Bangladesh J. Zool. **44**(1): 167-174, 2016 ISSN: 0304-9027 (print)
2408-8455 (online)

- Scientific note

STATUS OF AVIFAUNA IN BIRULIA - A PERI-URBAN AREA

Mahua Shahjadi*[1], Kamrul Hasan and Md. Nasif Sadat, Amit Kumer Neogi and Shayer Mahmood Ibney Alam

Department of Zoology, Jagannath University, Dhaka 1100, Bangladesh

Conversion of rural area into urban area affects many species and the ecosystem. The peri-urban area (area on the process of urbanization) cannot ensure a safe, sustainable natural habitat for its bird species. Aves are the most important groups of animal which have great ecological contribution (Graham 2004). There are about 9900 species of birds in the world of which 690 (380 residents, 209 winter visitors,11 summer visitors and 90 vagrants) are found in Bangladesh (Khan 2008). The term "peri-urban area" is a name given to the grey area which is neither entirely urban nor purely rural in the traditional sense; it is at most the partly urbanized rural area. Whatever definition may be given to it, it cannot eliminate some degree of arbitrariness (OECD 1979). The general impression about a peri-urban area reflects the view that it is in the nearly status to become a city with a tremendous impacts on its natural environment and biotic factors. At present the major portion of Birulia union, Savar is on the way to become a city. Effect of this urbanization process may lead a great threat to the existing bird fauna of this region. However, the main objectives of the present study were to record the existing species of birds of Birulia union, analyzing species fluctuation according to feeding habit, habitat and local status, to observe the anthropogenic threats on birds and its environment and to recommend few ideas for the future conservation of the present avifaunal groups in this area.

This study was conducted at Birulia union under Savar Upazilla of Bangladesh. It is located north-west of Dhaka city with an area of 30.16 sq. km having 10,000 households, and 34 villages with a population of 45,000 in 30 Mouzas. This whole area composed of low, plain or medium highlands and different ecological habitats including woodlands, wetland, open scrub jungles, grasslands and dry low-lying areas beside the highlands. Soil of this area is normally deep brown or blackish red. The average humidity of this area remains around 85% throughout the year while annual temperature varies from 10 to 35ºC. Here November to February is winter, March to June is summer and July to October is monsoon. This study area covers 466 different plant species belonging to 95 families (IACIB 2013). The study was conducted covering three

*Corresponding author: mahuashahjadi@yahoo.com

 DOI: 10.3329/bjz.v44i1.30187

seasons: winter, summer and monsoon. Winter observations were carried out from December, 2012 to January 2013, summer observations from March 2013 to June 2013 and the monsoon observations from August 2013 to November 2013. The study adopted line transect method to observe and count avifauna. The identification guide books (ALI 1996, Grimmett *et al.* 1999, Halder 2010, Khan 2008, Siddiqui *et al.* 2008) were used for identification of species during observation. A GPS (Garmin e-Trex 10) and binoculars (Bushnell and Tasco 20 × 21) were used for proper positioning and identification of birds. For capturing photographs a Canon Power shot S × 40 HS camera was used.

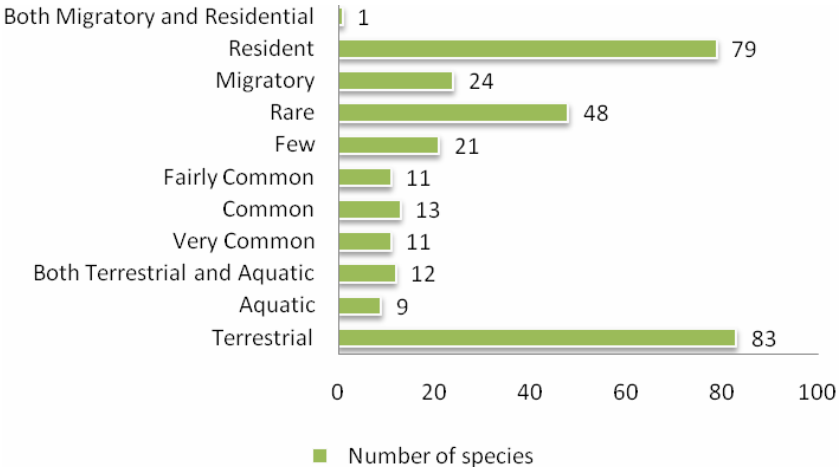

Fig. 1. Status of birds in Birulia.

