

STATUS AND SEASONAL OCCURRENCE OF BIRDS IN DHAKA UNIVERSITY CAMPUS

MST. FARHANA ARZUMAN BANU, MUNTASIR AKASH,
GAWSIA WAHIDUNNESSA CHOWDHURY* AND MD. ANWAR HOSSAIN

Department of Zoology, University of Dhaka, Dhaka 1000, Bangladesh

Key words: Birds, Status, Seasonal occurrence

Abstract

A study was conducted on the status and seasonal occurrence of the birds in Dhaka University campus, from July, 2013 to February, 2014. During the study period, 54 species of birds belonging to 10 orders, 27 families and 47 genera were recorded. Of the recorded species of birds, 10 (19%) species were found as migrants and 44 (81%) as residents. Out of total species, 14 (26%) were identified as very common, 7 (13%) common, 10 (19%) uncommon, and 23 (43%) as rare. Of the resident species, 14 (25%) were very common residents, 26 (48%) common residents, 3 (6%) uncommon residents, 1 (2%) was rare resident and of the migrants, 7 (13%) were common winter visitors and 3 (6%) were found as uncommon winter visitors. From the study site, 28 (52%) species of passerine birds were observed and remaining 26 (48%) were non-passerines. The highest number of birds was recorded in dry period/winter season (November - February) and the lowest in wet period/monsoon (July - October).

Introduction

Bird is a group of warm-blooded, egg-laying vertebrates of the class Aves having its body covered with feathers and forelimbs modified into wings^(1,2). They have relatively large brain, keen sight and acute hearing, but little sense of smell. They share a common ancestry with reptiles and are believed to be evolved on the earth more than 150 million years ago⁽²⁻⁴⁾.

Bangladesh lies in the north-eastern part of South Asia between 20°34' and 26°38' North latitude and 88°01' and 92°41' East longitude, consisting mostly of flood plains (80%), with some hilly areas (12%).

Climate of Bangladesh is generally typical to that of the tropics with a mild winter from October to March, and a hot, humid summer from March to June along with a heavy monsoon season lasting from June to October which supplies most of the country's rainfall⁽⁵⁾. Bangladesh has a sub-tropical monsoon climate; its natural forests are classified into three major vegetation types occurring in three distinctly different land types: Hill

*Author for correspondence: <gawsia@gmail.com>

forests, plain land sal forests and mangrove forests⁽⁶⁾. Natural calamities, such as floods, tropical cyclones, tornadoes, and tidal bores occur almost every year combined with the effects of deforestation, soil degradation and erosion⁽⁷⁾.

Biogeographically, Bangladesh is not easily distinguishable from its neighboring countries. It merges imperceptibly into the neighbor country to the west and has a slightly discernible geographical boundary to the east and north. Although a good variety of ecologically distinct areas do exist in Bangladesh, it is hardly divisible into topographically distinctive regions⁽⁶⁾.

Though Bangladesh occupies a small area of 147,570 sq km, the species account is very rich considering the landmass area of Bangladesh^(8,9). Of the birds, according to Siddiqui *et al.*⁽⁶⁾, Bangladesh harbors about 650 species of birds. However, due to excessive anthropogenic activities and lack of proper conservation measures the country has already lost 30 species, out of which, one i.e., Pink-headed Duck (*Rhodonessa caryophyllacea*) has gone globally extinct and 29 have become locally extirpated but continued to occur elsewhere^(6,10-12). Of the rest 620 species, 143 are vagrant and 477 are regularly occurring. Of these 477 birds, 301 are residents and 176 seasonal visitors. Among the seasonal visitors, 160 are winter visitors, 6 are summer visitors and 10 are spring or passage migrants⁽⁶⁾.

At present time, Dhaka, the capital of Bangladesh, being an overpopulated city (an estimated 12.8 million as of 2008), holds an area of 360 square kilometers with a very limited range of habitats for wildlife⁽¹³⁾. Although many birds from Dhaka are now considered to be extirpated, the list of birds seen in Dhaka today hovers in the vicinity of two hundred species, which is a bit beyond belief considering the all the land of this mega-city is now nearly covered in concrete and all the waters are being drained or poisoned^(13,14). Therefore, yet being damaged at present time, the city still provides a few but vital green spaces served as key areas for birds.

