

VOLUME 9

ISSUE 2

2023

ISSN 2454 – 3055



**INTERNATIONAL
JOURNAL OF
ZOOLOGICAL
INVESTIGATIONS**

***Forum for Biological and
Environmental Sciences***

Published by Saran Publications, India



International Journal of Zoological Investigations

Contents available at Journals Home Page: www.ijzi.net

Editor-in-Chief: Prof. Ajai Kumar Srivastav

Published by: Saran Publications, Gorakhpur, India



ISSN: 2454-3055

Avian Diversity and Their Status in Janeshwar Mishra Park, Lucknow, Uttar Pradesh, India

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Received: 10th April, 2023; **Accepted:** 22nd June, 2023; **Published online:** 30th July, 2023

<https://doi.org/10.33745/ijzi.2023.v09i02.023>

Abstract: India is home to 1364 species of bird among these 81 species of birds are endemic to India. This survey was done to study Avian diversity and their status in Janeshwar Mishra Park, Lucknow. Study was conducted between December 2021 to April 2022. The method used for the study was line transect method and instrument used were (10x42) binoculars and Nikon Coolpix digital camera. Eighty three species of birds were recorded during survey. The present study showed that the bird species found at Janeshwar Mishra Park are either resident like Eurasian Collared Dove, Indian Grey Hornbill or migrants like Eurasian Hoppoe, Wire Tailed Swallow or resident migratory like Crow Billed Drongo, Ashy Drongo. Majority of birds status was least concern. Near threatened bird Alexandrine Parakeet and vulnerable status bird Indian Spotted Eagle are also present.

Keywords: Bird species, Avian diversity, Eurasian Hoppoe, Wire Tailed Swallow, Crow Billed Drongo, Ashy Drongo

Citation: Anand Nidhi, Kanaujia Amita, Kumar Ashish and Antil Jyoti: Avian diversity and their status in Janeshwar Mishra Park, Lucknow, Uttar Pradesh, India. Intern. J. Zool. Invest. 9(2): 224-235, 2023.

<https://doi.org/10.33745/ijzi.2023.v09i02.024>



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Introduction

There are more than 10,000 species of birds present worldwide (Clements 2007). The first classification of birds was given by Francis Willughby and John Ray in their 1676 volume Ornithologiae then Carl Linnaeus modified this in 1758 to devise the taxonomic classification system currently in use. Birds come under biological class Aves in Linnaean taxonomy. Earlier birds were divided in 30 orders but subsequent analysis and improving of DNA sequences has contributed to

revised higher classification especially Orders. Sibley and Ahlquist's Phylogeny and Classification of Birds (1990) is a landmark work on the classification of birds. Birds play a key role in ecosystem services, so it is important to conserve birds. For conservation of birds and their habitat one of the most important part is to track their status. We carried out a study to generate a checklist of birds at Janeshwar Mishra Park, Lucknow. The study recorded 83 species of birds.

50 species of birds belong to order Passeriformes. Total 13 orders, 33 families and 51 genera was recorded. Dominating order is Passeriformes and dominating family is Passeridae. 78% of birds are resident and 16% of recorded birds are migratory.

The objectives of this study are – (i) to study the diversity of Birds in Janeshwar Mishra Park and (ii) to prepare the checklist of bird species in the proposed study area.

Materials and Methods

In the present study, observations were made throughout the study area. The survey was done in morning from 06:00 to 10:00 h and in evening from 16:30 to 18:30 h) of the day. The survey took place from December 2021 to April 2022. Observations were carried out with the help of binoculars and field characteristics were noted down on data sheet. Birds were categorized according to their presence (month-wise) status as residents (R) or migrants (M) and their abundance in park. Identification of birds was done with the help of key reference books (Ali, 2002; Grimmett *et al.*, 2007).

The method used for survey was Line Transect Method using transect of 100 m. In this method birds were identified using binoculars (bushnell 10x42) and by listening their voice. Photographs captured with Nikon Coolpix B500 digital camera which also helped in identifying birds. GPS location was also taken.

Study Area:

Janeshwar Mishra Park is located in Gomti Nagar in Lucknow, India (Figs. 1, 2). It is geographically located at Latitude: 26° 51' 13.14" N Longitude: 80° 59' 20.544" E. Janeshwar Mishra Park (Fig. 3) is Spread over 376 acres, it is the biggest park in Asia. Area of Janeshwar Mishra Park is 1.52 square km. There are two water bodies (14 Acre and 18 Acre) within the park, attracting migratory birds. The climate of Uttar Pradesh is generally defined to be tropical monsoon climate. However, based on the Köppen climate classification, it can be classified mostly as Humid Subtropical with dry

winter type with parts of Western Uttar Pradesh falling in the semi-arid category.