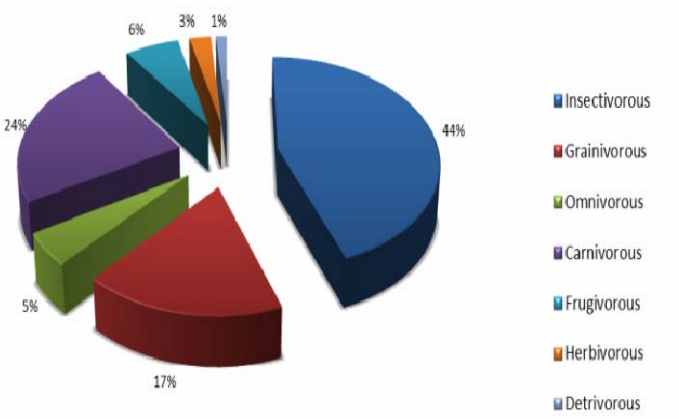

Fig. 2. Bird species according to feeding habit in Birulia.

The whole study area was divided into six line transects (Table 1). Each transact line was visited carefully and information was gathered about all corresponding features including number or abundance of individuals, feeding

habit, general habitat, and migration status of focusing birds members. Only proper identified species were enlisted in this survey. In those transects, data was collected walking slowly and silently at a stretch in the morning from 6.30 a.m. to 11.00 a.m. and in the evening from 2.30 p.m. to 5.30 p.m. Depending on the abundance, birds were divided into five categories *viz.* common (C), very common (VC), fairly common (FC), few (F) and rare (R). If any species was recorded in 80 - 100% of the visits, it was recorded as Very Common, and likewise Common (60 - 79%), Fairly Common (40 - 59%), Few (20 - 39%) and Rare (<20%).

Table 1. GPS location of the starting and ending point of the six transects within the study area

Sl. No.	Transect	Location	Geographical location			
			Start point		End point	
			N	E	N	E
1	T1	Zinzira to Akran Bazar	23°51'39.414"	90°17'31.563"	23°51'26.89"	90°18'41.256"
2	T2	Choto Kaliakoir to Kumaran	23°51'15.253"	90°17'49.451"	23°49'41.819"	90°17'29.979"
3	T3	Baghnibari to Choto Oalia	23°51'3.533"	90°18'59.825"	23°49'56.925"	90°20'1.309"
4	T4	Sarulia to Bara Kakar (east) via Birulia	23°50'27.156"	90°19'52.092"	23°51'36.26"	90°20'8.483"
5	T5	Uttar Dattapara to Deul via Dampara and Saipara	23°52'17.75"	90°18'52.378"	23°52'1.788"	90°20'35.015"
6	T6	Khagan to Samair	23°52'26.28"	90°18'39.637"	23°51'26.696"	90°18'56.983"

A total of 102 species of bird was recorded, during winter 43 during summer and 71 during monsoon. Combining all these three, the total number of birds was 104. The number of species in winter was more than the summer because of the migratory congregations. Among 104 species of bird, one species was near threatened, 93 least concern, 01 data deficient and the rest 09 not evaluated according to the IUCN Red List (IUCN Bangladesh 2015). The number of resident bird species was 79, while the migratory was 24. One species was both migratory and resident member of this area and this species is Little Ringed Plover. The local status of birds was recorded among which 11 species (11%) were found very common, 13 (12%) common, 11 (11%) fairly common, 21 (20%)

Table 2. Checklist of birds in Birulia with status.

