Bangladesh Journal of Veterinary and Animal Sciences
Journal home page: www.bjvas.com
pISSN 2227-6416
eISSN 2709-2542

Research article

Status and seasonal occurrence of birds in Chattogram Veterinary and Animal Sciences University campus, Bangladesh

Omar Faruk Miazi[1*], Ashutosh Das[1], Shahneaz Ali Khan[2], Sharmin Chowdhury[3]and ASM Lutful Ahasan[4]

[1]Department of Genetics and Animal Breeding, Chattogram Veterinary and Animal SciencesUniversity, Khulshi, Chattogram, Bangladesh.
[2]Department of Physiology, Biochemistry and Pharmacology, Chattogram Veterinary and Animal SciencesUniversity, Khulshi, Chattogram, Bangladesh.
[3]Department of Pathology and Parasitology, Chattogram Veterinary and Animal SciencesUniversity, Khulshi, Chattogram, Bangladesh.
[4]Department of Anatomy and Histology, Chattogram Veterinary and Animal SciencesUniversity, Khulshi, Chattogram, Bangladesh.

ARTICLE INFO

Article history:

Received:20/03/2024
Accepted:18/02/2025

Keywords:

Birds, abundance, seasonal occurrence, CVASU, Chattogram

[*]*Corresponding author:*
Cell: +8801716405111

E-mail:ofmiazi@cvasu.ac.bd

ABSTRACT

Urbanization is altering the natural habitats of many wild animal species. However, some species seem to be adapting and now have flourishing populations within urban areas. To examine the capacity of these spaces to provide "habitat", bird surveys were conducted at Chattogram Veterinary and Animal Sciences University (CVASU) main campus in Chattogram, Bangladesh, from October 2022 to June 2023. The study analyzed the status and seasonal patterns of wild birds on the CVASU campus. In total, 39 bird species were documented at CVASU during the winter season. Of the identified species, House Crow, House Sparrow, Common Myna, Indian Pied Myna and Rock Pigeon were very common. The birds belonged to 11 orders, with 19 species in the Passeriformes order and the other 20 in non-Passeriformes orders. The study found that in the total bird population during winter, very common, common, uncommon and rare species made up 12.80%, 20.50%, 15.40% and 51.3% respectively. In spring and summer, 33 bird species were observed at the CVASU campus. Of these, 15 were passerines and the other 18 were non-passerines. The most prevalent species were House crow, House sparrow, Common myna, Indian pied myna, Red-vented bulbul, Oriental Magpie robin and Rock pigeon. In spring and summer, the percentages for very common, common, uncommon and rare species were 24.20%, 15.20%, 18.20% and 42.40% respectively. This study identified the bird species and their seasonal status at the CVASU main campus. The findings will assist in benchmarking relative abundance and accordingly conservation plans for visibly abundant birds of CVASU main campus in Chattogram.

To cite this paper:*O. F. Miazi, A. Das, S. A. Khan, S. Chowdhury and ASM L. Ahasan, 2024.Status and seasonal occurrence of birds in Chattogram Veterinary and Animal Sciences University campus, Bangladesh.Bangladesh Journal of Veterinary and Animal Sciences, 12(2): 65-72.*

1.INTRODUCTION

Birds are some of the most fascinating creatures on Earth. The scientific study of birds, ornithology, is one of the oldest organized academic fields (Birkheadet al., 2014). Birds are wonderful addition to the nature that benefit humans in many ways, including providing economic value, controlling the environment,

