Research Article

SEASONAL DIVERSITY OF BIRDS AT MAVOOR WETLAND, KERALA

Shaheer Ansari, V.*, Ali Akshad, M., Sathick, O. and Amsath, A.

Department of Zoology, Khadir Mohideen College, Adirampattinam 614 701, Tamil Nadu, India

ABSTRACT

The diversity index of avifauna changed in the different months by the change in species composition. During the winter season, the number of resident and migratory species is increasing in number and local migratory species also changing the constancy in diversity. The flock of lesser whistling teal local movement happened during the favorable condition in Mavoor wetland. At Mavoor water birds, Dominance D is the highest index is 0.3339 in the month of October; the lowest value is 0.24 in the month of May. Shannon H is the highest index is 2.171 August and the lowest index is 1.091 in December. Evenness e^H/S: Highest is 0.7973 in August and the lowest 0.486 in March. Margalef species richness is highest in 3.135 and lowest 1.961 in the month of august At Mavoor non-water birds, Dominance D: Highest index 0.7133 in the month of May, and the lowest index is 0.542 in January. Shannon H: Highest index is 3.244 in the month of March, and the Lowest index is 0.9854 in January. Evenness e^H/S is the highest value 0.7863 in the month of November and 0.469 is the lowest value. Margalef richness is the highest 3.244 in the month of March and the lowest value 0.9854 in the month of January 2017.

Keywords: Wetland, Species Diversity, Seasonal Changes, Little cormorant.

INTRODUCTION

Wetlands are defined as areas of marsh, ponds, swamps, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including that of marine water the depth of which at low tide does not exceed six meters (IUCN,1971) Water birds are most important component of most of wetland ecosystem, because they occupy several trophic levels in the food web of wetland nutrient cycles. Moser & Summers, (1987) Water birds are broadly can be defined as 'birds ecologically dependent on wetlands and include recognized groups popularly known as wildfowl, waterfowl and shorebirds and waders (Jayson, 2002). Wetlands are important habitats for birds, which use them for feeding, roosting, nesting and rearing young (Weller, 1999) Water birds and aquatic plants (Perennou, 1989) .

MATERIALS AND METHODS

Counting methods for bird community

The regular census of avifauna was conducted and bird population and diversity was estimated by total count method and line transects method. In this method, birds were counted using binocular (80 x 30) Birds were identified based on physical features with the help of field guides and reference books

Study area

Mavoor, Thengilakkadavu wetland situated around (11.2604° N, 75.9391° E) 20 kms from the city of Kozhikode, Kerala. As different area of it spread about 50 hectors of wetlands. The wetland is enriched with rich diversity of plants, which include floating, submerged and emergent vegetation. The various types of angiosperm and gymnosperm in this wetland and associated places of wetland are *Eragrostis Paniculata, Eichornia Crassipes, Salvinia Molesta, Azolla Pinnata,Vallisneria Nattans, Hygrophila Salcifolia, Eclipta prostrate, Potamogeteon pectinatus, Salvinia molesta, Kyllinga Brevifolia, Pandanus tectorius, Lygodium flexuosum* and *Syzygium Caryophyllatu.*

Community structure of avifauna Species diversity

Species diversity is widely used terms in ecology and

natural resource management (Hamilton, 2005). Species diversity is commonly used representation of ecological diversity Environmentalist have found species diversity difficult to define and measure, and this may in fact reflect the possibility that it is a 'non-concept' In general, there have been two aspects to measuring species diversity, (MacArthur & MacArthur, 1961).

