Avian Species Diversity of University of Kashmir campus, Srinagar, Jammu and Kashmir, India

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Abstract

The University of Kashmir campus, located 11 kms away from city of Srinagar is known for its picturesque location and scenic beauty. Flanked by the famous Dal lake on its eastern side and Nigeen lake on western side, it remains a prime attraction for tourists. The campus is spread on 247 acres with its tall Chinar trees, variety of vegetation types, Botanical garden of the campus and green lawns serving as an attraction for different birds as well. A brief study was carried out for the period of two months, (May-June, 2017) to assess diversity of avifauna in University of Kashmir, main campus. Data collection was made through point count method with 9 fixed points in different habitat types. Field binocular (10x50 magnifications) was used for visual surveys. Surveys revealed the presence of 31 bird species with 27 genera placed taxonomically under 21 families which were further arranged systematically under nine orders. Passeriformes was the dominant group with 19 bird species followed by Columbiformes, Psittaciformes, Pelecaniformes and Coraciformes with two species of birds; while remaining four orders, Piciformes, Cuculiformes, Bucerotiformes and Accipiteriformes were represented by one species each.

Keywords: Avifauna, diversity, point count, Kashmir University

1. Introduction

In Western Himalaya and Trans-Himalayan biogeographical region, the state of Jammu and Kashmir lies between the temperate Palaearctic and tropical Oriental biogeographic regions of the world (Rahmani et al. 2012). Avifauna being the most important biotic component of any type of ecosystem (Dhindsa and Saini, 1994) plays a crucial role in maintaining ecological balance. Avifaunal diversity acts as an important bio-indicator (Bilgrami, 1995; Centrrbury et al., 2000; Mistry, 2008 and Slabbekoorn & Ripmeester, 2008) and helps in assessing habitat quality of an area. Over 10,000 different species of birds have been recorded by BirdLife worldwide. Climatic changes and anthropogenic activities have been regarded as the main cause for decline of avifauna (Rapoport, 1993; Chen et al., 2011 and Sekercioglu et al., 2012). Furthermore, bird population has further declined because of change in land use pattern (Roy et al., 2012). Reports have revealed that around sixteen million birds are being destroyed annually (Huges et al., 1997). In terms of number of threatened bird species, India stands at 7th position with 88 threatened bird species over the world (BirdLife International, 2010). Although numerous studies have been conducted on birds country wide only a few are from Kashmir valley (Shah et al. 2000; Dar and Dar 2009; Noor et al. 2014). With this background this study was carried out to explore the avifaunal diversity of the University of Kashmir campus.

2. Materials and Methods

2.1 Study area

The study was carried out in the University of Kashmir, Srinagar campus Fig 1. The campus is located 11 Kms away from city of Srinagar and is known for its picturesque location and scenic beauty. Flanked by the famous Dal lake on its eastern side and Nigeen lake on western side, it remains a prime site for birds. The campus is spread on 247 acres with its tall and beautiful chinar trees, variety of vegetation types, Botanical garden of the campus and various beautiful green lawns serve as an attraction for different birds as well.
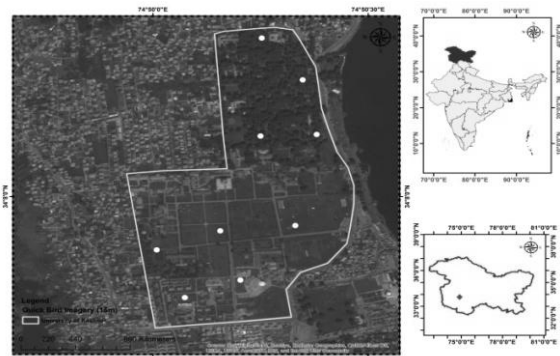
Fig 1. Location map of University of Kashmir campus showing different study sites represented by white dots

2.2 Method

Point count method was used for the study of bird diversity in the area. Nine locations were selected in three different habitat types in the area. The observation was made in morning from 8:00 to 9:00 am and 5:00 to 6:00 pm in evening with the binocular (10×50 magnifications). Identification was done based on the standard literature (Ali, S. 2008).
Data analysis
Bird species diversity and evenness
Bird diversity in different habitat types was calculated using both Shannon-Weiner (Shannon and Weiner, 1949), and Simpson's diversity indices (Stone and Pence, 1978). Shannon-Weiner diversity Index, 'H' was calculated using the formula:

$$H' = -\sum_{i=1}^{R} p_i \ln p_i$$

Where, Pi = Proportion of individual species and R = total number of species of the community (number seen and heard).
Simpson's diversity Index 'D' was calculated using the formula:

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

Where, ni = 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.