producing meat, indicating environmental health, expanding knowledge, and enabling recreation (Araki et al., 1989). The 11,000 living birds are the best-known class of all living organisms and the most species clad of terrestrial vertebrates. Aided by their unmatched capacity for dispersal, birds can be found virtually anywhere on the Earth's surface from pole to pole and at least seasonally from the remotest ocean basins to the most barren desert and highest mountains(Leeset al., 2022).Birds occupy a wide range of ecological niches within an ecosystem. From insectivores and herbivores to predators and scavengers, the presence and abundance of different bird species reflects the health of the various food webs within the ecosystem (Gill, 1994). They are used as tools for environmental conservation. Since the Stone Age, birds have had close relationships with humans, as shown by bird images engraved in caves in Spain about 25,000 years ago (Harikrishnan et al., 2010). Bangladesh has 668 bird species, with nearly 40% being resident birds (Harvey, 1990). Thomson and Johnson (1996- unpublished) listed 690 bird species in Bangladesh. Husain (1979) identified 30 threatened bird species in Bangladesh, while a recent IUCN (2000) report found 41 resident bird species under threat there. Bangladesh's total bird species represent about 50% of those in the Indian Subcontinent (2060) and over 7% of known global bird species 9021 (Shovon et al., 2014). There are birds all over Bangladesh. Ornithologists have categorized this country into five or six regions based on the habitats found there. According to biogeography regions and parts of Southeast Asia might encompass Chittagong. Chittagong is renowned for its breathtaking scenery. It is endowed with mangroves, lakes, hills, forests, wetland areas, and the sea. Thus it conserves over 400 species of Bangladesh's 700 resident and migratory bird species (CBC, 2018). There are certain unique birds that are unique to this area (CBC, 2018). Since wild birds are an integral part of the surrounding environment, you should plan your yard with bird-friendly landscaping, add fresh, clean water, and select the best bird feeders and birdhouses to draw them to your yard (Mayntz, 2020). According to Daniels et al. (1991) and Peterson et al. (2000), bird surveys are helpful for identifying priority areas for conservation as well as providing information for basic and applied ecology. Avifaunal inventories conducted by location are helpful in developing management plans related to habitat and species preservation (Welty and Bapista, 1988).

Large continuous habitats become disconnected and split up into smaller, disconnected patches because of habitat destruction, loss, and fragmentation brought on by urbanization. The loss of habitat brought about by human development, such as the construction of more roads and buildings, exposes wildlife to additional stressors. Certain animal species vanish or relocate in quest of food as a result of urbanization. Animals that are unable to keep up with the rate of urbanization will eventually go extinct. However, some species like pigeons, sparrows, doves, and crows appear to adapt to urban environments, increasing in density and possibly experiencing a boom in population. Urbanization thus filters bird communities as well. Many species can find natural habitat in urban areas with planned plantations especially appealing. One of Bangladesh's mostpopulous and densely populated cities is Chattogram. Every day, Chattogram City's expanding residential and commercial district poses a serious threat to biodiversity, particularly to avian species. The city's greener areas are disappearing at an alarming rate, leaving only a small number of areas that are conducive to growth and habitation. These areas include parks and public university campuses, which are home to a variety of wildlife and vegetation. Every day, many people from the CVASU campus neighborhood come to take in the beauty of the resident birds and experience a little bit of village life. The university appears to be a verdant island in aconcrete build city.

Being a university campus, CVASU features with large playground in addition to open spaces and plants. Without it, two government institutions that have lots of greenery, open spaces, and a few ponds surround our campus. Because of these factors, some birds live and wander year-round, while others visit only to eat and drink. There's a chance that this area might yield the collected appearance of an unusual bird species. As a result, the current study was conducted based on status and seasonal

occurrence of the wild birds in the CVASU main campus.

2.MATERIALS AND METHODS

Study location

The main campus of CVASU, which is situated in the heart of the Chattogram City Corporation area, Bangladesh was selected as the study site.

Observations and sampling protocol

The research work was conducted in period that was from October 2022 to June 2023. Data were gathered by means of firsthand field observations. Early in the morning at 6 am, when the birds are most active, the survey was conducted, and it lasted until dusk. Every month received the same number of observations. For four days in a month, the study area was visited. Equal numbers of observations were made at various times of the day and in all seasons. Transect lines, point counts, and look-and-see techniques were used to count the birds.

