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Avifaunal Diversity at Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGI Campus), Lucknow, Uttar Pradesh, India

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Abstract:- One of the most crucial ecological markers for assessing the condition of ecosystems is avifaunal diversity. In order to sustain a trophic level in an ecosystem, birds are a vital animal group. Therefore, it is crucial to thoroughly research the ecology and avifauna in order to safeguard them. They are one of the biological control methods used to manage pests in farms, gardens, and other locations. They assist in the pollination of plants. Surveys were carried out seasonally and observations were doneusing Line Transect Method with the aid of 10x50 binoculars and Canon (200 D) DSLR camera. The Avifaunal diversity at SGPGI campus, Lucknow includes 24 species most of the species belonging to 8 orders. Order Passeriformes had maximum 15bird species, Spilopelia chinensis, Turdodies striata, Oriental magpie- robin, Psittacula krameri, Columbia livia domestica are the most abundant residential species in the SGPGI campus, Lucknow. The present study is the first documentation of the avifauna from the region and the study was aimed for the support in the conservation of the bird species as well as for safeguarding the habitat of the bird species of the area.

Keywords:- *Ecological Markers, Sgpgi, Avifaunal Diversity, Biological Control Methods, Habitat*

I. INTRODUCTION

The diversity of the avifauna is one of the most crucial ecological markers for assessing the condition of habitats. Since ancient times, people have a close relationship with birds. Numerous birds are revered with religious overtones in Indian culture, and people are deeply concerned about preserving them. In order to sustain a trophic level, birds are an essential component of an ecosystem. They are the most fascinating group in the animal kingdom, and are studied by both scientists and students due to their unique biological characteristics. They are also a vital component of all natural ecosystems.Diversity of avifauna is one of the most important ecological indicators to evaluate the status of habitats. The human-bird association is since ancient times and is an intimate one. In Indian culture there are a number of birds that are worshiped with religious sentiments and people are emotionally involved in their conservation. Birds are crucial part of an ecosystem and contribute to maintain a trophic level. Activities of birds are considered as indicator of superiority of ecosystem and they also form the incurable links in many food chains, hence they imitate changes originating in several different ecosystem components (Custer and Osborne 1977). The detail study on avifauna and their ecology is important to protect them. They are one of the biological pest management tools to control pests in gardens, on farms, and other places.

Humans have a fascination with birds that goes back thousands of years across nearly every culture earth has ever witnessed. One of the fascinating things about the birds is their migration. The movement of birds from one place to another is an incredible migratory behavioural cycle driven by evolutionary trends among different species of birds and makes them one of the unique and fascinating creatures of this natural world (Lincoln & Peterson 1979). Birds are one the best indicators of our environmental health since we can predict the health of any ecosystem by monitoring birds that are residing in a particular place. There are around 10787 extant species of birds recorded across the globe, which on the contrary makes (40 Orders, 252 Families, and 2359 Genera) within the class Aves. In India, more than 1335 species of birds have been recorded across [26 orders, 113 families and 485 genera] (Patel et al. 2021; Praveen et al., 2020). The Indian bird fauna is very unique and important for the ecosystems of the vast country.

A number of studies on biodiversity, taxonomy and documentation of the avifauna have been reported from many parts of the Uttar Pradesh state by a number of authors; Gopi and Kittur, 2011; Yadav et al. 2020; Jha, 2013; Chaube et al. 2018; Mishra, 2020; Bhargava et al. 2016; Kumar et al. 2018; Mazumder and Khan, 2020; Verma, 2020; Kumari et al. 2020; Singh et al. 2018; Prakash & Verma 2016; Kanaujia et al. 2015; Tomar and Chouksey, 2018; Kumar et al. 2015; Mishra et al. 2016; Dwevedi et al. 2014; Kushwaha et al. 2019. The present study is the first documentation and checklist of the avifauna from SGPGI Campus, Lucknow, Uttar Pradesh, India.

