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Avifaunal Diversity of Integral University Campus, Lucknow, India

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Abstract: ***Integral University at Lucknow is a lush green campus of nearly 120 acres, preferred by number of bird species at its different types of habitat like trees, bushes, grasses, grounds and buildings etc. Study was conducted for two years through standard methods to collect information on different species of birds present in the campus. A total of eighty three species of birds belonging to fifteen orders and forty three families were recorded at the university campus. Majority of species were observed in the order Passeriformes and family Accipitridae and falling under Scheduled-IV category of IUCN i.e. of Least Concern. On the basis of their occurrence in the campus, around 60% of the bird species were found to be common, 30% visitor and 10% were rare. Feeding habits showed dominance of Carnivorous (34%) and Insectivorous (27%) bird species.***
Keywords: Avifaunal, Diversity, Composition, Abundance, Family.

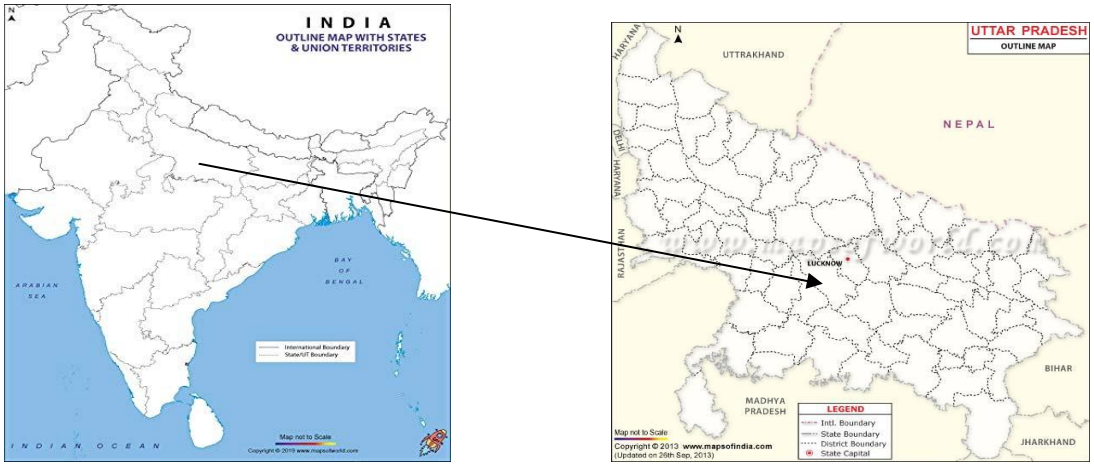
I. INTRODUCTION

University campus plays an important role in providing ambient environment not only to students and faculty but can be the areas of conserving floral and faunal biodiversity especially the trees and the avifauna. The presence of avifauna or birds in an area is an indicator of good health of an ecosystem. Importance of avifauna increases manifold due to ongoing rampant urbanization, and the climate change. India is blessed with rich avifaunal diversity, which constitutes nearly 13% of the world's bird species with its nearly 1300 recorded bird species (Javed and Kaul, 2000; Grimmett et al, 2011). As per State of India's Bird Report 2020 (SoIB, 2020), there is a decline in bird population in India, as more than 50% of Indian bird species (out of total 867 species) assessed have registered a decline during the last few decades. The total bird species found in Uttar Pradesh are nearly 550 (UPSBdB, 2014). A number of studies have documented avifaunal diversity at various university campuses in India (Amita et al, 2012; Tandon et al., 2015; Snehal et al., 2015; Vinay et al., 2017; Manoj et al., 2017; Kaushal et al., 2018; Singh et al., 2018; Pragasan and Madesh, 2018; Alok and Dhuria, 2019; Iqram et al., 2019), where bird species were observed it different habitats.

II. STUDY AREA

The study area includes nearly 120 acres main campus of Integral University (Photo 1 & Map 2), Lucknow (Lat 26.9585° N & Long 80.9992° E), Uttar Pradesh, India (Map 1). The campus is situated in close proximity to the Kukrail Reserve Forest (Map 3) towards its South. University campus has a good green cover with number of trees, bushes, sprawling grass lawns etc. These varied habitats like trees, lawns, buildings etc provide refuge to a number of bird species. The campus has good presence of trees like *Ficus glomerata, Tectona grandis, Delonix regia, Grewia abutilifolia, Anthocephalus cadamba, Azadirachta indica, Semi Casia, Psidium guajava* and *Mangifera indica* etc.

