

AVIAN SPECIES DIVERSITY IN SATHURUKONDAN WETLAND MANGROVE HABITAT, BATTICALOA DISTRICT, SRI LANKA

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ABSTRACT

Avifauna are playing significant role in ecosystem and highly interrelated with biotic and abiotic condition of habitats. Wet land ecosystem is the best and important place for breeding and foraging site as well as shelters of avifaunal species. Wet lands with mangrove habitats are considered as excellent biodiversity hot spots. The present study carried out during the period of September 2017 to assess the avian species diversity in Sathurukondan mangrove habitat. The prime objectives of the study are to ensure the avian species diversity in Sathurukondan wet land mangrove habitat and to get familiar with residential as well as migratory birds present in particular habitat. The bird counting was done by point count method within ten randomly selected sampling points. Totally 447 individuals of 36 avian species representing 22 families were recorded during the study period. Out of 36 species 3 were migratory bird species and others were breeding resident. Gull billed tern (*Gelochelidon nilotica*), Common redshank (*Tringa totanus*) and Common sand piper (*Actitis hypoleucos*) were recorded as migratory birds. Little egret (*Egretta garzetta*) and Lesser whistling duck (*Dendrocygna javanica*) were the most abundance species in this region. The Shannon index (3.19) and Simpson's diversity index (0.95) were clearly shows that, the Sathurukondan mangrove habitat site owning rich avifaunal diversity. This also ensures that, the area coming under the Important Bird Area (IBA). Proper management and protection against anthropogenic activities are necessary to enhance the existence of avian species diversity.

Keywords: Birds, species diversity, Sathurukondan wetland

INTRODUCTION

Wetlands are simply habitats with permanent or temporary accumulation of water with associated floral and faunal communities. These are the most productive ecosystem that having high bio diversity in nature, and many flora and fauna depending on these places for their survival (Green, 1996). Wet land ecosystem is the best and important place for breeding and foraging site as well as shelters of avifaunal species (Shapuor *et al.*, 2013). Wet lands are worldwide hold more than 40% of bird species and about 12% of other faunal species (Rajpar and Zakaria, 2010). The distribution and type of animals are determined by the distribution of plants in the ecosystem (Gunaratne and Gunatilleke, 2003; Thanusanth and Ahamed, 2018). Wet lands with mangrove habitats are considered as excellent biodiversity hot spots. Mangroves are well tolerant to the wet land ecosystem and its support many faunal species include birds. Some faunal species totally depend on mangrove habitat to better survival (Ahamed and Dharmaretnam, 2016). But in recent

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days wet lands and mangrove ecosystems are the most threatened habitats because of their vulnerability and attractiveness by anthropogenic activities (Giri and Chalise, 2008).

Sri Lanka is an island located in Indian Ocean which owing enriched avifauna diversity, about 439 species were recorded so far with 236 breeding resident and 203 purely migrant species. Among 33 species are endemic to it (Kotagama and Ratnavira, 2010). Owing to this diverse nature and endemism, Sri Lanka has been renowned as a country with “Important Bird Areas” (IBA) (Surasinghe and Alwis, 2010). According to the high bird diversity nature wet lands act as one of the most birding site. In Batticaloa district Sathurukondan and Urugamam are named as IBA and in this Sathurukondan Birding site coming under migratory disperse way from the Eastern route and Andaman route entries (Kotagama and Ratnavira, 2010). Sthurukondan is one of the well-known mangrove habitat wet land which supports many faunal species include residential and migratory birds by its productive nature. So we initiate the study on Sathurukondan birding site to ensure the current status of avian species diversity in this wet land mangrove habitat ecosystem and to get familiar with residential as well as migratory birds present in particular habitat.

