Bulletin of Pure and Applied Sciences
Vol.38A (Zoology), No.1, 2019: P.10-16

Print version ISSN 0970 0765
Online version ISSN 2320 3188
DOI 10.5958/2320-3188.2019.00002.0

Original Research Article
Available online at www.bpasjournals.com

A Survey on the Endangered Avian Biodiversity at Okhla Bird Sanctuary (OBS) Noida, Uttar Pradesh, India

Sushil Kumar Upadhyay[1,*]
Babita[2],
Raj Singh[3]

Authors Affiliation:
[1,2,3]Department of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana- Ambala, Haryana 133207, India.

***Corresponding address:**
Dr. Sushil Kumar Upadhyay,
Assistant Professor, Department of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana-Ambala, Haryana 133207, India

E-mail: sushil.upadhyay@mmumullana.org

Received: Nov 25, 2018
Revised: Dec 19, 2018
Accepted: May 14, 2019
Published: June 20, 2019

Abstract

The Okhla Bird Sanctuary (OBS) is approximately 4km^2 in area and is to be found at the doorway of NOIDA (New Okhla Industrial Development Authority) in Gautam Buddh Nagar district of Uttar Pradesh, India. It is located at a junction point where river Yamuna enters in the area of Uttar Pradesh and departing the Union territory of Delhi. It is one among 15 bird sanctuaries in the state Uttar Pradesh. The present survey report highlights the significant information about the threatened bird species of the Okhla bird Sanctuary, Noida, Uttar Pradesh. The Okhla bird sanctuary is one having marshy wet land among the 24 bird sanctuaries in the state Uttar Pradesh. The Sanctuary is declared as reserve area in 1986 but notified as sanctuary by the state Government in the year 1990 and now have attained position in IBAs (Important Bird Areas) and supposed to one among 466 IBAs in India. About 302 birds' species are viewed in this sanctuary due to the thorny scrub, grassland and wetland creation because of Okhla barrage and its unique positioning. Among 302 species about 131 are local, 121 are aquatic, and 50 are winter visitors. The immense diversity of avifauna consisting 11 threatened birds, among these 4 are vulnerable and 7 are critically endangered. The climatic conditions make the sanctuary a green wetland; thus has potential to support the existing avifauna. The efforts aim to maintain and save the threatened species by the conservation of microhabitat, nesting behaviour, resources utilization and prohibition of man-made activities by the present survey.

Keywords: Wetland conservation, Okhla bird sanctuary, Threatened species, Avifauna, Biodiversity.

1. INTRODUCTION

The birds have been described as feathered biped or bipedal featured animals which are first four chambered heart containing warm blooded organisms. The birds have its own ecological significance and these are key stone natural resources apart from adding beauty to the nature as well as alarming contrivance to the environmental or climate changes (Brusatte et al., 2015). The unusual changes in the environment and subsequent climatic changes along with other factors are responsible for the declining of the avian population due to loss of loss of habitat, environmental pollution, hunting and

man-made activities. Therefore, it an urgent need for the conservation of these beautiful creation or natural resources so that the extensive recovery a species can be attained either by protecting the habitat before its get that far gone or by conservation of the original species before it vanished out from the environment. This is not to say that we should protect specific critically endangered species, but to focus also on protecting endangered areas as well before it is too late. The total number of bird species inhabiting the earth is about 8600 belonging to 2400 (Ali, 2002). The latest checklist showed that there are 2061 forms of birds, out of which about 300 are winter visitors, chiefly from the Palaearctic region to the north mostly supposed to be threatened (Gill, 2007). The large number of threatened birds occur in Asia and fewer in Africa, however the most of the endangered species of birds to be found in Indonesia, Brazil, Philippines and China, India, Columbia, Peru, Ecuador, United States, and Vietnam (Collar, 2001) (Fig. 1).