Sl. no.	Order	Family	Scientific name	English name	Habitat	Feeding habit	Local status	Migratory status
1	Anseriformes	Dendrocygnidae	*Dendrocygna javanica*	Lesser whisling Duck	Aquatic	Herbivorous	FC	Resident
2	Piciformes	Picidae	*Jynx torquilla*	Eurasian Wryneck	Terrestrial	Insectivorous	R	Winter visitor
3			*Dendrocopos macei*	Fulvous breasted Woodpecker	Terrestrial	Insectivorous	R	Resident
4			*Celeus brachyurus*	Rufous Woodpecker	Terrestrial	Insectivorous	R	Resident
5			*Picus viridanus*	Streak breasted Woodpecker	Terrestrial	Insectivorous	R	Resident
6			*Dinopium benghalense*	Black rumped Flameback	Terrestrial	Insectivorous	R	Resident
7		Capitonidae	*Megalaima haemacephala*	Coppersmith Barbet	Terrestrial	Insectivorous	R	Resident
8			*Megalaima lineata*	Lineated Barbet	Terrestrial	Insectivorous	R	Resident
9	Upupiformes	Upupidae	*Upupa epops*	Common Hoopoe	Terrestrial	Insectivorous	FC	Resident
10	Coraciiformes	Coraciidae	*Coracias benghalensis*	Indian Roller	Terrestrial	Carnivorous	FC	Resident
11		Alcedinidae	*Alcedo atthis*	Common Kingfisher	Both	Carnivorous	FC	Resident
12		Dalcelonidae	*Halcyon smyrnensis*	White-throated Kingfisher	Both	Carnivorous	VC	Resident
13		Cerylidae	*Ceryle rudis*	Pied Kingfisher	Aquatic	Carnivorous	FC	Resident
14		Meropidae	*Merops leschenaulti*	Chestnut headed Bee Eater	Terrestrial	Insectivorous	R	Resident
15			*Merops orientalis*	Green Bee Eater	Terrestrial	Insectivorous	R	Resident
16		Cuculidae	*Clamator jacobinus*	Pied Cuckoo	Terrestrial	Insectivorous	R	Summer visitor
17	Cuculiformes		*Cuculus varius*	Common Hawk Cuckoo	Terrestrial	Insectivorous	R	Resident
18			*Cuculus micropterus*	Indian Cuckoo	Terrestrial	Insectivorous	R	Resident
19			*Eudynamys scolopaceus*	Asian Koel	Terrestrial	Grainivorous	VC	Resident
20		Centropodidae	*Centropus sinensis*	Greter Coucal	Terrestrial	Carnivorous	R	Resident
21	Psittaciformes	Psittacidae	*Psittacula krameri*	Rose-ringed Parakeet	Terrestrial	Frugivorous	FC	Resident
22	Apodiformes	Apodidae	*Cypsiurus balasiensis*	Asian Palm Swift	Terrestrial	Insectivorous	C	Resident
23			*Apus affinis*	House Swift	Terrestrial	Insectivorous	F	Resident
24	Strigiformes	Strigidae	*Otus bakkamoena*	Collared Scops Owl	Terrestrial	Carnivorous	R	Resident
25			*Bubo nipalensis*	Spotted Owlet	Terrestrial	Carnivorous	F	Resident
26	Columbiformes	Columbidae	*Columba livia*	Blue Rock Pigeon	Terrestrial	Grainivorous	C	Resident
27			*Streptopelia chinensis*	Spotted Dove	Terrestrial	Grainivorous	C	Resident
28			*Streptopelia decaocto*	Eurasian Collared Dove	Terrestrial	Grainivorous	F	Resident
29			*Streptopelia tranquebarica*	Red Collared Dove	Terrestrial	Grainivorous	FC	Resident
30			*Treron phoenicopterus*	Yellow Footed Green Pigeon	Terrestrial	Frugivorous	FC	Resident
31	Gruciformes	Rallidae	*Amaurornis phoenicurus*	White Breasted Waterhen	Both	Carnivorous	R	Resident

(Contd.)

(Contd.)