METHODOLOGY

Study area

The study area lied between the Geographical coordinates 7° 44' 12" N and 81° 39' 47" E in Batticaloa district, Eastern province, Sri Lanka (Figure 1). The total area extend about 1 km² and 6.17 km in perimeter. It situated near to the urban area of Batticaloa and adjacent to Batticaloa lagoon. This area comming under the migrant disperse route from the Eastern and Andaman route entries of Sri Lanka. Study site having marshy land in nature and associated with large belts of mangroves, which support the bio diversity nature.



Figure 1. Map of study area (Source: Google Earth Pro, 2018)

Methodology

Study was carried out on September 2017, during day time (0600h to 1800h). The bird count was directed using point count technique. Within a standard period of time (usually 8 to 10 minutes), bird records consisted of individuals by seen directly or with the help of 8x40 binoculars (Nikon, USA) from a fixed point. A survey consists of a series of such counts done at randomly selected ten various points within the study site because this site having water locked areas and dense mangrove patches (Somenzari *et al.*, 2011). Clear photographs were taken by using digital camera (Canon EOS 1100 D, Japan) for further confirmation of species, and observed birds were identified using bird guide books (Kotagama and Ratnavira, 2010; Grewal *et al.*, 2002). The species diversity were measured by using Shannon diversity index and Simpson's diversity index (Usher, 1983) as follows.

Shannon-wiener diversity index, $H = \sum |p_i \times \ln p_i|$

Where p_i is proportion of the total number of individuals in the population of i^{th} species.

Simpson's diversity index, $D' = 1 - \frac{\sum n \times (n-1)}{N \times (N-1)}$

Where n is total number of individuals of particular species, N is total number of organisms of all species.

DISCUSSION AND RESULTS

Total of 447 individuals of 36 avian species representing 22 families were recorded throughout the study period. Out of 36 species 3 were migratory bird species and others were breeding

resident. Gull billed tern (*Gelochelidon nilotica*), Common redshank (*Tringa totanus*) and Common sandpiper (*Actitis hypoleucos*) were recorded as migratory birds. Water dependent birds such as little cormorant (*Phalacrocorax niger*), Little egret (*Egretta garzetta*) and Lesser wistling duck (*Dendrocygna javanica*) were the most abundance species in this region. Owing to the favorable conditions for foraging and breeding, some species also having their own nesting patches in this area. Shannon index (H) and Simpson's diversity index (D') of study site were 3.19 and 0.95 respectively. These findings clearly shows that, the Sathurukondan mangrove habitat having rich avifaunal diversity.

Table 1 shows the bird species observed in the study site during the study period with their respective families, their residential and general abundance status of them. Total number of individuals of each species also mentioned in the table.

Where, BrR is Breeding Resident, M is Migrant, VC is Very Common and C is Common.

Table 1: Recorded avian species in Sathurukondan mangrove habitat

No	Common name	Family	Residential status	Abundance Status	Individuals
1	Black-headed Ibis	Threskiornithidae	BrR	C	14
2	Lesser-wistling duck	Anatidae	BrR	VC	31
3	Little egret	Ardeidae	BrR	VC	35
4	Intermediate egret	Ardeidae	BrR	C	18
5	Great egret	Ardeidae	BrR	C	17
6	Cattle egret	Ardeidae	BrR	VC	9
7	Indian cormorant	Phalacrocoracidae	BrR	C	8
8	Little cormorant	Phalacrocoracidae	BrR	VC	47
9	Oriental darter	Anhingidae	BrR	C	3
10	Indian pond-heron	Ardeidae	BrR	VC	25
11	Purple heron	Ardeidae	BrR	C	3
12	Grey heron	Ardeidae	BrR	C	4
13	White-breasted water hen	Rallidae	BrR	VC	6
14	Purple swamphen	Rallidae	BrR	VC	32
15	Painted stork	Ciconiidae	BrR	C	4
16	Red wattled lapwing	Charadriidae	BrR	VC	18
17	Black-winged stilt	Recurvirostridae	BrR	C	12
18	Gull billed tern	Laridae	M	C	16
19	Common redshank	Scolopacidae	M	C	2
20	Common sandpiper	Scolopacidae	M	C	7
21	Eurasian thick-knee	Burhinidae	BrR	C	1
22	Little green bee-eater	Meropidae	BrR	VC	12