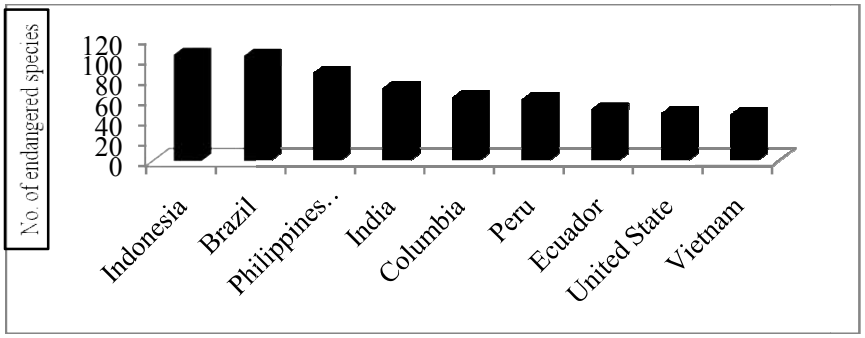

Figure 1: Global scenario of endangered avian fauna. (Source: N.J. Collar)

The IUCN Red list categories and criteria are meant for classifying species at high risk of global extinction. The aim of the system is to give an objective framework for the classification of the broadest range of species according to their extinction risk. However, while the Red list may focus attention on those taxa which are at the highest risk, it is not the sole means of setting priorities for conservation measures for their protection. Before 1994 the more subjective threatened species categories used in IUCN Red Data Books and Red lists had been in place, with some modification, for almost 30 years (Collar, 2001). According to IUCN the wild life has been classified as extinct, endangered, vulnerable, rare, and data not available. The endangered species are further classified as critically endangered (CR), endangered (EN), vulnerable (VU), near threatened (NT), and least concern (LC) (Fig. 2).

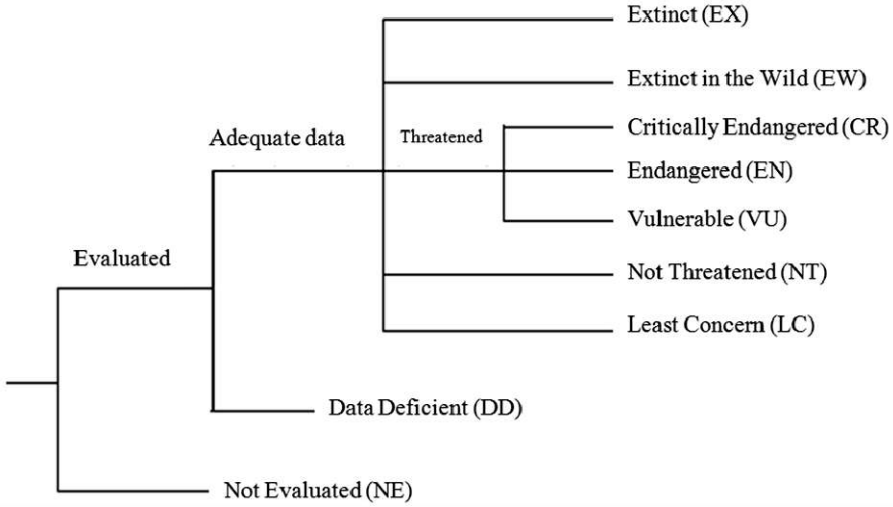

Figure 2: Cladogram showing categories of the threatened species. (Source: IUCN)

The earlier studies revealed that about 20% of bird population concerned to conservation out of these 70% are most endangered birds and having a population of less than 10,000 mature individuals. The most significant proportion of threatened species of birds was found in Philipines, Indonesia, Brazil, and Columbia. For the saving of avian fauna, there are worldwide protected areas have been created called as wildlife sanctuaries and reserve forests. In India a sum of 668 protected areas for wildlife are existing right now as per the protected area gazette notification database out of these about 24 protected areas are located in Uttar Pradesh (NWD, 2019) (Table 1).

Table 1: A glimpse of the protected areas (wildlife sanctuaries) located in Uttar Pradesh, India.

S. No.	Name of Protected Area	S. No.	Name of Protected Area
1.	Bakhira WLS	13.	Parvati Aranga WLS
2.	Chandraprabha WLS	14.	Patna WLS
3.	Dudhwa NP	15.	Ranipur WLS
4.	Hastinapur WLS	16.	Saman WLS
5.	Kaimur WLS	17.	Samaspur WLS
6.	Katerniaghat WLS	18.	Sandi WLS
7.	Kishanpur WLS	19.	Sohagibarwa WLS
8.	Lakh Bahosi WLS	20.	Sohelwa WLS
9.	Mahavir Swami WLS	21.	Sur Sarovar WLS
10.	National Chambal WLS	22.	Surha Tal WLS
11.	Nawabganj WLS	23.	Turtle WLS
12.	Okhala WLS	24.	Vijai Sagar WLS