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II. STUDY AREA

SGPGI Campus, Lucknow Uttar Pradesh 14 km (8.7 miles) south of Hazratganj on Raebareli Road in Lucknow, Uttar Pradesh, is a medical institute recognised by the State Legislature Act. In honour of Sanjay Gandhi, it was founded in 1983. On December 14, 1980, then-President of India, His Excellency, Shri Neelam Sanjiva Reddy, laid the cornerstone for the Sanjay Gandhi Postgraduate Institute of Medical Sciences on the grounds of what is now King Georges Medical University. The State Government aimed to create a state of the art quality medical education, training, medical care and cutting-edge research institution with the motto, "Hospitals with a long tradition of excellence have demonstrated abundantly that research enhances the vitality of teaching, teaching lifts the standards of service and service opens new avenues of investigation".

Fig 1 Map of the study area
(Source: satellite.pro)

III. MATERIALS AND METHODS

The study was conducted from **January to April 2023**. Survey work were carried out seasonally during suitable time (in summer- morning: 6:00 am to 10:00 am, evening: 3:30 pm to 6:30 pm, in winter morning: 7:00 am to 11:00 am, evening: 3:00 pm to 5:30 pm). Birds were monitored using Line Transect in a pre-defined area. A line transect of 1-100 meter was prepared and the birds were monitored on both the sides of transect by close end transect up to 2 Km. without stopping. The birds were identified using standard field guide books of Ali & Ripley, 1995, Grimmett et al., 1998, Salim Ali, 2002. Binoculars were used for viewing long distance sitting birds. Photography using Canon EOS 1300D.

IV. RESULT AND DISCUSSION

During the study period, a total of 24 bird species were recorded. 8 orders, belonging to 18 families, representing the total avian diversity by order Passeriformes (63%), Columbiformes (13%), Coraciformes (4%), Accipitriformes (4%), Cuculiformes (4%), Psittaciformes (4%), Strigiformes(4%), Galliformes (4%) so here the most dominant group from order is Passeriformes with 63% and the most predominant group from family is Columbidae with 13%.

From several families Columbidae (13%), Corvidae (8%), Estrilididae (8%), Musicapidae (8%), Nectarniidae (8%), Alcedinidae (4%), Acrocephalidae (4%), Accipitridae (4%), Cuculidae (4%), Dicruridae (4%), Leiothrichidae (4%), Psittaculidae (4%), Pycnonotidae (4%), Sturnidae (4%), Zosteropidae (4%), Strigidae (4%), Turdidae (4%), Cisticolidae (4%), Parridae (4%) and Phasianidae (4%) are the most diverse in SGPGI Campus of Lucknow, Uttar Pradesh.

All the species recorded were listed in the least concern category of the IUCN. Maximum species richness of avian species was recorded from the family Columbidae with 3 species with 13% and on the basis of the species composition of birds in SGPGI according to IUCN status **least concern** species percentage is 96% and **near threatened** species percentage is 4%.24family of Avifaunal species are in the category of least concern in the IUCN whereas one species belonging to the family Columbidae named *Patagioenas leucocephala* is near threatened.

Thus, study revealed the rich **Avian Diversity** at SGPGI Campus, Lucknow Uttar Pradesh, India.

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Table 1 Checklist of Total Number of Avifaunal Species According to their Families Recorded in SGPGI, Lucknow