The temperature varies within the year. The extreme low and high temperatures are usually from 4°C to 50°C in several parts. During the monsoon season, floods often take place, due to heavy rain. The summers are extremely hot, the winters are cold and the rainy season can be either very wet or very dry. Uttar Pradesh is represented by 56 species of mammals, 552 of birds of which 24 are globally threatened, 47 reptiles, 19 amphibians and 79 fishes. The Sarus Crane has been declared as the State Bird. 25 important Bird areas have been designated. The region is rich in endemic fauna, including birds, and has been of great bio-geographical interest. This study deals with the birds studied in Janeshwar Mishra Park, Lucknow.

Floral diversity of park is very rich having different types of trees, shrubs, palms which enhances the fauna diversity of the park. Study area inherits numerous species of butterfly like common crow, blue morph, swallowtails etc. and many types of insects, spiders.

Results and Discussion

The areas where birds are spotted in large number are shown in Table 1 and Figure 4. The checklist of birds present in Janeshwar Mishra Park is given in Table 2. The Janeshwar Mishra Park Bird Checklist acknowledges a total of 83 species of birds constituting 33 families of bird mentioned in birds of India by Ali (2002). Taxonomically, it covers 13 orders, 33 families and 51 genera, representing the park avian diversity. Order Passeriformes form the most predominant group (c. 60.2%), followed by the orders Columbiformes (c 6%), Accipitriformes (6%), Pelicaniformes (c 4.8%), Cuculiformes (c 4.8%). Among the bird families, Wagtails, Sparrows, Silverbills (Passeridae) about 8 species of birds present followed by Chats, Robins and Redstart (Muscicapidae) about 6 species of birds are present followed by Doves and Pigeons (Columbidae: 5 species). Other significant families include crows, treepie (Corvidae), Kites,



Fig.1: Map of Uttar Pradesh, India.
(Source: Google maps)



Fig. 2: Map of Lucknow.
(Source: Google maps)

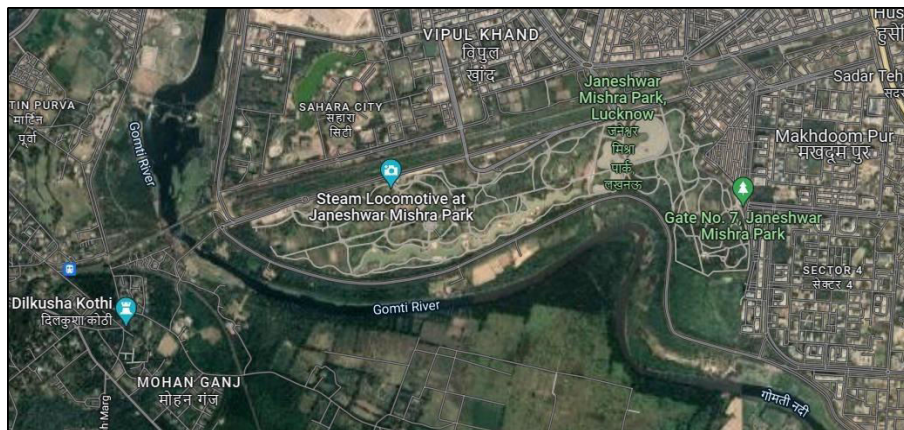


Fig. 3: Map of Janeshwar Mishra Park (Source: Google).



Fig. 4: Map showing Area marked where birds were spotted in large number.