In addition to above trees, there are good number of shrubs and



Map 1: Location of Study Area

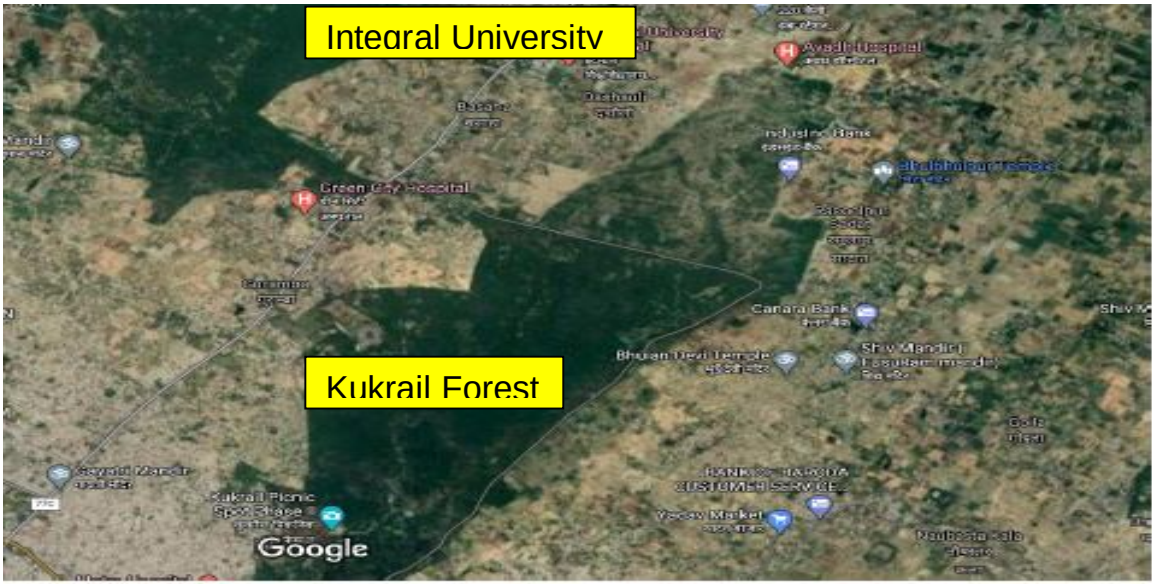
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Photo 1: A panoramic view of Integral University campus (Photo Courtesy: Integral University)



Map 2: Google map of Integral University Campus, Lucknow, Uttar Pradesh



Map 3: Google map of Integral University and nearby Kukrail Forest, Lucknow

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III. MATERIALS AND METHODS

Survey was conducted in the study area for recording the avifaunal diversity using line transects and point count methods and random sightings within the campus for two years during September 2016 to August 2018 covering winter, summer and monsoon seasons. Birds were identified and recorded using Binoculars and Camera for close observation and through photographs for their identification. Observations were made through visual sightings and also identified acoustically from the bird calls both in the morning and evening for their presence on trees, bushes, grass lawns, buildings etc.

Nikon P900 camera was used to collect photographic evidences of birds and bird identification was confirmed using guide books like "Birds of the Indian Subcontinent" (Grimmett et al., 2011) and "The book of Indian birds" (Ali S., 2002).

IV. RESULTS AND DISCUSSION

The result showed a rich avifaunal diversity in the campus as nearly 83 birds species belonging to 15 Order and 43 Families (Table 1) were observed during the study period. Passeriformes was the dominant order having nearly 40 species of birds (Figure 1) and Ardeidae was the most dominant family (Figure 2).