At the city centre, the Dhaka University is considered as a perfect "oasis"⁽¹³⁾. Despite the fact that campus is one of the critical areas for birds in Dhaka city, scientific studies on the status of birds are still limited⁽¹⁴⁻¹⁶⁾. This study was conducted to provide updated data and compilation of information on the status and seasonal occurrence of the birds residing in the premises of the University of Dhaka.

The study area covers the University of Dhaka including all dormitories and staff quarters (Fig. 1). The University was set up in 1921 in the heart of Dhaka city on 600 acres of land. It is geographically situated between 23°43'52"N latitude and 90°23'45"E longitude. It is defined by its location in between the city buzz on its north and west, and on its east by the peripheral region of a park named Ramna Park. On its south, it lies beside old Dhaka.

Along with having several bricked structures, the campus has been developed well in terms of plantation consisting of herbs, shrubs, trees, creepers and climbers⁽¹⁷⁾. Around

the buildings of Dhaka University different kinds of trees grow naturally. In addition, respective authorities have planted various new trees. In the campus, Ayahuma *Couroupita guianensis*, Mahua *Madhuca longifolia*, *Ficus* sp., *Gustava* sp., Flamboyant *Delonix regia*, Parrot tree *Butea monosperma*, Mahogani *Swietenia mahagoni*, Frywood *Albizia lebeck* and *Albizia saman*, Cape Lilac *Melia azedarach*, Himalayan Cedar *Cedrus deodara*, Golden Shower *Cassia fistula*, Pigeonwood *Plumeria* sp., Kadam tree *Neolamarckia cadamba*, Ashoka *Saraca asoca*, Powderpuff *Calliandra emarginata*, Traveler's Palm *Ravenala madagascariensis*, Crepe Myrtle *Lagerstroemia* sp., Almond tree *Prunus dulcis* and weed *Lantana* sp., are considered as favourite foraging and nesting sites by the birds⁽¹⁸⁾.

In the compound, many aquatic reservoirs and large ponds are implanted with several submerged and floating aquatic plants like *Hydrilla* sp., *Marsilea* sp., *Nymphaea* sp., *Nelumbo* sp., *Echinodorus* sp. etc. It is also noteworthy that two gardens under the authority of the Department of Botany, one located at the north-easternmost side of the premises and the other on the southern corner of the compound, are rich in exotic and indigenous plants⁽¹⁴⁻¹⁷⁾. The study was conducted to fulfill the few objectives which were as follows:

- To estimate the abundance of birds of the Dhaka University Campus; and
- To find the seasonal occurrence of birds of the campus.

Materials and Methods

Observations were made with a pair of *Bushnell Powerview* 10 × 42 binoculars. For identification of birds, Siddiqui *et al.*⁽⁶⁾, Halder⁽¹⁹⁾ and Grimmett *et al.*⁽²⁰⁾ were followed. In many cases photographs were taken by D80 SLR camera in order to confirm the identification.

The duration of the study period was eight months (July, 2013 - February, 2014). Study period fell under two seasons i.e., monsoon/wet period (July - October) and winter/dry period (November - February). Six days of each month were spent in the field.

Data were collected by direct observations in the field, during the study period, mainly in the morning and afternoon, when the birds were most active⁽²¹⁾. Only the species with confirmed identification were enlisted. Data regarding different species available in the study area were recorded by transect line method as of Banerjee⁽¹⁵⁾ and Yasmin⁽¹⁶⁾. In total 50 transect lines were made to observe the wild birds and their different activities covering the entire study site. Each transect line was 100 m in length and 20 m in breadth on both sides. Birds were counted everyday during the study period within the 50 transect lines set out at the study sites.



Fig. 1. Map of the Dhaka University campus.

Counting was conducted along the roads and in the Dhaka University campus. Similarly, during transect line survey, presence of some avifauna that normally stays in the bush, jungle and branch of trees were confirmed by hearing songs and calls. As of Khan⁽⁸⁾, the relative abundance of the birds were assessed as: 'Very Common' (seen in 75 - 100% of visits), 'Common' (seen in 50 - 74% of visits), 'Uncommon' (seen in 25 - 49% of visits), or 'Rare' (seen in < 25% of visits). For wintering migrants the abundance of birds was assessed only during the months when they were present in the campus. The months of nesting and other breeding activities were recorded in order to identify the breeding residents. The national threat status follows IUCN⁽¹¹⁾ and the national threat status as well as the taxonomy and nomenclature were followed according to Siddiqui *et al.*⁽⁶⁾.