23	Pied kingfisher	Alcedinidae	BrR	C	1
24	Stork-Billed kingfisher	Alcedinidae	BrR	C	1
25	White-throated kingfisher	Alcedinidae	BrR	VC	3
26	Yellow-billed babbler	Timaliidae	BrR	VC	12
27	Indian roller	Coraciidae	BrR	C	4
28	Common myna	Sturnidae	BrR	VC	24
29	Asian koel	Cuculidae	BrR	C	1
30	Greater coucal	Cuculidae	BrR	VC	2
31	Plain prinia	Cisticolidae	BrR	VC	3
32	Brahminy kite	Accipitridae	BrR	C	25
33	Spotted dove	Columbidae	BrR	VC	15
34	Rock Pigeon	Columbidae	BrR	VC	6
35	Jungle crow	Corvidae	BrR	VC	4
36	House crow	Corvidae	BrR	VC	22
Total number of individuals					447

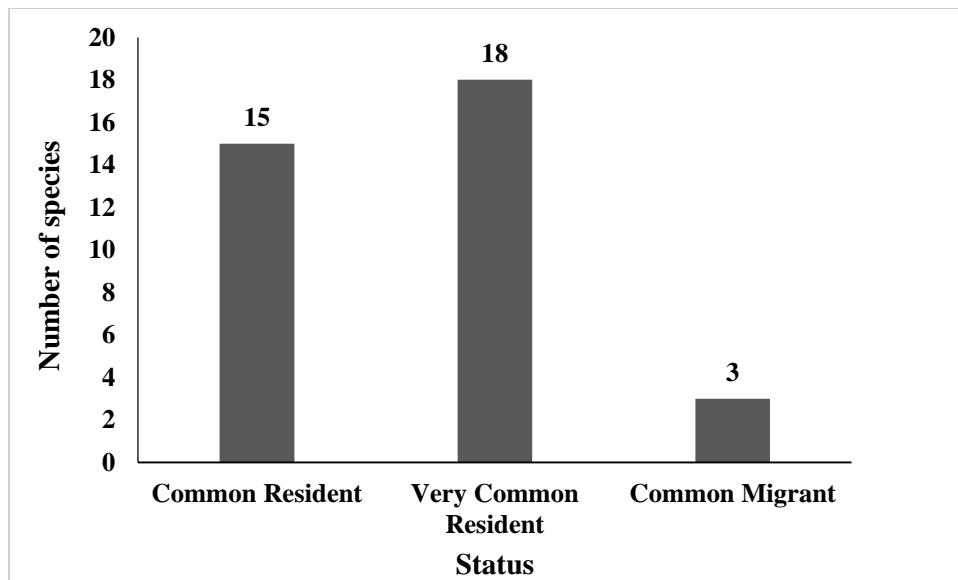


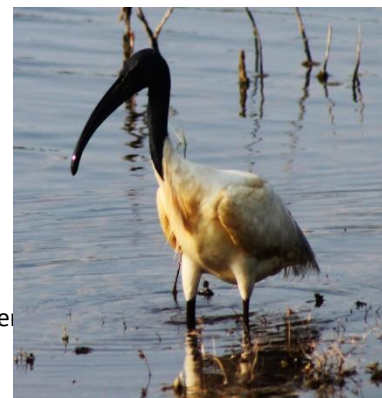
Figure 2: status of birds



Little cormorant



Lesser whistling duck



Black-headed Ibis



Red wattled lapwing



Black-winged stilt



Purple swamp hen



Grey heron



Purple heron



Indian pond-heron



Brahminy kite



Common redshank



Common sandpiper

Figure 3: very common and common resident birds

Figure 2 shows the general abundance status of avian species recorded in this region during the study period. The findings revealed that very common resident bird species are most abundant (about 50%) and common migrant species are less abundance (about 8%) in this habitat (Figure 3). There were no any endemic species observed throughout the study. The well grown mangrove patches along with shallowest water logging areas and marshy biofilm layers highly support the existence of avian species with ensuring dominancy of aquatic birds.