Sl. no.	Order	Family	Scientific name	English name	Habitat	Feeding habit	Local status	Migratory status
32	Ciconiiformes	Scolopacidae	*Gallinago gallinago*	Common Snipe	Aquatic	Carnivorous	R	Winter visitor
33			*Acitis hypoleucos*	Common Sandpiper	Both	Carnivorous	R	Winter visitor
34			*Tringa glareola*	Wood Sandpiper	Aquatic	Carnivorous	F	Winter visitor
35			*Tringa ochropus*	Green Sandpiper	Aquatic	Carnivorous	R	Winter visitor
36			*Calidris temminckii*	Temminck's Stint	Terrestrial	Insectivorous	R	Winter visitor
37		Jacanidae	*Metopidius indicus*	Bronze winged Jacana	Aquatic	Insectivorous	R	Resident
38		Charadriidae	*Charadrius placidus*	Little Ringed Plover	Aquatic	Insectivorous	R	Both
39			*Vanellus indicus*	Red-wattled Lapwing	Terrestrial	Carnivorous	F	Resident
40			*Vanellus malabaricus*	Yellow-wattled Lapwing	Terrestrial	Insectivorous	R	Resident
41		Accipitridae	*Elanus caeruleus*	Black-shouldered Kite	Terrestrial	Omniivorous	R	Resident
42			*MIlvus migrans*	Black Kite	Terrestrial	Detrivorous	C	Resident
43			*Haliastur Indus*	Brahminy Kite	Terrestrial	Carnivorous	F	Resident
44			*Circus melanoleucos*	Pied Harrier	Terrestrial	Carnivorous	R	Winter visitor
45		Falconidae	*Falco chicquerq*	Red necked Falcon	Terrestrial	Carnivorous	R	Resident
46			*Falco tinnunculus*	Common Kestrel	Terrestrial	Omniivorous	R	Winter visitor
47		Phalacrocoracidae	*Phalacrocorax niger*	Little Cormorant	Aquatic	Carnivorous	C	Resident
48		Ardeidae	*Egretta garzetta*	Little Egret	Both	Omniivorous	R	Resident
49			*Bubulcus ibis*	Cattle Egret	Terrestrial	Carnivorous	C	Resident
50			*Ardeola grayii*	Indian Pond Heron	Aquatic	Carnivorous	VC	Resident
51			*Butorides striata*	Little Heron	Terrestrial	Omniivorous	R	Resident
52		Ciconiidae	*Anastomus oscitans*	Asian Openbill	Terrestrial	Omniivorous	R	Resident
53	Passeriformes	Laniidae	*Lanius Cristatus*	Brown Shrike	Terrestrial	Insectivorous	VC	Winter visitor
54			*Lanius schach*	Long Tailed Shrike	Terrestrial	Insectivorous	VC	Resident
55		Corvidae	*Dendrocitta vagabunda*	Rufous Treepie	Terrestrial	Carnivorous	FC	Resident
56			*Corvus macrohynchos*	Jungle Crow	Terrestrial	Omniivorous	F	Resident
57			*Corvus splendens*	House Crow	Terrestrial	Omniivorous	C	Resident
58			*Artamus fuscus*	Ashy Woodswallow	Terrestrial	Insectivorous	R	Resident
59			*Oriolus xanthornus*	Black-hooded Oriole	Terrestrial	Frugivorous	VC	Resident
60			*Coracina macei*	Large Cuckooshrike	Terrestrial	Insectivorous	R	Resident
61			*Coracina melaschistos*	Black-winged Cuckooshrike	Terrestrial	Insectivorous	R	Winter visitor
62			*Dicrurus macrocercus*	Black Drongo	Terrestrial	Insectivorous	*VC*	Resident

(Contd.)

(Contd.)

