

AVIAN DIVERSITY OF MAVOOR – THENGILAKKADAVU WETLAND-KERALA

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ABSTRACT:

At mavoor ,major resident type of birds like Lesser whistling Duck and Cotton Teal were most abundant during wintering and succeeding months. The maximum number of 69 species were reported from mavoor , among them 33 species were non water birds and 36 species were water birds. 31 families were recorded in the year of 2016-17. A maximum number of 3018 birds were recorded in January (precipitation:1.6mm and the temperature was 35.0). In June, the number of birds were only 302 numbers during high precipitation (616.8mm) the recorded temperature was 30. Most of the migratory species were recorded in post monsoon . seasonal abundance of Lesser whistling Duck , cotton teal , Purple Moor hen etc very important in study , because they were most resident species recorded at mavoor. Lesser whistling duck found maximum in post monsoon season, and less in monsoon. Cotton teal found very less in monsoon, purple moorhen were absent in monsoon. Abundance of birds were less in monsoon season.

mavoor is a better attractive place for resident birds , especially ducks and also migratory species of water birds or Non water birds .Only 23 % were migratory , 66% were Resident , and 7.24% were local migratory among the total population of avifauna.

Key words: Cotton teal , abundance of birds, Migratory , community structure.

INTRODUCTION:

Wetlands support a wide array of flora and fauna and deliver many ecological, climatic function . **Koen, K.H. (1992)** Scientists often refer to wetlands as the “kidneys” of the earth and forests as the “lungs” of the earth.

Wetlands are complex ecosystems with interaction of many biotic and abiotic factor (Padmini, P. N *et al.*, 1997) . 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). . Wetlands are an important indicator of flora and fauna. Wet land provide habitat, feeding, nesting, and rearing for different species of birds in India Jayanta Mistry, and Sarada Mukherjee. (2015).

STUDY AREA:

Mavoor wetland provides a fresh water habitat for fauna and flora . Mavoor, thengilakkadavu wetland situated around (11.2604° N, 75.9391° E) 20kms from the city of Kozhikode, Kerala. As different area of it spread about 50 hectors of wetlands. This wetland formerly well known for its brick kilns. By over exploitation of human made activities such as excavating soil for brick manufactures the area became a wetland , actually we can called Mavoor wetland as human made wetland , and the area became well saturated with water throughout the year converting the temporary wetland to permanent wetland.

MATERIALS AND METHOD:

The present study mainly aimed to assess the avian diversity of wetland habitat with their seasonal variation. For direct observation I used a binocular (80x30) and photographed by a camera (Nikon-COOLPIX P610) . Mavoor wetland is a vast

wetland, line transect method is suited for observing and counting the birds. The observation and data were collected two days per month (morning 6.00 am- 10am, evening 4pm- 6.30 pm)

Study period: The study and data collection was started from July 2016 to June 2017. The observation of residential, wetland birds, and water quality parameters were studied in all months. seasonal variation in pre monsoon , monsoon and post monsoon also understood during the study period .During the period , different parameters of birds communities such as diversity of avifauna, species abundance , species occurrence , seasonal variation etc are studied .

Classification of avifauna:

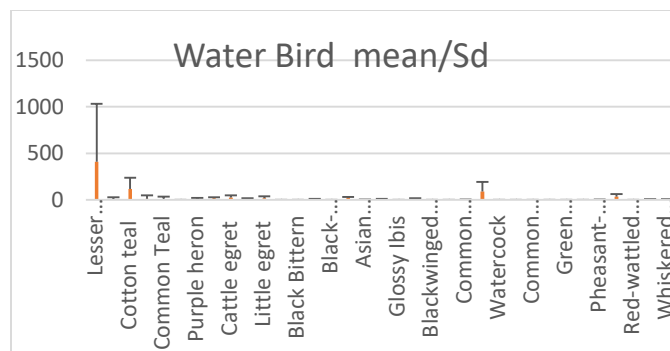
The total Avifauna observed in kadalundi and Mavoor wetland categorized mainly as two types.

- A) Wetland birds
- B) Non water birds.

Mavoor and Kadalundi wetland consist of various types of wetland birds , many of them are resident or common birds like Lesser whistling duck , Purple moor hen , Bronze winged jacana, Little cormorant etc , and some are migratory like Sea gulls, tens etc. These wetland also has a considerable diversity of Non water birds categorized as resident birds like common crows, Drongo, kites etc. So Non water birds study also significant role wetland studies.