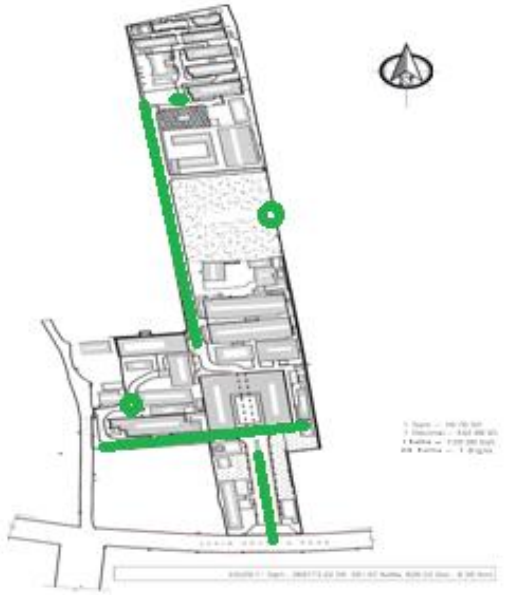

Figure 1. The map of CVASU main campus with transct lines and point counts

Wherever it was required to precisely identify birds at the generic and species levels, photos were taken. When using the point counting method, there had to be a minimum of 50 meters separating two points, and observations could only be made forward, or in the direction in which we were moving. Five minutes were allotted at each location for counting signs, recording calls, and looking into bird nests. Every technique was applied in the ensuing observation days. When using the line transect method, observations were made along a straight line with a width of 30 meters and a length of 300 meters. Additionally, random-direct counting was done multiple times. The characteristics that were used to distinguish between various species were color, size, and shape. Calls and songs were also used as criteria for identification. A set of Nikon 10x50 binoculars was utilized to observe the birds throughout the study. Often, DSLR cameras (Canon 200D Mark II) were used to take pictures of birds in order to verify their identification. The list contained only species that had been positively identified. The categories of "very common" (seen on 75–100% of visits), "common" (seen on 50–74% of visits), "uncommon" (seen on 25–49% of visits), and "rare" (seen on <25% of visits) were used to assess relative abundance (Khan, 2014). Three seasons characterize Bangladesh's climate: winter (November to February), spring and summer (March to June), and monsoon (July to September).

Data analysis

All the records were stored in Excel data sheets in tabular form. To examine the data, a basic statistical tool was utilized. Pie charts are used to show the abundance of bird species in the study area, and bar diagrams as recorded under this study used to identify the species of birds in various orders accounted on campus.

3. RESULTS AND DISCUSSION

During the study period, which accounted from October 2022 to February2023, 39 different species of birds were recorded on the CVASU campus, mostly during the winter month. Twenty of them were non-passerines, and 19 of them were passerines (Table 1). Among the identified species House crow, House sparrow, Common myna, Asian pied starling and Rock pigeon were found very commonly.

Most of the birds were found rarely among the total observed bird species. All of the species found in the study were not threatened based on national status and most were common resident based on resident status (Table1).

Table 1. Birds visibly recorded at Chattogram Veterinary and animal Sciences University campus with correspondence to National status, Relative abundance, and Resident status (October-February)