S.N.	Family	Common Name	Zoological Name	No of species	IUCN Status
1.	**Columbidae**	Feral pigeon	***Columbia livia domestica***	**3**	Least concern
2.		Spotted dove	***Spilopelia chinensis***		Least concern
3.		Pigeon	***Patagioenas leucocephala***		Near threatened
4.	**Corvidae**	Rufous Treepie	***Dendrocitta vagabunda***	**2**	Least concern
5.		House crow	***Corvus splendens***		Least concern
6.	**Estrildidae**	Scaly breasted munia	***Lonchura punctulata***	**2**	Least concern
7.		White throated munia	***Euodice malabarica***		Least concern
8.	**Muscicapidae**	Brown rock chat	***Cercomela fusca***	**2**	Least concern
9.		Oriental magpie robin	***Copsychus saularis***		Least concern
10.	**Nectariniidae**	Purple sunbird	***Cinnyris asiaticus***	**2**	Least concern
11.		Olive- backed sunbird	***Cinnyris jugularis***		Least concern
12.	**Alcedinidae**	White throated kingfisher	***Halcyon smyrensis***	**1**	Least concern
13.	**Accipitridae**	Eurasian sparrow hawk	***Accipiter nisus***	**1**	Least concern
14.	**Cuculidae**	Greater coucal	***Centropus sinensis***	**1**	Least concern
15.	**Dicruridae**	Black drongo	***Dicrurus macrocercus***	**1**	Least concern
16.	**Leiothrichidae**	Jungle babbler	***Turdodies striata***	**1**	Least concern
17.	**Psittaculidae**	Rose-ringed parakeet	***Psittacula krameri***	**1**	Least concern
18.	**Pycnonotidae**	Red whiskered bulbul	***Pycnonotus jocosus***	**1**	Least concern
19.	**Sturnidae**	Common myna	***Acridotheres tristis***	**1**	Least concern
20.	**Strigidae**	Jungle owlet	***Glaucidium radiatum***	**1**	Least concern
21.	**Turdidae**	Orange headed thrush	***Geokichla citrina***	**1**	Least concern
22.	**Cisticolidae**	Tailor bird	***Orthotomus sutorius***	**1**	Least concern
23.	**Paridae**	Coal tit	***Periparus ater***	**1**	Least concern
24.	**Phasianidae**	Indian peafowl	***Pavo cristatus***	**1**	Least concern
Total				**24**	

Table 2 Photographs of Avifaunal Species

White throated kingfisher	**Eurasian sparrow hawk**	**Feral pigeon**
		
Halcyon smyrensis	*Accipiter nisus*	*Columbia livia domestica*

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Spotted dove  *Spilopelia chinensis*	**Rufous treepie**  *Dendrocitta vagabunda*	**House crow**  *Corvus splendens*
Greater coucal  *Centropus sinensis*	**Black drongo**  *Dicrurus macrocercus*	**White throated munia**  *Euodice malabarica*
Jungle babbler  *Turdodies striata*	**Brown rock chat**  *Cercomela fusca*	**Oriental magpie robin**  *Copsychus saularis*
Purple sunbird  *Cinnyris asiaticus*	**Rose-ringed parakeet**  *Psittacula krameri*	**Red whiskered bulbul**  *Pycnonotus jocosus*
Olive-backed sunbird  *Cinnyris jugularis*	**Common myna**  *Acridotheres tristis*	**Jungle Owlet**  *Glaucidium radiatum*

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Orange headed thrush  *Geokichla citrina*	**Tailor bird**  *Orthotomus sutorius*	**Coal tit**  *Periparus ater*
Scaly breasted munia  *Lonchura punctulata*	**Pigeon**  *Patagioenas leucocephala*	**Indian peafowl**  *Pavo cristatus*

Table 3 Observation Table Showing % Composition of Order

S. N.	Name of order	Number of order in a family	% composition of order
1.	Passeriformes	15	63%
2.	Columbiformes	3	13%
3.	Coraciiformes	1	4%
4.	Accipitriformes	1	4%
5.	Cuculiformes	1	4%
6.	Psittaciformes	1	4%
7.	Strigiformes	1	4%
8.	Galliformes	1	4%

