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A preliminary study of avifaunal diversity in and around Govt. (Auto.) College, Angul, Odisha, India

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ABSTRACT

The present study was carried out between mid-December 2019 to November 2020 in and around Government Autonomous College, Angul, Odisha. Regular field survey was carried out by fixed route and direct observation method, which revealed a total of 46 bird species belonging to 40 genera, 13 orders and 26 families. Out of all the species, 28 species (60.87%) were common, 6 species (13.04%) were locally common, 8 species (17.39%) were uncommon and 4 species (8.70%) were rare. According to the residential status of bird community found in this area, 34 bird species (73.91%) were resident, 10 species (21.74%) were residential local migrants and only 2 species (4.35%) were residential winter migrants. Direct human intervention is one of the major factors affecting the campus avifaunal diversity which can be controlled by maintaining the campus environment and creating constant awareness among students and staffs.

Key words: Avifauna, campus biodiversity, direct observation method, habitat, species diversity

INTRODUCTION

Birds are the most liked animals because of their fabulous colours, melodious calls and easily identifying characters. They play a vital role in keeping balance of nature. Richness, abundance and community composition of birds are often used by ecologists to understand the diversity of species in natural occurrence (Singh et al., 2018; Khan et al., 2021). Avifauna are continuously threatened by drivers such as habitat loss and degradation, hunting, pollution, invasive species and disease (Palei et al., 2017). As the world is growing, urbanisation and concretisation are touching the sky. Due to this rapid expansion of urban development, it is important to understand the relationship between natural flora and fauna and urban habitats. Urban biodiversity has received very little attention from conservation biologists as compared to natural and protected ecosystems. Many cities in India contain vast biodiversity of flora and fauna but due to rapid urbanization there has been an alarming reduction in biodiversity (Dapke et al., 2015). Thus, bird community evaluation has become an important tool in biodiversity conservation and for identifying conservation actions in areas of high human pressure (Sethy et al., 2015).

About 1408 bird species are found in Indian subcontinent and 524 species of bird species found in Odisha (Lenka and Singh, 2020). Odisha is endowed with rich biodiversity due to its strategic location in the east coast of India (Mishra, 2007). Angul district is situated in the very centre of Odisha and lies between 20.50°N to 85.00°E. The total geographical area of the district is 6,375 sq. km with a human population of ~1 million in number (Angul district official site, 2021). The climatic condition of the district is much varied. Though having an average annual rainfall of 1421 mm, there is a remarkable variation of rainfall from year to year. The district is rich with forests having

371.01 sq. km of very dense forest, 1380 sq. km of moderately dense forest and 1031.62 sq. km of open forest (Indian State Forest Report, 2019). However, very few ornithological works has been done in the district to date. Pradhan et al. (2012) has done a status survey of the water birds of Angul district and recorded a maximum of 18 numbers of species, each at Mahanadi river and Sisupathar dam and 6 species in Athmallik water body. In a recent work, Panda et al. (2021) has reported 17 bird species in a wetland of Talcher, Angul. In their study, they found minimum number of species in Talcher site among all other sites studied. The present work is an attempt to study the birds found in and around Govt. Autonomous College, Angul and to prepare a preliminary checklist of birds found inside and vicinity of the college campus. Furthermore, this will be helpful for future studies of avian diversity of the district, urban areas and campus biodiversity.

MATERIALS AND METHODS

Study area

Govt. Autonomous College, Angul was established in the year 1957 by the then chief minister Dr. Hare Krishna Mahatab and Sri Kumuda Chandra Singh, the then Member of the Legislative Assembly of Hindol (Government Autonomous College Angul official site, 2021). It lies between 20. 82° N, 85.10° E and is located in the heart of Angul town, nearly 1 km away from NH - 55 (Fig.1). The college campus encompasses an area of land with varied habitat. The main college campus has buildings with very little vegetation; mostly large trees like *Mangifera indica* (mango), *Azadirachta indica* (neem) and *Albizzia lebbeck* (siris) as compared to the sports field area. The botanical garden of the department of botany is the only place inside the campus where the vegetation is richer and more diverse as compared to other parts of the college campus. However, it is mostly interfered with human disturbances. The college campus has a big sports field which is surrounded by green vegetation, which is dominated by large trees like neem (*Azadirachta indica*), teak (*Tectona grandis*) , kendu (*Diospyros melanoxylon*), honey hocust (*Senna siamea*), nadia (*Cocos nucifera*) and siris (*Albizzia lebbeck*). The college campus is surrounded by human habitations which include a busy market, a pond and households of the locals.