Order	Scientific Name	English Name	National Status	Relative abundance	Resident status
Passeriformes	*Corvussplendens*	House crow	NO	VC	CR
Passeriformes	*Corvusmacrorhynchos*	Large-billed crow	NO	R	CR
Cuculiformes	*Eudynamysscolopaceus*	Asian koel	NO	UC	CR
Columbiformes	*Spilopeliachinensis*	Eastern Spotted dove	NO	C	VCR
Passeriformes	*Passer domesticus*	House sparrow	NO	VC	CWV
Strigiformes	*Athene brama*	Spotted owlet	NO	R	UR
Gruiformes	*Amaurornisphoenicurus*	White-breasted waterhen	NO	UC	CR
Coraciiformes	*Halcyon smyrnensis*	White-throated kingfisher	NO	UC	CR
Coraciiformes	*Alcedoatthis*	Common kingfisher	NO	R	CR
Passeriformes	*Acridotherestristis*	Common myna	NO	VC	VCR
Passeriformes	*Gracupica contra*	Asian Pied starling	NO	VC	VCR
Passeriformes	*Acridotheresfuscus*	Jungle myna	NO	R	VCR
Passeriformes	*Sturniamalabarica*	Chestnut-tailed starling	NO	C	CR
Cuculiformes	*Centropussinensis*	Greater coucal	NO	R	CR
Passeriformes	*Pycnonotuscafer*	Red-vented bulbul	NO	C	CR
Passeriformes	*Pycnonotusjocosus*	Red-whiskered bulbul	NO	R	CR
Passeriformes	*Copsychussaularis*	Oriental Magpie robin	NO	C	VCR
Passeriformes	*Orthotomussutorius*	Common Tailor bird	NO	C	VCR
Columbiformes	*Columba livia*	Rock pigeon	NO	VC	CR
Psittaciformes	*Psittaculakrameri*	Rose-ringed parakeet	NO	C	RR
Passeriformes	*Parus major*	Great tit	NO	R	VCR
Piciformes	*Dinopiumbenghalense*	Black-rumpedflameback	NO	UC	CR
Piciformes	*Yungipicuscanicapillus*	Gray-capped pygmy woodpecker	NO	R	UR
Piciformes	*Dendrocoposmacei*	Fulvous-breasted woodpecker	NO	C	CR
Piciformes	*Psilopogonlineatus*	Lineated barbet	NO	R	CR
Piciformes	*Megalaimahaemacephala*	Coppersmith barbet	NO	R	CR
Passeriformes	*Cinnyrisasiaticus*	Purple sunbird	NO	R	CR
Passeriformes	*Lonchurapunctulata*	Scaly-breasted munia	NO	R	CR
Passeriformes	*Dicrurusmacrocercus*	Black drongo	NO	C	CR
Passeriformes	*Motacilla alba*	White wagtail	NO	R	UR
Passeriformes	*Oriolusxanthornus*	Black-hooded oriole	NO	UC	CR
Passeriformes	*Dendrocittavagabunda*	Rufous treepie	NO	R	CR
Apodiformes	*Apus affinis*	House swift	NO	UC	CR
Coraciiformes	*Meropsorientalis*	Asian green bee-eater	NO	R	VCR
Columbiformes	*Treronphoenicopterus*	Yellow-footed green pigeon	NO	R	CR
Pelecaniformes	*Ardeolagrayii*	Indian pond heron	NO	R	VCR
Pelecaniformes	*Bubulcus ibis*	Cattle egret	NO	R	CR
Passeriformes	Rhipiduraalbicollis	White-throated fantail	NO	R	CR
Suliformes	*Phalacrocoraxniger*	Little cormorant	NO	R	CR

* National status code: CR = Critically endangered, VU = Vulnerable, DD = Data deficient.(IUCN Bangladesh 2000) andNO =Not threatened. Relative abundance code: VC = Very common, C = Common, UC = Uncommon, R= Rare.(Khan,2014) Resident status code: VCR = Very common resident, CR = Common resident, UR = Uncommon resident, RR = Rare resident, CWV = Common winter visitor, UWV = Uncommon winter visitor.(Mohsanin and Khan 2009)

There were 39 species of birds recorded in this study from the 11 orders of birds. The highest 19 species of birds were registered under Passeriformes order then the second highest 5 were found under Piciformes. Both Columbiformes and Coraciiformes orders had been owned 3 species of birds. The Cuculiformes and Pelecaniformes also were comprised with 2 species. Only 1 species were found fewer than 5 orders (Figure2).

Rare birds were found the highest (51.3%) compared to common birds (20.50%) in October to February which considered mainly winter season. Among the observation frequency recorded, the lowest (12.80%) frequency of birds was found more abundantly in comparison to (15.40%) birds was found infrequent (Figure3).

Total 33 species of birds were recorded in the CVASU campus during the study period March to June mainly in spring and summer season. Out of them, 15 species were passerines and the remaining 18 were non- passerines (Table2). Among the identified species House crow, House sparrow, Common myna, Indian pied myna, Red-vented bulbul, Oriental Magpie robin and Rock pigeon were found frequently.