Table 1: Area with bird spotted in large numbers

Area	Birds spotted
1	Sparrow, Bulbul, Indian Silverbill, Crow, Laughing Dove, Cattel Egret, Myna, Oriental Magpie Robbin
2	India Grey Hornbill, Rock Pigeon, Crow, Ashy Prinia, Plain Prinia, Warbler
3	Cinerosus Tit, Oriental White Eye, Green Bee Eater, Crow
4	Owl, Black Hooded Oriole, Indian Golden Oriole, Indian Peafowl, Greater Coucal, Spiderhunter
5	Water thick knee, Indian Peafowl, Peahen, Ashy Prinia, Alexandrine Parakeet
6	Eurasian Hoopoe, White Breasted Kingfisher, Myna, Wagtails, Indian Robin
7	Cuckoo, Lesser Coucal, Egret, Myna, Crow, Purple Sunbird
8	Pied Bushchat, Indian Rockchat, Spotted Dove, Barn Swallow, Wire Tailed Swallow
9	Barn Swallow, Wire Tailed Swallow, White Breasted Kingfisher, Red Wattleed Lapwing
10	Black Drongo, Crow, Raven, Roufous Treepie, Wagtails, Myna
11	Coppersmith Barbet, Purple Sunbird, Black Drongo
12	Steppe Eagle, Black Kite, Black Redstart, Wagtail
13	Indian Silverbill, Wagtail, Black Redstart, Purple Sunbird, Ashy Prinia
14	Indian Roller, Red Wattleed Lapwing, Egret
15	Wagtail, Bulbul, Egret
16	Indian Peafowl, Peahen, Water thick knee, Greater Coucal

Eagles (Accipiteridae), Egrets, Heron (Ardeidae), Sunbirds, Flowerpeckers (Nectariniidae), Starling's Myna's (Sturnidae): each accounting for over 4 to 5 species among the Indian birds. Interestingly, some of the species rich bird families of the park are otherwise represented by only one or two species; Oriental White Eyes (Zosteropidae), Warblers (Sylviidae), Barbets (Megailimidae), Indian Roller (Coraciidae). Among the avian genera, the following are notably dominant (very common) birds present in large numbers Crows (Corvidae), Sunbirds (Nectariniidae), Mynas (Sturnidae), Sparrow Wagtails (Passeridae), Egrets (Ardeidae), Prinia (Cisticolidae) with each represented by population size above 200. Some common birds include Warblers (Sylviidae), Parakeets (Psittaculidae) Oriole (Oriolidae), Barbets (Megailimidae), Bulbuls (Pycnotidae), these birds have population size above 100.

Among rare birds present in park are Indian

Roller (Coraciidae), water thick knee (Burihinidae), Owls (Strigidae). These birds have population size less than 50. Water birds are not present in the study area in significant amount.

During the survey different behaviour of birds was observed and captured such as territorial behaviour, foraging behaviour, nesting behaviour, prining, sunbathing etc. In some birds sexual diamorphism is also observed such as Sunbird, Sparrow, Peacock etc.

The floral diversity of study area is also very enriched (Table 3). Many trees like *Anthocephalus cadamba*, *albizzia*, *Callistemon citrunus*, *Ficus benjamiana*, *Erythrina crystagalli*, on which members of family Nectariniidae, Megalaimidae feed and make their nest. Presence of 83 species of bird can be due to vast floral diversity present in the park. Also large number of birds were found near to the source of water (pond) which tells us the necessity of water for birds, and the need for protection of it.