Table 1: List of bird species observed in the Integral University campus

Bird Family	Common Name of Bird	Scientific Name	IUCN Category	Feeding behaviour	Abundance
Accipitridae	Black Eared Kite	*Milvus lineatus*	Least Concern	Carnivorous	Common
	Black Kite	*Milvus migrans*	Least Concern	Carnivorous	Common
	Egyptian Vulture	*Neophron percnopterus*	Endangered	Carnivorous	Common
	Oriental Honey Buzzard	*Pernis ptilorhynchus*	Least Concern	Carnivorous	Visitor
	Shikra	*Accipiter badius*	Least Concern	Carnivorous	Common
Acrocephalidae	Booted Warbler	*Iduna caligata*	Least Concern	Insectivorous	Common
Alcedinidae	White Throated Kingfisher	*Halcyon smyrnensis*	Least Concern	Carnivorous	Common
Anatidae	Lesser Whistling Duck	*Denrocygna javanica*	Least Concern	Omnivorous	Visitor
Ardeidae	Black Bittern	*Dupetor flavicollis*	Least Concern	Carnivorous	Visitor
	Black Crowned Night Heron	*Nycticorax nycticorax*	Least Concern	Carnivorous	Visitor
	Cattle Egret	*Bubulcus ibis*	Least Concern	Carnivorous	Common
	Grey Heron	*Ardea cinerea*	Least Concern	Carnivorous	Rare
	Indian Pond Heron	*Ardeola grayii*	Least Concern	Carnivorous	Common
	Intermediate Egret	*Mesophoyx intermedia*	Least Concern	Carnivorous	Visitor
	Little Egret	*Egretta garzetta*	Least Concern	Carnivorous	Visitor
Bucerotidae	Indian Grey Hornbill	*Ocyceros birostris*	Least Concern	Omnivorous	Visitor
Charadriidae	Red Wattled Lapwing	*Vanellus indicus*	Least Concern	Insectivorous	Common
Cisticolidae	Ashy Prinia	*Prinia socialis*	Least Concern	Insectivorous/ Nectivorous	Common
	Grey Breasted Prinia	*Prinia hodgsonii*	Least Concern	Insectivorous/ Nectivorous	Common
Columbidae	Common Pigeon	*Columbia livia*	Least Concern	Granivorous	Common

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	Laughing Dove	*Stigmatopelia senegalensis*	Least Concern	Granivorous	Common
	Orange Breasted Green Pigeon	*Treron bicinctus*	Least Concern	Frugivorous	Rare
	Oriental Turtle Dove	*Streptopelia orientalis*	Least Concern	Granivorous	Common
	Spotted Dove	*stigmatopelia chinensis*	Least Concern	Granivorous	Common
Coraciidae	Indian roller	*Coracias benghalensis*	Least Concern	Carnivorous	Common
Corvidae	House Crow	*Corvus splendens*	Least Concern	Carnivorous	Common
	Indian Jungle Crow	*Corvus Culminatus*	Least Concern	Carnivorous	Common
	Rufous Treepie	*Dendrocitta vagabunda*	Least Concern	Frugivorous	Common
Cuculidae	Asian Koel	*Eudynamys scolopaceus*	Least Concern	Omnivorous	Common
	Common Hawk Cuckoo	*Hierococcyx varius*	Least Concern	Omniivorous	Visitor
	Eurasian Cuckoo	*Cuculus carnous*	Least Concern	Insectivorous	Visitor
	Greater Coucal	*Centropus sinensis*	Least Concern	Omnivorous	Common
	Pied Cuckoo	*Clamator jacobinus*	Least Concern	Omnivorous	Visitor
Dicaeidae	Pale billed flower pecker	*Dicaeum erythrorhynchos*	Least Concern	Frugivorus	Common
Dicruridae	Black Drongo	*Dicrurus macrocercus*	Least Concern	Insectivorous	Common
Estrildidae	Indian Silverbill	*Euodice malabarica*	Least Concern	Omnivorous	Common
	Scaly Breasted Munia	*Lonchura punctulata*	Least Concern	Granivorous	Common
Fringillidae	Common Rosefinch	*Carpodacus rubescens*	Least Concern	Granivorous	Visitor
Hirundinidae	Red Rumped Swallow	*Cecropis daurica*	Least Concern	Insectivorous	Common
	Wire Tailed Swallow	*Hriundo smithii*	Least Concern	Insectivorous	Common
Jacanidae	Bronze Winged Jacana	*Metopidius indicus*	Least Concern	aquatic vegetation/ Insectivorous	Visitor
Laniidae	Long Tailed Shrike	*Lanius Schach*	Least Concern	Insectivorous	Rare
Megalaimidae	Copper Smith Barbet	*Megalaima Haemacephala*	Least Concern	Frugivorous	Common
Meropidae	Green Bee Eater	*Merops orientalis*	Least Concern	Insectivorous	Common
Motacillidae	White Browed Wagtail	*Motacilla madaraspatensis*	Least Concern	Omnivorous	Common
	White Wagtail	*Motacilla alba*	Least Concern	Insectivorous	Common
	Yellow Wagtail	*Motacilla flava*	Least Concern	Insectivorous	Visitor
Muscicapidae	Black Redstart	*Phoenicurus ochruros*	Least Concern	Insectivorous	Visitor
	Bluethroat	*Luscinia svecica*	Least Concern	Insectivorous	Rare
	Brown Rockchat	*Cercomela fusca*	Least Concern	Insectivorous	Common
	Oriental Magpie Robin	*Copsychus saularis*	Least Concern	Insectivorous	Common