Results and Discussion

A total of 54 species of birds belonging to 10 orders, 27 families and 47 genera were recorded during the study period. Of them, 28 species (52%) were passerines and remaining 26 (48%) were non-passerines.

Banerjee (1975) recorded 40 species of birds in Curzon Hall campus and 51 species in Ramna Park⁽¹⁵⁾. The present study observed a few species those were not recorded by Banerjee⁽¹⁵⁾ e.g., Alexandrine Parakeet *Psittacula eupatria*, Indian Blue Robin *Luscinia brunnea*, Thick-billed Warbler *Iduna aedon*. Although enlisted by Banerjee⁽¹⁵⁾, Indian Roller *Coracias benghalensis*, Scaly-breasted Munia *Lonchura punctulata*, Jungle Babbler *Turdoides striatus* and Common Woodshrike *Tephrodornis pondicerianus* were not sighted during the study period. Akash *et al.*⁽¹⁴⁾ recorded a total of 50 species at Curzon Hall.

Of the 54 species, 14 (26%) were identified as very common, 7 (13%) as common, 10 (19%) as uncommon, and 23 (43%) as rare (Fig. 2). The most common and dominant species were the open country species and those associated with human habitation.

Variation was observed in the number of birds between the seasons. Seasons were delineated according to the allowed study period. In the eight months of time frame, birds were counted through the four months of winter and four months of monsoon. In winter the highest number of birds (5879) was recorded as it was the time for wintering and passage migrants. However, 5400 birds were sighted in the monsoon (Fig. 3).

The migratory birds started arriving in the month of September and some of them stayed until the end of February. Among them, brown shrike was the first comer and Blyth's leaf warbler was the last. The highest number of migratory species came during the months of January and February. Brown shrike sightings increased in November and January (Fig. 4).

Table 1. Birds of Dhaka University campus with national status, relative abundance and resident status.

Order	Scientific name	English name	National status	Relative abundance	Resident status
Anseriformes	<i>Dendrocygna javanica</i>	Lesser Whistling Duck	NO	R	CR
Piciformes	<i>Megalaima haemacephala</i>	Coppersmith Barbet	NO	UC	CR
Piciformes	<i>Dinopium bengalensis</i>	Black-rumped Flameback	NO	VC	CR
Piciformes	<i>Dendrocopos macei</i>	Fulvous-breasted Woodpecker	NO	UC	CR
Piciformes	<i>Dendrocopos canicapillus</i>	Grey-capped Pigmy Woodpecker	NO	R	UR
Piciformes	<i>Celeus brachyurus</i>	Rufous Woodpecker	NO	R	CR
Piciformes	<i>Picus xanthopygaeus</i>	Streak-throated Woodpecker	NO	R	CR
Cuculiformes	<i>Eudynamys scolopacea</i>	Asian Koel	NO	C	CR
Cuculiformes	<i>Cacomantis merulinus</i>	Plaintive Cuckoo	NO	R	CR
Cuculiformes	<i>Centropus sinensis</i>	Greater Coucal	NO	R	CR
Psittaciformes	<i>Psittacula krameri</i>	Rose-ringed Parakeet	NO	VC	RR
Psittaciformes	<i>Psittacula eupatria</i>	Alexandrine parakeet	CR	R	CR
Apodiformes	<i>Apus affinis</i>	House Swift	NO	VC	CR
Apodiformes	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	NO	C	CR
Strigiformes	<i>Athene brama</i>	Spotted Owllet	NO	UC	UR
Strigiformes	<i>Tyto alba</i>	Barn Owl	NO	R	VCR
Columbiformes	<i>Columba livia</i>	Rock Pigeon	NO	VC	CR
Columbiformes	<i>Streptopelia chinensis</i>	Spotted Dove	NO	VC	VCR
Ciconiiformes	<i>Milvus migrans</i>	Black Kite	NO	VC	VCR
Ciconiiformes	<i>Haliastur Indus</i>	Brahminy Kite	NO	R	CR
Ciconiiformes	<i>Phalacrocorax niger</i>	Little Cormorant	NO	R	CR
Ciconiiformes	<i>Bubulcus ibis</i>	Cattle Egret	NO	R	VCR
Ciconiiformes	<i>Ardeola grayii</i>	Indian Pond Heron	NO	UC	CR
Coraciiformes	<i>Alcedo atthis</i>	Common Kingfisher	NO	C	CR
Coraciiformes	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	NO	UC	CR
Coraciiformes	<i>Merops orientalis</i>	Green Bee-eater	NO	UC	VCR
Passeriformes	<i>Corvus macrorhynchos</i>	Eastern Jungle Crow	NO	VC	VCR
Passeriformes	<i>Dendrocitta vagabunda</i>	Rufous Treepie	NO	UC	CR
Passeriformes	<i>Corvus splendens</i>	House Crow	NO	VC	CR
Passeriformes	<i>Coracina melanoptera</i>	Black-headed Cuckooshrike	NO	UC	CWV

