

Diversity and abundance of avifauna in forest research centre, Mulugu, Telangana, India

Abstract

A study was conducted to document the avian diversity of the Forest Research Centre (FRC) and Forest College and Research Institute (FCRI) Mulugu, Telangana, India from January 2020 to December 2020. Birds were surveyed at two different timings of the day i.e. early morning from 7 am to 10 am and at evening from 3 pm to 6 pm using line transect and point count method. A total of 77 species belonging to 15 orders and 42 families were recorded in which the maximum abundance of the species was recorded in the order Passeriformes. The analysis of dietary preference showed the dominance of the insectivorous community (52 %) followed by Frugivores (13%). The data on residential status revealed that all the 77 species observed, are resident in India with local migratory nature. The recorded species, Black-headed Ibis (*Threskiornis melanocephalus*) is listed under the near threatened (NT) category in the IUCN red data list. The work highlighted the importance of green cover around urban ecosystems as a preferred habitat for avian populations. FRC supports good bird diversity and protection and management of areas in and around them will help with conservation of the species.

Keywords: Avifauna, Diversity, Abundance, Telangana, India

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Mhaiskar Priya Rajendra,¹ Suharsha B,² Deepika G³

¹Department of Forest Ecology and Climate Science, FCRI, India

²Department of Wood Science, School of Forestry and Wildlife Science, India

³Department of Wildlife Science, School of Forestry and Wildlife Science, India

Correspondence: Mhaiskar Priya Rajendra, Assistant Professor, Department of Forest Ecology and Climate Science, FCRI, Mulugu, Telangana, India, 502279, Email mhaiskarpriya@gmail.com

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Introduction

The great beauty of avifaunal species in terms of colourful plumage, graceful, elegant, and merry flying and relaxing and musical cries has always fascinated and attracted mankind. All components of a natural ecosystem are interdependent and changing or removing one can cause the entire system to collapse. Birds are a well-known and crucial part of biodiversity. They serve a crucial role in maintaining the food web as a potential pollinator. They also serve as a bio-indicator of ecosystem quality, allowing one to assess the condition of an ecosystem's health based on their existence.¹⁻³ Ecologists utilise them to better understand the diversity of species in their natural habitat.⁴

Birds can serve as keystone species, whose presence or absence in an ecosystem can have an indirect impact on the survival of other species. They aid in the balance of prey and predator populations. They eat hazardous insects, which helps to keep their population under control. When birds are alive, they serve as hosts for parasites such as mites, flies, and lice, and when they die, they supply food for decomposers and scavengers.

The population of this beautiful creature is rapidly falling nowadays as a result of numerous anthropogenic disturbances, and many species have become extinct. The main reason is habitat destruction due to deforestation for agricultural, developmental, and other purposes, as well as random tree cutting, which has resulted in a reduction in forage and nesting places for the species.^{5,6} Another factor contributing to their reduction is changes in vegetation composition, which affects the quality and quantity of food, water, and cover essential for their survival, impacting the species' distribution, variety, and abundance.^{7,8}

The current study aims to prepare a species checklist in the Forest Research Centre (FRC) and Forest College and Research Institute (FCRI) campus as it indicated the diversity of the species in order to conserve bird's existence.⁹ As there has not been existing studies on bird diversity in this area, the study aims to explore the avian diversity associated with FRC and FCRI, as well as document the significance of greenery in bird conservation.

Materials and methods

Study area

Forest Research Centre (FRC) is situated between 17.7439° N and 78.6299° E in Mulugu Mandal, Siddipet District, Telangana State, India covering an extent of 196 ha which is nearly 50kms from the city of Hyderabad. The topography of the area is plains with gentle slopes. Summers in and around study area lasts for almost two months i.e. from April to June with an average daily high temperature of around 35°C and winters are dry and mild mostly from mid October to January, with an average daily temperature of around 20°C, with some showers except during south-west monsoon season. December is the coldest month. Temperature decreases with the onset of the south-west monsoon in the middle of June. Study area experiences seasonal variation in rainfall with maximum rainfall of around 7.1 inches mostly in the month of July and minimum rainfall of around 0.1 inches in the month of December. The forest type of the study site falls under Tropical dry deciduous forest as per Champion and Seth Classification of 1968. Area has very good diversity of flora comprising of around 171 species belonging to 53 families. Insects mostly from Hymenoptera, Orthoptera and Coleoptera orders are found in the study area such as grasshopper, beetles, crickets, ants, termites, thrips, weevils, moth, butterflies, bees, wasps etc.

