

Assessment of bird diversity on the St. Stephen's College Campus, Kollam, Southern Kerala

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Abstract

The present study provides a comprehensive assessment of avian diversity on the St. Stephen's College campus in Kollam, Kerala, offering insights into the bird species inhabiting the area. Over the study time, 15 distinct bird species were identified, with a total count of 91 individual birds. The majority of these species (98%) were resident birds, indicating their year-round presence on the campus. Additionally, 1% of the species were identified as migratory, and 1% as local migrants. The most frequently observed species included the House Crow, Blue Rock Pigeon, Common Myna, and Asian Koel, reflecting their adaptability to the campus environment. Conversely, species such as the Indian Treepie (*Dendrocitta vagabunda*) and Asian Paradise Flycatcher (*Terpsiphone paradisi*) were recorded less frequently, suggesting their lower abundance and possible sensitivity to specific environmental conditions. The present study contributes valuable data on local bird diversity, which can inform future conservation efforts and biodiversity management on the campus.

Keywords: Conservation, Diversity, Migrants, Resident birds.

Introduction

Avian diversity, representing the variety of bird species within ecosystems, is a vital component of global biodiversity. With over 10,000 species worldwide, birds play essential roles in ecological balance through activities like scavenging, pollination, and insect predation. India, home to more than 1,300 bird species, harbors 13% of the world's avian diversity, ranking third globally in terms of the number of threatened and rare species (Dandapat et al., 2010).

Birds, being highly visible and sensitive to environmental changes, serve as excellent indicators of ecosystem health. Environmental factors such as agricultural practices, pollution, and climate change significantly impact bird populations (Mitra et al., 2011). Monitoring avian populations provides crucial data for understanding ecological shifts and developing effective conservation strategies. Given the ongoing destruction of natural habitats, detailed studies on avifauna are essential for their protection and for maintaining ecological balance (Sarkar et al., 2009).

Materials and Methods

Study Area

The study was conducted on the campus of St. Stephen's College, Pathanapuram, located in the Kollam district of Kerala, India. The campus spans approximately 100 acres within the Pattazhy Vadakkekara Grama Panchayat. This area is characterized by its environmentally rich landscape, which includes the Kallada River situated nearby, as well as diverse vegetation comprising rubber plantations and various tree species such as Jungle Jack, Jackfruit tree, Cashew tree, Coconut tree etc. In accordance with highland open area, the entire campus was divided into distinct quadrates.

Bird Survey

The composition and occurrence of birds were systematically documented through direct field visits and observations throughout the study period. The transect method was employed ensure a standardized approach to recording bird species over time and across different locations. Surveys were conducted monthly, with observations carried out at three distinct sites within the campus. The site was surveyed in the morning between 08:00 AM and 09:30 AM, a time chosen for its high avian activity.

During each survey, all birds observed or heard were documented. Care was taken to avoid double counting. Observations were made using binoculars (Olympus 8x42 EXWPI) to enhance accuracy. Bird identification was conducted using established field guides and reference books (Ali & Ripley, 1983; Ali, 1984; Neelakantan et al., 1993; Grimmett et al., 1998; Manakadan and Pittie, 2001). Birds were identified based on physical characteristics to the species level, and the number of individuals observed was recorded. The census was conducted over a two-month period, from February 2021 to March 2021, with surveys

performed fortnightly. The status of species is classified into wetland birds and terrestrial birds and also the status of species is classified into Resident (R), Migrant (M) and Local Migrant (LM).

Results and Discussion

A comprehensive avifaunal survey was conducted at the St. Stephen's College Campus, Kollam, during the period from February to March 2021. The study identified a total of 15 bird species, distributed across 13 families and 6 orders (Table 1). The orders documented were Columbiformes (1 sp.), Psittaciformes (1 sp.), Cuculiformes (1 sp.), Coraciiformes (2 sp.), Piciformes (2 sp.), and Passeriformes (8 sp.). The month of February recorded the highest species diversity, with 11 species documented, while March recorded 10 species, including one wetland species.

The majority of the bird species identified were residents, comprising 13 species (98%), while one species was classified as a local migrant (1%) and another as a migrant (1%). Among the resident species, the House Crow was the most prevalent. Notably, the Asian Paradise Flycatcher was the sole migrant species observed during this study, and the Black-hooded Oriole was the only local migrant recorded. The White-throated Kingfisher was the only wetland-associated species observed. The conservation status of the species documented revealed that five species had not been assessed by the IUCN, while ten species were classified as of Least Concern, including the Blue Rock Pigeon, Asian Koel, Indian Tree Pie, Pale-billed Flowerpecker, Yellow-billed Babbler and Asian Paradise Flycatcher (Table 2).

Shannon-diversity index showed a value of 1.96. This value suggests a moderate diversity in the bird community. The values of Pielou's evenness index is 0.72. Here, the value indicates a fairly even distribution, though some species are more abundant than others. Similarly, the values of Margalef's richness index is 3.10. In this case, the value suggests a reasonably rich bird community, given the number of individuals observed. Berger-Parker dominance index is 0.37. Berger-Parker index showed that higher the species dominance, the lesser the diversity is. The Berger-Parker index reflects the dominance of the most abundant species. A lower value would indicate a more even distribution, while a higher value indicates that a few species dominate. Here, the House Crow is the most dominant species, making up 37% of the total bird population.

