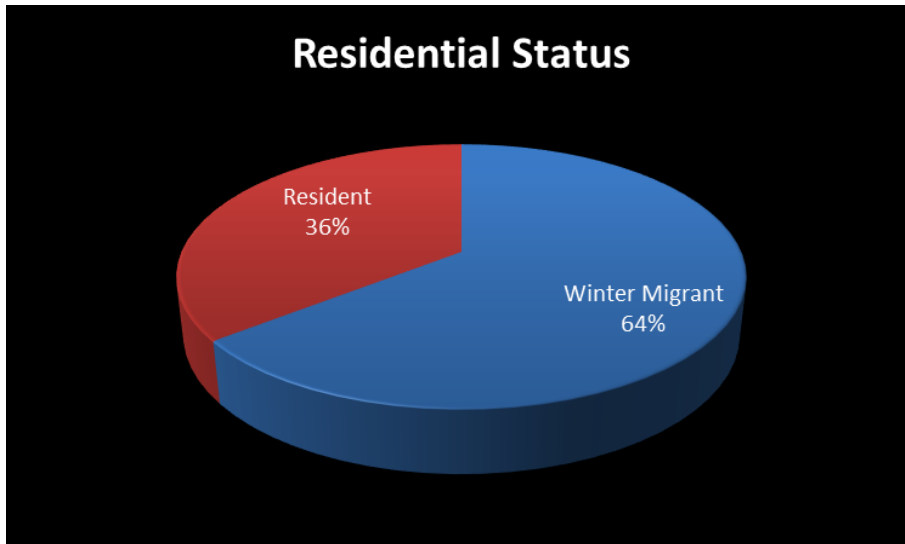


Fig. 1 Residential status of birds of the study area

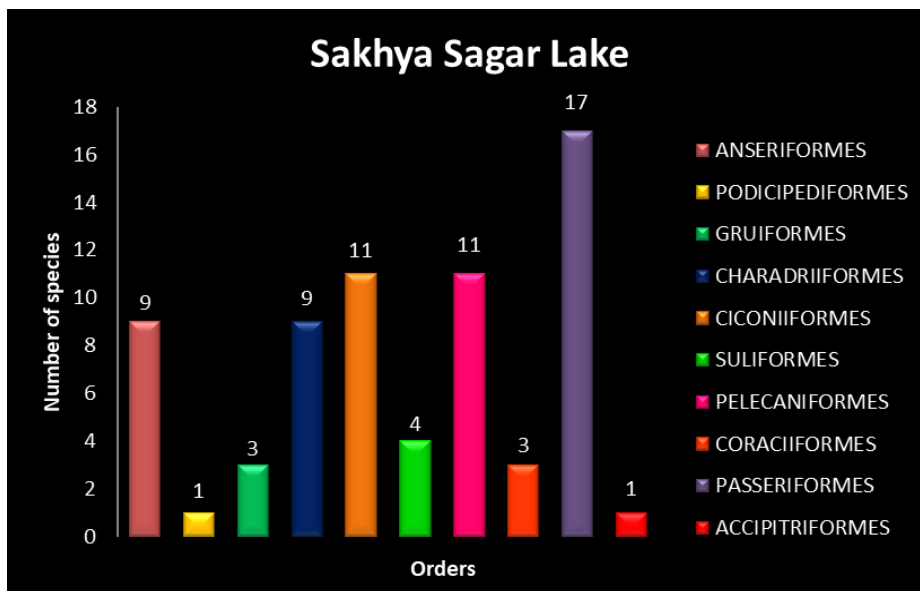


Fig-2 Order-wise distribution of bird species at Sakya Sagar lake (Site-1)

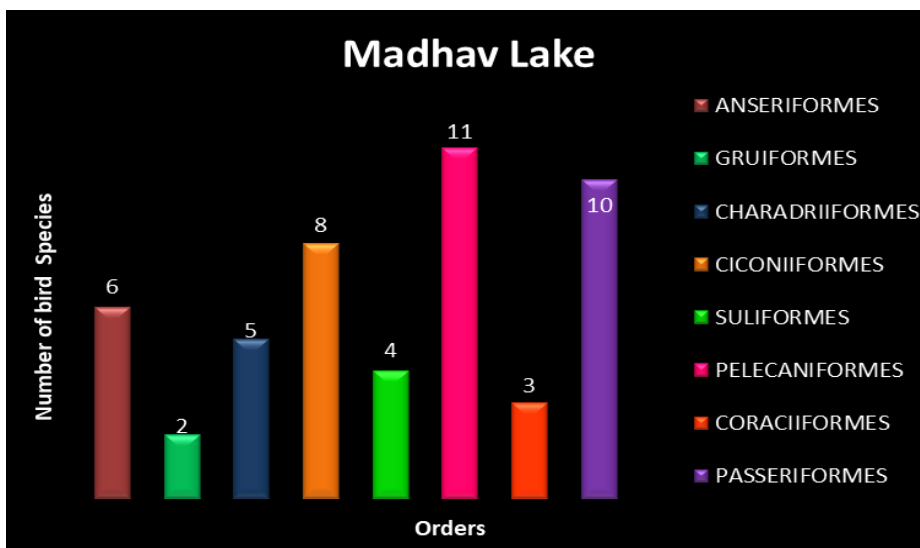


Fig-3 Order-wise distribution of bird species at Madhav lake (Site-2)

## CONCLUSIONS

The present study indicates that Madhav National Park represents a good diversity of birds. Comparative data shows Sakhya Sagar lake had a higher bird diversity (69 species) as compared to Madhav lake with 49 species. Variation in bird diversity may be due to larger area of Sakhya Sagar than that of Madhav lake and also due to the availability of more aquatic food, water and increased vegetation. Overall, there was no major difference in bird species diversity at both study sites throughout the year. This also indicates that both study sites are equally valuable for bird conservation and study. This kind of research is important as it provides information on the biological diversity and raises awareness among local people of the importance of the aquatic habitat.

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