Methodology

The study was carried out from January 2020 to January 2021. For data collection, line transects of around to 500 to 1 km length was used depending upon the field condition. Along with line transect, birds were also observed using point count method in which birds were counted from a fixed point within the circle of 50 m radius. Each point was visited twice every month. The bird species were observed early in the morning between 7am to 10 am and from 3 pm to 6pm in the evening which is the most active period of the day for birding by walking within the study site.^{10,11} However, the birds were observed throughout the day also. Olympus (10×50) binocular and Nikon Digital Camera were used to take photographs. Correct identification

of birds was done using book by Salim Ali on Indian Birds and Birds of the Indian Sub-continent¹²⁻¹⁴ and checklist was prepared. While documenting the species, their feeding habit was also observed and birds were classified into 7 feeding habits such as frugivores, carnivores, insectivores, granivores, piscivores, omnivores and nectarivores were recorded. IUCN status of the recorded species was also studied while preparing the checklist (Figure 1).



Figure 1 Google map of study area.

Results and discussion

Protection status of birds species in forest research centre (FRC)

A total of 77 species belonging to 15 orders and 42 Families were recorded during our study (Table 1). Order Passeriformes recorded with maximum abundance of species with 58.4 per cent of total represented by forty-five species belonging to 24 families, followed by order Palecaniformes, Columbaformes and Accipitriformes. Family Accipitridae and Muscicapidae found to have maximum species richness with four species in each family. Among the bird species recorded, Black-headed Ibis (*Threskiornis melanocephalus*) is listed under near threatened (NT) category in IUCN red data list. Rest of the species recorded in the area belongs to least concerned category. Dietary preference and feeding habits of birds is very important in understanding the complexity of ecosystem (Azman et al., 2011) and the present study showed the dominance of insectivorous community (52 %) followed by Frugivores (13%) (Figure 2). A dominance of

insectivorous species indicates important agents of biocontrol of insect pest in agriculture, horticulture and forests.^{15,16} The analysis of data on residential status revealed that all of 77 species, are resident with local migratory nature.

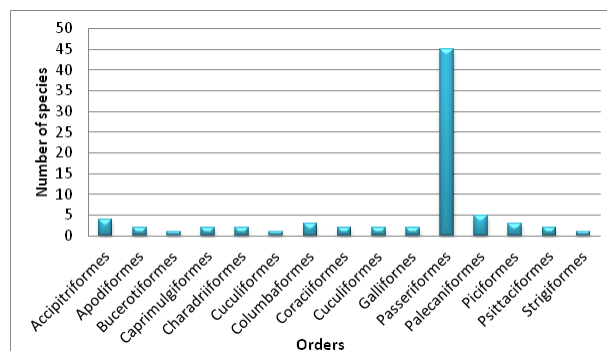


Figure 2 Frequency of occurrence of bird species in each order.

The present study was an attempt to make an inventory of the avian species of FRC and to delineate the importance of local landscape in conservation of avian fauna. Data recorded shows the rich diversity of avian species. Good diversity of birds in FRC and FCRI campus is attributed to the presence of good patch of forest in FRC and very good number of trees in FCRI campus. The study site is a transition zone and it serves as an eco-tone between forest ecosystem and urban areas (Figure 3).

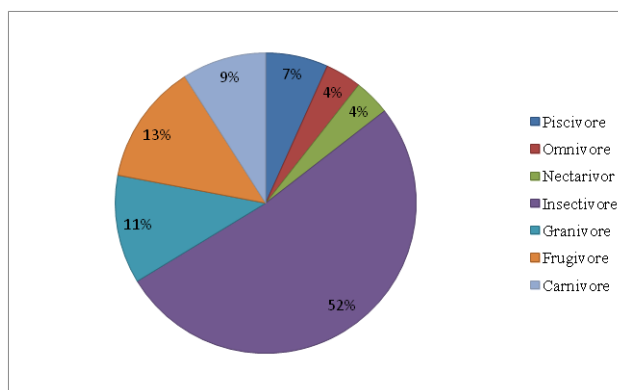


Figure 3 Dietary habit of bird species in the study area.

