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Assessment Of Avifaunal Diversity In G.H.S. Government College, Sujangarh, Rajasthan, India

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ABSTRACT

Urban and semi-urban academic campuses serve as crucial green refuges for avian populations, especially in arid regions like the Thar Desert. This study presents the first systematic assessment of the avian diversity at the G.H.S. Government College campus in Sujangarh, Rajasthan. Conducted over a period from September 2024 to April 2025, the research aimed to document the species composition, their seasonal variation, and conservation status. Using the line transect method and systematic observation points, a total of 49 bird species across 30 families were recorded. The assemblage was dominated by resident species along with few summer and winter visitors also reported, reflecting the campus resource availability. The presence of species like Cattle egret (*Ardea coromanda*) and the Indian Peafowl (*Pavo cristatus*) underscores the campus ecological value. However, species of conservation concern, such as the Egyptian Vulture (*Neophron percnopterus*; Endangered), were also observed utilizing the area as a flyover zone. This study concludes that the college campus, with its mosaic of gardens, scattered trees, and built-up areas, functions as a vital micro-habitat for local avifauna. The findings highlight the importance of urban biodiversity conservation and recommend specific green management practices to enhance the campus's value for wildlife.

Keywords: Avian diversity, Urban ecology, College campus, Sujangarh, Thar Desert, Micro-habitat, Conservation, Green refuge, Resident birds, Line transect.

1. Introduction

Birds are excellent bio-indicators of ecosystem health due to their sensitivity to environmental changes and their position at various trophic levels (Gill, 2007). In rapidly urbanizing landscapes, fragmented green spaces like academic campuses, parks, and gardens become critical sanctuaries for local wildlife, offering essential resources such as food, water, and nesting sites (Chace & Walsh, 2006). The Thar Desert region of Rajasthan, characterized by its arid climate and sparse vegetation, presents a challenging environment for its fauna. In such a context, the value of any vegetated area is significantly heightened.

Throughout the world, 9702 avian species belonging to more than 1800 genera exist (Sibley and Monroe, 1990). Of these, approximately 1300 species of birds have been reported from India (Manakadan and Pittie, 2001). Many ornithologists have also reported many species from Rajasthan. Over 500 bird species have been reported here including approximately 100 migratory species which visit here during the winter months. In Rajasthan, studies on avian fauna have been mostly performed in the Bharatpur, South Rajasthan, Jodhpur, Jaisalmer, and Churu districts (Bhatnagar *et al*. 2007, 2008, 2011, 2013; Bhatnagar and Shekhawat, 2014; Chhangani, 2002, 2009; Koli *et al*., 2011; Kushwaha and Kananjia, 2011; Sangha and Devarshi, 2006; Saxena, 2003; Sharma, 1998; Sharma and Tehsin, 1994; Shekhawat *et al*., 2014).

Sujangarh, located in the Churu district of Rajasthan, lies within the semi-arid zone of the Thar Desert. The campus of G.H.S. Govt. College, with its mature trees, ornamental gardens, lawns, and water sources, presents a unique anthropogenic ecosystem that contrasts with the surrounding urban and agricultural land. Despite their potential importance, the biodiversity of such educational campuses in semi-arid India remains largely undocumented. This study aims to fill this gap by:

1. Conducting a comprehensive census of the bird species inhabiting and utilizing the GHS Govt. College campus.
2. Analyzing the guild structure (diet, habitat preference) of the observed avifauna.
3. Assessing the conservation significance of the campus for local and regional bird populations.
4. Providing a baseline for future monitoring and recommending management strategies to promote biodiversity.

2. Materials and Methods

2.1. Study Area

G.H.S. Govt. College, Sujangarh (27.70°N, 74.45°E) is located between triangle of three towns namely Sujangarh, Ladnun and Jaswantgarh, popularly known as “Sujla”. The Institute was founded in the year 1968 as two separate units, Gyaniram Harakchand Sarawagi Arts & Commerce College and Seth Moti Lal Bengani Science College, Ladnun. On January 01, 1982, two units were merged and present name G.H.S. Govt College, Sujangarh came in authentication. At present it has two campuses; one is Arts and Commerce block and second is Science block. College has the affiliation to Maharaja Ganga Singh University, Bikaner (Rajasthan). Campus of G.H.S. Govt. College, Sujangarh has an area approximately 82 acres which provides a suitable place for many bird species. The habitat is a mosaic of:

-Built-up area: College buildings, roads, and paved areas.
-Green area: Lawns, irrigated gardens with flowering plants, and hedges.
-Tree cover: Scattered mature trees, primarily native species like *Prosopis cineraria* (Khejri), *Azadirachta indica* (Neem), and Ficus species, alongside some exotic ornamental trees.
-Water source: A small, human-maintained water body and overhead tanks that often leak, creating temporary puddles.