Methodology

The study was carried out from mid-December 2019 to early November 2020 in Govt. Autonomous College Angul and the adjoining area. The study area can be divided into 3 parts, the main building, sports field and the pond. Bird survey was done following a fixed route and direct observation methods. Observations were made twice a day *i.e.,* 6.30 am- 9.00 am and 4.30 pm- 6.00 pm in the evening every day by walking on the fixed route and directly observing the birds without disturbing them.

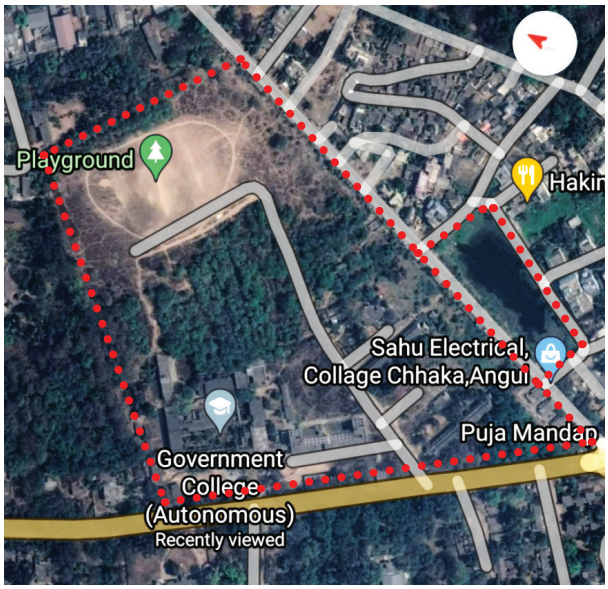

Fig. 1. Satellite image of Govt. College (Autonomous), Angul, Odisha. Lines demarcated with red colour, represent the studied area.

Birds were sighted using Super Zenith (10 × 50 mm), Tasco (8 × 25 mm) binoculars and were identified with the help of the standard field guides of Indian birds (Ali, 2002; Kumar et al., 2005). In case of confusion, photographs were captured by Nikon digital SLR D3500 with the 70-300 mm telephoto zoom lens and identified with help of more bird identification guides and websites (Mohapatra et al., 2019 a,b; ebird.org). The threat category of each bird species was also determined by the threatened list of IUCN (IUCN, 2022).

The birds were categorised based upon their sighting frequency such as (1) common (C): if the bird was sighted for more than 30 times or found regularly during every field visit in the study area and its vicinity; (2) locally common (LC): if a common bird species was found only in the study area and not anywhere else; (3) uncommon (U): if the bird was sighted for 5 to 30 times and lastly (4) rare (R): if the bird was sighted for less than 5 times during the entire study period. The residential status of birds were categorised as (1) resident (R): if the bird species is resident to the study area; (2) local migrant (LM): if the bird was not found to breed inside the study area; (3) winter migrant (WM): if the bird species was found only during the winter season.

RESULTS AND DISCUSSION

In the present study, a total of 46 bird species belonging to 40 genera and 26 families under 13 orders were recorded (Table 1). IUCN status revealed that all species were under the least concern category (IUCN, 2022). Among all the bird species, 28 species (60.87%) were common, 6 species (13.04%) were locally common, 8 species (17.39%) were uncommon and 4 species (8.70%) were rare. Out of all the species, 34 species (73.91%) were residential birds, 10 species (21.74%) were residential local migrants and 2 species (4.35%) were residential winter migrants.

Table 1. Annotated checklist of bird species recorded in the study area

Sl.	Order	Family	Common name	Scientific name	Abundance	Status
1	Passeriformes	Passeridae	House sparrow	*Passer domesticus*	C	R
2		Motacillidae	White-browed wagtail	*Motacilla maderaspatensis*	R	R
3			Grey wagtail	*Motacilla cinerea*	U	R/WM
4		Oriolidae	Indian golden oriole	*Oriolus kundoo*	U	R/LM
5		Dicruridae	Black drongo	*Dicrurus macrocercus*	C	R
6			Ashy drongo	*Dicrurus leucophaeus*	U	R
7		Sturnidae	Common myna	*Acridotheres tristis*	C	R
8			Jungle myna	*Acridotheres fuscus*	C	R
9			Asian pied starling	*Gracupica contra*	C	R
10		Corvidae	Common crow	*Corvus splendens*	C	R
11			Indian jungle crow	*Corvus macrorhynchos*	U	R
12		Pycnonotidae	Red-vented bulbul	*Pycnonotus cafer*	C	R
13			Red-whiskered bulbul	*Pycnonotus jocosus*	C	R
14		Phylloscopidae	Greenish warbler	*Pylloscopus trochiloides*	C	R
15		Paradoxornithidae	Yellow-eyed babbler	*Chrysomma sinense*	C	R
16		Muscicapidae	Asian brown flycatcher	*Muscicapa dauurica*	U	R
17			Indian robin	*Saxicoloides fulicatus*	R	R
18		Nectariniidae	Purple sunbird	*Cinnyris asiaticus*	C	R
19		Dicaeidae	Pale-billed flowerpecker	*Dicaeum erythrorhynchos*	U	R
20		Estrildidae	Scaly-breasted munia	*Lonchura punctulata*	C	R
21		Muscicapidae	Oriental magpie-robin	*Copsychus saularis*	C	R