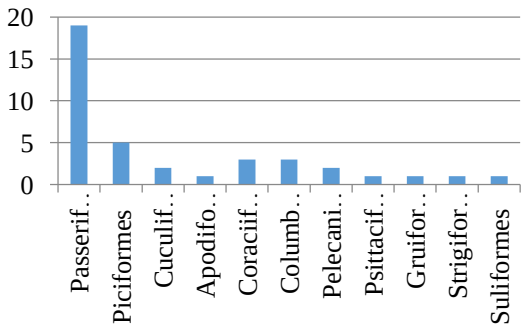

Figure 2. Number of birds under several orders in CVASU campus (October-February)

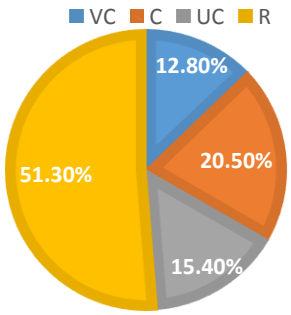

Figure 3. Relative abundance of birds in CVASU campus (October-February)

Most of the birds were found rarely among the total observed bird species. Here only 5 birds' species were found commonly. All of the species found in the study were not threatened based on national status and most were common resident based on resident status (Table 2).

There were 33 species of birds observed from the 10 orders of birds. The highest 15 species of birds were found under Passeriformes order then the second highest 5 were found under Piciformes. Both Columbiformes and Coraciiformes orders owned 3 species of birds. The Cuculiformes was comprised with 2 species but only 1 species were found under the 5 orders (Figure4).

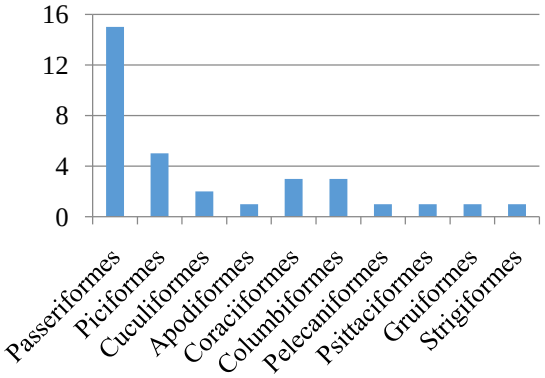

Figure 4. Number of birds under several orders in CVASU campus (March-June)

Rare birds were found with the highest (42.40%) then the very common birds (24.20%) in March to June which considered mainly spring and summer season. The lowest (15.20%) birds were found commonly and (18.20%) birds were found uncommonly (Figure5).

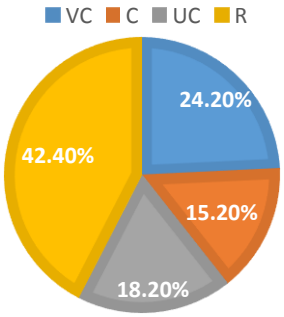

Figure 5. Relative abundance of birds in CVASU campus (March-June)

Table 2.Birds visibly recorded at Chattogram Veterinary and animal Sciences University campus with correspondence to National status, Relative abundance, and Resident status (March-June)