The climate is semi-arid, with hot summers, mild winters, and low, erratic rainfall concentrated during the monsoon (July-September).

Map 1: Satellite Map of G.H.S. Govt. College, Sujangarh, Rajasthan

2.2. Data Collection

Data was collected from September 2024 to April 2025 to account for seasonal variations. Surveys were conducted thrice a month during the early morning (6:30–9:30 h) and late afternoon (15:30–18:30 h), periods of peak avian activity.

The Line Transect Method (Bibby *et al*., 2000) was employed. Two fixed transects of 500m each, covering all habitat types within the campus, were traversed at a slow, steady pace. All birds seen or heard within a fixed distance (approximately 50m on either side of the transect line) were recorded.

Canon SX 50HS digital camera and Sony handycam were used for the photography and videography of birds. Nikon Aculon A211 10x50 binoculars were used to observe birds from a safe distance.

2.3. Data Analysis

The birds sighted during present investigations were identified and classified with the help of field guides, E-bird records and conservation reports. For each species, the following data was compiled:

Diet Guild: Insectivorous, Granivorous, Frugivorous, Nectarivorous, Carnivorous,Scavanger and Omnivorous.

Conservation Status: As per the IUCN Red List (2023).

3. Results

3.1. Species Composition and Diversity

A total of 49 bird species belonging to 30 families were recorded (Table 1) . The family Columbidae was the most dominant, represented by 5 species (10.2% of the total) followed by Accipitridae (8.16%) and Alaudidae(6.12%). The assemblage was dominated by resident species with few being seasonal visitors.

3.2. Dietary Guild Structure

Insectivorous birds formed the largest guild (17 species, 34.7%), followed by omnivorous (9 species, 18.36%), carnivorous (9 species, 18.36%), granivorous (8 species, 16.3%) birds. Frugivorous, nectarivorous, and scavanger birds were less common, reflecting the availability of insects, seeds, and human food scraps.

Table: 1 Checklist of the Avian Diversity observed in G.H.S. Govt. College, Sujangarh

S. No.	Family	Common Name	Zoological Name	IUCN Status	Feeding Habit
1	Phasianidae	Indian peafowl	*Pavo cristatus*	**LC**	Omnivorous
2	Phasianidae	Grey Francolin	*Ortygornis pondicerianus*	**LC**	Omnivorous
3	Cuculidae	Asian koel	*Eudynamys scolopaceus*	**LC**	Omnivorous
4	Sturnidae	Brahminy starling	*Sturnia pagodarum*	**LC**	Omnivorous
5	Sturnidae	Common mynah	*Acridotheres tristis*	**LC**	Granivorous
6	Corvidae	House crow	*Corvus splendens*	**LC**	Carnivorous
7	Corvidae	Rufous treepie	*Dendrocitta vagabunda*	**LC**	Frugivorous
8	Psittacidae	Rose-ringed parakeet	*Psittacula krameri*	**LC**	Granivorous & Frugivorous
9	Psittacidae	Alexandrine parakeet	*Psittacula eupatria*	**LC**	Granivorous & Frugivorous
10	Columbidae	Eurasian Collared Dove	*Streptopelia decaocto*	**LC**	Granivorous
11	Columbidae	Red Collared Dove	*Streptopelia tranquebarica*	**LC**	Granivorous
12	Columbidae	Laughing Dove	*Spilopelia senegalensis*	**LC**	Granivorous
13	Columbidae	Rock Pigeon	*Columba livia*	**LC**	Granivorous
14	Columbidae	Yellow-footed Green Pigeon	*Treron phoenicopterus*	**LC**	Frugivorous
15	Meropidea	Green Bee-eater	*Merops orientalis*	**LC**	Omnivorous
16	Meropidea	Blue-cheeked bee-eater	*Merops persicus*	**LC**	Insectivorous
17	Upupidae	Eurasian Hoopoe	*Upupa epops*	**LC**	Insectivorous
18	Dicruridae	Black Drongo	*Dicrurus macrocerus*	**LC**	Insectivorous
19	Pycnonotidae	Red-Vented Bulbul	*Pycnonotus cafer*	**LC**	Frugivorous
20	Pycnonotidae	White-Eared bulbul	*Pycnonotus leucotis*	**LC**	Frugivorous