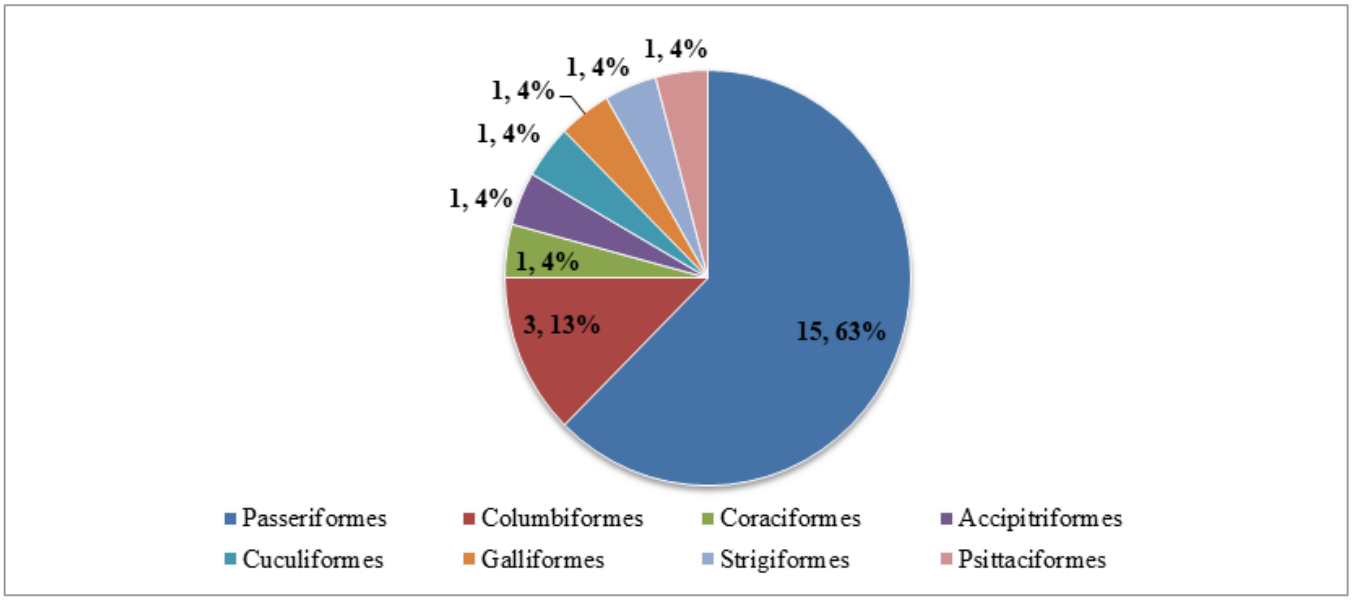

Fig 2 Pie Chart Showing % Depicting the Maximum Number of Bird Species According to Order

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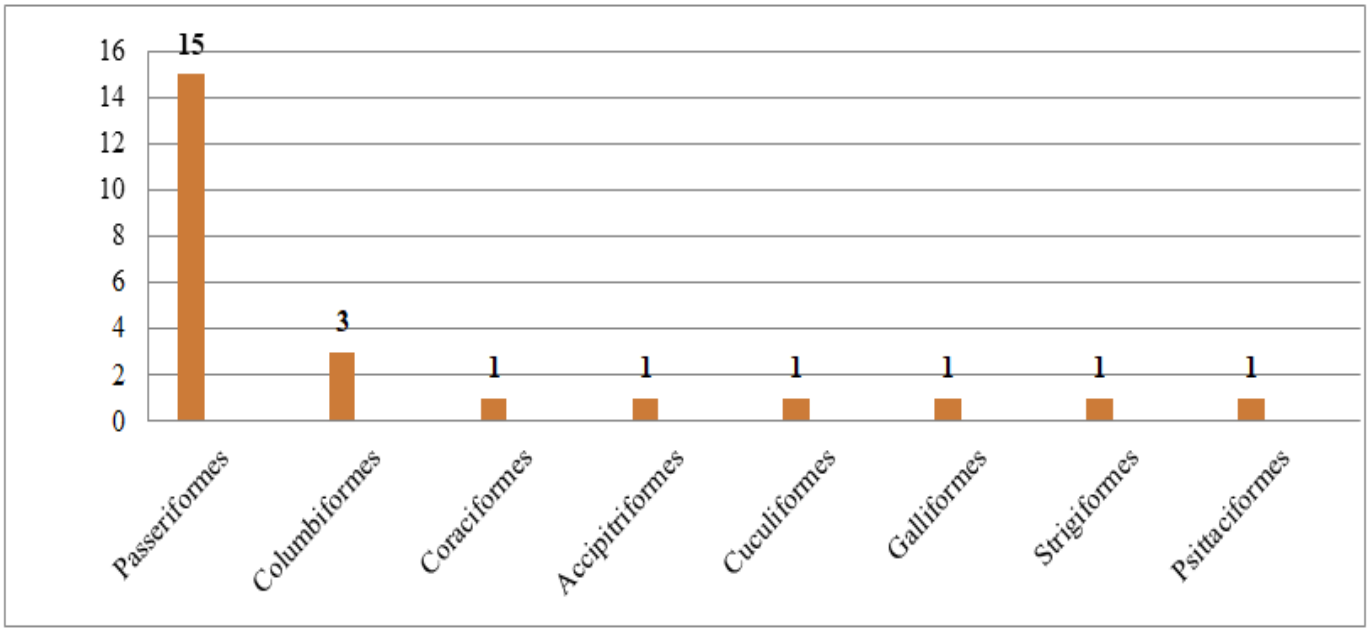