Table 1 Status of Birds Species in Forest Research Centre

Birds recorded under Order Accipitriformes & Family Accipitridae			
Scientific name	Common name	IUCN	Feeding habit
<i>Accipiter badius</i>	Shikra	LC, R	C
<i>Butastur teesa</i>	White-eyed Buzzard	LC, R	C
<i>Elanus caeruleus</i>	Black winged kite	LC, LM, R	C
<i>Haliastur indus</i>	Brahminy kite	LC, LM, R	C
Birds recorded under Order Apodiformes & Family Apodidae			
<i>Cypsiurus balasiensis</i>	Asian palm swift	LC, LM, R	I
<i>Apus affinis</i>	Little swift	LC, R	I
Birds recorded under Order Bucerotiformes & Family Upupidae			
<i>Upupa epops</i>	Common hoppe	LC, LM, R, r	I
Birds recorded under Order Caprimulgiformes & Family Caprimulgidae			
<i>Caprimulgus asiaticus</i>	Indian nightjar	LC, LM, R	I
<i>Caprimulgus artipennis</i>	Jerdons nightjar	LC, R	I
Birds recorded under Order Charadriiformes & Family Charadriidae			
<i>Vanellus indicus</i>	Red wattled lapwing	LC, R	I

Table Continued...

Birds recorded under Order Accipitriformes & Family Accipitridae			
Venellus malabaricus	Yellow wattled lapwing	LC, LM, R	I
Birds recorded under Order Cuculiformes & Family Cuculidae			
Phaenicophaeus viridirostris	Small Green billed malkoha	LC, R	O
Birds recorded under Order Columbaformes & Family Columbidae			
Streptopelia chinensis	Spotted dove	LC, R	G, F
Streptopelia decaocto	Eurasian connred-dove	LC, R	G, F
Streptopelia senegalensis	Laughing dove	LC, R	G
Birds recorded under Order Coraciiformes & Family Alcetinidae			
Halcyon smyrnensis	White throated kingfisher	LC, R	P
Birds recorded under Order Coraciiformes & Family Meropidae			
Merops orientalis	Asian Green bee eater	LC, R	I
Birds recorded under Order Cuculiformes & Family Cuculidae			
Centropus sinensis	Greater coucal	LC, R	I
Eudynamys scolopacea	Asian koel	LC, R	F, I
Birds recorded under Order Galliformes & Family Phasianidae			
Francolinus pondicerianus	Grey froncolin	LC, R	G, I
Pavo cristatus	Indian peafowl	LC, R	O
Birds recorded under Order Passeriformes & Family Cisticolidae			
Prinia inornate	Plain prina	LC, R, LM	I
Prinia socialis	Ashy prinia	LC, R, LM	I
Orthotomus sutorius	Common tailor bird	LC, R	I
Birds recorded under Order Passeriformes & Family Pycnonotidae			
Pycnonotus cafer	Red vented bulbul	LC, R	I, F, N
Pycnonotus luteolus	White-browed bulbul	LC, R	F, N, I
Birds recorded under Order Passeriformes & Family Muscipidae			
Eumyias thalassina	Verditer flycatcher	LC, R, LM	F, I, M
Cyornis tickelliae	Tickell's blue-flycatcher	LC, R	I
Muscicapa dauurica	Asian brown flycatcher	LC, R, WM	F, I
Birds recorded under Order Passeriformes & Family Monarchidae			
Terpsiphone paradise	Asian Paradise flycatcher	LC, R	I
Birds recorded under Order Passeriformes & Family Sylviidae			
Chrysomma sinense	Yellow eyed babbler	LC,	I, F, N
Birds recorded under Order Passeriformes & Family Aegithinidae			
Aegithina tiphia	Common lora	LC, R, r	I
Birds recorded under Order Passeriformes & Family Chloropseidae			
Chloropsis jerdoni	Jerdons leaf bird	LC, R	I, F, N
Birds recorded under Order Passeriformes & Family Campephagidae			
Coracina melanoptera	black headed Cuckoo- shrike	LC, R	I
Birds recorded under Order Passeriformes & Family Corvidae			
Corvus macrorhynchos	Jungle crow	LC, R	C
Corvus splendens	House crow	LC, R	C
Dendrocitta vagabunda	Indian Treepie	LC, R	F, I, O
Birds recorded under Order Passeriformes & Family Dicruridae			
Dicrurus macrocercus	Black drongo	LC, R	I
Dicruru scaerulescens	White bellied drongo	LC, R	I
Birds recorded under Order Passeriformes & Family Estrildidae			
Amandava amandava	Red Munia	LC, R	G, O
Lonchura punctulate	Spotted Munia	LC, R	G, F
Lonchura malabarica	White throated munia	LC, R	G
Birds recorded under Order Passeriformes & Family Hirudinidae			
Hirundo rustica	Barn swallow	LC, WM, r	I
Hirundo fluvicola	Streak-throated swallow	LC, R	I
Birds recorded under Order Passeriformes & Family Motacilidae			
Anthus hodgsoni	Oriental tree Pipit	LC, R, LW	I
Anthus rufulus	Paddy field pipit	LC, R	I, G
Motacilla maderaspatensis	Large Pied Wagtail	LC, R	I
Birds recorded under Order Passeriformes & Family Muscipidae			
Copsychus saularis	Oriental magpie robin	LC, R	I
Ficedula parva	Red throated flycatcher	LC, WM, R	F

Table Continued...