21	Leiothrichidae	Jungle Babbler	*Turdodies striata*	**LC**	Insectivorous
22	Leiothrichidae	Large grey babbler	*Argya malcolmi*	**LC**	Insectivorous
23	Passeridae	House sparrow	*Passer domesticus*	**LC**	Granivorous
24	Ploceidae	Baya weaver	*Ploceus philippinus*	**LC**	Omnivorous
25	Charadriidae	Red-Wattled Lapwing	*Vanellus indicus*	**LC**	Insectivorous
26	Tytonidae	Barn Owl	*Tyto alba*	**LC**	Carnivorous
27	Coraciidae	Indian Roller	*Coracias benghalensis*	**LC**	Carnivorous
28	Turdidae	Oriental Magpie robin	*Copsychus saularis*	**LC**	Insectivorous
29	Threskiornithidae	Red-napped ibis	*Pseudibis papillosa*	**LC**	Insectivorous
30	Muscicapidae	Indian Robin	*Copsychus fulicatus*	**LC**	Insectivorous
31	Muscicapidae	Asian brown flycatcher	*Muscicapa dauurica*	**LC**	Insectivorous
32	Muscicapidae	Brown rock chat	*Oenanthe fusca*	**LC**	Insectivorous
33	Ardeidae	Cattle egret	*Ardea coromanda*	**LC**	Carnivorous
34	Ardeidae	Indian pond heron	*Ardeola grayii*	**LC**	Carnivorous
35	Nectariniidae	Purple sunbird	*Cinnyrus asiaticus*	**LC**	Nectarivorous
36	Hirundinidae	Dusky crag-martin	*Ptyonoprogne concolor*	**LC**	Insectivorous
37	Alaudidae	Indian bush lark	*Mirafrae rythroptera*	**LC**	Omnivorous
38	Alaudidae	Oriental sky lark	*Alauda gulgula*	**LC**	Insectivorous
39	Alaudidae	Ashy-crowned sparrow lark	*Eremopterix grisea*	**LC**	Omnivorous
40	Motacillidae	White wagtail	*Motacilla alba*	**LC**	Insectivorous
41	Alcedinidae	White-throated king fisher	*Halcyon smyrnensis*	**LC**	Carnivorous
42	Laniidae	Great grey shrike	*Lanius excubitor*	**LC**	Insectivorous
43	Sylviidae	Lesser white throat	*Sylvia curruca*	**LC**	Insectivorous
44	Gruidae	Demoiselle crane	*Grus vigro*	**LC**	Omnivorous
45	Strigidae	Spotted owlet	*Athene brama*	**LC**	Insectivorous
46	Accipitridae	Egyptian vulture	*Neophron percnopterus*	**EN**	Scavanger
47	Accipitridae	Eastern imperial eagle	*Aquila heliaca*	**VU**	Carnivorous
48	Accipitridae	Marsh harrier	*Circus aeruginosus*	**LC**	Carnivorous
49	Accipitridae	Shikra	*Accipiter badius*	**LC**	Carnivorous