(Contd.)

(Contd.)

Order	Scientific name	English name	National status	Relative abundance	Resident status
Passeriformes	<i>Oriolus xanthornus</i>	Black-hooded Oriole	NO	UC	CR
Passeriformes	<i>Dicrurus macrocercus</i>	Black Drongo	NO	C	UWV
Passeriformes	<i>Dicrurus leucophaeus leucophaeus</i>	Ashy Drongo	NO	R	VCR
Passeriformes	<i>Acridotheres tristis</i>	Common Myna	NO	VC	VCR
Passeriformes	<i>Acridotheres fuscus</i>	Jungle Myna	NO	C	VCR
Passeriformes	<i>Sturnus contra</i>	Asian Pied Starling	NO	VC	VCR
Passeriformes	<i>Sturnus malabaricus</i>	Chestnut-tailed Starling	NO	C	CR
Passeriformes	<i>Parus major</i>	Great Tit	NO	R	VCR
Passeriformes	<i>Pycnonotus cafer</i>	Red-vented Bulbul	NO	VC	CR
Passeriformes	<i>Passer domesticus</i>	House Sparrow	NO	VC	CWV
Passeriformes	<i>Motacila alba</i>	White Wagtail	NO	R	UR
Passeriformes	<i>Lanius cristatus</i>	Brown Shrike	NO	C	CWV
Passeriformes	<i>Lanius tephronotus</i>	Grey-backed Shrike	NO	R	UWV
Passeriformes	<i>Leptocoma zeylonica</i>	Purple-rumped Sunbird	NO	R	CR
Passeriformes	<i>Cinnyris asiaticus</i>	Purple Sunbird	NO	UC	CR
Passeriformes	<i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker	NO	R	CR
Passeriformes	<i>Copsychus saularis</i>	Oriental Magpie Robin	NO	VC	VCR
Passeriformes	<i>Luscinia brunnea</i>	Indian Blue Robin	NO	R	UWV
Passeriformes	<i>Ficedula albicilla</i>	Taiga Flycatcher	NO	R	CWV
Passeriformes	<i>Terpsiphone paradisi</i>	Asian Paradise Flycatcher	NO	R	VCR
Passeriformes	<i>Orthotomus sutorius</i>	Common Tailorbird	NO	VC	VCR
Passeriformes	<i>Acrocephalus stentoreus</i>	Clamorous Reed Warbler	NO	R	CWV
Passeriformes	<i>Phylloscopus reguloides</i>	Blyth's Leaf Warbler	NO	R	CWV
Passeriformes	<i>Iduna aedon</i>	Thick-billed Warbler	NO	R	CWV

National status code: CR = Critically endangered, VU = Vulnerable, DD = Data deficient⁽¹¹⁾ and NO = Not threatened. Relative abundance code: VC = Very common, C = Common, UC = Uncommon, R = R are.⁽⁸⁾ Resident status code: VCR = Very common resident, CR = Common resident, UR = Uncommon resident, RR = Rare resident, CWV = Common winter visitor, UWV = Uncommon winter visitor.⁽²⁰⁾

Migrants started arriving in September and some of them stayed until the end of February. Of the observed 54 species of birds, 14 (26%) were very common residents, 26

(48%) common residents, 3 (6%) uncommon residents and 1 (2%) was rare resident. Among the migrants, 7 (13%) were common winter visitors and 3 (6%) were found as uncommon winter visitors. The highest number of migrants arrived in January and February (Fig. 5).