Sl.	Order	Family	Common name	Scientific name	Abundance	Status
22	Cuculiformes	Cuculidae	Greater coucal	*Centropus sinensis*	C	R
23			Asian koel	*Eudynamys scolopaceus*	C	R
24			Common hawk-cuckoo	*Hierococcyx varius*	C	R
25			Grey-bellied cuckoo	*Cacomantis passerinus*	R	R/LM
26	Pelecaniformes	Ardeidae	Indian pond heron	*Ardeola grayii*	C	R/LM
27			Little egret	*Egretta garzetta*	C	R/LM
28			Intermediate egret	*Mesophyox intermedia*	R	R/LM
29			Cattle egret	*Bubulcus ibis*	C	R
30	Gruiformes	Rallidae	Purple moorhen	*Porphyrio porphyrio*	LC	R/LM
31			Eurasian moorhen	*Gallinula chloropus*	C	R/WM
32			White-breasted waterhen	*Amaurornis phoenicurus*	LC	R
33	Columbiformes	Columbidae	Blue rock pigeon	*Columba livia*	C	R
34			Spotted dove	*Streptopelia chinensis*	C	R
35			Release dove	*Columba livia domestica*	C	R
36	Accipitriformes	Accipitridae	Shikra	*Accipiter badius*	C	R
37			Black kite	*Milvus migrans*	C	R
38	Strigiformes	Strigidae	Spotted owl	*Athene brama*	U	R
39			Jungle owlet	*Glaucidium radiatum*	U	RS
40	Coraciiformes	Alcedinidae	White-throated kingfisher	*Halcyon smyrnensis*	C	R/LM
41		Meropidae	Green bee-eater	*Merops orientalis*	C	R
42	Bucerotiformes	Bucerotidae	Indian grey hornbill	*Ocyceros birostris*	C	R
43	Charadriiformes	Jacanidae	Bronze-winged jacana	*Metopidius indicus*	LC	R
44	Podicipediformes	Podicipedidae	Little grebe	*Tachybaptus ruficollis*	LC	R/LM
45	Anseriformes	Anatidae	Cotton pygmy-goose	*Nettapus coromandelianus*	LC	R/LM
46	Suliformes	Phalacrocoracidae	Little cormorant	*Phalacrocorax niger*	LC	R/LM

Abundance: C- Common, LC- Locally Common, U-Uncommon, R-Rare; Status: R- Resident, LM- Local Migrant, and WM- Winter Migrant

The highest number of bird species was recorded from order Passeriformes i.e., 21 species (45.65%), followed by 4 species each (8.70%) from order Cuculiformes and Pelecaniformes; 3 species each (6.52%) from order Gruiformes and Columbiformes; 2 species each (4.35%) from order Accipitriformes, Strigiformes and Coraciiformes; and only 1 species each (2.17%) from four orders such as Bucerotiformes, Charadriiformes, Podicipediformes, Anseriformes and Suliformes.

The maximum number of species were recorded from family Ardeidae and Cuculidae with 4 species each (8.69%), followed by Rallidae, Columbidae, Sturnidae, and Muscicapidae with 3 species each (6.52%), Accipitridae, Strigidae,

Motacillidae, Pycnonotidae, Dicruridae, Corvidae with 2 species each (4.34%). Only 1 species each (2.17%) was recorded from 14 families such as Podicipedidae, Phalacrocoracidae, Anatidae, Jacanidae, Bucerotidae, Alcedinidae, Meropidae, Nectariniidae, Dicaeidae, Estrildidae, Passeridae, Phylloscopidae, Paradoxornithidae, Muscicapidae.

Among all the study sites, the highest species richness was found in the sports field (31 spp. = 67.39% of total bird species), followed by the pond (27 spp. = 58.70%) and lastly the least species richness was observed around the main building (15 spp. = 32.61%). There are several factors which support such number of bird species in the campus such as availability of food material, suitable sites for nesting, low temperature throughout the year and easy availability of nesting material (Mohapatra et al., 2019 a,b).