IUCN Status: LC - Least Concern EN – Endangered VU - Vulnerable

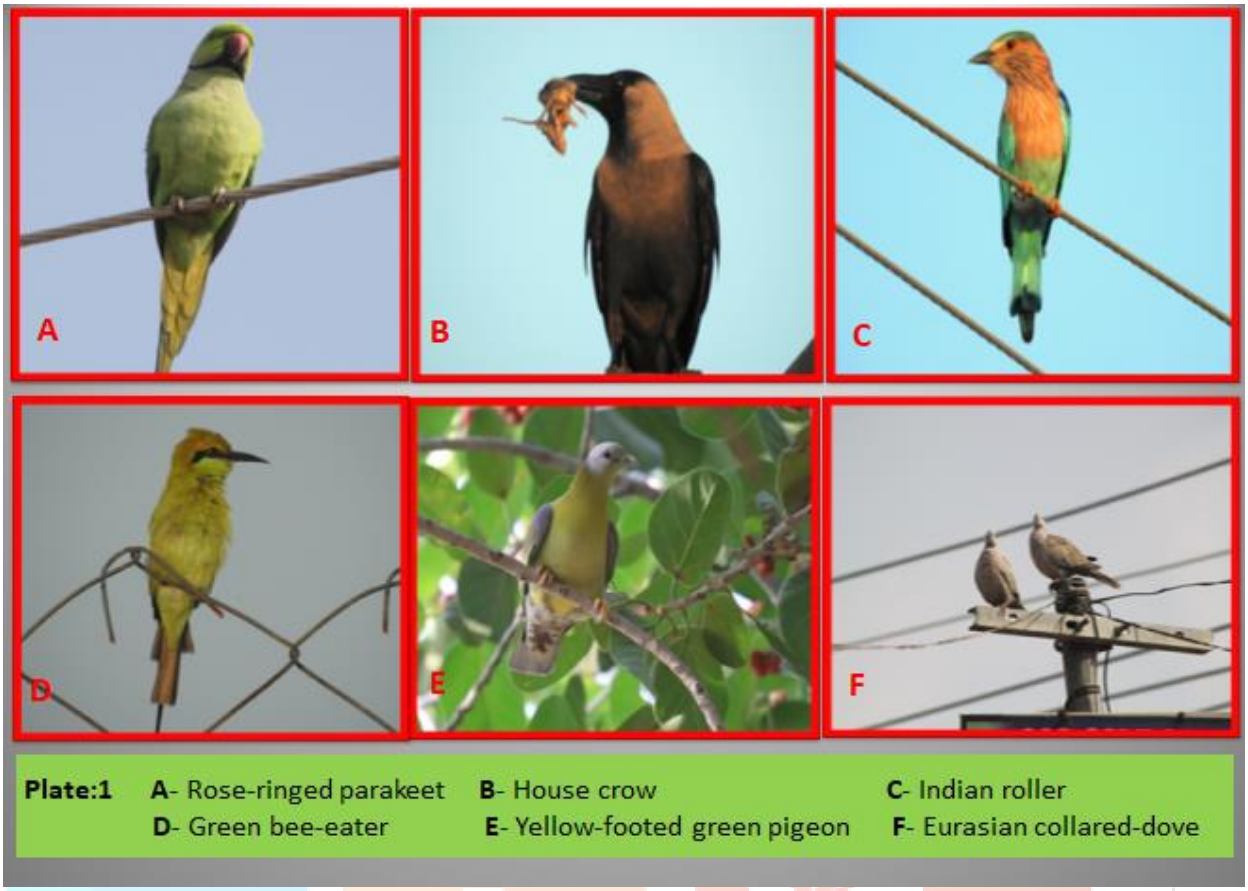

Plate:1 **A**- Rose-ringed parakeet **B**- House crow **C**- Indian roller
D- Green bee-eater **E**- Yellow-footed green pigeon **F**- Eurasian collared-dove

Plate 2: A- Red-vented bulbul **B- Rock pigeon** **C- Indian peafowl**
D- Grey francolin **E- Brown rock chat** **F- Egyptian vulture**

