Avifaunal Diversity of Aligarh Fort, Aligarh, Uttar Pradesh, India

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ABSTRACT

Aligarh Fort is located in the city of Aligarh , Uttar Pradesh at coordinates 27°55'N and 78°03'E. It has steep ravines, over 30 feet high, on every side, and bastions in every angle on the walls. The rosy, luminous qualities of the walls still stand tall and fortified even today. The Fort is home to a lavish botanical garden that is directly controlled by the Botanical department of Aligarh Muslim University. In and around it consists of lush green gardens and diversified floral species. The botanical garden exhibits lot of beautiful and colorful trees and flowers, and many animals and birds species like Koel birds, peacocks and ferrets. A brief study was carried out for the period of four months, (July-October, 2020) to assess diversity of avifauna in Aligarh fort. Data collection was made through point count method with 8 'fixed points in different habitat types. Field binocular (10x50 magnifications) was used for visual surveys. Surveys revealed the presence of 33 bird species with 22 genera placed taxonomically under 28 families which were further arranged systematically under nine orders. Passeriformes was the dominant group with 26 bird species followed by Columbiformes, Psittaciformes, Pelecaniformes and Coraciformes with six species of birds; while remaining four orders- Piciformes, Cuculiformes, Bucerotiformes and Accipiteriformes were represented by two species each.
Key words: Avifauna, Diversity, Point count

INTRODUCTION

Avifaunal diversity comprises of vital biotic component of ecosystem and is a source of ecological indicator about overcall health and status of habitat quality of an area (Slabbekoorn and Ripmeester, 2008). Due to rapid influx of anthropogenic activities and deteriorating climate conditions, avifaunal species are declining throughout the globe (Sekercioglu *et al.*, 2012). There has been a tremendous decline of 79% of the Indian birds species. (India Birds Report 2020). Approximately 101 sp. are categorized as of high conservation concern. 59 based on range and abundance and rest from high risk on the IUCN Red list (The Hindu, 17-Feb, 2020). India exhibits 1361 sp. of birds since 2021 out of which 81 are endemic. Although various studies are going on birds countywide, only few are recorded from the Aligarh region. As such present study is undertaken to exploit avifaunal diversity of Aligarh fort that is in the centre of the Aligarh city.

MATERIALS AND METHODS

STUDY AREA:
The study was carried out in the Aligarh fort Fig 1. That is part of Aligarh Muslim University as a botanical garden. The fort of Aligarh is located at a distance of 06 Km from the city of Aligarh and is well known for its picturesque location and scenic beauty. Although it's a small study area it supports an extremely rich and diverse bird community. The botanical garden, beautiful and tall trees and colorful flowers serve as an attraction of different bird species.

METHOD:
For the purpose of study Point count method was used to study avian diversity in the area. 8 locations were selected in three different habitat types in the area. Observations were executed during morning hours (9am to 10am) and 6pm to 7pm in the evening with binoculars (10x50 magnifications). Identification was carried out based on the standard literature (Ali, S., 2008).

Fig. 1: Location map of Aligarh fort showing different study sites shown by white marks

DATA ANALYSIS

Species Diversity and Evenness
The species diversity of birds in different habitat types was calculated using Shannon& Weiner index (Shannon& Weiner, 1949) and Simpson's diversity index (Stone & Pence, 1978).
Shannon-Weiner diversity index (H) was calculated using formula:

$$H=\sum[(pi)\times ln(pi)$$

Where pi = proportion of total sample represented by species. l = Divide no. of individuals of species i by total number of samples.
Simpson's diversity Index 'D' was calculated using the formula:

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

Where, n = the total number of birds of each individual species and N = the total number of birds of all species. The value of D ranges between 0 and 1 in this index, 1 represents infinite diversity and 0 no diversity.

RESULTS AND DISCUSSION
Study revealed the presence of (33 birds) species with 26 genera, placed taxonomically under 28 families, further arranged systematically under 12 orders (Table 1).