Sl. no.	Order	Family	Scientific name	English name	Habitat	Feeding habit	Local status	Migratory status
63			*Terpsiphone paradisi*	Asian Paradise Flycatcher	Terrestrial	Insectivorous	R	Resident
64			*Aegithina tiphia*	Common Iora	Terrestrial	Insectivorous	F	Resident
65		Muscicapidae	*Zoothera citrina*	Orange headed Thrush	Terrestrial	Insectivorous	R	Resident
66			*Ficedula albicilla*	Taiga Flycatcher	Terrestrial	Insectivorous	F	Winter visitor
67			*Luscinia calliope*	Siberian Rubythroat	Terrestrial	Insectivorous	R	Winter visitor
68			*Copsychus saularis*	Oriental Magpie Robin	Terrestrial	Insectivorous	VC	Resident
69			*Phoenicurus ochruros*	Black Redstart	Terrestrial	Insectivorous	R	Winter visitor
70		Sturnidae	*Sturnus contra*	Asian Pied Starling	Terrestrial	Omniivorous	VC	Resident
71			*Sturnus malabaricus*	Chestnut Tailed Starling	Terrestrial	Frugivorous	C	Resident
72			*Acridotheres fuscus*	Jungle Myna	Terrestrial	Insectivorous	F	Resident
73			*Acridotheres tristis*	Common Myna	Terrestrial	Omniivorous	VC	Resident
74		Paridae	*Parus major*	Great Tit	Terrestrial	Insectivorous	R	Resident
75		Hirundinidae	*Hirundo rustica*	Barn Swallow	Terrestrial	Insectivorous	R	Resident
76		Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul	Terrestrial	Frugivorous	C	Resident
77		Cisticolidae	*Cisticola juncidis*	Zitting Cisticola	Terrestrial	Insectivorous	VC	Resident
78			*Prinia hodgsonii*	Grey-breasted Prinia	Terrestrial	Insectivorous	F	Resident
79			*Prinia inornata*	Plain Prinia	Terrestrial	Insectivorous	R	Resident
80		Sylviidae	*Orthotomus sutorius*	Common Tailor Bird	Terrestrial	Insectivorous	F	Resident
81			*Phylloscopus fuscatus*	Dusky Warbler	Terrestrial	Insectivorous	R	Winter visitor
82			*Seicercus affinis*	Golden-spectackled Warbler	Terrestrial	Insectivorous	F	Winter visitor
83			*Megalurus palustris*	Straited Grassbird	Terrestrial	Insectivorous	C	Resident
84			*Malacocincla abbotti*	Abbott's babbler	Terrestrial	Insectivorous	R	Resident
85			*Turdoides striatus*	Jungle Babbler	Terrestrial	Insectivorous	F	Resident
86		Alaudidae	*Mirafra assamica*	Bengal Bushlark	Terrestrial	Grainivorous	F	Resident
87			*Eremopterix griseus*	Ashy crowned Sparrow Lark	Terrestrial	Grainivorous	R	Resident
88		Nectariniidae	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	Terrestrial	Herbivorous	F	Resident
89			*Leptocoma zeylonica*	Purple Rumped Sunbird	Terrestrial	Insectivorous	F	Resident
90			*Cinnyris asiaticus*	Purple Sunbird	Terrestrial	Insectivorous	R	Resident
91		Passeridae	*House Sparrow*	House Sparrow	Terrestrial	Grainivorous	C	Resident
92			*Dendronanthus indicus*	Forest Wagtail	Both	Insectivorous	R	Winter visitor
93			*Motacilla alba*	White Wagtail	Both	Insectivorous	C	Winter visitor
94			*Motacilla cinerea*	Grey Wagtail	Both	Insectivorous	F	Winter visitor
95			*Motacilla citreola*	Citrine Wagtail	Both	Insectivorous	R	Winter visitor

(Contd.)

(Contd.)

Sl. no.	Order	Family	Scientific name	English name	Habitat	Feeding habit	Local status	Migratory status
95			*Motacilla citreola*	Citrine Wagtail	Both	Insectivorous	R	Winter visitor
96			*Motacilla flava*	Western Yellow Wagtail	Both	Insectivorous	F	Winter visitor
97			*Motacilla madaraspatensis*	White Browed Wagtail	Both	Insectivorous	FC	Resident
98			*Anthus campestris*	Tawny Pipit	Terrestrial	Grainivorous	R	Winter visitor
99			*Anthus hodgsoni*	Olive backed Pipit	Terrestrial	Omnivorous	R	Winter visitor
100			*Anthus rufulus*	Paddyfield Pipit	Terrestrial	Grainivorous	F	Resident
101			*Ploceus philippinus*	Baya Weaver	Terrestrial	Grainivorous	C	Resident
102			*Lonchura malabarica*	Indian Silverbill	Terrestrial	Grainivorous	F	Resident
103			*Lonchura puntulata*	Scaly-breasted Munia	Terrestrial	Grainivorous	FC	Resident
104		Fringilidae	*Carpodacus erythrinus*	Common Rosefinch	Terrestrial	Grainivorous	R	Winter visitor

few and 48 (46%) rare. A total of 83 (80%) were found to occur in terrestrial habitat, 09 species (9%) were in aquatic habitat and the rest 12 (11%) in both terrestrial and aquatic habitat. By observing feeding habit of birds, 52 (44%) were insectivorous, 10 (5%) omnivorous, 20 (24%) carnivorous, 05 (6%) frugivorous, 02 (3%) herbivorous, 01 (1%) detrivorous and 14 (17%) grainivorous species. The abundances of *Sturnus contra*, *Acridotheres tristis, Cypsiurus balasiensis*, *Dicrurus macrocercus* and *Pycnonotus cafér* were greater than any other species. *Sturnus contra* was recorded for a total of 269 times, *Acridotheres tristis* 251 times, *Cypsiurus balasiensis* 154 times, *Dicrurus macrocercus* 148 times and *Pycnonotus cafer* 137 times during the transect wise observations. On the other hand, the study found *Jynx torquilla*, *Dinopium benghalense*, *Charadrius placidus, Falco chicquerq*, *Carpodacus erythrinus* and *Phoenicurus ochruros* to be the rare birds of this region. Birulia Union is 5 km away from the nearby Jahangirnagar University (JU) campus that shows a rich abundance (180 species) of avifaunal species due to spontaneous strict protection (Mohsanin and Khan 2009). Due to the proximity to JU campus and few existing patches of planted and natural; vegetation, Birulia also have the potentiality to harbor abundant bird species, but lack of protection and human disturbances may have contributed to the poor status of bird species in this area in comparison to JU. Common anthropogenic threats to bird species in this region were observed as, most of the low lands and wet lands are under the process of rapid urbanization and encroachment of new buildings and cities, resulting in the decreased number of aquatic birds *Metopidius indicus*, *Tringa ochropus*, *Gallinago gallinago, Dendrocygna javanica,* etc. More and more industries have been established and toxic substances exhaled from those industries seem to be causing tremendous harm to nature and food chain of the birds. Besides, climate change, deforestation practices are also continuing in this area (IACIB