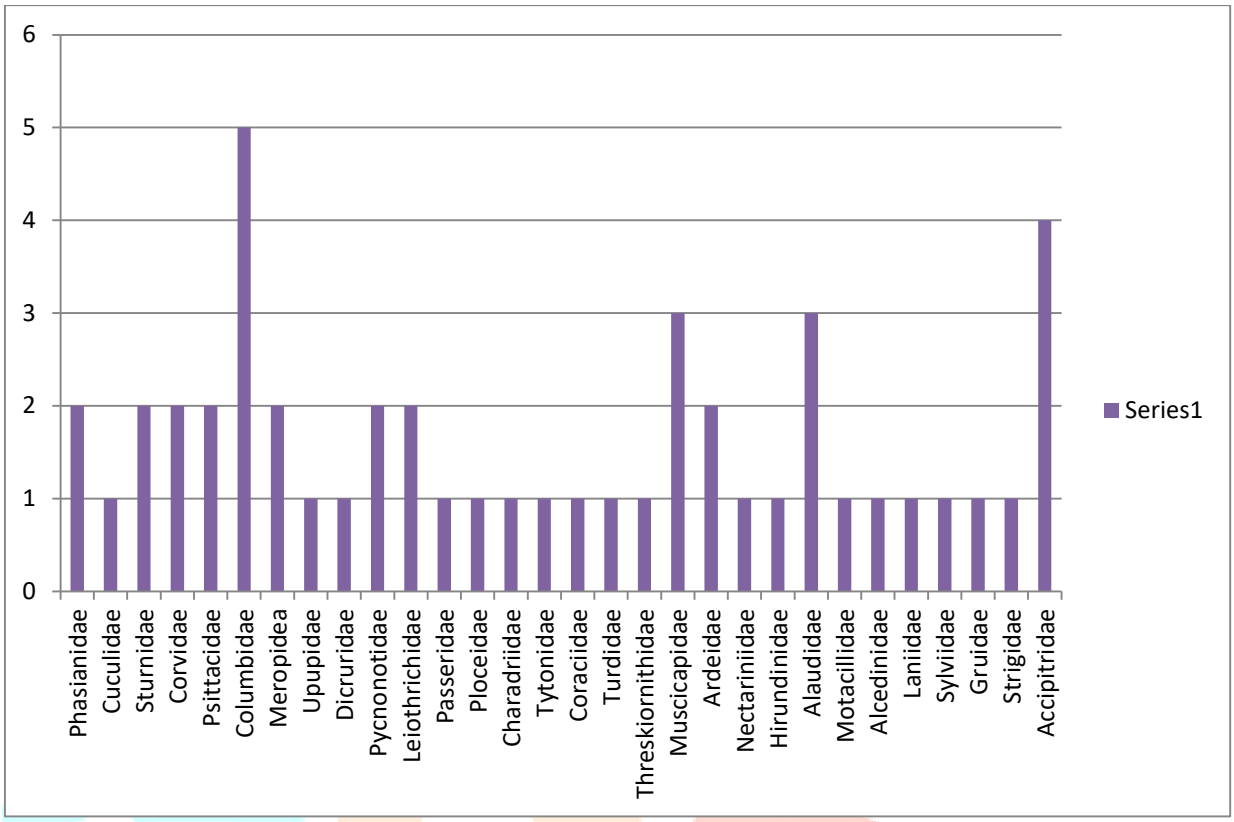

Figure 1: Bar Chart showing No. of species (Family wise)