Table 2: Checklist of birds of Janeshwar Mishra Park

S. No.	ORDER	FAMILY	COMMON NAME	ZOOLOGICAL NAME	IUCN STAT US	Resident / migrator ystatus	Study area statu s
1	Accipitriformes	Accipiteridae	Black Kite	<i>Milvus migrans</i>	LC	R	C
			Black Eagle	<i>Ictinaetus malaiensis</i>	LC	R	R
			Bonelli's Eagle	<i>Hieraaetus fasciatus</i>	LC	R	R
			Indian Spotted Eagle	<i>Clanga hastata</i>	V	R	UC
			Steppe Eagle	<i>Aquila nipalensis</i>	EN	M	R
2	Apodiformes	Apodidae	Indian House Swift	<i>Apus nipalensis</i>	LC	R	C
3	Bucerotiformes	Bucerotidae	Indian Grey Hornbill	<i>Ocyeros birostris</i>	LC	R	C
		Upupidae	Eurasian Hoopoe	<i>Upupa epops</i>	LC	M	C
4	Charadriiformes	Burhinidae	Water thick knee	<i>Burhinus vermiculatus</i>	LC	R	UC
		Charadriidae	Red Wattleed Lapwing	<i>Vanellus indicus</i>	LC	R	C
5	Columbiformes	Columbidae	Barbary Dove	<i>Streptopelia risoria</i>	LC	R	C
			Eurasian Collared Dove	<i>Streptopelia decaocto</i>	LC	R	C
			Laughing Dove	<i>Spilopelia senegalensis</i>	LC	R	C
			Rock Pigeon	<i>Columba livia</i>	LC	R	C
			Spotted Dove	<i>Spilopelia chinensis</i>	LC	R	C
6	Coraciiformes	Alcedinidae	White breasted Kingfisher	<i>Halcyon smyrnensis</i>	LC	R	C
		Coraciidae	Indian Roller	<i>Coracias benghalensis</i>	LC	R	R
		Meropidae	Green Bee Eater	<i>Merops orientalis</i>	LC	R	C
7	Cuculiformes	Centropodidae	Greater Coucal	<i>Centropus sinensis</i>	LC	R	C
			Lesser Coucal	<i>Centropus bengalensis</i>	LC	R	C
		Cuculidae	Asian Koel	<i>Eudynamys scolopaceus</i>	LC	R	C
			Common Cuckoo	<i>Hierococcyx varius</i>	LC	R	UC
8	Galliformes	Phasianidae	Indian Peafowl	<i>Pavo cristatus</i>	LC	R	C
9	Passeriformes	Alaudidae	Common Crested Lark	<i>Galerida cristata</i>	LC	R	C
			Indian Short Toed Lark	<i>Calandrella brachydactyla</i>	LC	M	C
		Cisticolidae	Ashy Prinia	<i>Prinia socialis</i>	LC	R	C
			Plain Prinia	<i>Prinia inornata</i>	LC	R	C
		Corvidae	House Crow	<i>Corvus splendens</i>	LC	R	VC
			Large Billed	<i>Corvus</i>	LC	R	VC

			Crow	<i>macrorhynchos</i>			
			Raven	<i>Corvus corax</i>	LC	R	C
			Rufous Treepie	<i>Dendrocitta vagabunda</i>	LC	R	UC
	Dicruridae		Ashy Drongo	<i>Dicrurus leucophaeus</i>	LC	RM	VC
			Black Drongo	<i>Dicrurus macrocercus</i>	LC	R	C
			Crow billed Drongo	<i>Dicrurus annectens</i>	LC	RM	C
			Great Racket tailed Drongo	<i>Dicrurus paradiseus</i>	LC	R	UC
	Hirundinidae		Barn Swallow	<i>Hirundo rustica</i>	LC	M	C
			Pacific Swallow	<i>Hirundo tahitica</i>	LC	R	C
			Wire Tailed Swallow	<i>Hirundo smithii</i>	LC	M	C
	Laniidae		Brown Shrike	<i>Lanius cristatus</i>	LC	M	UC
	Muscicapidae		Black Redstart	<i>Phoenicurus ochrurus</i>	LC	R	VC
			Brown Rockchat	<i>Oenanthe fusca</i>	LC	R	VC
			Common Redstart	<i>Phoenicurus phoenicurus</i>	LC	M	VC
			Indian Robin	<i>Copsychus fulicatus</i>	LC	R	VC
			Oriental Magpie Robin	<i>Copsychus saularis</i>	LC	R	VC
			Pied Bushchat	<i>Saxicola caprata</i>	LC	M	C
	Nectariniidae		Long Billed Spiderhunter	<i>Arachnothera robusta</i>	LC	R	C
			Pale Billed Flowerpecker	<i>Dicaeum erythrorhynchos</i>	LC	R	C
			Purple Sunbird	<i>Cinnyris asiaticus</i>	LC	R	VC
			Thick Billed Flowerpecker	<i>Dicaeum agile</i>	LC	R	C
	Oriolidae		Black Hooded Oriole	<i>Oriolus xanthornus</i>	LC	R	C
			Indian Golden Oriole	<i>Oriolus kundoo</i>	LC	RM	C
	Paridae		White Napped Tit	<i>Machlolophus nuchalis</i>	V	R	UC
	Passeridae		Black Backed Wagtail	<i>Motacilla alba lugens</i>	LC	R	VC
			Grey Wagtail	<i>Motacilla cinerea</i>	LC	M	VC
			House Sparrow	<i>Passer domesticus</i>	LC	R	VC
			Indian Silverbill	<i>Euodice malabarica</i>	LC	R	VC