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	Taiga Flycatcher	*Ficedula albicilla*	Least Concern	Insectivorous	Rare
Nectariniidae	Purple Sunbird	*Cinnyris asiaticus*	Least Concern	Nectivorous	Common
Oriolidae	Black Hooded Oriole	*Oriolus xanthornus*	Least Concern	Omnivorous	Visitor
	Indian Golden Oriole	*Oriolus kundoo*	Least Concern	Omnivorous	Rare
Paridae	Great Tit	*Parus major*	Least Concern	Omnivorous	Common
Passeridae	House Sparrow	*Passer domesticus*	Least Concern	Granivorous	Common
Phalacrocoracidae	Little Cormorant	*Phalacrocorax niger*	Least Concern	Carnivorous	Visitor
Phasianidae	Grey Francolin	*Francolinus Pondicerianus*	Least Concern	Omnivorous	Common
	Indian Peafowl	*Pavo cristatus*	Least Concern	Omnivorous	Common
Phylloscopidae	Common Chiffchaff	*Phylloscopus collybita*	Least Concern	Insectivorous	Common
Ploceidae	Baya Weaver	*Ploceus philippinus*	Least Concern	Omnivorous	Visitor
Podicipedidae	Little Grebe	*Tachybaptus ruficollis*	Least Concern	Carnivorous	Visitor
Psittacidae	Rose Ringed Parakeet	*Psittacula krameri*	Least Concern	Frugivorous	Common
Pycnonotidae	Red Vented Bulbul	*Pycnonoytus cafer*	Least Concern	Frugivorous	Common
	Red Whiskered Bulbul	*Pycnonotus Jocosus*	Least Concern	Frugivorous	Common
Rallidae	Common Moorhen	*Gallinula cholopus*	Least Concern	Omnivorous	Visitor
	White Breasted Waterhen	*Amaurornis phoenicurus*	Least Concern	Omnivorous	Visitor
Recurvirostridae	Black Winged Kite	*Elanus careuleus*	Least Concern	Omnivorous	Common
	Black Winged stilt	*Himantopus himantopus*	Least Concern	Carnivorous	Visitor
Rostratulidae	Greater Painted Snipe	*Rostratula benghalensis*	Least Concern	Omnivorous	Rare
Scolopacidae	Green Sandpiper	*Tringa ochropus*	Least Concern	Insectivorous	Visitor
	Wood Sandpiper	*Tringa glareola*	Least Concern	Insectivorous	Visitor
Strigidae	Spotted Owlet	*Athene brama*	Least Concern	Carnivorous	Common
Sturnidae	Asian Pied Starling	*Gracupica contra*	Least Concern	Granivorous	Visitor
	Brahminy Starling	*Sturnia Pagodarum*	Least Concern	Granivorous	Common
	Common Myna	*Acridotheres tristis*	Least Concern	Granivorous	Common
Sylviidae	Clamorous Reed Warbler	*Acrocephalus stentoreus*	Least Concern	omnivorous	Common
	Common Tailor Bird	*Orthotomus sutorius*	Least Concern	Insectivorous/ Nectivorous	Common
	Lesser White throat	*Sylvia curruca*	Least Concern	Insectivorous	Visitor
	Orphean Warbler	*Sylvia hortensis*	Least Concern	Insectivorous	Rare
Timaliidae	Jungle Babbler	*Turdoides striata*	Least Concern	Omnivorous	Common
Zosteropidae	Oriental White Eye	*Zosterops palpebrosus*	Least Concern	Omnivorous	Common

