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Original Research Article

A Preliminary Study of Avian Fauna in Barkheda Lake, Jaipur, India

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Abstract: The study, undertaken in January 2023, aimed to observe the avifaunal status of Barkheda Lake in the Jaipur district of Rajasthan. The primary objective was to document various avifaunal species present during the winter season in the area. Photographic evidence of the avifauna was captured using a DSLR camera, and identification was conducted by both an experienced expert and with the assistance of a field guide. A total of 21 bird species, representing 17 different families, were identified at the site. The assessment of IUCN status revealed that only one species was classified as near-threatened, while the remaining 20 species were categorized as least concerned. 11 birds were found as terrestrial while 10 were aquatic birds. 6 birds were most common in the study area, 9 were found as common and 6 were rare. Residential status of birds revealed that 14 were found as resident of the place and another 7 birds were winter visitors.

Keywords: Avifauna, Barkheda lake, Jaipur, IUCN.

Introduction

Avifauna is the term used for the birds of a particular region, habitat, or geological period. Birds are one of the most diverse groups of animals, with over 10,000 species distributed across the world. Avian diversity is important because birds play vital roles in ecological processes such as pollination, seed dispersal and pest control. According to a study by Jetz *et al.* (2019), avian diversity is not evenly distributed across the globe. They found that tropical regions, particularly South America and Southeast Asia, have the highest avian diversity. In contrast, temperate regions such as Europe and North America have lower avian diversity.

India boasts a remarkable avian diversity, harboring over 1300 bird species, as documented by Grimmett *et al.* (1998), Ali (2002) and Wagh and Prathmesh (2020). This constitutes over 13% of the world's total bird species. The country's diverse topography and climatic conditions contribute significantly to this rich birdlife. India's avian fauna encompasses both resident and migratory birds, ranging from diminutive flower peckers to majestic birds of prey such as the Himalayan Griffon. Recognizing the importance of avian species assemblages, they serve as potent indicators of ecosystem health and functioning, as highlighted by studies by Turner *et al.* (1990), Newton (1995) and Padoa–Schioppa *et al.* (2006).

Birds play an important role in ecosystem and playing vital roles in pollination, seed dispersal and pest control. They also provide food for other animals and help to regulate population levels in their habitats. Birds have their own ecological significance, and they are important natural resources that contribute both to the beauty of nature and to the worrisome effects of environmental or climate change (Brusatte *et al.*, 2015). Prior to their sensitiveness to habitat change, birds are considered as one of the most important

indicators of environmental change (Pitera *et al*., 2021). They play significant role in controlling insect outbreak. Birds like Barn Swallow helps in mosquito control by eating around 850 mosquitoes each day (Vinod *et al.,* 2023). Biodiversity assessment applying short span studies are becoming widespread and in this regard, preparation of checklists of birds on a broader scale has been given much importance (Chakravarthy and Sridhar, 1995). The present study represented the avian diversity of Barakheda lake.

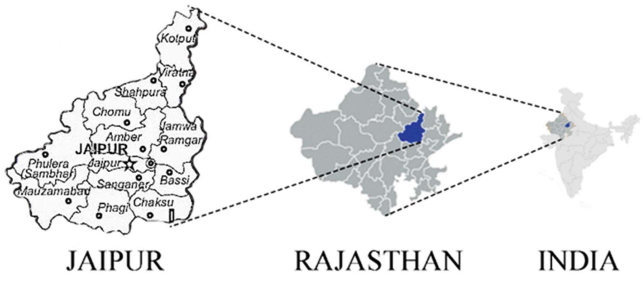

Fig. 1. Map showing location of Chaksu block in Jaipur where Barkheda lake is situated.

Fig. 2. Barkheda lake.

Metarials and Methods

Study Sites

Barkheda, a charming village situated in Chaksu Tehsil within the Jaipur District of Rajasthan State, India, is well-known for the Barkheda Lake. Located 40 km away from Jaipur, the lake (22°22'31"N, 74°40'25"E; elevation 531 M above sea level) spans an expansive 25 sq km during the monsoon season, reaching a depth of 15 feet. The lake area experiences a hot semi-arid climate, with temperatures ranging from 14°C to 34°C throughout the year. Occasionally, temperatures can drop to 3°C or soar to as high as 47°C. The warmest months are May, June, and July, with daily mean temperatures ranging from 31 to 34°C. Conversely, the coldest temperatures occur in January, February, and December, with daily mean temperatures ranging from 14 to 19°C.