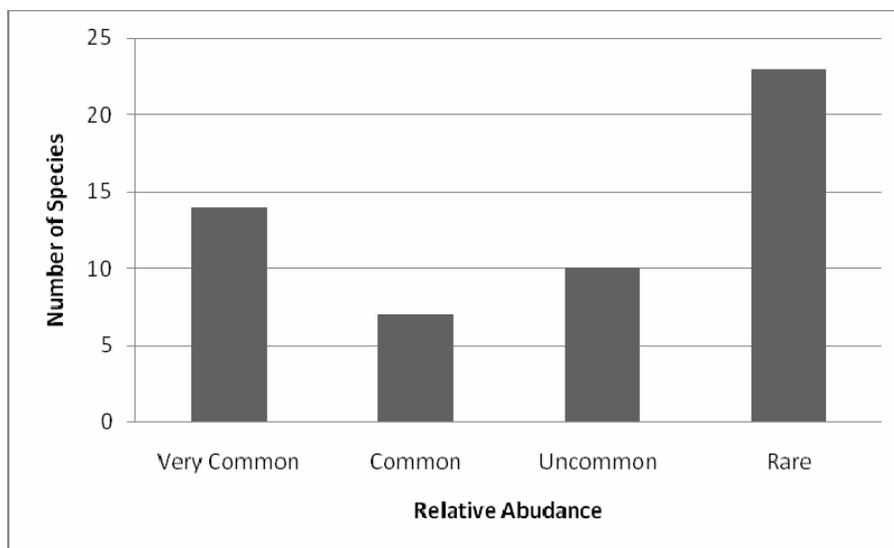


Fig. 2. Relative abundance of the birds of the study area.

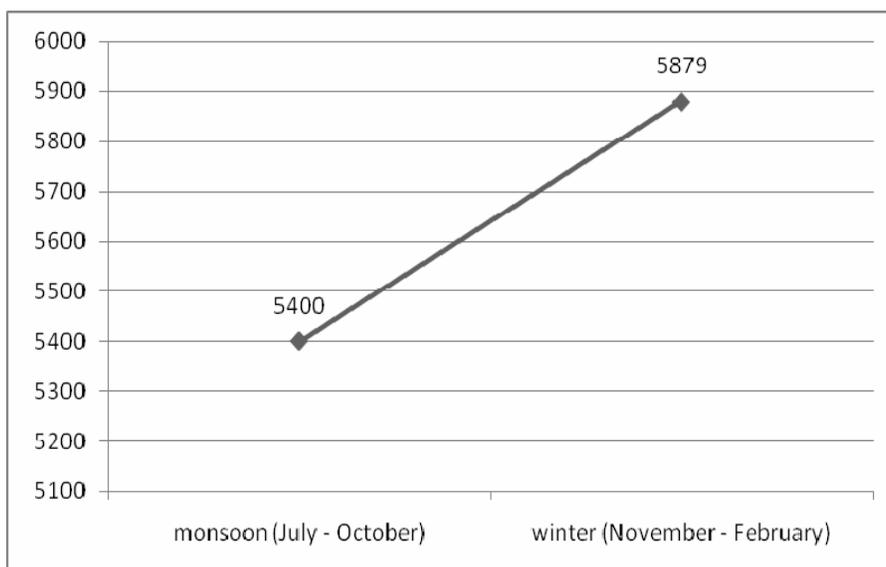


Fig. 3. Seasonal variation in the number of birds counted at the study area.

