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Diversity of birds in and around Kohima Science College campus, Jotsoma, Kohima, Nagaland (India)

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ABSTRACT The present study on Birds diversity in the Kohima Science College campus and surrounding areas (India) was done over a period of six months from September 2023 to May 2024. A total number of 48 bird species belonging to 27 families were recorded during the study covering an area of about 3.2 km^2. The family Muscicapidae was found to be dominant with a 13% contribution followed by families like Laniidae, Leiothrichidae, Cuculidae and Pycnonotidae with a 6% contribution which is further followed by families like Columbidae, Hirundinidae, Motacillidae, Paridae and others with 4% contribution.

KEY WORDS Bird species; diversity; Jotsoma; Status; Survey.

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INTRODUCTION

Biodiversity refers to the variety and variability of life on Earth, and the Indian subcontinent is exceptionally rich in this diversity. Birds, a group of warm-blooded vertebrates constituting the class Aves, are distinguished by their feathers, toothless beaked jaws, the laying of hard-shelled eggs, high metabolic rates, four-chambered hearts, and strong yet lightweight skeletons. These creatures inhabit all corners of the globe, with sizes ranging from the 5.5 cm (2.2 in) bee hummingbird to the 2.8 m (9 ft 2 in) ostrich. The Indian subcontinent alone is home to approximately 1,300 species of birds, representing over 13% of the world's avian population (Grimmett et al., 2013). Birds are excellent environmental indicators, reflecting the health of ecosystems, yet global bird diversity is continually declining due to human activities (Rapoport, 1993).

While numerous studies have explored avifaunal diversity in India, there is a notable lack of research on the bird diversity in Kohima and especially Jotsoma. This study aims to address this gap by investigating the bird diversity in and around the Science College Campus in Jotsoma, Kohima district. According to the eBird checklist, Kohima, Nagaland, hosts 203 bird species. The objective of this research is to establish baseline data on bird diversity in Jotsoma, Kohima district, which will be valuable for future ecological and environmental assessments.

MATERIAL AND METHODS

Study area

Kohima Science College, Jotsoma (25.6657° N, 94.0755° E), is an autonomous government institute for undergraduate and postgraduate science education, located in Jotsoma village in Kohima District, Nagaland, India. The college spans 50 acres. The study was conducted on the southern side of the campus, which shares a boundary with the Pulie Badze Reserve Forest, and extended to the lower

side of the reserve up to Nagi Resort. The total study area covered approximately 3.2 km².

Jotsoma is renowned for its forested areas, situated within the Kohima district of Nagaland, part of the Eastern Himalayan biodiversity hotspot - one of the world's richest areas in terms of biodiversity. The forests in Kohima district primarily consist of subtropical and temperate broadleaf forests, home to a diverse range of flora and fauna. Common tree species in these forests include oak, rhododendron, magnolia, chestnut, and maple. The bird diversity is also abundant, with numerous species inhabiting the forested areas, including hornbills, pheasants, thrushes, and many others.

The region experiences a moderate humid subtropical climate, with cold winters and moderately warm summers. The mean annual temperature ranges from 13.4 °C to 25.24 °C. The average annual rainfall is between 1700 to 2000 mm, with about nine rainy months. Winter temperatures can drop to as low as 1 °C, with December and January being the coldest months of the year.

Material

Observations were conducted at various spots in and around the Kohima Science College campus (Fig. 1). The observations were made using Celestron 10x50 binoculars (model 71256), and photography was done with a Canon R10 digital camera equipped with a Sigma 150–600 mm F5-6.3 DG OS HSM telephoto lens. Bird identification was carried out using field guides (Salim & Ripley, 1983; Salim & Daniel, 2002; Grewal, 2021; Asad, 2011), as well as the eBird, BirdNET, and Merlin Bird apps (Table 1, Figs. 2, 3).

Data Collection

The study area was surveyed from September 2023 to May 2024 at regular intervals. Visits were conducted in the morning from 6:00 am to 9:00 am and in the evening from 3:00 pm to 5:00 pm. Birds were either photographed or their calls and songs recorded. Identifying a bird can be a challenging process as birds are active animals. Quick eye spotting is required to capture as many details as possible in a short span of time (Singh et al., 2018). The birds were observed by sitting / standing from a hiding place. The following two methods were employed in this study:

(a) Point counts: observations were made from a fixed location for a fixed period, recording all bird species seen or heard.