(***Source:*** *Protected area gazette notification, UP*)

A recent study shows that India is estimated to have 45000 plant species and 81000 animal species representing 7% and 6.5% of world flora and fauna respectively. An important investigation report on bird gives the information about the loss of avian biodiversity. According to which about 50% biodiversity was lost in 40 years which is an irreparable loss to environment and society due to loss of habitats that has not only affected the iconic species but also lesser known reptiles and birds (IUCN SSC, 1994). The study shows that as much as 11% of the world's avifauna is at risk; but altogether 20% of the species given the reason for concern. The 70% of most endangered birds have a population less than 10,000 mature individuals. It was identified that habitat destruction was the major cause of thrashing or endangerment of avian fauna (Mace and Lande, 1991; Mace, and Kunin, 1994). The earlier study revealed that birds may endangered at different level that is at Global, National, regional or local levels. Collar et al. Mentioned that the large number of birds' species are at risk of endangerment. It was suggested that there is an urgent need to discover the new criteria for measurement of endangerment based on broadly applicable numerical threshold. Black (1991) recommended that the reintroduction is the key feature for recovery of lost or endangered species as well as several causes of the extinction of passenger pigeon was discussed by many ornithologists (Bucher, 1992; Collar et al., 1994; 1997). In Dibru Saikhowa Biosphere Reserve, Assam about five threatened species have been identified among the total 107 occurring bird species in the area (Allen, 2002). The present work has been done to study the diversity of threatened birds at Okhla Bird Sanctuary

2. MATERIALS AND METHODS

a. Site of investigation: Okhla Bird Sanctuary (OBS) officially known as Shaheed Chander Shekhar Azad Sanctuary is located in Noida, Gautam Buddh Nagar district, Uttar Pradesh, on Delhi-Uttar Pradesh state border (Lon UP 28°33'56.3" N, Lat 77°18'56.6" E; Lon Delhi 28°32'43.5" N, Lat 77°18'41.7" E) and known as a haven for over 300 bird species, especially water birds and covering an area of 4km^2 on the river Yamuna was designated a bird sanctuary by the Government of Uttar Pradesh under the Wildlife Protection Act, 1972. The most prominent feature of the sanctuary is the large lake created by damming the river, which lies between Okhla village to the west and Gautam Buddh Nagar to the east. Thus it is situated at a point where river Yamuna enters in the state of Uttar

Pradesh leaving the territory of Delhi (Fig. 3). It is one among fifteen bird sanctuaries in the state and having the rich animal diversity including protozoans to bird species of thorny scrub, grassland and wetland (Somasundaram et al., 2015).

