

# A preliminary study on the birds of a typical suburban region of Lucknow, Uttar Pradesh, India

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#### ABSTRACT

Birds are the most popular and interesting group on the globe and their diversity leads to a richness of life and beauty. Birds have always fascinated mankind with their naturally attractive plumage, harmonious songs and creative behavior. The population of birds in an ecosystem displays the environmental quality of an area, its pollution level, safety and accessibility of food and habitat. The Sahara Estate in Lucknow district is one of the distinctive locations represents a typical sub-urban area of Lucknow with a mix of some parks, a seasonal water body, few open and closed drains, a refuse dumping area and isolated trees and shrubs that one can expect to find in a typical city suburb setup of India. Bird surveys were carried out using the Line transect and point count method across two different locations at Sahara Estate. A total of 37 species spread across 9 orders are reported during the study. The Passeriformes order which seems to be the major order both species count as well individual count wise. A vigorous diversity of bird species observed indicates the high efficiency of the Sahara States.

Key words: Avifauna, Sahara Estate, Ecosystem, Lucknow district, Diversity

#### INTRODUCTION

Birds are the most popular and interesting group on the globe and their diversity leads to a richness of life and beauty. Birds have always fascinated mankind with their naturally attractive plumage, harmonious songs and creative behavior. The population of birds in an ecosystem displays the environmental quality of an area, its pollution level, safety and accessibility of food and habitat. Apart from the bird parks and sanctuaries, one can also spot variety of birds around the city and villages. Some urban birds become unusually tamed and relatively simple to observe. The species of birds that are less affected by contaminated constituents flowing through cities, that are better able to acclimate to artificial light, to communicate over the noise of traffic and mechanization, to breed successfully on human built constructions. As most of natural habitat of earth is destroyed, only the urban habitat is providing the typical abode for survival and life (Paul et al. 2008).

The artificial ecosystems of cities such as well-maintained parks and seasonal ponds can support an astoundingly large number of birds. The birds are often most visible where people have congregated to buy, sell, eat and discard food. The commensal relationship between birds and humans

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for food, habitat and protection shows near benches in city parks, in playgrounds, sports stadiums, at deserted refuse disposal areas, and at window ledge feeders.

There are numerous studies that have previously been conducted on bird diversity in urban habitats viz. city parks, field remnants, community, private gardens etc. by many research works (Newton 1995; Navarro and Benítez 1995; Blair 1999; Hobson and Rempel 2001; Turner 2003). Though, few studies have been done in Indian context in urban habitats (Sonika Kushwaha et al. 2015; Ramitha & Vijayalaxmi 2001; Dookia 2002; Praveen & Joseph 2006; Kanaujia et al. 2012; Tanveer et al. 2002; Sidra et al. 2013). A total of 64 species of birds at the New Campus of Punjab University have been studied by Tanveer et al. (2002).

Urban birds differ from wild populations in several ways, besides just being easier to observe. The aim of this study was to assess the avifauna diversity in a typical sub-urban setting (Sahara States) of Lucknow where usually one does not expect to observe species beyond the most common ones like House sparrows, Rock Pigeons, House Crow and Myna etc. The study can also be treated as a mini photographic catalogue of typical city birds of Uttar Pradesh.

#### STUDY AREA

The area (Sahara States, Lucknow) for the study was chosen for the convenience to regular and

periodic observation as required for the study (Fig.1). The location represents a typical sub-urban area of Lucknow with a mix of some parks, a seasonal water body, few open and closed drains, a refuse dumping area and isolated trees and shrubs that one can expect to find in a typical city suburb setup of India. The maximum temperature recorded was 47.5 °C and minimum was 2.5 °C. The average rainfall recorded for was 1056 mm. The principal river Gomti originates near the Maldo Tada town of Pilibhit. The river extends to about 900 km.