			Plain Backed Sparrow	<i>Passer flaveolus</i>	LC	R	C
			Sind Sparrow	<i>Passer pyrrhonotus</i>	LC	R	C
			Western Yellow Wagtail	<i>Motacilla flava</i>	LC	M	VC
			White Browed Wagtail	<i>Motacilla maderaspatensis</i>	LC	M	VC
		Phylloscopidae	Common Chiffchaff	<i>Phylloscopus collybita</i>	LC	M	VC
			Hume's Leaf Warbler	<i>Phylloscopus humei</i>	LC	M	VC
		Pycnotidae	Red Whiskered Bulbul	<i>Pycnonotus jocosus</i>	LC	R	VC
			Red Vented Bulbul	<i>Pycnonotus jocosus</i>	LC	R	VC
		Sylvidae	Common Babbler	<i>Argya caudata</i>	LC	R	VC
			Garden Warbler	<i>Sylvia borin</i>	LC	M	VC
			Jungle Babbler	<i>Argya striata</i>	LC	R	VC
			Large Grey babbler	<i>Argya malcolmi</i>	LC	R	C
		Sturnidae	Asian Pied Starling	<i>Gracupica contra</i>	LC	R	VC
			Bank Myna	<i>Acridotheres ginginianus</i>	LC	R	VC
			Common Myna	<i>Acridotheres tristis</i>	LC	R	VC
			Jungle Myna	<i>Acridotheres fuscus</i>	LC	R	C
		Zosteropidae	Oriental White Eye	<i>Zosterops palpebrosus</i>	LC	R	C
10	Pelicaniformes	Ardeidae	Cattle Egret	<i>Bubulcus ibis</i>	LC	RM	VC
			Great Egret	<i>Ardea alba</i>	LC	RM	C
			Intermediate Egret	<i>Ardea intermedia</i>	LC	R	C
			Pond Heron	<i>Ardeola grayii</i>	LC	R	UC
11	Piciformes	Megalauidae	Brown Headed Barbet	<i>Psilopogon zeylanicus</i>	LC	R	UC
			Coppersmith Barbet	<i>Psilopogon haemacephalus</i>	LC	R	C
12	Psittaciformes	Pssittculidae	Alexandrian Parakeet	<i>Psittacula eupatria</i>	NT	R	UC
			Rose ringed Parakeet	<i>Psittacula krameri</i>	LC	R	C
13	Strigiformes	Strigidae	Barn Owl	<i>Tyto alba</i>	LC	R	UC
			Spotted Owlet	<i>Athene brama</i>	LC	R	R

Resident status R – resident, RM - resident migratory, M – migratory Abundance status, VC- very common, C – common, UC- uncommon, R- rare

Table 3: Trees present in park

S. No.	Botanical name	Common name
1	<i>Alstonia scholaris</i>	White cheesewood
2	<i>Bauhinia purpurea</i>	Butterfly tree
3	<i>Callistemon citrinus</i>	Bottle brush
4	<i>Ficu benjamina</i>	Weeping fig
5	<i>Plumerea alba</i>	White frangipani
6	<i>Nerium oleander</i>	Oleander
7	<i>Rauwolfia serpentina</i>	Indian snake root
8	<i>Polyalthia longifolia</i>	False ashok
9	<i>Terminalia arjuna</i>	Arjun tree
10	<i>Tabebuia argentea</i>	Tree of gold
11	<i>Wadelia trilobata</i>	Yellow creeping daisy
12	<i>Tabebuia avellaneda</i>	Pink trumpet
13	<i>Seietenia mahogoni</i>	Mahogany
14	<i>Saraca asoca</i>	Ashok tree
15	<i>Spathoda campanulata</i>	African tulip tree
16	<i>Butea monoperma</i>	Sacred tree
17	<i>Salix babylonica</i>	Weeping willow
18	<i>Bambusa ventricosa</i>	Buddha bamboo
19	<i>Tabebuia chrysantha</i>	Trumpet tree
20	<i>Rubus armeniacus</i>	Black berry tree

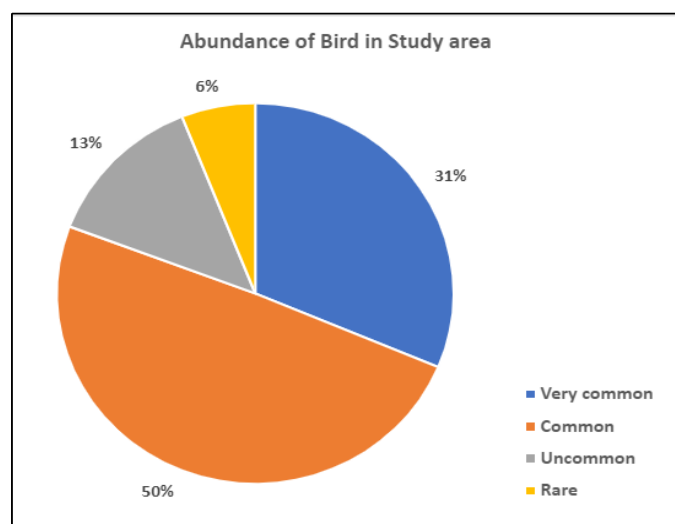


Fig. 5: Abundance status of birds in park.