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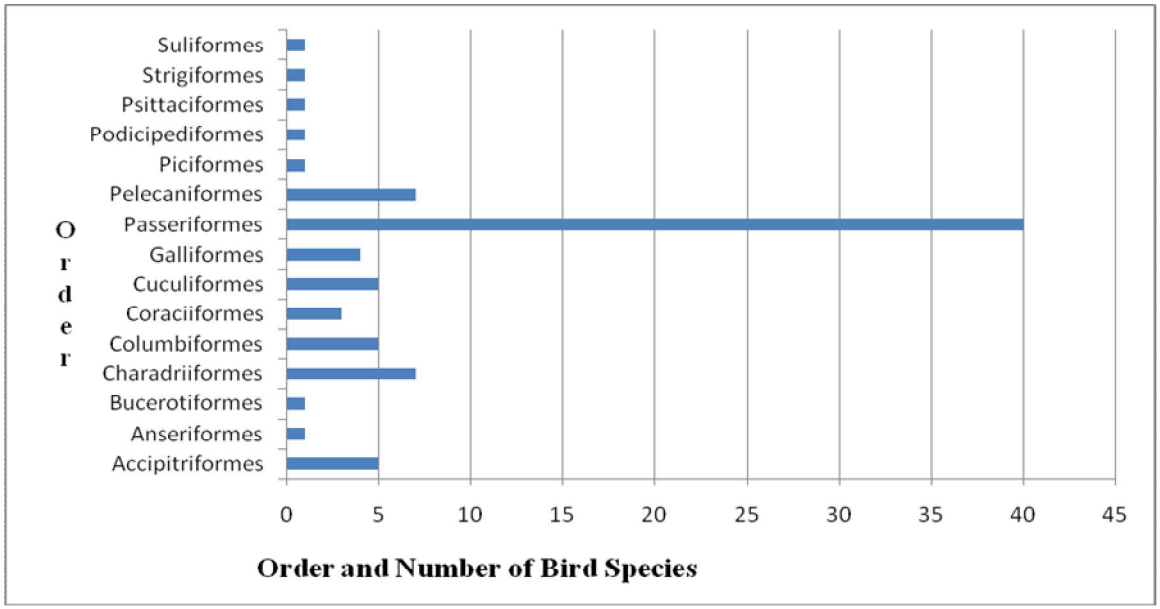