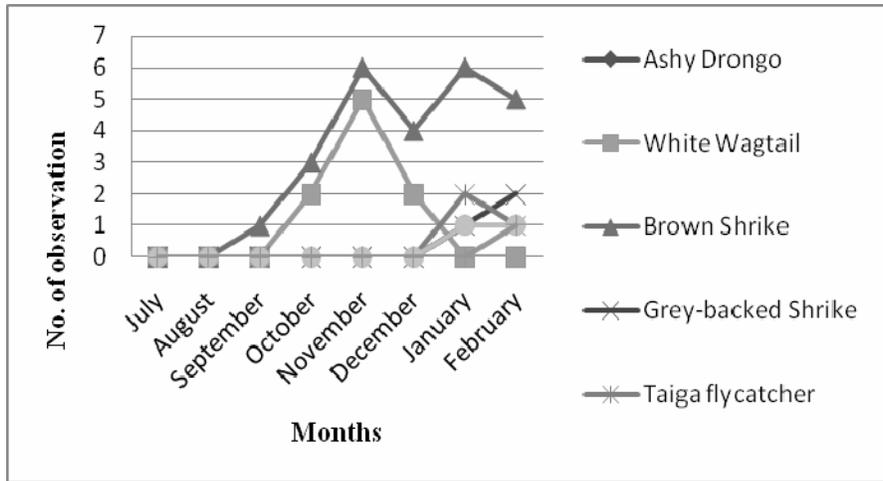


Fig. 4. Seasonal occurrence of winter visitors in Dhaka University campus.

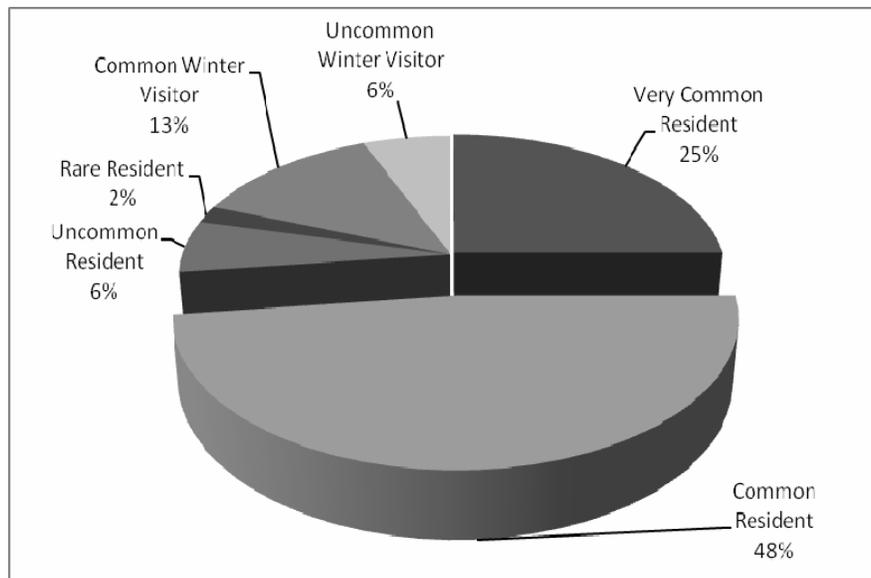


Fig. 5. Resident status of birds in the study area.

Conclusions

The urban ecosystem follows the same principles as of other ecosystems⁽²²⁾. The difference, though, is that here the changes are drastic and rapid so pose a severe challenge to biodiversity and its environs. An advantage is that cities and towns are on average five degrees warmer than the countryside. This gives the urban regions a longer growing season and higher average temperature offering advantages to many life forms necessarily including avian species, which have a relatively higher rate of metabolism⁽²²⁾.

However, anthropogenic threats were identified as to be the cause for the declining of the avifaunal diversity. As the infrastructure of the campus has been increasing so the habitats for birds' feeding, foraging, roosting and breeding are declining⁽¹³⁾. This necessitates a long-term plan so that the open space with woods and other vegetation like bushes in the gardens are left for the birds and other animals to survive.

To conserve the avifauna of Dhaka University 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. Some recommendations are given below for the survival of birds:

- Long term studies and monitoring are needed to understand the temporal and spatial dynamics of bird communities and the process and functioning of restored habitats;
- All the variables related to the habitat use should be considered together for the conservation of birds; and
- Research is needed to make a specific guidance for the practice of habitat management.