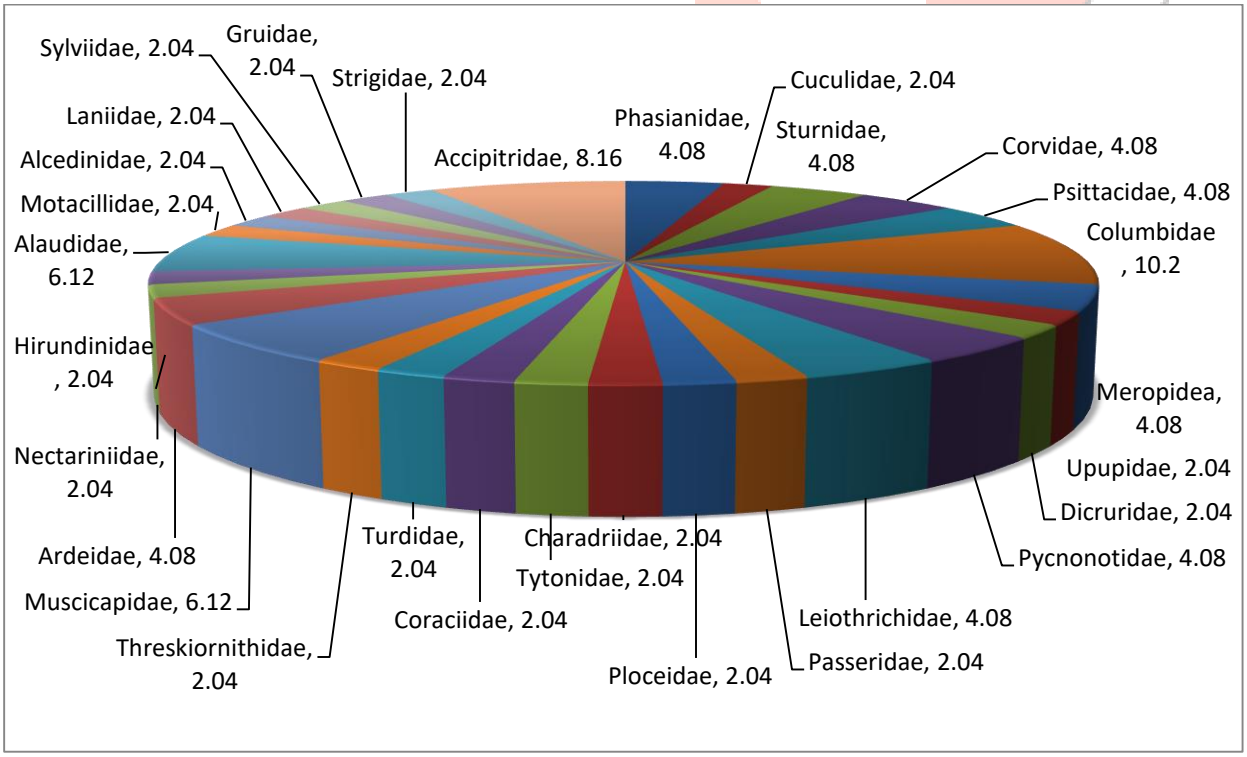

Figure 2: Pie Chart showing % of species (Family wise)

3.3. Conservation Significance

The majority of species (95.9%) were classified as Least Concern by the IUCN. However, the occasional sighting of the Egyptian Vulture (*Neophron percnopterus*), listed as Endangered, was significant. This species was not breeding on campus but was observed soaring overhead, suggesting the campus is part of its foraging landscape. The presence of species like the Shikra, a raptor, indicates a healthy food chain.

4. Discussion

The diversity of 49 species in campus is noteworthy and aligns with studies emphasizing the role of urban green spaces as biodiversity reservoirs (Turner, 2003). The high proportion of resident insectivorous,omnivorous and carnivorous birds directly reflects the habitat structure: trees provide foraging grounds for insectivores, while lawns and gardens provide seeds and attract insects.

The campus's habitat heterogeneity—a mix of trees, shrubs, lawns, and buildings—creates niches for a variety of species. The small water source, though artificial, is a critical resource, particularly during the scorching summer months. The presence of fig trees (*Ficus spp*.) attracts frugivorous birds like parakeets and bulbuls, which are key agents for seed dispersal.

The sighting of an Endangered species, the Egyptian Vulture, even as a flyover, underscores the campus's role within a wider ecological network. It suggests that conserving such micro-habitats can contribute to the survival of threatened species by providing connectivity between larger habitat patches. However, the dominance of common, generalist species like the House Crow and Common Myna also highlights the simplified nature of urban ecosystems, where specialist species often struggle to persist.

5. Conclusion and Recommendations

This study establishes that the G.H.S. Govt. College campus is a significant green refuge supporting a diverse community of birds in the semi-arid landscape of Sujangarh. It provides essential resources and potentially serves as a stepping stone for species moving through the urban environment.

To enhance and conserve this avian diversity, the following campus management strategies are recommended:

1. Native Plantation: Prioritize planting native, fruit-bearing trees (e.g., *Ficus, Ziziphus*) and thorny shrubs to provide food and nesting sites for a wider variety of birds.

2. Water Management: Develop and maintain a permanent, clean water source, such as a small bird bath or pond, to support birds year-round.

3. Sustainable Practices: Reduce pesticide use in gardens to ensure a healthy insect population for insectivorous birds.

4. Awareness and Education: Integrate these findings into the college curriculum and install informational signage to foster a sense of stewardship among students and staff.

This baseline data can be used for long-term monitoring to study trends and assess the impact of future campus development on its avian inhabitants.

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