RESULT AND DISCUSSION:

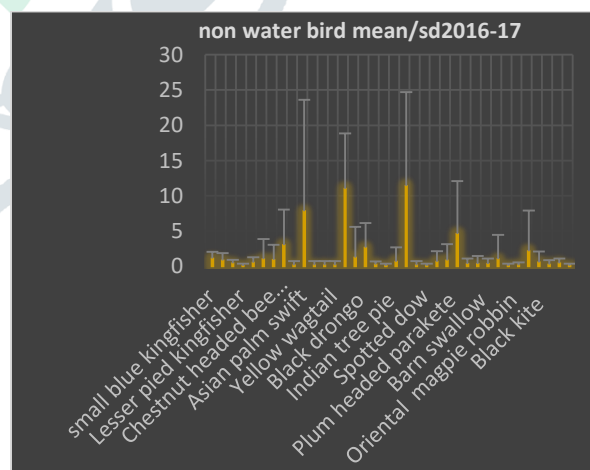
July 2016 to June 2017 ,a total number of 69 species were observed from mavoor wetland , which included both water birds and non-water birds. At mavoor, non-water birds were counted as 619 and water birds were 2935 in number .



Graph 1. Showing number of water birds at Mavoor wetlands July 2016 to June 2017

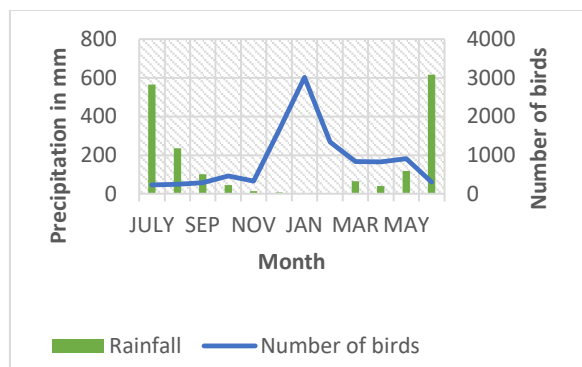
In mavoor wetland a large species diversity of water birds were there in the year of 2016 to 2017. Even though the temperature of this year was too high, the resident lesser whistling duck was in plenty number. The presence of purple moorhen also a moderate number in the month of April and May .The mean value and Standard Deviation are given in graph.

In Mavoor wetland, even though non-water bird's number was less in number, the species diversity was in high. Many resident type and migratory types of birds were attracted in this year. House crows' number was peak in number, which showed minimum level of pollution. The mean value and Standard Deviation are shown in graph 2.



Graph 2. Showing number of Non – water birds at Mavoor wetlands July 2016 to June 2017

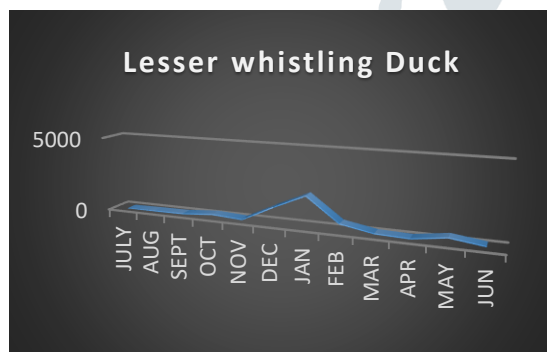
Bimonthly occurrence:



Graph 3. Showing bimonthly occurrence number of birds at Mavoor wetlands July 2016 to June 2017

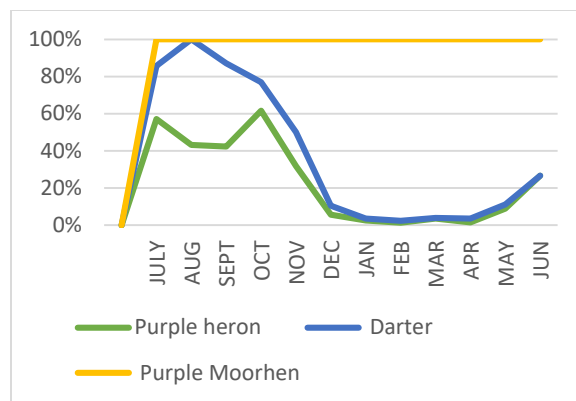
The relation of precipitation with number birds is easily predictable in graph shown : (fig:57) . Number of birds are few in rainy season in mavoor , and in wintering season the number of birds are increasing . In high temperature and absence of precipitation, the number of avifauna became decreases