The structure of vegetation plays a pivotal role in shaping the avian community at a given location. Areas with more complex vegetation structures tend to harbor higher species diversity. The diversity observed among terrestrial birds can be attributed to the variety of habitats and microhabitats within roadside plantations, bamboo groves, mango orchards, and narrow forested areas (Harisha & Hosetti, 2009).

The St. Stephen's College Campus exhibited significant species richness, indicating that the area is capable of sustaining a diverse array of bird species by offering adequate food resources and shelter (Lakshmi, 2006). Birds inhabit various environments and depend on a complex network of microhabitats for their survival. Birds utilize a range of environments and rely on a complex network of microhabitats for their survival. The presence of paddy fields near to the campus is particularly beneficial, attracting a larger variety of bird species. The findings of this study align with those of previous research on wetland birds in the Chhilchhila Wildlife Sanctuary, where paddy fields with scattered trees were found to provide protection and suitable foraging areas for birds (Kumar & Gupta, 2013). The habitat of the college campus offers a variety of food sources, including invertebrates, fish, and plankton, which likely contribute to the increased diversity of avian species. These findings are consistent with observations made by Basavarajappa (2006). The absence of Black Kites (*Milvus migrans*) in the study area suggests a relatively unpolluted environment. The high number of resident birds documented during the present study may indicate that the ecosystem experiences minimal disturbances. Furthermore, bird diversity is observed to be greater in February, which may be linked to the seasonal effects of winter. The diversity indices indicate that the bird community at St. Stephen's College Campus is moderately diverse with a fair level of evenness. While there is a relatively high species richness, the dominance of the House Crow (*Corvus splendens*) is notable, as it accounts for a significant portion of the total bird population. This dominance slightly reduces the overall evenness and diversity of the community.

Understanding the diversity of bird species is imperative for conservation efforts, as it provides critical insights into the ecosystem health. The present study enhances the understanding of the interactions between bird species and their environments, revealing the importance of biodiversity conservation.

Table 1. Showing orders, families, scientific names, common names and no. of birds in St. Stephen's College Campus, Pathanapuram.

Sl.No.	Order/ Family	Scientific Names	Common Names	Number of Birds		
				Feb.	Mar.	Total
1	Coluumbiformes Columbidae	<i>Columba livia</i>	Blue Rock Pigeon	12	9	21
2	Psittaciformes Psittacidae	<i>Psittacula krameri manillensis</i>	Rose-ringed Parakeet	4	2	6
3	Cuculiformes Cuculidae	<i>Eudynamys scolopaceus</i>	Asian Koel	-	1	1
4	Coraciiformes Centropodidae	<i>Upupa epops</i>	Greater Coucal	1	1	2
	Alcedinidae	<i>Halcyon smyrnensis</i>	White -throated Kingfisher	-	1	1
5	Piciformes Megalamidae	<i>Megalaima viridis</i>	White-cheeked Barbet	1	-	1
	Picidae	<i>Dinopium benghalense tehmina</i>	Wood Pecker	2	-	2
6	Passeriformes Oriolidae	<i>Oriolus xanthornus</i>	Black-hooded Oriole	1	-	1
	Dicruridae	<i>Dicrurus macrocercus</i>	Black Drongo	3	-	3
	Sturnidae	<i>Acridotheres tristis</i>	Common Myna	6	4	10
	Corvidae	<i>Corvus splendens</i>	House Crow	15	19	34
		<i>Dendrocitta vagabunda</i>	Indian Tree Pie	-	2	2
	Dicaeidae	<i>Dicaeum erythrorhyncos</i>	Pale-billed Flowerpecker	2	-	2
	Muscicapidae	<i>Turdoides affinis</i>	Yellow-billed Babbler	3	1	4
<i>Terpsiphone paradise</i>		Asian Paradise Flycatcher	-	1	1	

Table.2 Checklist of birds recorded in St. Stephen’s College Campus with their residential status, habitat and conservation status.

Sl. No.	Common Name	Status	Habitat	Conservation Status
1	Blue Rock Pigeon	R	T	NA
2	Rose-ringed Parakeet	R	T	LC
3	Asian Koel	R	T	NA
4	Greater Coucal	R	T	LC
5	White-throated Kingfisher	R	W	LC
6	White-cheeked Barbet	R	T	LC
7	Wood Pecker	R	T	LC
8	Black-hooded Oriole	LM	T	LC
9	Black Drongo	R	T	LC
10	Common Myna	R	T	LC
11	House Crow	R	T	LC
12	Indian Tree Pie	R	T	NA
13	Pale-billed Flowerpecker	R	T	NA
14	Yellow-billed Babbler	R	T	NA
15	Asian Paradise Flycatcher	M	T	LC

* R-Resident, M-Migrant, LM-Local Migrant

** W-Wetland bird, T-Wetland Associated Terrestrial Bird

*** LC-Least Concern, NA-Not Assessed

Conclusion

The present study underscores the campus's success in attracting a wide variety of avian species. The findings reveal that the distribution and relative abundance of these birds are intricately connected to factors such as aquatic vegetation, prey availability, and foraging success. Given the vital role birds play in nature, the study emphasizes the importance of avian conservation, particularly in light of the extensive landscape changes occurring in Kerala's lowlands due to population growth, tourism, and development. The relatively undisturbed ecosystem of St. Stephen’s College Campus, presents a valuable setting for conservation initiatives. To ensure the long-term preservation of the area's ecological diversity, active

engagement with the campus management is essential to raise awareness about the significance of wetlands and bird species, ensuring the long-term preservation of the area's ecological diversity.

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