Receiving an annual rainfall of 500-600 mm, the lake experiences a decline in water levels post-monsoon, with most water either percolating into the groundwater table or evaporating. Barkheda Lake is particularly enchanting during the winter season, attracting migratory birds from various parts of the world to the lakes and water bodies near Jaipur. Today, the lake holds significance as a site for biodiversity study and serves as a vital habitat for diverse flora and fauna. It has become a popular destination for birdwatchers and is home to various species of fish, amphibians, reptiles, and mammals.

Data collection

The study was conducted in the month of January, 2023 with the aim to explore the "Faunal study of Jaipur and its nearby area". The study was based on the survey of the area. Quantitative avifauna data was collected in the point count survey and combined with distance estimation with the help of binocular and camera. Photographic evidences of avifaunal population were collected through camera. Direct count methods were adopted from Bibbey *et al*. (2000) and Javad and Kaul (2002) for recording and analysis. Birds were identified by experienced resource person as well as with the help of field guide (Grimmett *et al*., 1998).

Tools used

A high quality digital camera (Canon SX10), binoculars, field guide, observation sheet and oxford pocket guide to the birds of the Indian subcontinent by Grimmett *et al*. (1998) were used during field trip for the present investigation.

Results

In the results section, we have integrated a compilation of identified birds, featuring their family, common name, and

IUCN status. We have also mentioned habitat, residential as well as migratory status of all identified birds. Furthermore, figures 3 to 23 exhibit photographs of the identified birds, all of which were captured by the authors.

Discussion

The current study's results emphasize the significance of Barkheda lake as an essential habitat for birds. Although Barkheda lake is small in size, it is home to an incredibly

Table 1. List of birds recorded from Barkheda lake site along with their IUCN status.

S.No.	Scientific name	Family	Common name	IUCN Status
1	*Accipiter striatus*	Accipitridae	Sharp shinned hawk	Least concern
2	*Alcedo atthis*	Alcedinidae	Common kingfisher	Least concern
3	*Anser indicus*	Anatidae	Bar headed geese	Least concern
4	*Ardea alba*	Ardeidae	Great white erget	Least concern
5	*Calidris pugnax*	Scolopacidae	Ruff	Least concern
6	*Ceryle rudis*	Alcedinidae	Pied kingfisher	Least concern
7	*Gallinula chloropus*	Rallidae	Indian moorhen	Least concern
8	*Halcyon smyrnensis*	Alcedinidae	White-throated kingfisher	Least concern
9	*Hydrophasianus chirugus*	Jacanidae	Pheasant tailed jacana	Least concern
10	*Limosa limosa*	Scolopacidae	Black tailed godwit	Near Threatened
11	*Lonchura punctulata*	*Estrildidae*	Scaly breasted munia	Least concern
12	*Luscinia svecica*	Muscicapidae	Bluethroat	Least concern
13	*Merops orientalis*	*Meropidae*	Green bee eater	Least concern
14	*Pelecanus onocrotalus*	Pelecanidae	Great white pelican	Least concern
15	*Phalacrocorax fuscicollis*	Phalacrocoracidae	Cormorant	Least concern
16	*Ploceus philippinus*	Ploceidae	Baya weaver	Least concern
17	*Prinia socialis*	Cisticolidae	Ashy prinia	Least concern
18	*Psittacula krameri*	Psittaculidae	Rose-ringed parakeet	Least concern
19	*Rostratula benghalensis*	Rostratulidae	Painted snipe	Least concern
20	*Spatula clypeata*	Anatidae	Northern shoveler	Least concern
21	*Turdoides caudata*	Leiothrichidae	Common babbler	Least concern

Fig. 3-23. Photographs of birds recorded from Barkheda lake site.