Fig 3 Bar Chart Depicting the Maximum Number of Bird Species According to Order

Table 4 Showing % Composition of Species Dominance with Respect to Family

S.N.	Name of family	Number of species in a family	% composition of species in a family
1.	Columbidae	3	13%
2.	Corvidae	2	8%
3.	Estrildidae	2	8%
4.	Muscicapidae	2	8%
5.	Nectariniidae	2	8%
6.	Alcedinidae	1	4%
7.	Accipitridae	1	4%
8.	Cuculidae	1	4%
9.	Dicruridae	1	4%
10.	Leiothrichidae	1	4%
11.	Psittaculidae	1	4%
12.	Pycnonotidae	1	4%
13.	Sturnidae	1	4%
14.	Strigiformes	1	4%
15.	Turdidae	1	4%
16.	Cisticolidae	1	4%
17.	Paridae	1	4%
18.	Phasianidae	1	4%

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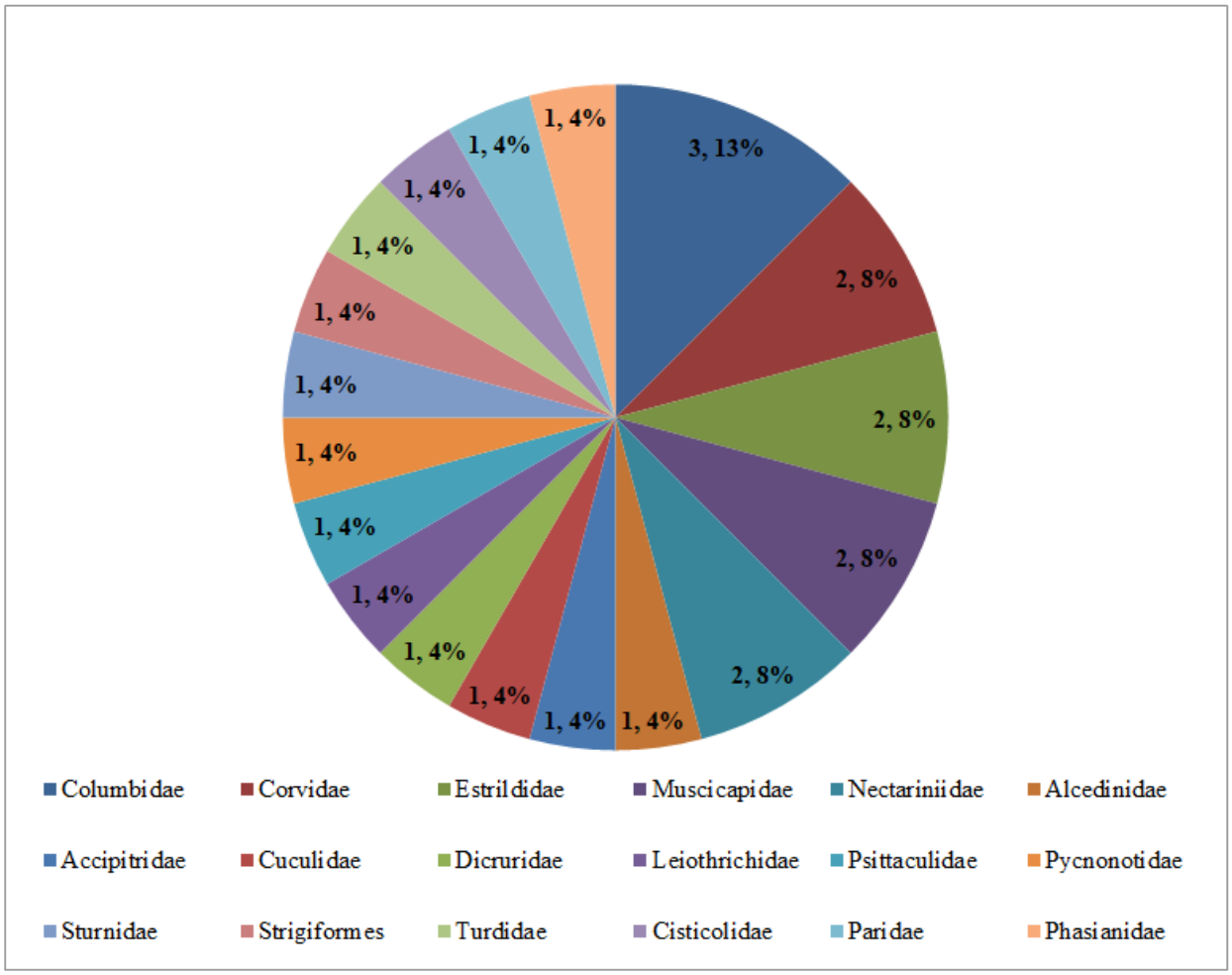