Sahara-states itself is a gated community with a human population of about 4000 individuals living in apartments and row-houses. Apart from the usual small parks and a playground, there is a patch of undeveloped land area in the north (about 3 hectares) that probably provides a conducive habitat for many of the resident avifauna. The vegetation is primarily bush and shrub like with two small isolated pockets of tall trees. This undeveloped patch of land also has a seasonal pond that serves to store rain water during monsoon though for rest of the year it is mostly dry. There is an open drain system in Sahara-states for natural run-off water that usually holds drain water coming from people watering their lawns, porches etc. As is common in a gated community, several of the houses have small gardens with many ornamental and seasonal flower bearing plants as wells as few fruit bearing plants/trees like bananas, papaya, pomegranate, berries guava, mango, etc.



Fig. 1. Location of Sahara-states residential community in Lucknow and observation path denoted by orange line

#### MATERIAL AND METHODS

The study consisted of surveys conducted between a period of 8th Oct 2017 to 10th Dec 2017. The

report provides species wise count for each of the day of observation. A transect adjacent to the open undeveloped land described earlier was selected to observe and count the number of birds of different species at fixed time and day of successive weeks. The survey was carried out at suitable time (from 7:00 to 11:00 am in morning and 3:00-5:30 pm in evening during the winters) of the day. The path transects used for this purpose is shown in the image with an orange line. The path covered a total distance of about 500 m. This path transact was chosen as this path had shown maximum bird activity based on a coarse observation earlier. This is expected as this path forms the edge of open undeveloped land. No observations were made inside the land itself as it was not possible to move inside due to thick bushes and shrubs. Observations were carried out with the aid of 10x50 binoculars and field features were noted down on data. An electronic memo pad and Nikon D500 with Tamron 150-600 mm G2 lens were used to observe and record the observations.

Identification of birds was done with the help of key reference books (Grewal 2002; Ali S 2002; Grimmett et al. 2007). Kindly note that the count is indicative and only covers the area that was visible or audible around the path transact chosen for this study. Actual count in the habitat are expected to be much greater as a substantial area of the bush/shrub land was unapproachable. To reduce the complexity some of the very common species have not been included in this report for their sheer abundance that made it difficult to keep a reasonably accurate count of them.

Excluded Species: House Sparrow, Common Myna, Jungle Babbler and Common House Crow.

#### **RESULTS AND DISCUSSION**

A total of 37 species spread across 9 orders are reported during the study for the observation period (excluding the most common ones). Order wise distribution of species count is Passeriformes (21), Ciconiformes (4), Cuculiformes (3), Columbiformes (3), Coraciiformes (2), Piciformes (1), Bucerotiformes (1), Gruiformes (1) and Strigiformes (1) (Table.1). Species diversity of birds according to their order has been shown in Fig.2. About 57% of the species belong to the Passeriformes order which seems to be the major order both species count as well individual count wise. For migrant species, the approximate period of arrival (as in the case of redstarts, reed warblers etc.) and the period of departure (as in the case of Jacobin cuckoo) can be clearly observed. Birds are extremely diverse and obvious species of the ecosystem and birds as sentry to environmental stresses (Newton 1995; Navarro and Benítez 1995).

At the same time one can observe a marked reduction in the count of Green Bee-eaters, Black Drongos, Coppersmith Barbet and Scaly breasted Munia with the onset of winter. It is believed these birds have migrated locally to other habitats that provide better food opportunity and would probably return back again based on improved local foraging opportunities. The resident bird populace like Purple Sunbird, Flowerpeckers seems to be primarily supported by several flower and fruit bearing plants and trees that have been planted in the neighborhood for landscaping as well as for ornamental purpose in the small private gardens. The green-spaces of urban area have an important role to play in conservation biology (Zerbe et al. 2003; Alvey 2006; Mason 2006; Khera et al. 2009).

Ample presence of bushes and shrubs supports the Warblers. Prinias and White-eves, it is important to deliberate the spatial connectivity of study area with the surrounding landscape components, especially green patches, open spaces, grasslands and urban parks with presence of hedges (Sodhi et al. 1999; Farina 2006). A large number of bird-feeders present in the community support the Silver bills and Munias. Whereas the refuse area supports, Bee-eaters, Drongos, Coucals, Chats and even Cattle egrets and Pied Starlings. The open drain system and the area around seasonal pond has a resident populace of White breasted Waterhen with occasional visitors like Pond Heron. The urban areas have supported significant number of avifauna although they are in under threats or in disturbed condition such as in Delhi, Pakistan and Canada (Environment Canada 2009; Anonymous 2006) also revealed good number of avifauna in the areas. Photographs of birds and their observation chart is shown in Fig.3-40.