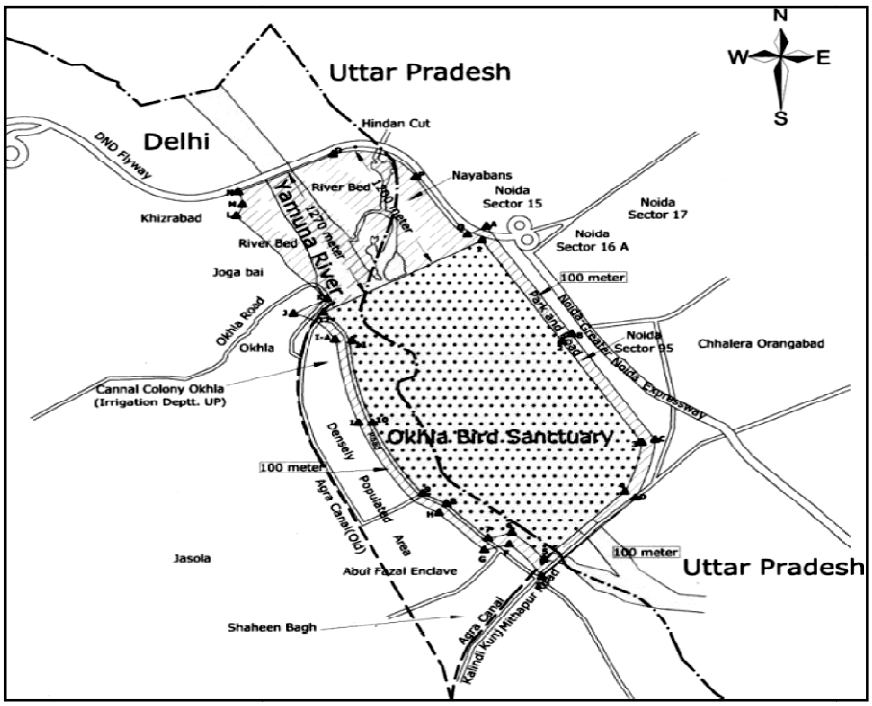

Figure 3: The map showing the location of Okhla Bird Sanctuary at the Delhi-Uttar Pradesh state border.

b. Survey: The work of survey was performed by the use of binoculars, camera, motorbike, oar boat, field stick etc. The findings are based upon the work conducted during yesteryear (2018) by the consecutive visit of survey site. The data of investigation based on the weekly during the period of investigation. The observations of various species were made while moving in an oar boat and walking along the OBS croplands, marshlands, riparian wetlands and natural areas. Besides actual sightings, inquiries from local people were also made to ensure the estimate of existing avifauna. The number of species in the OBS were recorded and tabulated in the register. The identification of birds was made with the available keys and 'Text book of Indian birds' by Ali (2002).

3. RESULTS

Out of the total occurring 302 species many species are migratory and many are threatened. Apart from these large number of local migratory and threatened birds could be observed in the sanctuary also including comb duck, coots, lesser whistling teal, Northern pintail, bar headed goose, common shell duck, marbled duck, pond heron, open billed stork, grey lag goose, sarus crane, egrets, flamingos, great white pelican, cormorants, cranes, white spoonbill, black naked stork, peafowl, cuckoos, darters, white breasted kingfisher, sandpipers, common teal, gadwall, mallard, spot billed duck, common pilchard, red crested pochard, ruddy shell duck, pigeon, painted stork, tufted duck, tufted pochard, lesser adjutant, etc. No significant deaths were reported from these wetland sites, except for Delhi zoo, which still remains under quarantine. Besides of the avian faunal diversity, more than 184 species of plants were recorded including herbal plants. Among them 121 species of herbs, 10 species of shrubs, 29 species of trees, 9 species of herbaceous climbers and 15 species of grasses were noticed during the period of investigation (Fig. 4). A variety of both native and exotic species of plants found to be occurred in OBS including patchy distribution of water hyacinth, water lettuce and submerged vegetation such as *Pistia, Hydrilla, Vallisnaria* etc. The reed beds, *Typha angusatata* and

Phragmites maxima are abundant along the deltas and banks providing habitat for birds of all kinds in the Sanctuary and may also be the excellent hiding, and roosting site for birds. About 11 species of threatened birds were recorded including species of critically endangered (CR) birds, species of nearly threatened (NT) birds recorded. Among the recorded avian species, there was 20 common resident water bird species and 44 common resident woodland species and 43 migratory water birds species and 26 migratory woodland bird species (Fig. 5). About 10 species of mammals includes nilgai, Indian mongoose, blacknaped hare, jackels, 08 species of reptiles, 03 species of amphibians are also notified during the investigation.