Fig. 3. *Accipiter striatus*

Fig. 4. *Alcedo atthis*

Fig. 5. *Anser indicus*

Fig. 6. *Ardea alba*

Fig. 7. *Calidris pugnax*

Fig. 8. *Ceryle rudis*

Fig. 9. *Gallinula chloropus*

Fig. 10. *Halcyon smyrnensis*

Fig. 11. *Hydrophasianus chirugus*

Fig. 12. *Limosa limosa*

Fig. 13. *Lonchura punctulata*

Fig. 14. *Luscinia svecica*

Fig. 15. *Merops orientalis*

Fig. 16. *Pelecanus onocrotalus*

Fig. 17. *Phalacrocorax fuscicollis*

Fig. 18. *Ploceus philippinus*

Fig. 19. *Prinia socialis*

Fig. 20. *Psittacula krameri*

Fig. 21. *Rostratula benghalensis*

Fig. 22. *Spatula clypeata*

Fig. 23. *Turdoides caudata*

Table 2. Habitat, residential and migratory status of birds recorded from Barkheda lake

S.No.	Scientific name	Habitat	Residential status	Migratory status
1	*Accipiter striatus*	Terrestrial Bird	Resident	Common
2	*Alcedo atthis*	Terrestrial Bird	Resident	Rare
3	*Anser indicus*	Water Bird	Winter visitor	Rare
4	*Ardea alba*	Water Bird	Resident	Common
5	*Calidris pugnax*	Terrestrial Bird	Winter visitor	Common
6	*Ceryle rudis*	Water Bird	Resident	Common
7	*Gallinula chloropus*	Water Bird	Resident	Most Common
8	*Halcyon smyrnensis*	Terrestrial Bird	Resident	Most Common
9	*Hydrophasianus chirugus*	Water Bird	Resident	Common
10	*Limosa limosa*	Water Bird	Winter visitor	Rare
11	*Lonchura punctulata*	Terrestrial Bird	Resident	Common
12	*Luscinia svecica*	Terrestrial Bird	Winter visitor	Rare
13	*Merops orientalis*	Terrestrial Bird	Resident	Most Common
14	*Pelecanus onocrotalus*	Water Bird	Winter Visitor	Rare
15	*Phalacrocorax fuscicollis*	Water Bird	Resident	Common
16	*Ploceus philippinus*	Terrestrial Bird	Resident	Most Common
17	*Prinia socialis*	Terrestrial Bird	Resident	Common
18	*Psittacula krameri*	Terrestrial Bird	Resident	Most Common
19	*Rostratula benghalensis*	Water Bird	Winter Visitor	Rare
20	*Spatula clypeata*	Water Bird	Winter Visitor	Common
21	*Turdoides caudata*	Terrestrial Bird	Resident	Most Common

diverse and abundant bird community. This may be attributed to the green space and tree cover in the area, which are crucial factors in supporting avian ecological diversity (Blair, 1996). The varied feeding habits of the avifauna indicate that Barkheda lake offers a wealth of diverse food resources. During field survey, we have observed 21 bird's species of 17 different families. Among the 21 bird species observed, 11 were identified as terrestrial birds, and the remaining 10 were classified as water birds. In terms of residential status, 14 bird species were categorized as residents, while 7 were identified as winter visitors. The birds' migratory status revealed that 6 species were most common, 9 were considered common, and 6 were deemed rare at the study site. According to their IUCN status 1 species was found as near threatened while rest 20 species were found least concerned. The IUCN status "Least concern" indicates that these species are currently not considered to be at significant risk of extinction. However, it's important to note that conservation statuses can change over time due to various factors such as habitat loss, climate change, and other threats to wildlife. The species '*Limosa limosa*' (Black-tailed godwit) is listed as "Near Threatened," which suggests that it may be facing a higher level of risk compared to the others on the list. Conservation efforts may be necessary to protect this species.

It is a well-known fact that as human population continues to grow, natural green spaces are being cleared to make way for urbanization, pollution and overgrazing. This loss of prime habitat poses a significant threat to all forms of wildlife (Das and Bandyopadhyay, 2022). Nevertheless, anthropogenic interference and development activities have been identified as major threats to avifaunal diversity in the area under study. By maintaining the area's landscaping and vegetation patterns, the diversity of bird species may increase, creating a fertile ground for avifauna conservation and research. Furthermore, it is necessary to avoid increasing human interference in the region over time to sustain the diverse composition of bird species.

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