Table 1:	List of Birds	observed	during th	e study	period
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No	Common Name	Order	Family	Res.	Total
	Scientific Name	Family		Туре	Count
1.	Ashy Prinia Prinia Socialis	Passeriformes	Cisticolidae	R	5
2.	Red whiskered Bulbul Pycnonotus Jacosus	Passeriformes	Pycononotidae	R	10
3.	Red vented Bulbul	Passeriformes	Pycononotidae	R	6

	Pycnonotus cafer				
4.	Rock Pigeon	Columbiformes	Columbidae	R	12
	Columba livia				
5.	Eurasian Collared Dove	Columbiformes	Columbidae	R	2
	Streptopelia decaocto				
6.	Laughing Dove	Columbiformes	Columbidae	R	5
	Stigmatopelia senegalensis				
7.	Brown Rock Chat	Passeriformes	Muscicapidae	R	7
	Cercomela fusca				
8.	Oriental Magpie Robin	Passeriformes	Muscicapidae	R	7
	Copsychus saularis				
9.	Indian Robin	Passeriformes	Muscicapidae	R	3
	Saxicoloides fulicatus				
10.	Scaly Breasted Munia	Passeriformes	Estrildidae	ML	3
	Lonchura punctulata				
11.	Indian Silverbill	Passeriformes	Estrildidae	R	14
	Euodice malabarica				
12.	Asian Pied Starling	Passeriformes	Sturnidae	F	3
	Gracupica contra				
13.	Coppersmith Barbet	Piciformes	Megalaimidae	ML	4
	Megalaima haemacephala				
14.	Rufous Treepie	Passeriformes	Corvidae	R	2
	Dendrocitta vagabunda				
15.	Green Bee-eater	Coraciiformes	Meropidae	ML	3
	Merops orientalis				
16.	Grey Hornbill	Bucerotiformes	Bucerotidae	RO	1
	Ocyceros birostris				
17.	Blyth Reed Warbler	Passeriformes	Sylviidae	М	4
	Acrocephalus dumetorum				
18.	Common Chiff Chaff	Passeriformes	Sylviidae	М	3
	Phylloscopus collybita				
19.	Black Redstart	Passeriformes	Muscicapidae	М	2
	Phoenicurus ochruros				
20.	White breasted Waterhen	Gruiformes	Rallidae	R	3
	Amaurornis phoenicurus				
21.	Pond Heron	Ciconiiformes	Ardeidae	F	1
	Ardeola grayii				

22.	Cattle Egrets Bubulcus Ibis	Ciconiiformes	Ardeidae	F	1
23.	Greater Coucal Centropus sinensis	Cuculiformes	Centropodidade	R	2
24.	Oriental White-eye Zosterops palpebrosus	Passeriformes	Zosteropidae	R	12
25.	Sykes Warbler Iduna rama	Passeriformes	Sylviidae	М	1
26.	Common Shikra Accipiter Badius	Ciconiformes	Accipitridae	R	1
27.	Spotted Owlet Athene Brama	Strigiformes	Strigidae	R	1
28.	Common Tailorbird Orthotomus sutorius	Passeriformes	Cisticolidae	R	3
29.	Black Kite Milvus migrans	Ciconiiformes	Accipitridae	F	2
30.	Black Drongo Dicrurus macrocercus	Passeriformes	Dicruridae	ML	2
31.	White throated Kingfisher Halcyon pileata	Coraciiformes	Alcedinidae	R	1
32.	Asian Koel Eudynamys scolopacea	Cuculiformes	Cuculidae	ML	2
33.	Pale billed Flowerpecker Dicaeum erythrorhynchos	Passeriformes	Decaeidae	R	1
34.	Black hooded Oriole Oriolus xanthornus	Passeriformes	Oriolidae	ML	1
35.	Great Tit Parus major	Passeriformes	Aegithalidae	ML	2
36.	Jacobin Cuckoo Clamator jacobinus	Cuculiformes	Cuculidae	М	1
37.	Purple Sunbird Nectarinia asiatica	Passeriformes	Nectarinidae	R	4

(Legend: R: Permanent Resident, ML: Migrant Local, F: Foraging visitor, RO: Roosting visitor, M: Migrant Resident)



Fig 2. Species diversity of birds according to their order.