Bimonthly occurrence of lesser whistling duck



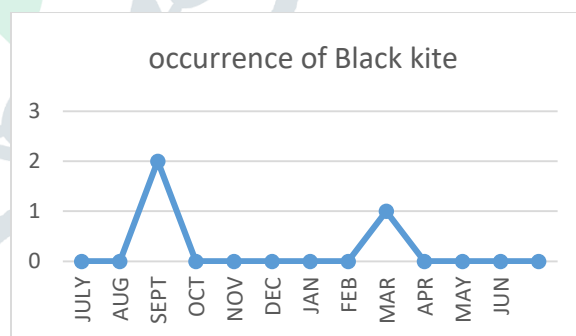
Graph 4. Showing bimonthly occurrence of Lesser whistling teal at Mavoor wetlands July 2016 to June 2017 .

Lesser whistling teal is a common resident type of duck, which are found only in wetland. In estuarine wetland, it was absent. In mavoor wetland their number is significant important in avifauna of wetland .The local movement of this duck changes the avifaunal structure. Their flock could observe in the wintering season only. Few number of ducks persist only favorable condition



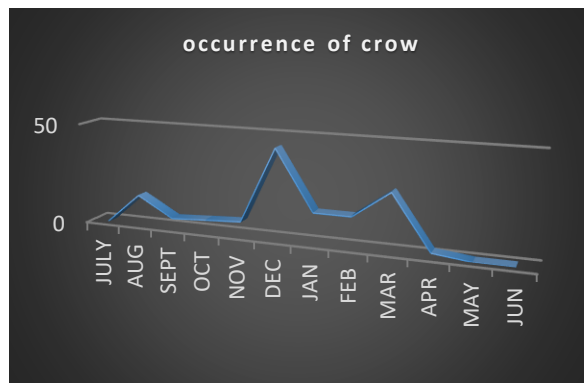
Graph 5. Showing bimonthly occurrence of purple moorhen, Darter and Purple heron at Mavoor wetlands July 2016 to June 2017

At mavoor wetland , the monthly occurrence of purple moorhen , Darter , Purple heron is shown in graph 5. Purple moorhen is an highly mobile and active species . They are most resident type of bird, which eat younger shoot of plant, and rhizome. In the month of June they were less in number and in July increase its number, in august , September, December up to June . Darter is a diving bird, which also present in every month, but their breeding season only the mostly abundant. **Lekshmy, S (2013)** Purple heron also found all observation less than a five number, but in its breeding season august, September, October they were mostly abundant.



Graph 6 Showing bimonthly occurrence of Black kite at Mavoor July 2016 to June 2017 .

Black kite is rarely in mavoor wetland. Few number found In the month of September and march .

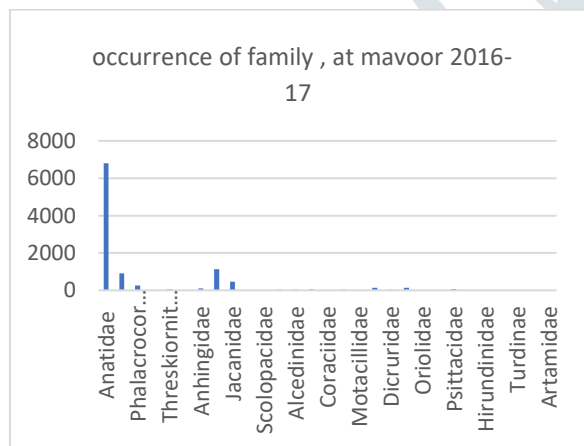


Graph 7 Showing biomonthly occurrence of crows at Mavoor wetlands July 2016 to June 2017

Crows are very important for detecting the quality of wetlands. Little rise in the number of crows is in December and March only, the reason less number of crows may due to less pollution at mavoor wetland.

Cumulative occurrence of birds at mavoor revealed that, Mavoor water birds diversity is large and most abundant. In July and December most number of birds found in this wetland, Probably in the month of August water bird and non-water birds number was less.