Figure 1: Number of bird species in each Order

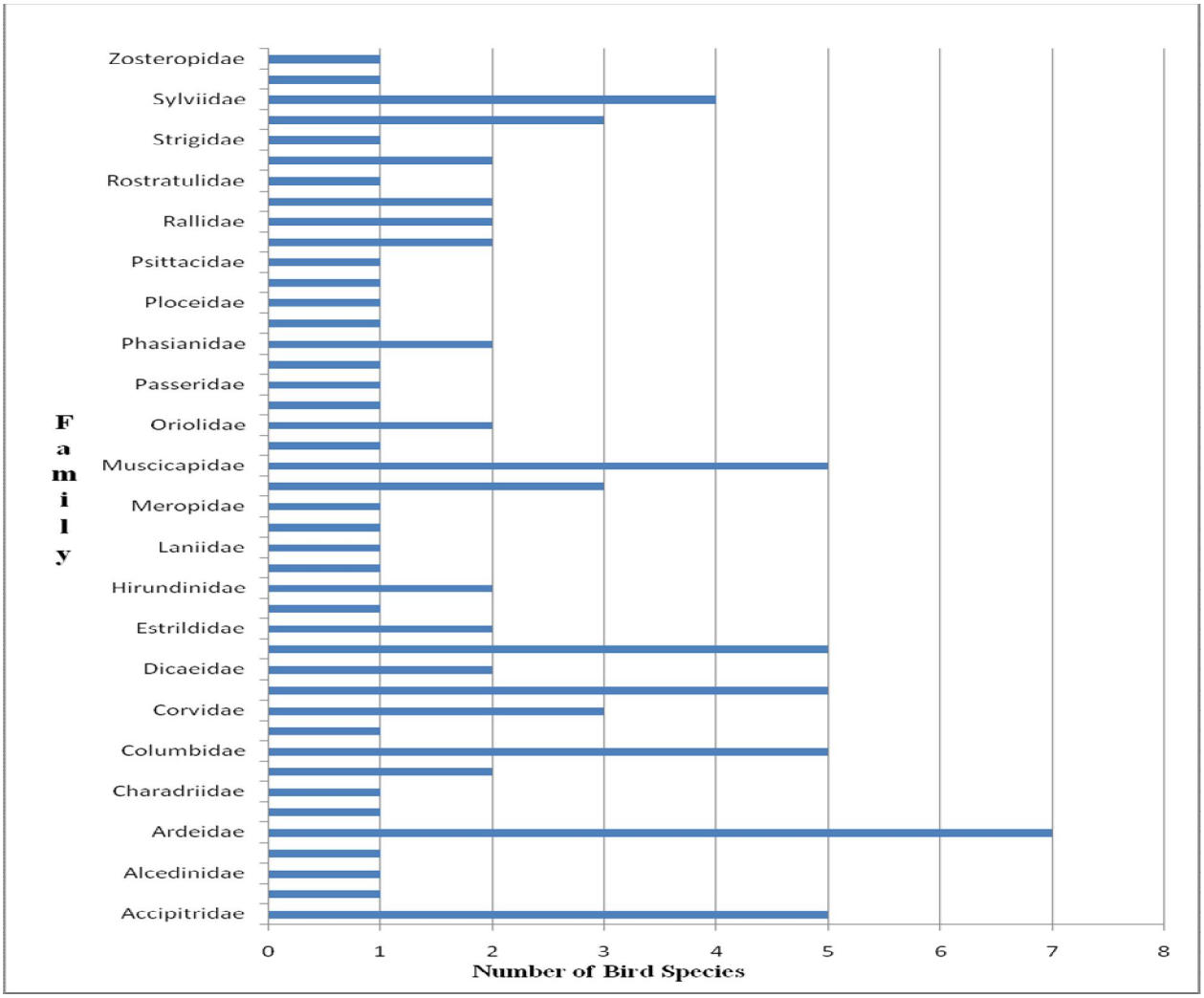


Figure 2: Family wise composition of bird species

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The avifaunal species composition based on feeding behavior was found to be Carnivorous (34%), followed by Insectivorous (27%), Omnivorous (21%), Granivorous (11%) and Frugivorous (7%) (Figure 3). Majority of bird species fell under Scheduled-IV category of IUCN that is of least Concern.