1. Ashy Prinia (Prinia Socialis)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	7	8	4	5	-	7	6	5	5	7

Fig. 3. Ashy Prinia (Prinia Socialis)

2. Red whiskered Bulbul (Pycnonotus Jacosus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	11	12	9	9	-	12	10	8	10	9

Fig.4. Red whiskered Bulbul (Pycnonotus Jacosus)

3. Red vented Bulbul (Pycnonotus cafer)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	6	7	5	7	-	6	4	7	5	4

Fig.5. Red vented Bulbul (Pycnonotus cafer)

# 4. Rock Pigeon (Columba livia)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	12	15	10	14	-	13	8	14	12	11

Fig.6. Rock Pigeon (Columba livia)

5. Eurasian Collared Dove (*Streptopelia decaocto*)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	0	1	-	2	1	2	3	3

Fig.7. Eurasian Collared Dove (Streptopelia decaocto)

# 6. Laughing Dove (Stigmatopelia senegalensis)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	4	5	5	5	-	4	6	4	3	5

Fig.8. Laughing Dove (Stigmatopelia senegalensis)

7. Brown Rock Chat (Cercomela fusca)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	9	7	7	6	-	8	6	6	8	7

Fig.9. Brown Rock Chat (Cercomela fusca)

10/12

6

# 8. Oriental Magpie Robin (Copsychus saularis)



Fig.10. Oriental Magpie Robin (Copsychus saularis)

9. Indian Robin (Saxicoloides fulicatus)

Day

Count



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	3	2	4	3	-	3	2	2	3	2

Fig.11. Indian Robin (Saxicoloides fulicatus)

# 10. Scaly Breasted Munia (Lonchura punctulata)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	5	3	4	4	-	2	2	0	0	0

Fig.12. Scaly Breasted Munia (Lonchura punctulata)

11. Indian Silverbill (Euodice malabarica)



	0/12	
<b>Count</b> 14 18 12 15 - 16 12 8 16	13	

Fig.13. Indian Silverbill (Euodice malabarica)

# 12. Asian Pied Starling (Gracupica contra)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	6	7	5	0	-	4	0	2	0	0

Fig.14. Asian Pied Starling (Gracupica contra)

13. Coppersmith Barbet (Megalaima haemacephala)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	5	6	4	3	-	1	2	0	0	0

Fig.15. Coppersmith Barbet (Megalaima haemacephala)

#### 14. Rufous Treepie (Dendrocitta vagabunda)

Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	3	2	3	2	-	2	3	2	2	2

Fig.16. Rufous Treepie (Dendrocitta vagabunda)

# 15. Green Bee-eater (Merops orientalis)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	3	2	0	2	-	0	0	0	1	0

Fig.17. Green Bee-eater (Merops orientalis)

# **16. Grey Hornbill** (*Ocyceros birostris*)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	1	1	2	0	-	0	2	0	1	1

Fig.18. Grey Hornbill (Ocyceros birostris)

17. Blyth Reed Warbler (Acrocephalus dumetorum)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	3	5	4	-	5	4	5	3	4

Fig.19. Blyth Reed Warbler (Acrocephalus dumetorum)

# 18. Common Chiffchaff (Phylloscopus collybita)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	2	4	-	3	3	3	4	3

Fig.20. Common Chiffchaff (Phylloscopus collybita)

**19. Black Redstart** (*Phoenicurus ochruros*)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	1	2	1	2	-	2	0	1	2	1

Fig.21. Black Redstart (Phoenicurus ochruros)

# 20. White breasted Waterhen (Amaurornis phoenicurus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	2	0	2	1	-	4	3	2	1	2

Fig.22: White breasted Waterhen (Amaurornis phoenicurus)

21. Pond Heron (Ardeola grayii)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	1	0	1	2	-	0	0	1	0	1

Fig.23. Pond Heron (Ardeola grayii)