(b) Line transect: observations were made while moving along a fixed path, recording all bird species seen and heard on both sides of the path (Bibby et al., 1992).

The following formula was used to determine the percentage of occurrence of families (Basavarajappa, 2006; Kushwaha & Kulkarni, 2013):

$$\text{Percentage occurrence} = \frac{\text{No of species of each family observed}}{\text{Total number of species observed}} \times 100$$

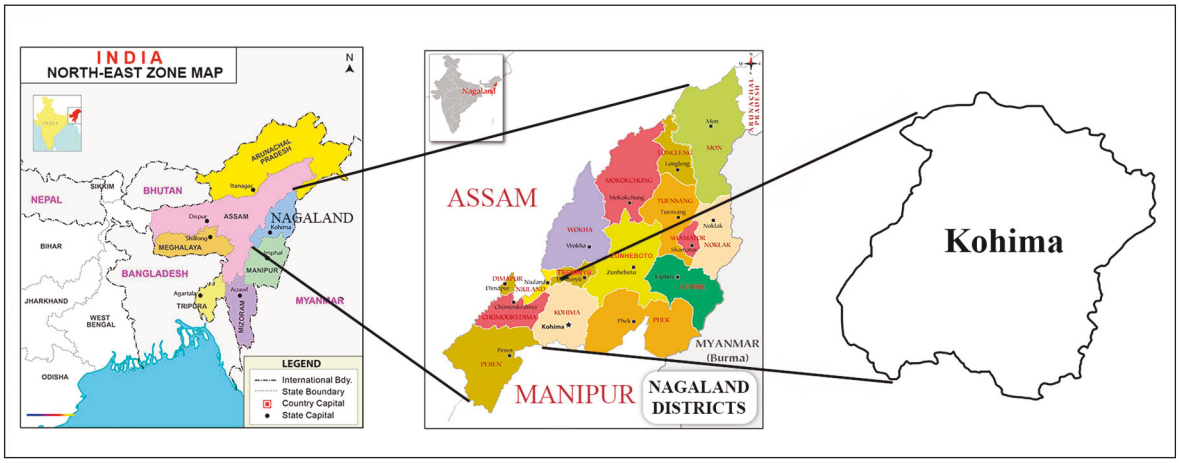

Figure 1. Study area in Jotsoma village, Kohima District, Nagaland, India.