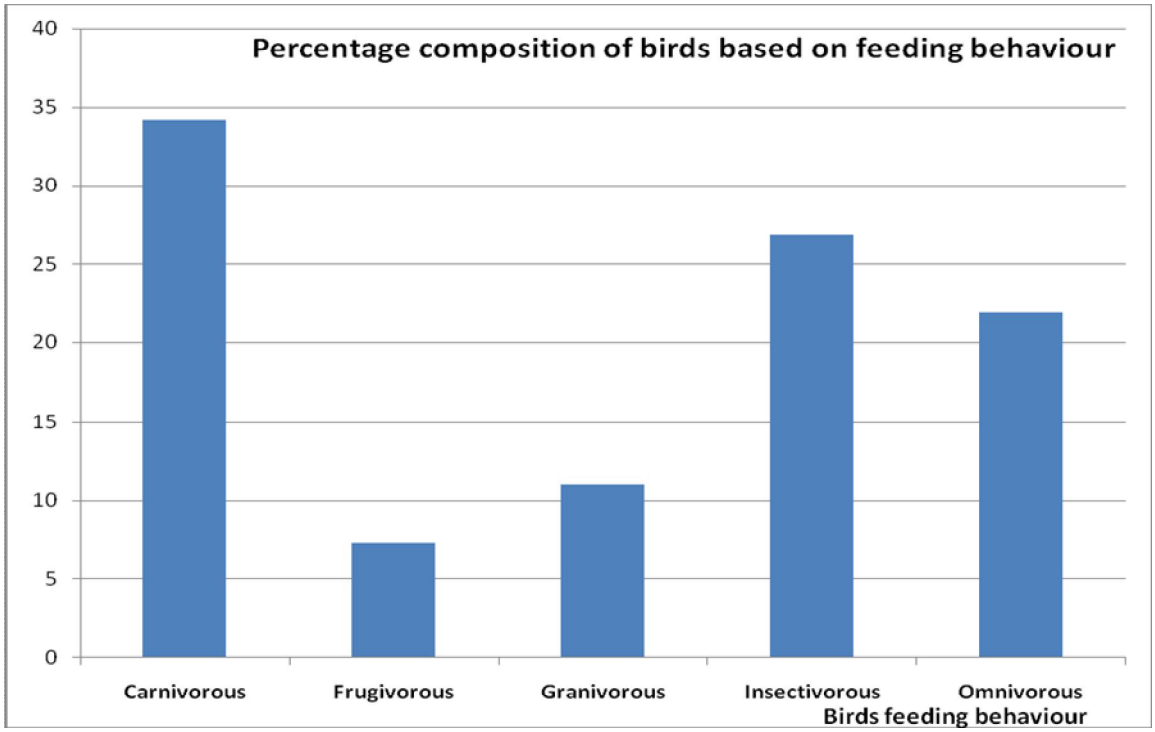


Figure 3: Percentage composition of bird types based on their feeding behavior (%).

Avifaunal abundance recorded in the campus was mainly under the category of Common birds (60%), followed by Visitor (30%) and Rare (10%) birds (Figure 4). The dominant common birds found in the campus were Common Pigeon, House Crow, Indian Jungle Crow, Cattle Egret, Black Kite, Wire Tailed Swallow, Red Rumped Swallow, Green Bee Eater, White Browed Wagtail, Rose Ringed Parakeet, Red Whiskered Bulbul, Common Myna etc. Few visitor birds observed were Oriental Honey Buzzard, Black Crowned Night Heron, Common Hawk Cuckoo, Pied Cuckoo, Yellow Wagtail, Baya Weaver etc. Proximity to Kukrail forests is also aiding in observing visitor and rare birds in the campus in few seasons.

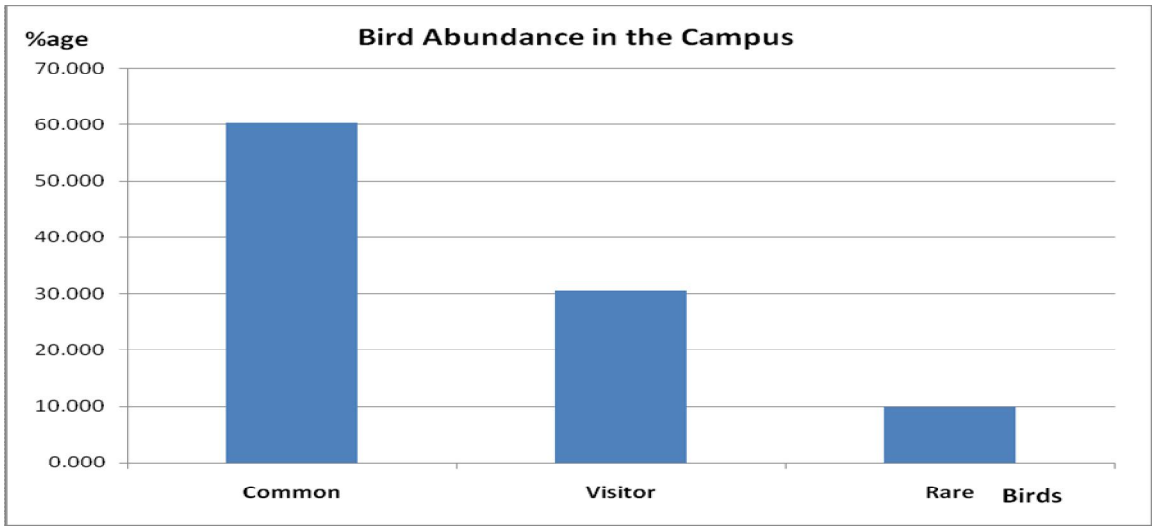


Fig. 4: Bird abundance observed in the Campus.