Fig 4 Pie Chart in % Depicting the Different Bird Families

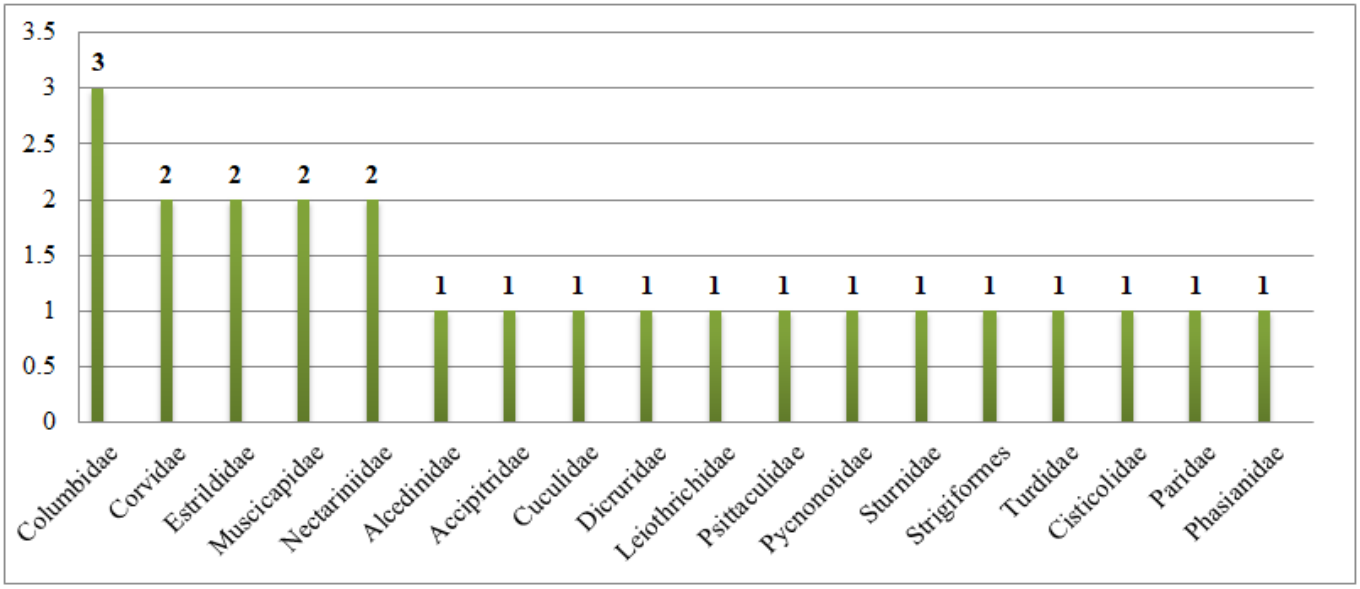

Fig 5 Bar Chart Showing % of Bird Species with Respect to Different Avifaunal Families

