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Avian Diversity of Vellayani Lake in Thiruvananthapuram District, Kerala, South India

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***Abstract*: The study was focused on the avifauna of Vellayani Lake which is the largest fresh water lake in Thiruvananthapuram district, Kerala. The diversity and various components of bird fauna were studied from October 2017 to March 2018. Direct observation and the Total count method were employed to conduct the census of the birds. Weekly counts were noted accurately and 24 species of birds belonging to 16 families were recorded. Statistical tools, tables and figures were used for calculating the Simpson diversity index, abundance and frequency. The Grey headed swamp hen is the most abundant bird (0.3364) present in Vellayani lake with a lowest Simpson index rate (D) of 0.8869. Asian open bill has the least abundance value (0.0003). Barn swallow was the only one migrant bird, which was recorded from the study area. This wetland ecosystem is highly polluted due to the agricultural practices and encroachment.**

***Keywords*: Asian open bill, Grey headed swamp hen, Vellayani Lake.**

1. Introduction

Wetlands are important habitats for birds, which use them for feeding, roosting, nesting and rearing young (Weller 1999; Stewart 2001). Expansive studies on wetlands and their avifauna have been carried out in different geographic areas. Kerala is one of the biodiversity rich states of India that is well known for its wetlands with a total area of 160,590 ha. The Vellayani Lake forms the major drinking and irrigation water resource for the people inhabited in that area. The lake is a rich repository of flora and fauna, and its biodiversity supports the livelihood of people around the lake. Food accessibility in enormous quantity constitutes one of the major requisites of birds. So many birds are attracted to this study area by this factor. The Lake and the adjoining Punchakkari wetlands are the prominent biodiversity areas. According to the reports of Kerala State Council for Science Technology and Environment, the lake is a habitat to nearly 92 species of wetland birds and 37 species of fishes. This area also supports excellent population of butterflies and dragonflies.

2. Materials and Methods

The avian diversity of Vellayani Lake was studied from October 2017 to March 2018.This area lies between Latitude 8.4233° or 8° 25' 23.7" N and Longitude 76.9934° or 76° 59' 36.2" E.

Direct observation and Total count method were employed to conduct the census of the birds. During canopy watching, the observer made use of high ground, slopes, hill sides or high elevations to increase the chance of watching the canopy species. Some species (e.g. parrots and pigeons) roost communally and could be counted while flying to and from the roost at dawn and dusk. Ground birds and flocks could be detected using fast pace method of watching; slow walking was better for detecting canopy species. To detect the under storey species the observer used various techniques like frequent stops and listening for the movements such as rustling of leaves. The alpha diversity can be calculated using Simpson diversity index.

3. Result and Discussion

A total of 24 species belonging to 16 families were recorded from Vellayani Lake (Table: 1).Among these 17 species were common resident of the lake. Six of them are resident or sometimes seems to be local migrant in search for food. Barn swallow was the only one migrant bird species, recorded from the study area. A total of 15,754 birds were recorded during the study period. The Grey headed swamp hen is the most abundant bird (0.3364) (Figure: 1) and present in the lake with a lowest Simpson index rate (D) of 0.8869 (Figure: 2). Asian open bill has the least abundance value (0.0003) (Figure: 1).The bird's frequency rates with 100% are belongs to resident waterfowl community (Figure: 3).

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Table 1
Avian diversity of Vellayani Lake

S.No	Common Name	Scientific Name	Family	status	
				lake	IUCN
1	Asian Open bill stork	*Anastomus oscitans*	Ciconiidae	LM	LC
2	Baya weaver	*Ploceus philippinus*	Ploceidae	R	LC
3	Barn swallow	*Hirundo rustica*	Hirundinidae	M	LC
4	Black drongo	*Dicrurus macrocercus*	Dicruridae	R	LC
5	Brahminy kite	*Haliasturindus Indus*	Accipitridae	R	LC
6	Cattle egret	*Bubulcus ibis*	Ardeidae	R/LM	LC
7	Common kingfisher	*Alcedo atthis*	Alcedinidae	R	LC
8	Common myna	*Acridotheres tristis*	Sturnidae	R	LC
9	Darter	*Anhinga rufa melanogaster*	Anhingidae	R/LM	NT
10	Greater Coucal	*Centropus sinensis parroti*	Cuculidae	R	LC
11	Green bee-eater	*Merops orientalis*	Meropidae	R	LC
12	Grey-headed Swamphen	*Porphyrio poliocephalus*	Rallidae	R	LC
13	House crow	*Corvus splendens*	Corvidae	R	LC
14	Ibis (Black headed)	*Threskiornis melanocephalus*	Threskiornithidae	R	NT
15	Indian pond heron	*Ardeola grayil*	Ardeidae	R	LC
16	Intermediate egret	*Mesophoyx intermedia*	Ardeidae	R/LM	LC
17	Little cormorant	*Micro carboniger*	Phalacrocoracidae	R/LM	LC
18	Little egret	*Egretta garzetta*	Ardeidae	R/LM	LC
19	Pied kingfisher	*Ceryle rudis*	Alcedinidae	R	LC
20	Purple heron	*Ardea purpurea*	Ardeidae	R	LC
21	Rose ringed Parakeet	*Psittacula krameri manillensis*	Psittacidae	R	LC
22	The great egret	*Ardea alba*	Ardeidae	R	LC
23	White breasted water hen	*Amaurornis phoenicurus*	Rallidae	R	LC
24	White-throated kingfisher	*Halcyon smyrnensis*	Alcedinidae	R	LC