Species richness

Species richness, defined as the number of species per unit area, or we can say that the simplest measure of biodiversity. Understanding the factors that affect and are affected by small-scale species richness is fundamental to community ecology. Species richness measures are typically separated into measures of alpha beta and gamma diversity (Whittaker, 1972).
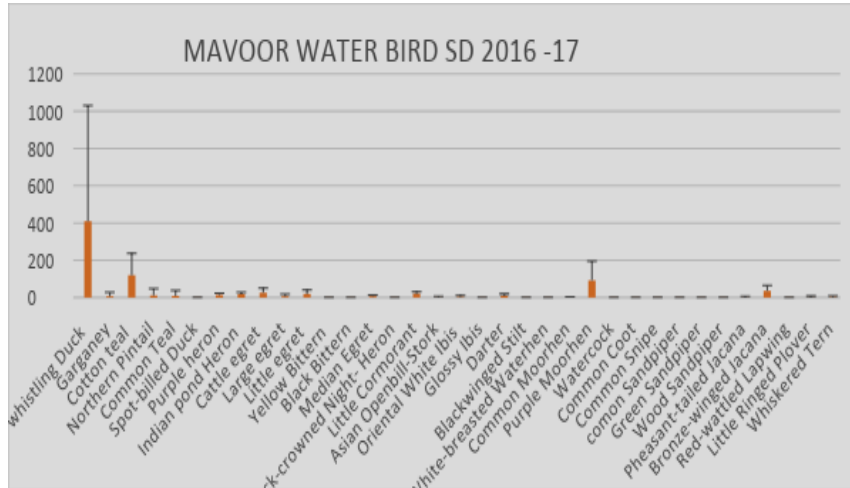

Figure 1. Seasonal combined annual mean diversity.

Species evenness

The distribution of individuals over species is called evenness. It helps sense to consider species richness and species evenness like two independent characteristics of biological communities that together contain its diversity.

Diversity indices

Measurement of diversity the type of diversity used here is α- diversity which is the diversity of species within a community or habitat. The diversity index was calculated by using the Shannon – Wiener diversity index.

Simpson dominance index

Simpson Index (D) = $D = \Sigma n(n - 1) / N(N - 1)$.

RESULTS AND DISCUSSION

Occurrence of species July 2016 to June2017 During the second year of my study period (from July 2016 to June 2017) a total number of 69 species were observed from mavoor wetland, which included both water birds and non-water birds (Subramanya, 1996). The number of water birds at Mavoor wetlands are given in Figure 1-3.
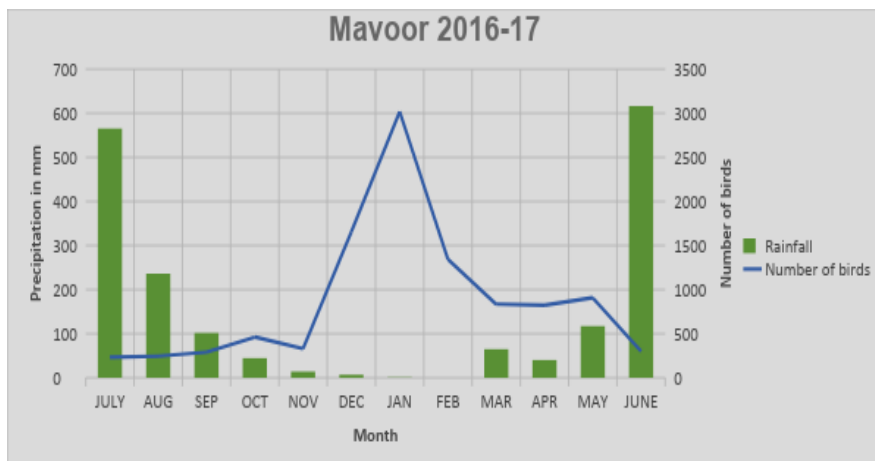

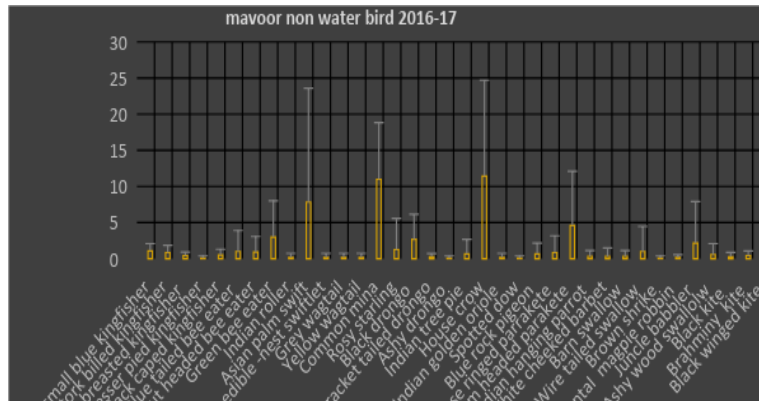**Figure 2**. Seasonal combined annual mean diversity.