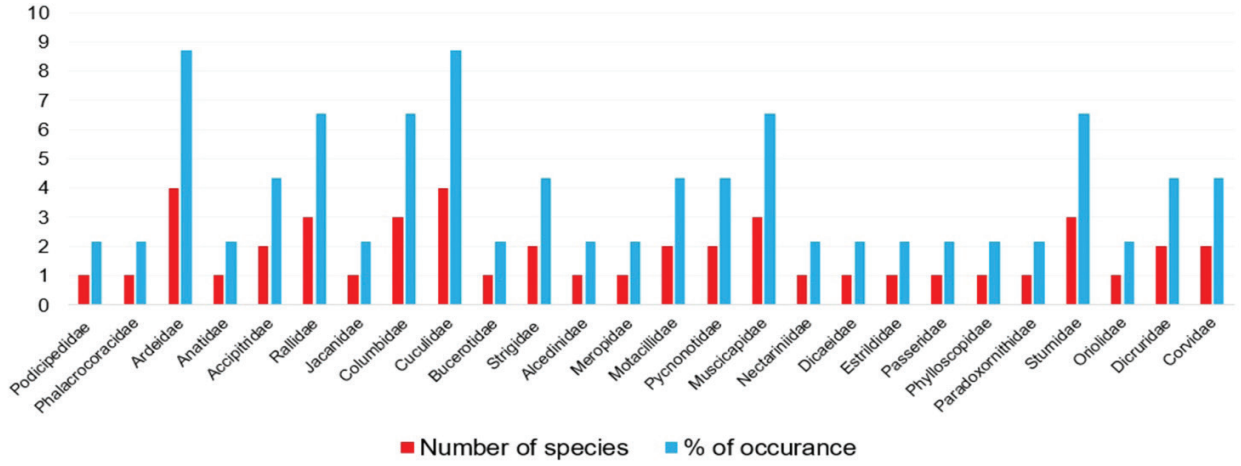

Fig. 2. Graph representing number of species and percentage of occurrence of various families

Bird species found around the main building area are few in number and mostly inhabit large trees present inside the campus whereas the sports field area has a diverse number of bird species and dominated by large and long trees as mentioned under study area heading. One part of the field is covered with honey locust (*Senna siamea*) plants and opposite to this an area was covered with teak trees and *Eucalyptus* trees. In both of the areas, black drongo (*Dicrurus macrocercus*) was recorded in the maximum numbers. Species like Indian golden oriole (*Oriolus kundoo*) was sighted rarely in this area. The house sparrows (*Passer domesticus*) were only found in the field among the three sites surveyed. It is may be due to less human interference and presence of heavy vegetation in comparison to other sites. One part of the field is filled with middle length trees which are mostly inhabited by passerines like warblers, robins. They are quick in action and escape the viewer eyes quickly. The field is devoid of grass in the middle as it is widely used not only by the students but also by the local people for different activities. But the surrounding area of the field has enough grass. wagtails and house sparrows are mostly seen in those places. Opposite to the large trees, the field contains shrubs and creepers which are sudden associated with more big trees on the side and lined with mud houses and markets by the wall. Those areas are mostly used by the pigs domesticated by the local people. Spotted owlet (*Athene brama*) were seen very rarely, because this bird species was sighted for only 3-4 times during the whole study time. Indian grey hornbill (*Ocyceros birostris*) was very common in the field area and they mostly sighted on the *Eucalyptus* trees.

The pond is located just adjoining the campus. This site was taken into account to check and compare the urban wetland avifaunal diversity as it is present in the middle of the market and houses. One side of the pond is attached to the campus road and all the other three sides are surrounded by houses. However, the numbers of species found in

the area are quite good despite of being a disturbed area with high level of human interference. The pond is dominated by Eurasian moorhen (*Gallinula chloropus*) (in water) and bulbuls (inland). Both the Red-whiskered Bulbul (*Pycnonotus jocosus*) and red vented bulbul (*Pycnonotus cafer*) was widely present in the area. The pond site has several palash (*Butea monosperma*), where the Sunbirds and Flower Peckers were sighted. Occasionally, spotted munia (*Lonchura punctulata*) and Starlings were also recorded near the pond areas which are not commonly seen. The diversity of bird distribution concerning available habitat types represents the importance of the college campus as a suitable bird habitat.

CONCLUSION

The major influencing factors on the composition and distribution of bird species in the study area is the environmental pressure due to direct human intervention. Campuses are mostly set in the urban areas due to the easy mode of communication, where the human interventions remain high. This high anthropogenic pressure affects the birds in a negative manner. But the study area can be turned into to a better place for bird study and conservation if the campus environment is maintained well and the awareness is created among the students and staffs. The present study showed that the bird species diversity of the Govt. Autonomous College, Angul is due to the habitat heterogeneity and varied vegetation despite the urban location and human intervention in the study area.

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