OCCURRENCE OF FAMILY -2016-17



Graph 8 .Showing occurrence of families at Mavoor wetland from July 2016 to June 2017

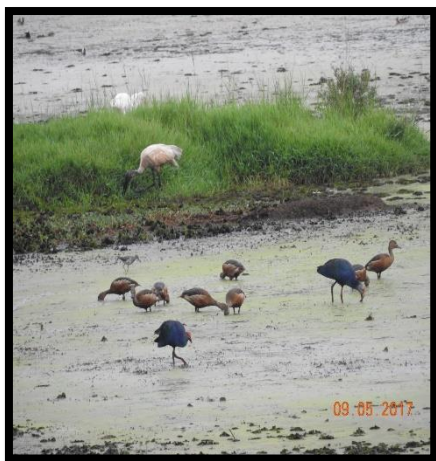
COMMUNITY STRUCTURE OF AVIFAUNA :

At mavoor, water birds, Dominance_D : is highest index is 0.3339 in the month of October,

lowest value is 0.24 in the month of May. Shannon_H : is highest index is 2.171 August and lowest index is 1.091 in December. Evenness_e^H/S: Highest is 0.7973 in August, and lowest 0.486 in March. Margalef species richness is highest in 3.135 And lowest 1.961 in the month of August. In Mavoor water birds, **Pielou, E. C., (1966)** Dominance_D: Highest index 0.7133 in the month of May, and lowest index is 0.542 in January. Shannon_H : Highest index is 3.244 in the month of March, and Lowest index is 0.9854 in January **Neelakantan, K. K. (1980)**. Evenness_e^H/S : is highest value 0.7863 in the month of November and 0.469 is the lowest value. Margalef richness: is highest 3.244 in the month of March and lowest value 0.9854 In the month of January.

Seasonal abundance of avifauna in 2016 to 2017: At mavoor wetland, Most of the migratory species were recorded in post monsoon, seasonal abundance of Lesser whistling Duck, cotton teal, Purple Moor hen etc very important in study, because they were most resident species recorded at mavoor. **Manjula Menon (2007)** Lesser whistling duck found maximum in post monsoon season, and less in monsoon. Cotton teal found very less in monsoon, purple moorhen were absent in monsoon. Abundance of birds were less in monsoon season. Seasonal abundance shown in graph and mean.





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Photos of avifauna at mavoor wetland.

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Table: 1. Alpha diversity values of water birds at Mavoor in July 2016-June 2017

	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	16-17MEAN
Dominance_D	0.1835	0.1291	0.1602	0.3339	0.1667	0.5571	0.5062	0.2507	0.1778	0.32	0.24	0.2677	0.2885
Shannon_H	2.004	2.171	2.019	1.619	2.258	1.091	1.224	1.822	1.987	1.522	1.936	1.697	1.857
Evenness_e^H/S	0.6743	0.7973	0.6278	0.4207	0.5032	0.1751	0.1889	0.2812	0.486	0.3053	0.4334	0.4962	0.183
Margalef	1.975	1.961	2.003	1.828	3.135	2.178	2.123	2.947	2.102	2.093	2.205	1.768	5.067

table: 2. Alpha diversity values of Non water birds at Mavoor in July 2016-June 2017

	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	MEAN2016-17
Dominance_D	0.2184	0.1157	0.2232	0.2204	0.1809	0.2631	0.542	0.1554	0.2906	0.3906	0.7133	0.4609	0.1171
Shannon_H	1.796	2.37	1.945	1.787	1.839	1.641	0.8872	2.128	1.819	1.094	0.534	0.9869	2.616
Evenness_e^H/S	0.6028	0.7135	0.5829	0.6633	0.7863	0.469	0.6071	0.5597	0.4405	0.7464	0.5686	0.6707	0.3802
Margalef	2.054	3.177	2.857	2.025	2.002	2.144	0.9854	3.053	3.244	1.019	0.4885	1.082	8.705

Si:NO	FAMILY	COMMON NAME	SCIENTIFIC NAME	STATUS
1.	Anatidae	Lesser whistling Duck	<i>Dendrocygna javanica</i>	R
		Garganey	<i>Anas querquedula</i> Linnaeus	M
		Cotton teal	<i>Nettapus coromandelianus</i>	R
		Northern Pintail	<i>Anas acuta</i> Linnaeus	M
		Common Teal	<i>Anas crecca</i> Linnaeus	M
		Northern Shoveller	<i>Anas clypeata</i> Linnaeus	LM
		Spot-billed Duck	<i>Anas poecilorhyncha</i> J.R. Forester	LM