No	Common Name	Scientific name	Family	Habitat	Status	IUNC
1	Black tailed Crake	*Zapornia bicolor*	Rallidae	W	LM	LC
2	Green back tit	*Parus monticolus*	Paridae	F	R	LC
3	Brown Shrike	*Lanius cristatus*	Laniidae	F	R	LC
4	White eye	*Zosterops palpebrosus*	Zosteropidae	F,S	R	LC
5	Little pied flycatcher	*Ficedula westermanni*	Muscicapidae.	F	R	LC
6	Verditer flychater	*Eumyias thalassinus*	Muscicapidae,	F	R	LC
7	Eurasian tree sparrow	*Passer montanus*	Passeridae	HH	R	LC
8	Gray Wagtail	*Motacilla cinerea*	Motacillidae	O	R	LC
9	Mountain bulbul	*Ixos mcclellandii*	Pycnonotidae	F	R	LC
10	Red vented Bulul	*Pycnonotus cafer*	Pycnonotidae	F	R	LC
11	Flavescent Bulbul	*Pycnonotus flavescens*	Pycnonotidae	F	R	LC
12	Red faced liocichla	*Liocichla phoenicea*	Leiothrichidae	F	R	LC
13	Long tailed Shrike	*Lanius schach*	Laniidae	F	R	LC
14	Olive backed pipit	*Anthus hodgsoni*	Motacillidae	F	R	LC
15	Purple finch	*Haemorhous purpureus*	Fringillidae	F	R	LC
16	Gray bushchat	*Saxicola ferreus*	Muscicapidae	S	R	LC
17	Taiga flycatcher	*Ficedula albicilla*	Muscicapidae	F	LM	LC
18	White throated bushchat	*Saxicola insignis*	Muscicapidae	F	R	VU
19	Little bunting	*Emberiza pusilla*	Emberizidae	F	R	LC
20	Ashy drongo	*Dicrurus leucophaeus*	Dicruridae	F	R	LC
21	Whiskered yuhina	*Yuhina flavicollis*	Zosteropidae	F	R	LC
22	Canary island stonechat	*Saxicola dacotiae*	Muscicapidae	F	R	NT
23	Mrs.gould's sunbird	*Aethopyga gouldiae*	Nectariniidae	F	R	LC
24	Sparrow hawk	*Accipiter nisus*	Accipitridae	R	LM	LC
25	Hill prinia	*Prinia superciliaris*	Cisticolidae	F	R	LC
26	Laughing thrush	*Pterorhinus albogularis*	Leiothrichidae	F	R	LC
27	Eye browed thrush	*Turdus obscurus*	Turdidae	F	R	LC
28	House Sparrow	*Passer domesticus*	Passeridae	F	R	LC
29	Common cuckoo	*cuculuc canorus*	Cuculidae	F	R	LC
30	Lesser coucal	*Centropus bengalensis*	Cuculidae	F	R	LC
31	Mountain Bamboo Partridge	*Bomussiocla fytchii*	Phasianidae	F	R	LC
32	Rufous throated Partidge	*Arborophila rufogularis*	Phasianidae	F	R	LC
33	Gray backed shrike	*Lanius tephronotus*	Laniidae	F	R	LC
34	Yellow cheeked tit	*Machlolophus spilonotus*	Paridae	F	R	LC
35	Short billed mini vet	*Pericrocotus brevirostris*	Campephagidae	F	R	LC
36	Long tailed minivet	*Pericrocotus ethologus*	Campephagidae	F	R	LC
37	Domestic pigon	*Columba livia domestica*	Columbidae	F	R	LC
38	Spotted dove	*Spilopelia chinensis*	Columbidae	HH	R	LC
39	Black faced warbler	*Abroscopus schisticeps*	Cettiidae	F,S	R	LC
40	Chesnut headed tesia	*Cettia castaneocoronata*	Cettiidae	F	R	LC
41	Straiated swallows	*Cecropis striolata*	Hirundinidae	HH, F	R	LC
42	Asian house martin	*Delichon dasypus*	Hirundinidae	HH	R	LC
43	Ashy throated warbler	*Phylloscopus maculipennis*	Phylloscopidae	S	R	LC
44	Yellow browed warbler	*Phylloscopus inornatus*	Phylloscopidae	CF,F	R	LC
45	Fire-breasted flower-pecker	*Dicaeum ignipectus*	Dicaeidae	F	R	LC
46	Silver-eared Mesia	*Leiothryx argentarius*	Leiothrichidae	F	R	LC
47	Dark-backed Sebia	*Heterophasia melanoleuca*	Leiothrichidae	F	R	LC
48	Eurasian Siskin	*Spinus spinus*	Fringillidae	CF ,F	R	LC

Table 1. Showing different bird species found in and around Science College Campus, Jotsoma Habitat: F - Forest, R-Raptor, W - water, S - Shrub, HH - human habitation, O - open area, CF - Coniferous Forest Residential. Status: R - Resident, LM - Local migratory, SM - Semi migratory, M - Migratory, WV - Winter visitor. IUCN Status: LC - Least concern, NT - Near Threatened, VU - Vulnerable, EN - Endangered.

Figure 2. Some of the birds observed during this study in Jotsoma village, Kohima District, Nagaland, India.

Figure 3. Other birds observed during this study in Jotsoma village, Kohima District, Nagaland, India.

RESULTS AND DISCUSSION

In the present study, a total of 48 bird species, belonging to 27 families, were recorded (see Table 1) and some are shown in Figs. 2, 3.

The family Muscicapidae was found to be dominant with a 13 % contribution followed by families like Laniidae, Leiothrichidae, Cuculidae and Pycnonotidae with a 6% contribution which is further followed by families like Columbidae, Hirundinidae, Motacillidae, Paridae and others with 4% contribution. The remaining families have contribution around 2% as shown in Fig. 4.

The most commonly seen bird species were the Red-vented Bulbul, Tree Sparrow, Green-backed Tit, White-eye, and Olive-backed Pipit (Fig. 2). In the nearby forest area, the frequently observed species included the Common Cuckoo, Brown Shrike, Prinia, Gray Bushchat, Bamboo Partridge, and Rose Finch. Uncommon (but not rare) species included the Mountain Bulbul, Flavescent Bulbul, Verditer Flycatcher, Grey Wagtail, Mrs. Gould's Sunbird, and Sibia. Unexpected species observed on the campus were the Black-tailed Crake and Sparrow Hawk shown in Fig. 3. This study was based on field surveys, as a result, the probability of recording the most common species is significantly higher, which in turn increased the chance of missing rare bird species (Harde et al., 2020; Rawat & Rao, 2022).