Birds recorded under Order Accipitriformes & Family Accipitridae			
<i>Ficedula superciliaris</i>	Ultramarine flycatcher	LC,WM,R	I
<i>Saxicolides fulicatus</i>	Indian robin	LC,R	I
Birds recorded under Order Passeriformes & Family Nectarinidae			
<i>Nectarinia asiatica</i>	Purple sunbird	LC,R	N
<i>Nectarinia zeylonica</i>	Purple-rumped sunbird	LC,R	N
Birds recorded under Order Passeriformes & Family Oriolidae			
<i>Oriolus oriolus</i>	Indian golden oriole	LC,R,r	I, FN
<i>Oriolus xanthorus</i>	Black headed oriole	LC,R	F, I
Birds recorded under Order Passeriformes & Family Dicaeidae			
<i>Dicaeum erythrorhynchos</i>	Tickell's Flowerpecker	LC,R	N, F
<i>Dicaeum agile</i>	Thick billed flower pecker	LC,R	F
Birds recorded under Order Passeriformes & Family Laniidae			
<i>Lanius schach</i>	Rufous-backed shrike	LC	C
Birds recorded under Order Passeriformes & Family Leiothrichidae			
<i>Turdoides striatus</i>	Jungle Babbler	LC,R	I
<i>Turdoides affinis</i>	White headed babbler	LC,R	I, G, F
Birds recorded under Order Passeriformes & Family Passeridae			
<i>Passer domesticus</i>	House sparrow	LC,R,r	GI
Birds recorded under Order Passeriformes & Family Phylloscopidae			
<i>Phylloscopus griseolus</i>	Sulphur bellied warbler	LC,WM	I
Birds recorded under Order Passeriformes & Family Passeridae			
<i>Passer domesticus</i>	House sparrow	LC,R,r	GI
Birds recorded under Order Passeriformes & Family Paradoxornithidae			
<i>Chrysommasinense</i>	Yellow eyed babbler	LC,R	I, F
Birds recorded under Order Passeriformes & Family Tamaliidae			
<i>Dumertiahyperythra</i>	Rufous-bellied babbler	LC,R	O
Birds recorded under Order Passeriformes & Family Campephagidae			
<i>Pericrocotus cinnamomeus</i>	Small Minivet	LC,R	I
Birds recorded under Order Passeriformes & Family Zosteropidae			
<i>Zosterops palpebrosus</i>	Oriental white-eye	LC,R,LW	I, N, F
Birds recorded under Order Pelecaniformes & Family Ardeidae			
<i>Ardea purpurea</i>	Purple heron	LC,WM,r	P
<i>Ardeola grayii</i>	Indian pond-heron	LC,R	P
<i>Egretta garzetta</i>	Little egret	LC,R	P
Birds recorded under Order Pelecaniformes & Family Threskiornithidae			
<i>Threskiornis melanocephalus</i>	Black headed Ibis	NT,R	P, I
<i>Pseudibis papillosa</i>	Red naped ibis	LC, R	I, G
Birds recorded under Order Piciformes & Family Megalaimidae			
<i>Megalaima haemacephala</i>	Coppersmith barbet	LC,R	F
Birds recorded under Order Piciformes & Family Picidae			
<i>Dinopium benghalensis</i>	Lesser Golden backed woodpecker	LC,R	I, N
<i>Leopicus mahrattensis</i>	Yellow crowned woodpecker	LC,R	I, FN
Birds recorded under Order Psittaciformes & Family Psittaculidae			
<i>Psittacula cyanocephala</i>	Plum headed parakeet	LC,R LM	F, N, G
<i>Psittacula krameri</i>	Rose-ringed parakeet	LC,R	G, I, N
Birds recorded under Order Strigiformes & Family Stigidae			
<i>Athene brama</i>	Spotted owl	LC,R,r	I, C

Conclusion and recommendation

The study shows the importance of green space of the campus for maintaining the balance and conservation of avian diversity. The area around the institute progressing rapidly towards the developmental activities, and hence there is a need to protect the habitat structure of birds in an around the institute. This study is the first attempt towards the conservation of avian species by documenting the diversity and abundance. For better understanding of the bird community further scientific studies are needed. The findings will aid in the preparation of a baseline data set on avian diversity as well as future conservation research.

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Conflicts of interest

All author listed here declare no conflict of interest exists.

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