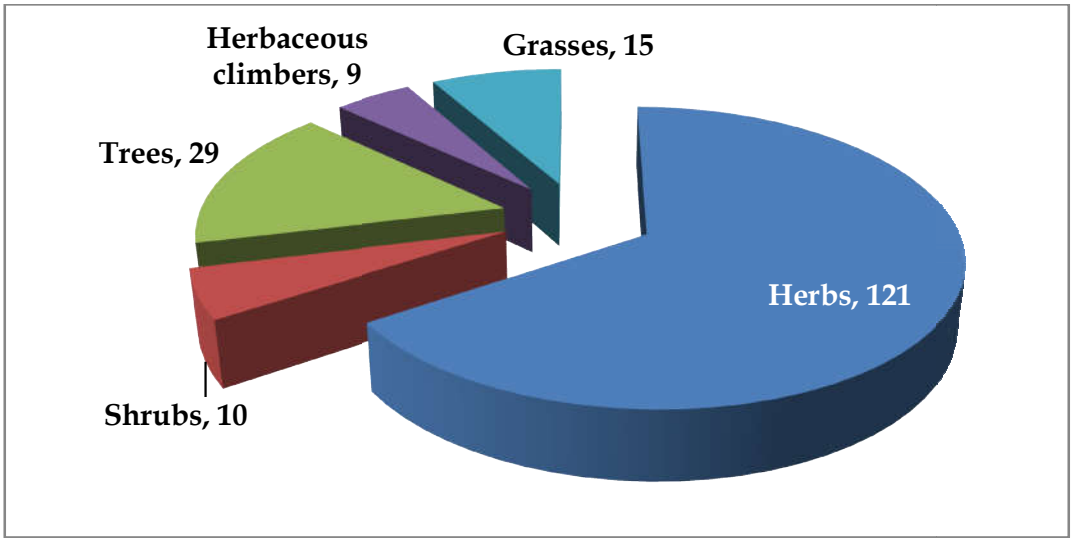

Figure 4: Pie chart showing phytodiversity at Okhla Bird Sanctuary based on the number of species.

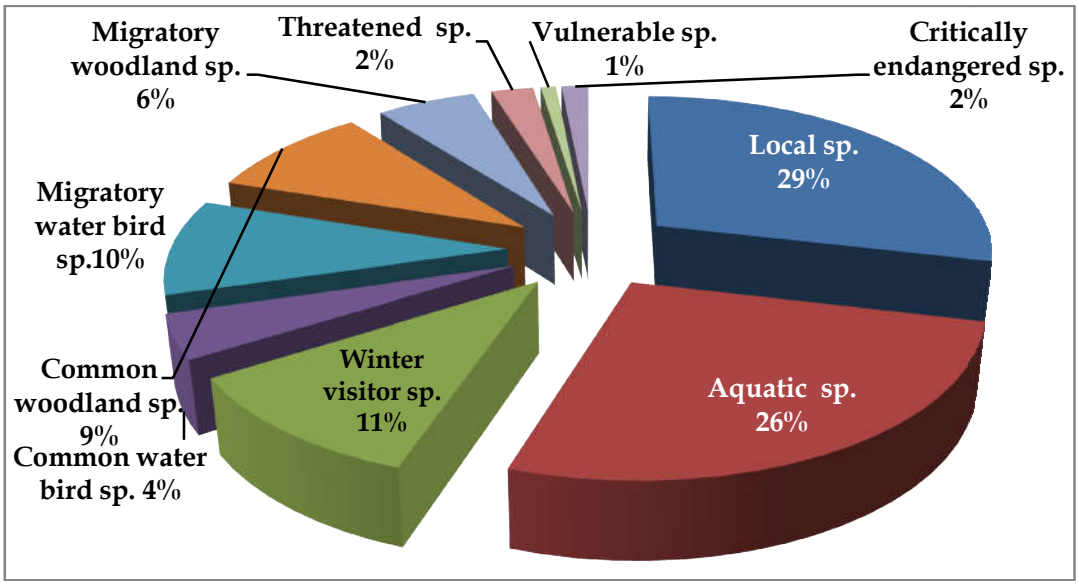

Figure 5: The distribution pattern of avian diversity at Okhla Bied Sanctuary showing the abundance of local and aquatic sp.

4. DISCUSSION

The sanctuary is home to more than 300 bird species, including the painted stork, darter and migratory birds like northern shoveller and gadwall. "The sanctuary is a haven for water birds," says biologist Urfi (2003). "The wintering ducks at Okhla are dependent upon the surrounding area, especially the grassy patches, and marshes around the barrage for feeding. Among the recorded birds species from Okhla Bird Sanctuary (OBS) about 48% were migratory, 39% are resident and 11% threatened and other 2% of unknown category corroborated to the earlier reports. About 42% were covering the local population on contrary to 40% as noticed by the earlier investigators. Likewise the total bird listed about 5% of threatened categories of birds in OBS including 3 critically endangered, 7 vulnerable, 2 near threatened and one conservation dependent species quite farther apart from the past reports report as 2 critically endangered, 9 vulnerable, 7 near threatened and one conservation dependent species. At a closer look it can be seen that nearly 50% of the birds reported are migratory (Urfi, 2003). Thus the bird population taking their usual and standard position reflected in present investigation which was found to be condensed of declined in the past years (Asian Bird Census, 2017). According to ABC-2017, sum of 6,183 birds were counted at the Okhla Bird Sanctuary on the first day of the census. The other ecologist TK Roy encountered 46 water bird species with a total population of 3,113 at the Okhla Bird Sanctuary as part of the Asian Water bird Census 2016. The population had attained nearly doubled position in only one year. In the year 2017-2018 more than 53 different birds have been spotted as per the report of Asian Water bird Census Delhi state coordinator, Wetlands International South Asia, published in Hindustan Times. About 1030 bird species were identified at the verge of extinction in 1988 however this number augmented to 1111 in 1994 (Collar et al., 1997). According to Moors (1985) most avian extinction was found in Island therefore, significant number of threatened birds was spotted as Island species now a day. The new IUCN criteria attach hypothetical probability of extinction to different categories of threat on the basis of which 400 species may be expected to become extinct if they are not given proper attention and, concern for their conservation because the loss of habitat was a main cause of their status.