Abundance status of the birds in park, percentage of birds according to IUCN status, number of birds and families present in respective order, percentage of birds present with respect to order and percentage of bird species with respect to family are illustrated in Figures 5, 6, 7, 8 and 9, respectively. Photographs of some birds recorded in the study area are shown in Figure 10.

Conclusion

The study of avian diversity of Janeshwar Mishra Park harbors 83 species of birds belonging to 33 families. The study indicates that avifaunal diversity of the park is rich and can be maintained further by little care and concern. Due to anthropogenic activities there is plastic pollution

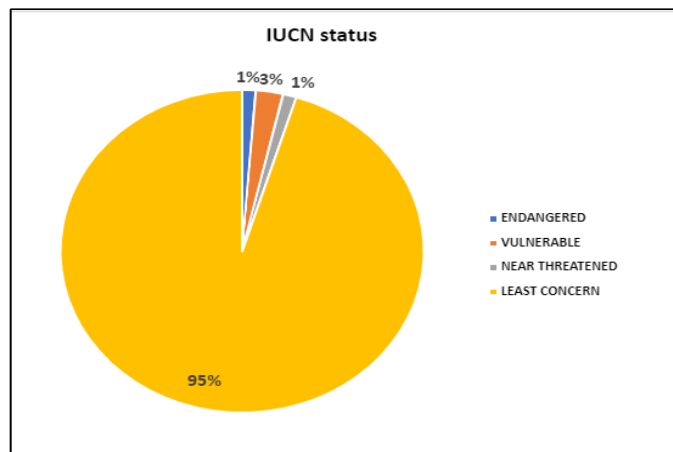


Fig. 6: Percentage of birds according to IUCN status present in park.

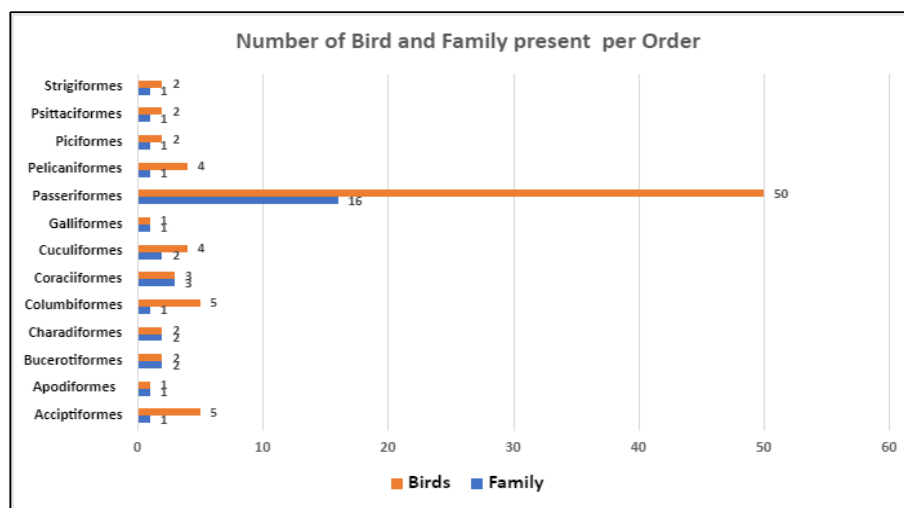


Fig. 7: Number of Birds and Families present in respective order.