CONCLUSIONS

The present study revealed that the campus area is a semi-urban site experiencing continuous disturbances due to increasing human activity. Birds perceive humans as predators and tend to leave such areas, resulting in reduced bird species diversity. However, the southern side of the campus shares a boundary with the Pulie Badze Reserve Forest, which hosts a significant number of avifauna, indicating excellent ecosystem health. Bird hunting is

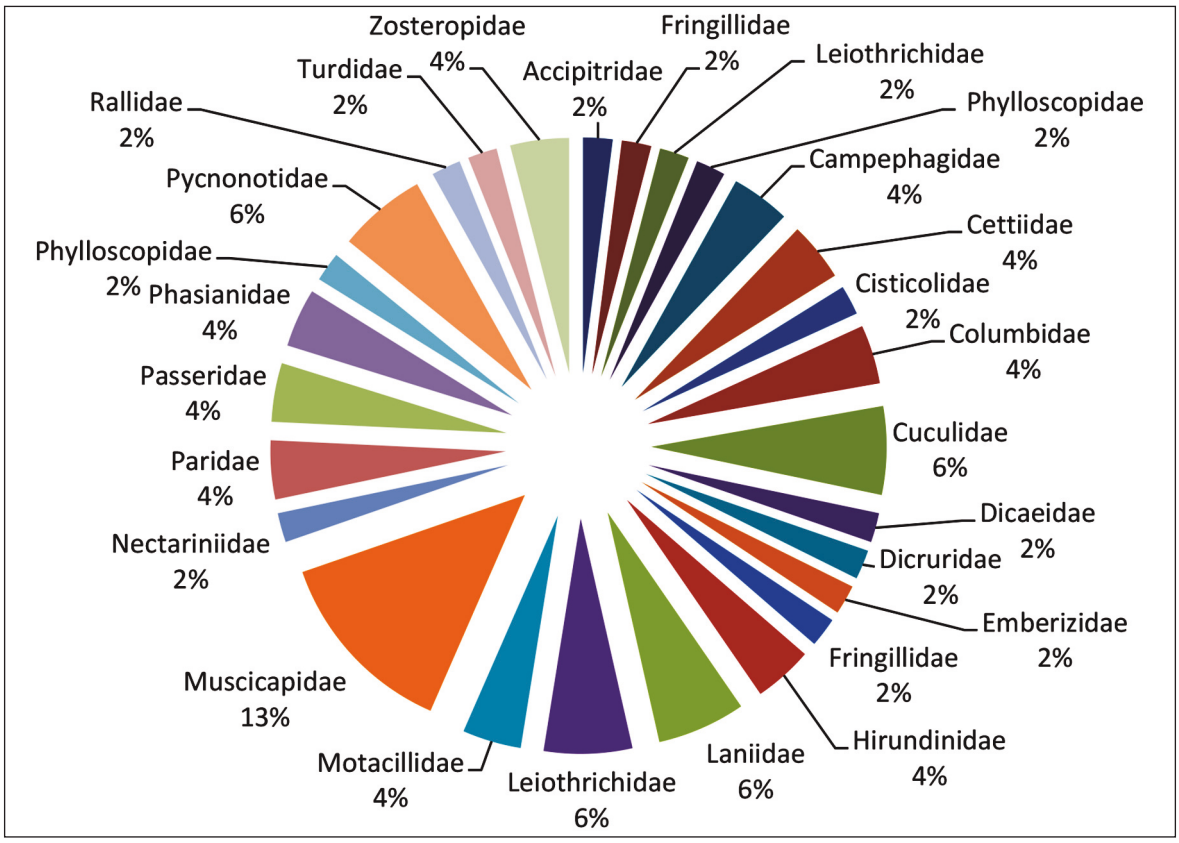

Figure 4. Family wise distribution of birds (Jotsoma village, Kohima District, Nagaland, India).

quite common in this area, which is a challenge in maintaining bird diversity and conservation .

From a conservation perspective, it is crucial to raise awareness about the role of birds in the ecosystem and encourage the plantation of bird-attracting plants, as well as the creation of sheltering and breeding areas for birds. These efforts could lead to an increase in species richness in the area. Researchers have a larger scope to explore the avian fauna in the Pulie Badze Reserve Forest.

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