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V. CONCLUSION

The campus showed a rich and diverse presence of nearly 83 species of birds in its varied habitats. Various authors have confirmed that birds are ecological indicators (Padoa-Schioppa et al, 2006; Gregory et al, 2003) of ecosystem and green spaces in the urban areas have immense importance in conservation of biodiversity (Khera et al, 2009; Mason, 2006; Alvey, 2006 etc). In that context, Integral University campus provides safe and excellent habitats to the avifauna as evident from its rich species diversity. Current study will form the baseline for conducting further studies on bird abundance, species richness etc in the campus.

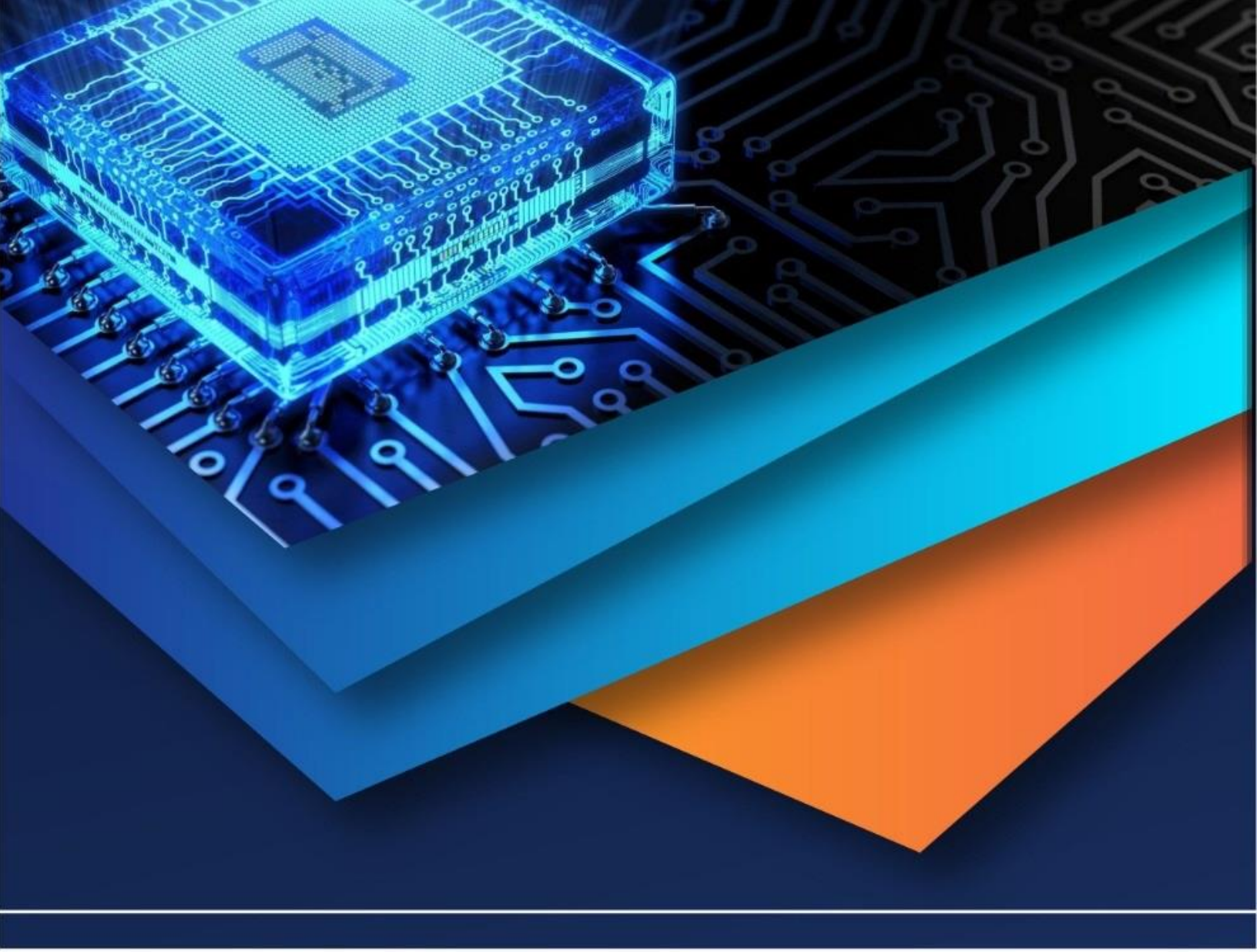
VI. ACKNOWLEDGEMENTS

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