2013). Another big threat was observed as illegal trapping and hunting of *Amaurornis phoenicurus*, *Bubulcus ibis*, *Ardeola grayii*, *Treron phoenicopterus*, *Streptopelia chinensis,* etc., because some greedy people shows great demand for the meat of those species as food. Day by day all these threats are becoming more and more harmful for its bird species. In this regard, some recommendations may be suggested, such as protection of natural habitats for birds through controlled exploitation; protection of bird species through strict enforcement of existing avifauna related legislations; public awareness related to the conservation of nature specially birds should be emphasized and involvement of more organizations related to nature and conservation to protect the existing bird species of a peri-urban area like Birulia.

Acknowledgements: The study was partially supported by Eco-health Initiative of IACIB (Institute of Allergy and Clinical Immunology of Bangladesh). The authors are thankful to Professor Dr. Moazzem Hossain, Chairman, IACIB, for supporting during field visits. They are also grateful to Mr. Khandaker Tanvir Hossain, Assistant Professor, Department of Geography and Environment, Jagannath University, for his extended support on providing GIS based maps and information and Md. Faysal Ahmad, Department of Zoology, Jagannath University, Dhaka.

LITERATURE CITED

ALI, S. 1996. *The Book of Indian Birds* (12th revised and centenary edition). Bombay Natural History Society, New Delhi.

GRAHAM, B. 2004. *Integrating Biodiversity Conservation and Sustainable Use: Lessons Learned from Ecological Networks.* IUCN, Gland, Switzerland and Cambridge, UK.

GRIMMETT, R., INSKIPP, C. and INSKIPP, T. 1999. *Pocket Guide to the Birds of the Indian Subcontinent*. Oxford University Press, New Delhi.

HALDER.R.R. 2010. *Birds of Bangladesh*, 1st Edition, Baikal Teal production, Bangladesh, Dhaka.

IACIB *(*Institute of Allergy and Clinical Immunology of Bangladesh). 2013. *Rapid Biodiversity Assessment* – BBEHI. Institute of Allergy and Clinical Immunology of Bangladesh (IACIB), Dhaka, Bangladesh.

IUCN BANGLADESH. 2015. *Red List of Bangladesh: A Brief on Assessment Result 2015*. IUCN, International Union for Conservation of Nature, Bangladesh Country Office, Dhaka, Bangladesh. pp. 11.

KHAN, M.M.H. 2008. *Protected area of Bangladesh - A Guide to Wildlife.* Nishorgo Program, Bangladesh Forest Department, Dhaka, Bangladesh.

MOHSANIN S. and KHAN, M.M.H. 2009, Status and Seasonal occurrence of Birds in Jahangirnagar University Campus, Bangladesh. *Bangladesh Journal of Life Sciences* **21**(1): 29-37.

SIDDIQUI, K.U., ISLAM, M.A., KABIR, S.M.H., AHMAD, M., AHMED, A.T.A., RAHMAN, A.K.A. HAQUE, E.U. AHAMED, Z.U. BEGUM, Z.N.T., HASSAN M.A., KHONDKER, M. AND RAHMAN, M.M. (eds.). 2008. *Encyclopedia of Flora and Fauna of Bangladesh*, Vol. **26**. *Aves.* Asiatic society of Bangladesh, Dhaka. 662 pp.

OECD, 1979. *Agriculture in the Planning and Management of Peri-urban Areas.* Volume **1**: synthesis. Paris. pp. 94.

(Manuscript received on 22 December, 2015; revised on 27 June, 2016)