3. Results and Discussion

This study revealed the presence of 31 bird species with 27 genera placed taxonomically under 21 families which were further arranged systematically under nine orders (Table 1). Passeriformes was the

dominant group with 19 bird species followed by Columbiformes, Psittaciformes, Pelecaniformes and Coraciformes with two species of birds; while remaining four orders, Piciformes, Cuculiformes, Bucerotiformes and Accipiteriformes were represented by one species each. Diversity index of birds in different habitat types is given in table 2.

Table 1: Checklist of Birds recorded during the current study

S. No.	Species	Family	Resident /Migrant	IUCN Status
1	Black Drongo	Dicruridae	M	LC
2	Alaxanderine Parakeet	Psittacidae	R	NT
3	Barn swallow	Hirundinidae	M	LC
4	Blue whistling thrush	Muscicatidae	R	LC
5	Himalayan Bulbul	Pycnonotidae	R	LC
6	Common Kingfisher	Alcedinidae	R	LC
7	Common Myna	Sturnidae	R	LC
8	Eurasian Collared Dove	Columbidae	M	LC
9	Common Starling	Sturnidae	M	LC
10	Common Cuckoo	Cuculidae	M	LC
11	Scaly Bellied woodpecker	Picidae	R	LC
12	European Goldfinch	Fringillidae	M	LC
13	Little Egret	Ardidae	R	LC
14	Fork tail	Muscicapidae	M	LC
15	Golden Oriole	Oriolidae	M	LC
16	Cinereous tit	Paridae	M	LC
17	Hoopoe	Upupidae	M	LC
18	House Sparrow	Passeridae	R	LC
19	Eurasian Jackdaw	Corvidae	R	LC
20	Black Kite	Accipitridae	R	LC
21	Large Billed crow	Corvidae	R	LC
22	Long tailed Shrike	Lanidae	M	LC
23	Yellow billed blue magpie	Corvidae	M	LC
24	Indian Paradise Flycatcher	Monarchidae	M	LC
25	Common Pigeon	Columbidae	R	LC
26	Indian Pond Heron	Ardidae	R	LC
27	Rose Ringed Parakeet	Psittacidae	R	LC
28	House Crow	Corvidae	R	LC
29	Streaked laughing thrush	Liothrichidae	R	LC
30	Mistle thrush	Turdidae	M	LC
31	White throated kingfisher	Alcedinidae	R	LC

Table 2: Diversity indices of different habitat types

S.no.	Habitat	No. of bird Species	Simpson index (D)	Shannon-Weiner index (H)
1	Chinar dominated	18	0.879	2.322
2	Mixed Vegetation	22	0.916	2.706
3	Grass dominated	10	0.841	1.962

The study area despite small in size appears to support an extremely rich and diverse bird community. Overall, 31 species of birds were recorded during this study. The observed bird diversity in relatively small area underlines the importance of this area for biodiversity conservation. Since the campus is located in the vicinity of Dal lake, that adds to the bird diversity of the campus.

The variation in species diversity and species evenness at various habitats observed in this study may be due to the availability of food and the nesting sites in the different habitat types. It has been observed that the abundance of numerous bird species is highly influenced by the composition of the vegetation that forms a major element 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 as the habitat changes (Lee & Rotenberry 2005, Noor et al. 2014). In present study highest number of species where recorded from mixed vegetation habitat. The high diversity of birds in this habitat may be influenced by the presence of vital resources. The presence of trees with understory vegetation in this area provided food resources, breeding habitat and cover for the birds.

4. Conclusions

Birds are recognized among the most important indicators of the situation of the environment. They are threatened by different anthropogenic pressures such as human settlement, unsustainable tourism, land conversion and unplanned urbanized developments. Conservation of birds is not possible unless we have sound understanding of avifaunal diversity of a region. Thus there is a need to enlist the data and manage the habitat in consideration with various requirements of fauna. Current study provided baseline information on the number of bird species present in different habitats of the campus. Further study of factors affecting bird diversity in different habitats considering spatio-temporal factors and the availability of specific food resources is recommended. This was a short span study and will act as a baseline for conducting detailed studies on population abundance, reproductive behavior, nesting mechanism, nesting site selection, feeding behavior, etc. to gain additional knowledge on avifaunal diversity of the study area.

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