Table 5 IUCN Status According to % Composition of Avifaunal Species

S.N.	IUCN status	Total no. of species	% composition of species
1.	Least concern	23	96%
2.	Near threatened	1	4%

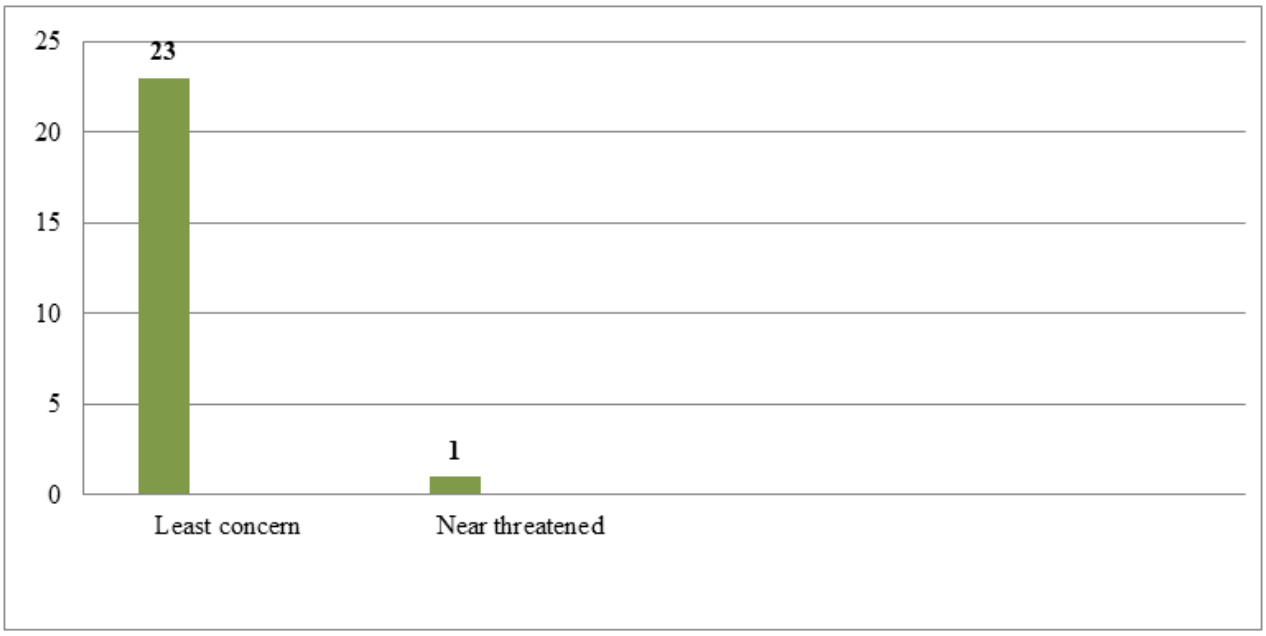

Fig 6 Bar Chart Showing Avifaunal IUCN Status According to % Composition of Avifaunal Species

V. CONCLUSION

It can be concluded that SGPGI Campus supports variety of avifaunal species. Since there is no published Avifaunal checklist prior to this, the present work can form the baseline for further research and comparative studies. The study establishes that the present ecological status of the SGPGI Campus supports the birds' population. A **total number of 24 bird species** were observed and photographed. The rising population, industrialization and large-scale utilization of pesticides have created havoc among the bird communities and habitats in which they are residing. The breeding and feeding grounds of these bird species are turning into garbage yards which have resulted in the excessive loss of the bird species and their habitats. The loss of these bird species has negative implications for both humankind and natural ecosystems since these animal species are an important part of our ecosystems.The present millennium is experiencing a high and fast rate of endangerment and extinction of both floral and faunal species hence conservation steps should be put forward and management strategies should be executed to safeguard the Avifaunal Diversity.

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