5. CONCLUSIONS

The survey reflected the shrinkage in the number of species of birds this area supposed to be due to the man made activities and abrupt climate change. The current study showed that the habitat destruction, climatic condition and a veterinary preparation diclofenac are the main reasons of their present threatened status. Steps and measures should be taken to protect these wonderful creatures of nature apart from the inclusion of the subject Environment and Ecology in the syllabus practical approach should be developed seminars, workshops to save the threatened birds should be organised. Public awareness is also very important to attain the original task to wildlife and natural resources for sustainable development. The efforts aim to maintain and save the threatened species by the conservation of microhabitat, nesting behaviour, resources utilization and prohibition of man-made activities by the present survey.

ACKNOWLEDGEMENT

Authors are grateful to Head, Department of Biotechnology, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala (Haryana), India for his incessant support to the extension research work.

REFERENCES

1. Ali. S. (2002). The text book of Indian birds. Oxford University Press.
2. Allen, D. (2002). A bird survey of the Amarpur area of the Dibru Sarkhowa Biosphere Reserve, Assam, India. *Forktail* 18: 87-91.

3. Black, J.M. (1991). Reintroduction and restocking: Guidelines for bird recovery programmes. *Bird Conservation International* 1: 329-334.
4. Brusatte, S.L, O'Connor, J.K. and Jarvis, E.D. (2015). The Origin and Diversification of Birds. *Current Biology* 25(19): 888-898.
5. Bucher, E.H. (1992). The causes of extinction of the passenger pigeon. *Current Ornithology* 9: 1-36.
6. Collar, N. J., Crosby, M.J. and Stattersfield. A.J. (1994). The world list of threatened birds: Birdlife conservation series 4. Birdlife International, Cambridge UK.
7. Collar, N.J. (2001). Endangered bird (vol. 2). Bird life International, Encyclopedia of Biodiversity, Academic Press.
8. Collar, N.J., Wege, D.C. and Long, A.J. (1997). Patterns and causes of endangerment in the new world avifauna. Birdlife International, *Ornithological Monographs* 48: 237-260.
9. Gill, F.B. (2007). Ornithology (3rd ed). W.H. Freeman and Company, London.
10. IUCN Species Survival Commission (1994). IUCN Red List categories as approved by the 40th meeting of the IUCN Council, The World Conservation Union Gland Switezerland.
11. Mace, G.M. and Kunin, W. (1994). Classifying threatened species: means and ends. *Philosophical Transactions of the Royal Society of London (Biological Sciences)* 344(1307): 91–97.
12. Mace, G.M. and Lande, R. (1991). Assessing extinction threats: towards a reevaluation of IUCN threatened species categories. *Conservation Biology* 5(2): 148-151.
13. Moors, P.J. (1985). Conservation of Island birds. International Council for Bird Preservation, Cambridge, UK.
14. National Wildlife Database (2019). ENVIS Centre on Wildlife & Protected Areas. Wildlife Institute of India, Ministry of Environment, Forest & Climate Change, Govt of India.
15. Somasundaram, S., Abraham, J.S., Gupta, R., Makhija, S. and Toteja, R. (2015). Diverse freshwater spritrich ciliate fauna from Okhla Bird Sanctuary, Delhi, India. *Global Journal of Research Analysis* 4(9): 2277-8160.
16. Urfi A.J. (2003). The birds of Okhla Barrage bird Sanctuary, Delhi, India. *Forktail* 19: 39- 50