Order	**Scientific Name**	**English Name**	**National Status**	**Relative abundance**	**Resident status**
Passeriformes	*Corvussplendens*	House crow	NO	VC	CR
Passeriformes	*Corvusmacrorhynchos*	Large-billed crow	NO	R	CR
Cuculiformes	*Eudynamysscolopaceus*	Asian koel	NO	C	CR
Columbiformes	*Spilopeliachinensis*	Eastern Spotted dove	NO	C	VCR
Passeriformes	*Passer domesticus*	House sparrow	NO	VC	CWV
Strigiformes	*Athene brama*	Spotted owlet	NO	R	UR
Gruiformes	*Amaurornisphoenicurus*	White-breasted water hen	NO	UC	CR
Coraciiformes	*Halcyon smyrnensis*	White-throated kingfisher	NO	UC	CR
Coraciiformes	*Alcedoatthis*	Common kingfisher	NO	R	CR
Passeriformes	*Acridotherestristis*	Common myna	NO	VC	VCR
Passeriformes	*Gracupica contra*	Indian pied myna	NO	VC	VCR
Passeriformes	*Acridotheresfuscus*	Jungle myna	NO	R	VCR
Passeriformes	*Sturniamalabarica*	Chestnut-tailed starling	NO	C	CR
Cuculiform	*Centropussinensis*	Greater coucal	NO	R	CR
Passeriformes	*Pycnonotuscafer*	Red-vented bulbul	NO	VC	CR
Passeriformes	*Pycnonotusjocosus*	Red-whiskered bulbul	NO	R	CR
Passeriformes	*Copsychussaularis*	Oriental Magpie robin	NO	VC	VCR
Passeriformes	*Orthotomussutorius*	Common Tailor bird	NO	C	VCR
Columbiformes	*Columba livia*	Rock pigeon	NO	VC	CR
Psittaciformes	*Psittaculakrameri*	Rose-ringed parakeet	NO	C	RR
Passeriformes	*Parus major*	Great tit	NO	R	VCR
Piciformes	*Dinopiumbenghalense*	Black-rumpedflameback	NO	UC	CR
Piciformes	*Yungipicuscanicapillus*	Gray-capped pygmy woodpecker	NO	R	UR
Piciformes	*Dendrocoposmacei*	Fulvous-breasted woodpecker	NO	C	CR
Piciformes	*Psilopogonlineatus*	Lineated barbet	NO	R	CR
Piciformes	*Megalaimahaemacephala*	Coppersmith barbet	NO	R	CR
Passeriformes	*Dicrurusmacrocercus*	Black drongo	NO	VC	CR
Passeriformes	*Oriolusxanthornus*	Black-hooded oriole	NO	UC	CR
Passeriformes	*Dendrocittavagabunda*	Rufous treepie	NO	R	CR
Apodiformes	*Apus affinis*	House swift	NO	UC	CR
Coraciiformes	*Meropsorientalis*	Asian green bee-eater	NO	R	VCR
Columbiformes	*Treronphoenicopterus*	Yellow-footed green pigeon	NO	R	CR
Pelecaniformes	*Ardeolagrayii*	Indian pond heron	NO	R	VCR

* National status code: CR = Critically endangered, VU = Vulnerable, DD = Data deficient.(IUCN Bangladesh 2000) and NO =Not threatened. Relative abundance code: VC = Very common, C = Common, UC = Uncommon, R= Rare.(Khan, 2014) Resident status code: VCR = Very common resident, CR = Common resident, UR = Uncommon resident, RR = Rare resident, CWV = Common winter visitor, UWV = Uncommon winter visitor.(Mohsanin and Khan 2009)

The present study indicated that the most prevalent and dominant bird species were those found in open areas and around human settlements, since the CVASU campus is in the main city of Chattogram. Variation was seen in the number of birds between seasons, with more birds observed in the winter season, as expected, since more birds are typically found in winter compared to other seasons. Similar findings were also observed by Banu *et al.* 2016, the highest number of birds was recorded in dry period/winter season (November to February) and the lowest in wet period/monsoon (July to October). Common birds were more abundant in the spring and summer due to those being the breeding seasons for most birds. The CVASU campus has some trees and places for birdsmight allow them to nest in spring. Some birds like Rock Pigeons, Parrots, and Starlings are always living there due to the available habitat, abundant food, and nesting places.Based on objective four, we did not find any critically endangered or endangered bird species in the CVASU campus that are considered threatened globally or in Bangladesh. Most of the species were identified while counting indicator birds along transects, so some may have gone unnoticed because they happened outside of the transects or because observers were not paying close attention. The relative abundance's coarseness may also have been influenced by some birds' cryptic nature.

Biodiversity loss poses a major ecological threat, however relatively few people are actively engaged with addressing this problem. The presence of birds on campus provides benefits such as insect and weed control, flower pollination, educational opportunities through interacting with nature, and can even increase the value of the CVASU campus overall.

4. CONCLUSION

The main campus of Chattogram Veterinary and Animal Sciences University is in the heart of Chattogram city. However current study initiated a preliminary report with frequency of 39 bird species observed in the small campus area. Urbanization promotes certain lifestyles among birds; omnivorous, seed-eating, and cavity-nesting species were more prevalent in urbanized areas compared to surrounding regions of the same habitat type. Exotic species are also favored by urbanization. The university campus has diverse vegetation and open spaces in the city, supporting many bird species. The key factor influencing urbanization's effect on bird life is vegetation cover. Birds respond to both plant density and composition. Recent studies found major threats to campus birds are decreasing habitat and destroying vegetation through unwise infrastructure expansion and damage to breeding sites. To conserve the avifauna of CVASU main campus, it is important to preserve the habitats. Habitat preservation mainly depends on its variables such as food availability, vegetation, topography, humidity, water sources, etc.