Table1: Check list of birds recorded during the study

S. No.	Species	Family	Resident/Migrant	IUCN status
01	Egyptian Vulture	Accipitridae	Resident	EN
02	Common Kingfisher	Alcedinidae	Resident	LC
03	Cattle Egret	Ardeidae	Resident	LC
04	Great Egret	Ardea	Resident	LC
05	Indian Grey Hornbill	Bucerotidae	Resident	LC
06	Spotted Dove	Columbidae	Migrant	LC
07	Common Starling	Sturnidae	Migrant	LC
08	Common Cuckoo	Cuculidae	Migrant	LC
09	House Sparrow	Passeridae	Resident	LC
10	European Goldfinch	Fringillidae	Migrant	LC
11	Black Kite	Accipitridae	Resident	LC
12	Common Pigeon	Columbidae	Resident	LC
13	House Crow	Corvidae	Resident	LC
14	Rose Ringed Parakeet	Psittacidae	Resident	LC
15	Greater Spotted Eagle	Accipitridae	Migrant	LC
16	Black Headed Ibis	Threskiornithidae	Resident	LC
17	Streaked Laughing Thrush	Liothrichidae	Resident	LC
18	Rufous Treepie	Corvidae	Resident	LC
19	Asian Koel	Cuculidae	Migrant	LC
20	Common Barbbler	Leiothrichidae	Migrant	LC
21	Asian Paradise Flycatcher	Monarchidae	Resident	LC
22	Woodpecker	Picidae	Migrant	LC
23	Spotted Owlet	Strigidae	Migrant	LC
24	Common Horpoe	Upupidae	Resident	LC
25	Oriental Magpie Robin	Turdidae	Resident	LC
26	Common Tailorbird	Cisticolidae	Resident	LC
27	Black Winged Stilt	Recurvirostridae	Resident	LC
28	Indian Silverbill	Estrildidae	Resident	LC
29	Green Bee Eater	Meropidae	Migrant	LC
30	Sarus Crane	Gruidae	Migrant	LC
31	Red vented Bulbul	Passerines	Resident	LC
32	Common Woodshrike	Vangidae	Resident	LC
33	Common Myna	Sturnidae	Resident	LC

Dominant Group - Passeriformes - 24 species 48%, Columbiformes - 6 species, Piciformes and Coracciformes with 4 species each. Accpitriformes, Cuculiformes, Psittaciformes with two species each. One vulnerable species Egyptian vulture (Neophron perenopterus) was also noted during study. Diversity index of birds in different types of habitats are given in Table 2.

Table 2: Diversity indices of different habitat types

Sr. No.	Habitat	No. of Birds Species	Simpson's Index (D)	Shanon-Weiner Index (H)
1	Tree dominated	28	1.367	3.612
2	Scrub dominated	16	0.732	1.968
3	Grass dominated	08	0.672	1.569

Although the study area is confined in its size but it has been reportedly supporting rich and diverse bird community. On a record overall 31 species of birds are recorded. As per our record the bird's diversity in such a small area is inevitable for the proper understanding of avian biodiversity and conservation in the study sites. The variation has been seen in the species diversity and species evenness at various habitats which we find may be due to the availability of food and resources as well altering nesting sites in the different habitat types. It has came to our observation that the abundance of avian species is highly impacted by the composition of the vegetation or flora that is a major constituent of their habitats (Noor *et al.*, 2014). As vegetation changes along complex biological and environmental gradients, a particular bird species can

appear, increase or decrease in number and vanish (Lee & Rotenberry, 2005). In this study the highest species of birds has been recorded from the mixed vegetation areas. The change in the avifaunal diversity in between different habitat types in the area is speculated to be influenced by the availability of essential resources. The presence of trees along with understory shrub and grass vegetation serves as source of food resources, breeding, habitat and cover for the birds.

CONCLUSION

Birds are important elements of our biodiversity and often serve as bio-indicators of our environment. Now a days due to human interferences the bird's population and diversity is declining rapidly throughout the globe and same impact is visible in the India's scenario. Along with anthropogenic factors climate change and natural disasters are also serving as a source of destruction to the avifauna. In such alarming circumstances conservation of birds has become a burning issue today's. But without proper understanding of avifaunal diversity it has been a challenging task. Thus arises a need for prior understanding, proper management of avian habitats as well as maintaining record of adequate data of avifauna. Present study is focused to provide information pertaining avian species in the different habitat types of Aligarh fort. It was a short-span study to provide baseline information that may be utilized to conduct further studies on population abundance and diversity, behavior, nesting and feeding patterns etc. of avifauna in Aligarh region. Further studies on factors affecting avifaunal diversity are necessitated and recommended in this region.

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