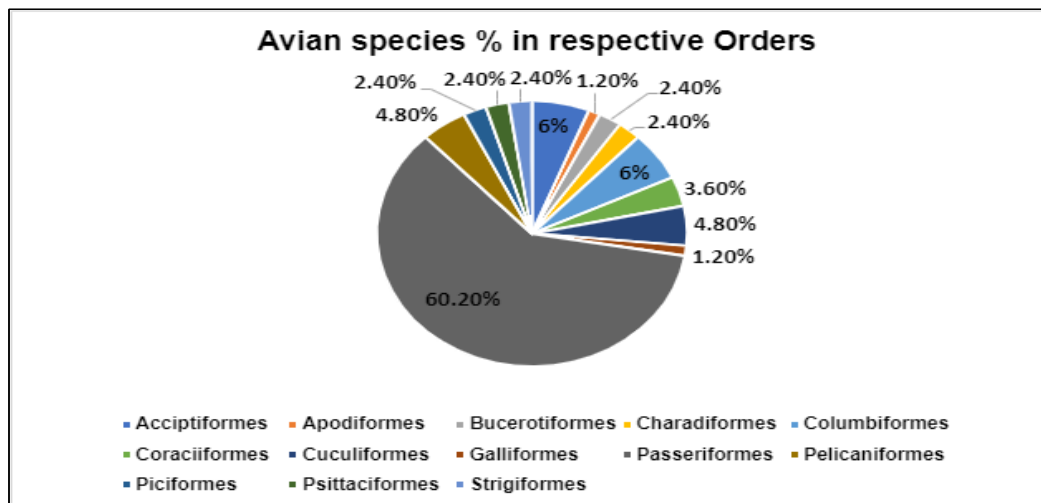


Fig. 8: Percentage of birds present with respect to Order.

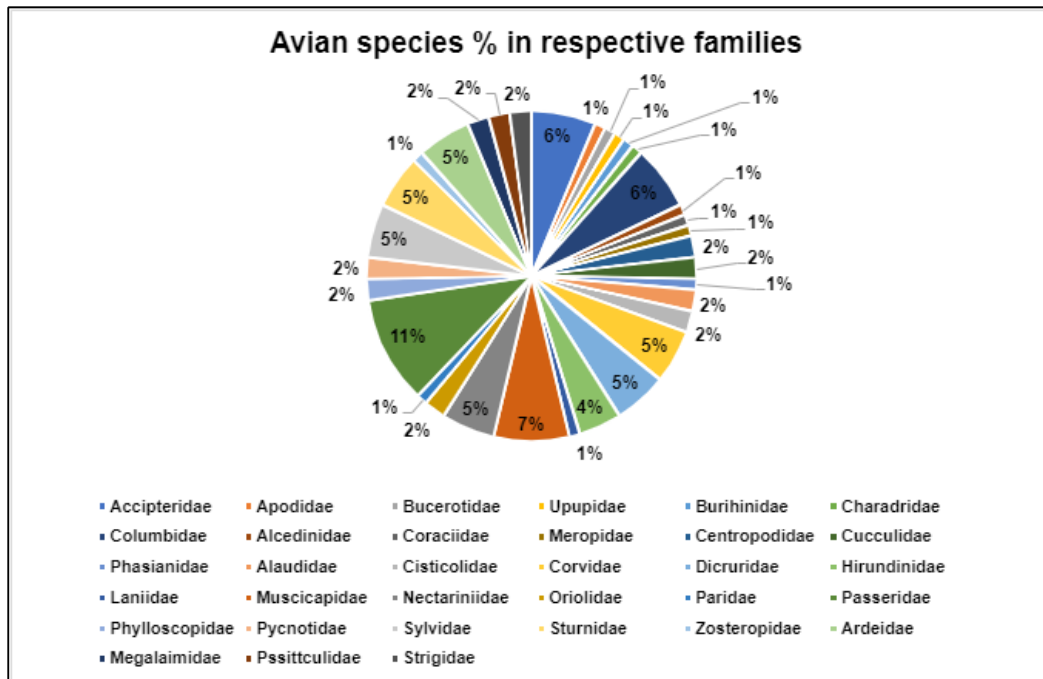


Fig. 9: Percentage of bird species with respect to Family.





Fig. 10: Photographs of some birds documented at Janeshwar Mishra Park.

and noise pollution in some part of study area which will affect the birds behavioral pattern and health. Water present in the pond is not suitable for attracting migratory birds. Need for regulations on Anthropogenic activities in study area and maintenance of water present in pond for richness of more species of birds especially water birds. The study is significant for future related studies and will help to conserve the species present in the study area.

Acknowledgements

Thanks are extended to authorities at Biodiversity and Wildlife Conservation Lab, Department of Zoology, University of Lucknow for providing necessary facilities to perform this work.

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