ACKNOWLEDGEMENTS

The authors would like to thank the University Grants Commission (UGC) for financial support. The authors express gratitude and special thanks also to ChattogramVeterinary and Animal Sciences University (CVASU) authority for awarding a research grant for this research project.

REFERENCES

Araki, T., Kudo, K., Kuramoto, M. and Torikata, T. 1989. The amino acid sequence of Indian peafowl (*Pavocristatus*) lysozyme and its comparison with lysozymes from phasianoid birds. Agricultural and Biological Chemistry, 53(11): 2955-2962.

Banu, M. F. A., Akash, M., Chowdhury, G. W. and Hossain, M. A. 2016. Status and seasonal occurrence of birds in Dhaka University campus. Dhaka University Journal of Biological Sciences, 25(1): 27-37.

Birkhead, T., Wimpenny, J. and Montgomerie, B. 2014. Form and Function. In Ten Thousand Birds (pp. 201-244). Princeton University Press.

CBC. 2018. Chattogram bird club. birds of Bangladesh. 4th Annual Photographic Exhibition. 1-3 February. ZillaShilpakala Academy, Chittagong.

Daniels, R. R., Hegde, M., Joshi, N. V. and Gadgil, M. 1991. Assigning conservation value: a case study from India. Conservation Biology, 5(4): 464-475.

Gill, F.B. 1994. Ornithology, 2nd Edition. Oxford University Press, New York, pp. 117.

Harikrishnan, S., Vasudevan, K., & Sivakumar, K. 2010. Behavior of Indian peafowl (*Pavocristatus*

Linn). 1758 during the mating period in a natural population. The Open Ornithology Journal, 3(1): 13-19.

Harvey, W.G.1990. Birds in Bangladesh. University Press Ltd., Dhaka.

Husain, K.Z. and Sarker, S.U. 1979. Notes on a collection of birds from pabna.J. Asitic Soc. Bangladesh,5(1):15-24.

IUCN Bangladesh. 2000. Red Book of Threatened Birds of Bangladesh. IUCN - International Union for Conservation of Nature, Dhaka. pp. 294.

IUCN, 2000. Red list of threatened animals of Bangladesh. Eds. Islam, M.A., Ameen, M. and Nishat, A. IUCN Bangladesh, Dhaka.

Khan, M.A.R. 2014. Wildlife of Bangladesh: A Checklist. Dhaka University Press, Dhaka. pp. 174.

Lees, A. C., Haskell, L., Allinson, T., Bezeng, S. B., Burfield, I. J., Renjifo, L. M., and Butchart, S. H. 2022. State of the world's birds. Annual Review of Environment and Resources, 47(1): 231-260.

Lepage, D. 2008. Avibase-Birds checklists of the World.http://avibase.bscoc.org/checklist.jspregion=afr&list=howardmoore&lang=EN/; Accessed on 12 April, 2021.

Mayntz, M. 2020. Benefits of Attracting Birds.https://www.thespruce.com/benefits-of-attracting-birds-386399, July. 2021.

Mohsanin, S. and Khan, M.M.H. 2009. Status and seasonal occurrence of the birds in Jahangirnagar University Campus, Bangladesh. Bangladesh J. Life Sci.,21(1): 29- 37.

Peterson, A.T., L.G. Ball and Brady, K.W. 2000. Distribution of the birds of the Philippines: biogeography and conservation priorities. Bird Conservation International, 10(2): 149-167.

Shovon, S.C., Md. Shariful Islam, S. M., Al-Mahmud, J, Chowdhury, M. S. N, Md. Nazmul Alam, M. N., Sultana, T. and Islam, M.M. 2014. Diversity of avifauna in Sher-e-Bangla agricultural university campus. International Journal of Business, Social and Scientific Research, 2(1): 58-63.

Thompson, P. M. and Johnson, D. L.1996. Birding in Bangladesh: a guide to birdwatching sites and a checklist of birds. Unpublished report.

Welty and Bapista, 1988. The Life of Birds (4th Edition).Saunders College Publishing. USA.