Figure 3. Seasonal combined annual mean diversity

The relation of precipitation with number birds, Number of birds is few in rainy season in mavoor, and in wintering season the number of birds is increasing. In high temperature and absence of precipitation, the number of avifauna became decreases (Ravindran, 1992).

Figure 4. Egrets and teals at mavoor wetland.

Figure 5. Little cormorants at Mavoor wetland.

Figure 6. Darter, cormorants, oriental white ibis at Mavoor. wetland

Figure 7. Spot billed duck ,Mavoor wetland.

Table 1. Alpha diversity values (seasonal mean diversity of water birds) of water birds at Mavoor.

Diversity Parameters	Monsoon	Post monsoon	Pre monsoon
Dominance_D	0.1292	0.4472	0.1986
Shannon_H	2.266	1.423	2.022
Evenness_e^H/S	0.567	0.1383	0.2221
Margalef	3.084	4.126	4.855

Table 2. Alpha diversity values (seasonal mean divercity of non water birds) of Non- water birds at Mavoor.

Diversity Parameters	Monsoon	Post monsoon	Pre monsoon
Dominance_D	0.1063	0.1438	0.1347
Shannon_H	2.544	2.377	2.413
Evenness_e^H/S	0.6062	0.3714	0.399
Margalef	5.498	6.569	6.421

The count of birds was high at morning and less at afternoon, but in mavoor vise verse. Usually lesser whistling teal and cotton teal were located as separated flock in mavoor wetland. Normally other resident birds were recorded in this period .Succeeding month there were a decline in wintering bird, as in minimum number of wetland birds like lesser teal and Cotton Teal. In April, the number of resident birds, purple moorhen was recorded (Table 1- 2) maximum number, and temperature was too high. The major threat to avifauna are the dense growth of verities of grass , like *Actinocirpus grossus, Eragrosis viscosa, Pancum species, Cyprus iria, Panicum repens,* etc. were prevent smooth movement and walking of birds through wetland. And also plants like *Nymphaea nouchali, Salvinia molest*a, etc. were deposited in high manner throughout the wetland (Menon, 1981).

CONCLUSION

Shannon H: Highest index is 3.244 in the month of March, and lowest index is 0.9854 in January. Evenness e^H/S: is highest value 0.7863 in the month of November and 0.469 is the lowest value. Margalef richness: Are highest 3.244 in the month of March and lowest value 0.9854 in the month of January.

ACKNOWLEDGMENT

REFERENCES

Hamilton, A.J. (2005). Species diversity or biodiversity *Journal of Environmental Management, 75*(1), 89-92.

IUCN, (1971). Birds of kole wetlands, Thrissur, Kerala. *Zoos' Print Journal, 15*(10), 344-349.

Jayson, E. (2002). Ecology of wetland birds in the Kole lands of Kerala. *Kerala Forest Research Institute Research Report 2002a, 244*, 102.

MacArthur, R.H., & MacArthur, J.W. (1961). On bird species diversity. *Ecology, 42*(3), 594-598.

Menon, G.K. (1981). Cattle egrets feeding in association with human workers. *Wilson Bulletin, 93*(4), 549-550.

Moser, M., & Summers, R. (1987). Wader populations on the non-estuarine coasts of Britain and Northern Ireland: results of the 1984–85 Winter Shorebird Count. *Bird Study, 34*(1), 71-81.

Perennou, C. (1989). Southern wintering range of some waterbirds. *Journal of Bombay Natural History Society, 86*(2), 247-248.

Ravindran, (P.K.) 1992. Breeding of Purple Moorhen in Kole wetland, India. *Newsletter Bird Watchers, 32* (11-12), 13.

Subramanya, S. (1996). Distribution, status and conservation of Indian Heronries. *Journal of Bombay Natural History Society, 93*(3), 459-485

Weller, M.W. (1999). *Wetland Birds: Habitat Resources and conservation Implications*. Cambridge University Press.1-316.

Whittaker, R.H. (1972). Evolution and measurement of species diversity. *Taxon*, 213-251.