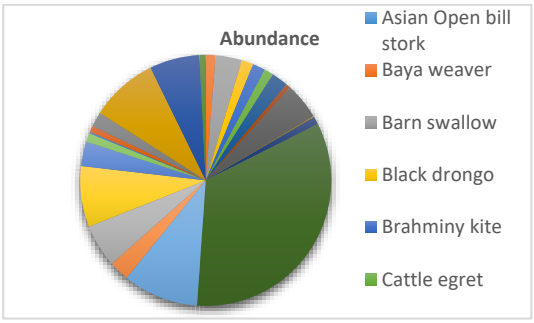

Fig. 1. Abundance of species

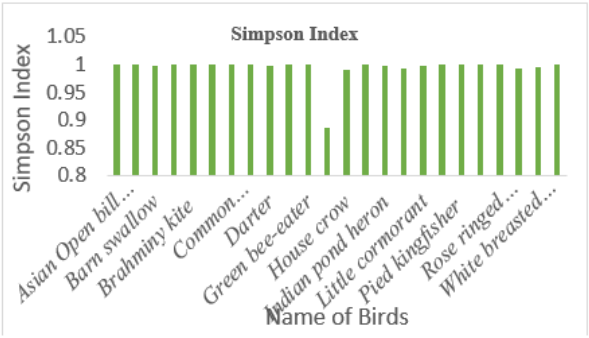

Fig. 2. Simpson index

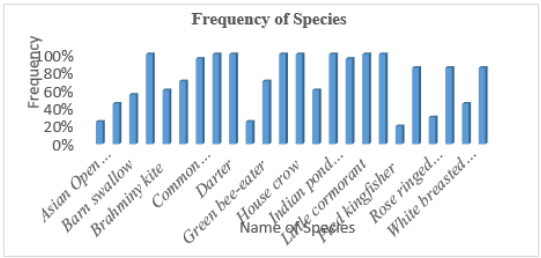

Fig. 3. Frequency of species

Wetlands provide the critical habitat for many such organisms to survive (Buckton, 2007).As the Lake has rich repository flora and fauna, it support livelihood for many of the local people surrounding it.Several species of migratory birds have been documented over the years from Vellayani Lake and the neighboring area. Many studies have pointed out that water depth affects waterfowl diversity (Isola et al 2002).The water depth plays a significant role in bird diversity, abundance and also in foraging and open deep water is most suitable for both divers and swimmers (Ajitha &Boby 2015).During the study period it was found that Vellyani lake provides an ideal habitat for Little cormorants and Darters.

From the count of 15,754 birds, the Grey headed swamp hen is the most abundant bird (0.3364) present in Vellayani lake with a lowest Simpson index rate (D) of 0.8869. This shows that grey headed swamp hen is more diverse due to the availability of food and good habitat. The birds such as Black Drongo, Common myna, House crow, Grey headed Swap hen, Darter, Indian pond heron, Little cormorant, Little egret were present during every day of visit. The birds' frequency rate with 100% are belongs to resident waterfowl community .Of the migratory birds such as barn swallow and several local migrants were spotted. During the harvest season, Rose ringed Parakeet, Pigeon and Baya weaver's count increased in the daily count of birds. Also there was a prominent increased in the daily count of birds during the harvest time. So we can declare that the bird count increases in the harvest period. The field present in the right side of the lake is flourished with agricultural crops also. This is also a reason for the presence of birds in this region.

4. Limitations of the Study

During the study period, the sudden seasonal change disturbed the migratory pattern as well as the crop production

in that area. The study was conducted only on the weekend days. Increase in pollution results in the decline of migratory birds. Due to the limitations, even though January – March is the migratory season in Vellayani Lake, spotting the migratory birds was difficult.

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