# 22. Cattle Egret (Bubulcus Ibis)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	2	0	0	2	-	0	0	2	0	0

Fig.24. Cattle Egret (Bubulcus Ibis)

# 23. Greater Coucal (Centropus sinensis)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	2	2	1	1	-	2	1	2	2	1

Fig. 25. Greater Coucal (Centropus sinensis)

# 24. Oriental White-eye (Zosterops palpebrosus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	14	8	6	13	-	10	5	9	16	8

Fig.26. Oriental White-eye (Zosterops palpebrosus)



25. Sykes Warbler (Iduna rama)

Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	1	2	1	-	2	1	0	0	1

Fig.27: Sykes Warbler (Iduna rama)

26. Common Shikra (Accipiter Badius)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	0	1	-	0	0	1	0	0

Fig. 28: Common Shikra (Accipiter Badius)

27. Spotted Owlets (Athene Brama)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	2	0	-	0	1	0	0	0

Fig.29. Spotted Owlets (Athene Brama)

10/12

2

# 28. Common Tailorbird (Orthotomus sutorius)



E: 20	<b>C</b>	T-11-11-1	( <b>0</b> , <b>1</b> , <b>1</b> )		
rig.sv.	Common	<b>I</b> allorbird	Orinoiomus	sutorius	,

# 29. Black Kite (Milvus migrans)

Day

Count



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	2	3	2	1	-	2	0	2	1	2

Fig. 31. Black Kite (Milvus migrans)

# 30. Black Drongo (Dicrurus macrocercus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	3	3	1	0	-	2	1	0	0	0

Fig. 32. Black Drongo (Dicrurus macrocercus)

**31.** White throated Kingfisher (*Halcyon pileata*)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	1	0	-	1	0	0	1	0

Fig.33. White throated Kingfisher (Halcyon pileata)

32. Asian Koel (Eudynamys scolopacea)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	2	1	2	1	-	0	0	0	0	0

Fig.34. Asian Koel (Eudynamys scolopacea)

33. Pale billed Flowerpecker (Dicaeum erythrorhynchos)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	1	0	-	0	1	0	0	1

Fig. 35. Pale billed Flowerpecker	· (Dicaeum	erythrorhyncl	hos)
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# 34. Black hooded Oriole (Oriolus xanthornus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	1	1	0	1	-	1	0	1	0	0

Fig. 36. Black hooded Oriole (Oriolus xanthornus)

35. Great Tit (Parus major)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	0	0	0	2	-	1	0	2	2	3

Fig. 37. Great Tit (Parus major)

#### 36. Jacobin Cuckoo (Clamator jacobinus)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	1	1	1	1	-	0	0	0	0	0

Fig.38. Jacobin Cuckoo (Clamator jacobinus)

37. Purple Sunbird (Nectarinia asiatica)



Day	8/10	15/10	22/10	29/10	5/11	12/11	19/11	26/11	3/12	10/12
Count	6	5	4	5	-	3	1	0	2	0

Fig. 39. Purple Sunbird (Nectarinia asiatica)

#### CONCLUSION

It is observed that despite common belief, even a limited urban ecosystem is able to support a varied avifauna that in a sense perhaps shows that birds are quite resilient. A total of more than 40 bird

species were observed in a residential gated community. To some extent one can observe the start and end of seasonal as well as local migration of non-resident and resident birds respectively. Jacobin cuckoo, Reed warblers, White wagtails and Redstarts give examples of seasonal migration whereas Bee-eaters, Scaly breasted Munia, Coppersmith Barbets and Black hooded oriole are some of the examples of local migration. More exhaustive and vigilant study is required to monitor this migration in an urban setup as well as to understand the impact of variation in local ecosystem to their presence or absence.

It was interesting to observe that the resident human populace of Sahara-states itself is not aware of the variety of avifauna existing in their neighborhood. In a way sharing the observations of this study with the local population at least sensitizes them about birds and makes them probably a bit more aware and careful of any of their actions that might be infringing upon the small but beautiful yet fragile ecosystem of their neighborhood. An observation spread over a longer period of time can provide better representation and seasonal variation of the avifauna diversity in this suburban cityscape.

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