CONCLUSION

The results and findings clearly figure out that, the Sathurukondan wet land mangrove habitat consisting high avifaunal diversity in nature. The marshy wet land combine with mangrove ecosystem was give favorable condition to the survival of many flora and fauna. According to this productive nature many species of water birds as well as terrestrial birds use this site as foraging, nesting and breeding habitat. The findings of migratory birds clearly shows that, this area coming under the migratory disperse way. The high avian diversity of Sathurukondan birding site also ensures that, the area coming under the Important Bird Area (IBA).

RECOMMENDATIONS

Saturukondan wet land having large patches of mangrove ecosystem which one of the main factor influence the avian species diversity in this region. But in present situation mangrove destruction and land encroachment like anthropogenic activities are highly impact on the existence of avifauna. So proper management and protection against this kind of activities are necessary to enhance the existence of avian species diversity. Further long term studies with seasonal comparison will be helpful to understand the dynamic nature of particular mangrove habitat.

REFERENCES

- Ahamed, R., & Dharmaretnam, M. (2016), Relationships between Nesting Activities of Cichlids and Vegetation in Batticaloalagoon, Sri Lanka. *Bulletin of Environment, Pharmacology and Life Sciences*, 5, 7.
- Giri, B., & Chalise, M. K. (2008). Seasonal Diversity and Population Status of Waterbirds in Phewa Lake, Pokhara, Nepal. *Journal of Wetlands Ecology*, 1 (1/2), 3-7.
- Green, A. J. (1996). Analyses of Globally Threatened Anatidae in Relation to Threats, Distribution, Migration Patterns and Habitat Use. *Conservation Biology*, 10 (5), 1435-45.
- Grewal, B., Harvey, B., & Pfister, O. (2002). *A Photographic Guide to the Birds of Sri Lanka & India*. Periplus Editions (Hong Kong) Ltd.
- Gunaratne, A. M. T. A., & Gunatilleke, C. V. S. (2003). "Avifaunal Diversity and Plant-Bird Interactions in Three Selected Habitats of Lower Hantana (Campus Land), Sri Lanka." *The Sri Lanka Forester*, 26, 41-52.
- Kotagama, S. W., & Ratnavira, G. (2010). *An Illustrated Guide to the Birds of Sri Lanka*. Colombo, Sri Lanka: Field Ornithology Group of Sri Lanka.



- Rajpar, M. N., & Zakaria, M. (2010). Density and Diversity of Water birds and Terrestrial birds at Paya Indah Wet land Reserve, Selangor Peninsular Malaysia. *Journal of Biological Science*, 10 (7), 658-666.
- Shapuor, Z., Javad, R., & Ali, A. (2013). Site-Selection of Optimal Sites for Bird watching to Ecotourism and Hospitality Development in International Qurigol Wetland. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 12 (5), 30-36.
- Somenzari, M., Silveira, L.F., Piacentini, V.Q., Rego, M. A., Schunck, F. & Cavarzere, V. (2011). Birds of an Amazonia-Cerrado ecotone in southern Pará, Brazil, and the efficiency of associating multiple methods in avifaunal inventories. *Revista Brasileira de Ornitologia*, 19, 260-275.
- Surasinghe, T.D. & De Alwis, C. (2010). Birds of Sabaragamuwa University campus, Buttala, Sri Lanka. *Journal of Threatened Taxa*, 2(5), 876-888.
- Thanusanth, S., & Ahamed, R. (2018). Avian species diversity and its distribution in eastern university, sri lanka. *International Journal of Agriculture, Forestry and Plantation*, 7.
- Usher, M. B. (1983). Species Diversity: A Comment on a Paper by W. P Yapp. *Field Studies*, 5, 825-832.