2.	Ardeidae	Purple heron	<i>Ardea purpurea</i> Linnaeus	R
		Indian pond Heron	<i>Ardeola grayii</i> Sykes	R
		Cattle egret	<i>Bubulcus ibis</i> Linnaeus	R
		Large egret	<i>Casmerodius albus</i>	R
		Little egret	<i>Egretta garzetta</i>	R
		Yellow Bittern	<i>Ixobrychus sinensis</i>	R
		Median Egret	<i>Mesophoyx intermedia</i> (Wagler)	R
		Black-crowned Night- Heron	<i>Nycticorax nycticorax</i> Linnaeus	
3.	Phalacrocoracidae	Little Cormorant	<i>Phalacrocorax niger</i>	R
4.	Ciconiidae	Asian Openbill-Stork	<i>Anastomus oscitans</i> Boddaert	LM
5.	Threskiornithidae	Oriental White Ibis	<i>Threskiornis elanocephalus</i>	LM
		Glossy Ibis	<i>Plegadis falcinellus</i> (Linnaeus)	LM
6.	Accipitridae	Black Kite	<i>Milvus migrans</i>	R
		Brahminy Kite	<i>Haliastur Indus</i>	R
		Black winged kite	<i>Accipiter badius</i>	R
			<i>Elanus caeruleus</i>	
7.	Anhingidae	Darter	<i>Anhinga melanogaster</i> Pennant	LM
8.	Rallidae	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	R
		Common Moorhen	<i>Gallinula chloropus</i>	R
		Purple Moorhen	<i>Porphyrio porphyrio</i>	LM
		Watercock	<i>Gallixrex cinerea</i>	R
		Common Coot	<i>Fulica atra</i> Linnaeus	LM
9	Jacanidae	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LM
		Bronze-winged Jacana	<i>Metopidius indicus</i>	R
10.	Charadriidae	Red-wattled Lapwing	<i>Vanellus indicus</i>	R
		Little Ringed Plover	<i>Charadrius dubius</i> Scopoli	M
11	Scolopacidae	Wood Sandpiper	<i>Tringa glareola</i> Linnaeus	M
		Common Sandpiper	<i>Actitis hypoleucos</i>	M
12.	Laridae	Whiskered Tern	<i>Chlidonias hybridus</i>	M
13	Alcedinidae	Small Blue Kingfisher	<i>Alcedo atthis</i>	R
		Stork-billed Kingfisher	<i>Halcyon capensis</i>	R
		White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	R
		Lesser Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus)	R
		Black-capped Kingfisher	<i>Halcyon pileata</i> (Boddaert)	R
14	Meropidae	Blue-tailed Bee-eater	<i>Merops philippinus</i> Linnaeus	LM
		Chestnut-headed Bee-eater	<i>Merops leschenaulti</i> Vieillot	R
		Green Bee-eater	<i>Merops orientalis</i> Latham	R

15	Coraciidae	Indian Roller	<i>Coracias benghalensis</i>	R
17	Apodidae	Asian Palm Swift Indian Edible-nest Swiftlet	<i>Cypsiurus balasiensis</i> <i>Collocalia unicolor</i> (Jerdon)	R R
18	Motacillidae	Grey Wagtail Yellow Wagtail	<i>Motacilla cinerea</i> Tunstall <i>Motacilla flava</i> Linnaeus	LM LM
19	Sturnidae	Common Myna Rosy Starling	<i>Acridotheres tristis</i> <i>Sturnus roseus</i> (Linnaeus)	R M
20	Dicruridae	Black Drongo Greater Racket-tailed Drongo Ashy Drongo	<i>Dicrurus macrocercus</i> Vieillot <i>Dicrurus paradiseus</i> <i>Dicrurus leucophaeus</i> Vieillot	R R R
21	Corvidae	Indian Tree Pie House Crow	<i>Dendrocitta vagabunda</i> <i>Corvus splendens</i> Vieillot	R R
22	Oriolidae	Indian golden oriole	<i>Oriolus kundoo</i>	M
23	Columbidae	Spotted Dove Blue Rock Pigeon	<i>Streptopelia chinensis</i> (Scopoli) <i>Columba livia</i> Gmelin	R R
24	Psittacidae	Rose-ringed Parakeet Plum-headed Parakeet Indian Hanging Parrot	<i>Psittacula krameri</i> (Scopoli) <i>Psittacula cyanocephala</i> (Linnaeus) <i>Loriculus vernalis</i> (Sparman)	R R R
25	Capitonidae	White-cheeked Barbet	<i>Megalaima viridis</i> (Boddaert)	
27.	Hirundinidae	barn swallow	<i>Hirundo rustica</i>	R
28	Lanidae	Brown Shrike	<i>Lanius cristatus</i> Linnaeus	M
29	Turdinae	Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus)	R
30	Timaliinae	Jungle Babbler	<i>Turdoides striatus</i> Jerdon	R
31	Artamidae	Ashy Woodswallow	<i>Artamus fuscus</i> Vieillot	R

Occurrence of species from July 2016 to June 2017