References

1. Welty JC 1988. *The Life of Birds*. Saunders College Publishing Co., Philadelphia. pp. 581.
2. Hickman CP, LS Roberts, and A Larson 2001. *Integrated Principles of Zoology*. 11th Edition. Mosby - Year Book Inc., Missouri. pp. 905.
3. Padian K and LM Chiappe 1998. The origin and early evolution of birds. *Biological Reviews of the Cambridge Philosophical Society* 73(1): 1-42.
4. Islam MA 2003. *In: Islam S, Miah S, Ahmed W, Chowdhury AM, Rahman SMM, Siddiqui K, Kabir SMH, Kabir A, Huq KMH, Alam F, Kamal BA, and Akhter S (Eds), Banglapedia - National Encyclopedia of Bangladesh, Vol. 2. Bird*. Asiatic Society of Bangladesh, Dhaka, Bangladesh, pp. 221-224.
5. Alexander DE 1993. *Natural Disasters*. Kluwer Academic Publishers, Dordrecht. p. 532.
6. Siddiqui KU, MA Islam, SMH Kabir, M Ahmed, ATA Ahmed, AKA Rahman, EU Haque, ZU Ahmed, ZNT Begum, MA Hassan, M Khondoker and MM Rahman (Eds), 2008. *Encyclopedia of Flora and Fauna of Bangladesh*. Vol. 26. Birds. Asiatic Society of Bangladesh, Dhaka. pp. 622.
7. Haggert P 2002. *Encyclopedia of World Geography*. Marshall Cavendish, New York. pp. 2, 634.
8. Khan MAR 1982. *Wildlife of Bangladesh: A Checklist*. Dhaka University Press, Dhaka. pp. 173.
9. Khan MAR 1988. The Grassland Avifauna of Bangladesh. *Ecology and Conservation of Grassland Birds* 7: 215.
10. Sarker SU and NJ Sarker 1983. Extinct Birds and Mammals of Bangladesh. *SCONE Bull.* 10: 6-7.
11. IUCN Bangladesh 2000. *Red Book of Threatened Birds of Bangladesh*. IUCN - International Union for Conservation of Nature, Dhaka. pp. 294.
12. Khan MAR 2014. *Wildlife of Bangladesh: Checklist and Guide*. Chayabithi Publ., Dhaka. pp. 567.

13. Kabir SMH, EU Haque and MA Islam 2010. *In: Islam MA, Ahmed SU, and Rabbani AKMG (Eds), Environment of Capital Dhaka: Plants Wildlife Gardens Parks Open Spaces Air Water Earthquake. Wildlife of Dhaka. Asiatic Society of Bangladesh, Dhaka. pp. 83-128.*
14. Akash M, A Hossain, GW Chowdhury, H Mahmud and MA Islam 2014. Status of avifauna in Curzon Hall premises, University of Dhaka, Bangladesh. *Ecoprint: An International Journal of Ecology* **20**: 1-8.
15. Banerjee AK 1975. *Status and Composition of Avifauna of the Curzon Hall Campus and Ramna Park.* M.Sc. Thesis (unpubl.). Department of Zoology, University of Dhaka.
16. Yasmin N 2000. *Plant-animal Association (Nesting Pattern of Birds in Some Areas of Dhaka University Campus).* M.Sc. Thesis (unpubl.). Department of Zoology, University of Dhaka, Dhaka.
17. Akther MS and I Islam 2010. *In: Islam MA, Ahmed SU, and Rabbani AKMG (Eds), Environment of Capital Dhaka: Plants Wildlife Gardens Parks Open Spaces Air Water Earthquake. Open Spaces in Bangladesh Period. Asiatic Society of Bangladesh, Dhaka. pp. 265-280.*
18. Halder RR 2010. *A Photographic Guide to Birds of Bangladesh.* Baikal Teal Production, Dhaka. pp. 257.
19. Grimmett R, C Inskipp, T Inskipp and R Allen 2011. *Birds of the Indian Subcontinent.* Christopher Helm, London. pp. 528.
20. Mohsanin S and MMH Khan 2009. Status and seasonal occurrence of the birds in Jahangirnagar University Campus, Bangladesh. *Bangladesh J. Life Sci.* **21**(1): 29-37.
21. Bilgrami KS 1995. *Concept and Conservation of Biodiversity.* CBS Publishers and Distributors, New Delhi. pp. 424.
22. Islam S 2011. *A Study on Zoning Regulations' Impact on Thermal Comfort Conditions in Non-Conditioned Apartment Buildings in Dhaka City.* Ph.D. Thesis. Texas A&M University, USA.

(Manuscript received on 16 April, 2015; revised on 14 January, 2016)