

WATER QUALITY PARAMETERS AT MAVOOR WETLAND- KERALA

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ABSTRACT: Analysis of water sample from July 2016 to June 2017 at mavoor, showed that BOD, Phosphate, and Nitrite and Total Dissolved solids and salinity were low in monsoon season than pre monsoon and post monsoon, due to dilution by rainwater. Dissolved oxygen was comparatively high at mavoor in monsoon than other season, that may be due to plenty aeration during rainy season. Dissolved oxygen was maximum at mavoor at July by the availability of rain. The water temperature was measured than the atmospheric temperature, in mavoor showed comparatively high temperature in the month of March April and May. High water temperature were recorded mavoor in March. The Karl Pearson correlation coefficient, related to number of birds and water quality parameters tabulated in table: showed that a low, moderate, or high correlation, which proved that there is inter relationship between water quality and arrival of birds.

Key words : Total dissolved solid, BOD, water birds, conservation problem.

INTRODUCTION:

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). Kumar, P., Gupta, S.K. (2009). 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).

Quality of wetland also an important factor which influence the arrival of avifauna to any habitat, so I studied different physicochemical water quality parameters like pH, salinity, temperature, Total dissolved solid, phosphate, Nitrite, Biochemical Oxygen Demand, Dissolved Oxygen etc., mavoor wetland provide a fresh water habitat with river water.

MATERIALS AND MATHOD:

STUDY AREA:

In the present study, wetland namely Mavoor – Thengilakkadavu wetland at Kozhikode districts selected for studying seasonal changes in bird population and influence of basic water quality parameters. The selected wetland provides a fresh water habitat for fauna and flora. The study areas has mainly two types of available monsoon are Southwest monsoon and Northern monsoon. The south west monsoon starts in the last week of May or the first week of June onwards, heavy rainfall occurs during these months. North East monsoon is comparatively weak which occurs in month of October and January Kerala Agricultural University (1989.)

Water quality studies monitored during the period of July 2016 to June 2017. Monthly variation of water qualities with different parameters are studied to know bird's relationship with their habitat. The detected parameters are, P^H, Salinity, Water temperature, Total Suspended Solids (TDS), Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), Phosphate, Nitrites. The water samples were collected during morning 0800 hrs, from study site.

For analyzing water quality, the samples were collected in Two liters bottle, The PH and water temperature are measured immediately at the site water was studied at the site. The sample for detecting BOD and DO were collected in BOD bottle after adding 2 ml of Winkler solution A, B in both bottles, these bottle were taken to laboratory for determination of BOD and DO. The following parameters are done in standard method APHA, James, E.J. (2002)

Temperature

Temperature is an important parameter required to get an idea of self-purification of rivers, reservoirs and control of treatment plants. Temperature is measured using mercury thermometer having a scale marked for every 0.1°C

pH

The pH of a solution refers to its hydrogen ion activity and is expressed as the logarithm of the reciprocal of the hydrogen ion activity in moles per liter at a given temperature. pH values from 0 to 7 are diminishingly acidic, 7 to 14 increasingly alkaline and 7 is neutral. (Tara, J.S., Kour, R. and Sharma, S. 2011)

Total Dissolved Solid determination:

Centrifuged or filtered a suitable volume of sample through Whatman No. 30 or equivalent filter paper or through a glass fiber filter paper. Evaporated the filtered sample in a tared dish, platinum dish are used for water samples or industrial effluents. Dried the residue at 103-108 °C or at 179-181 °C. The increase in weight of the dish equals the total dissolved solids. It may also be obtained by the difference between the total solids and total suspended solids.

Dissolved Oxygen

2ml of manganese sulphate added followed by 2ml of alkali azide reagent to the sample collected in BOD bottles. Then added 2ml of concentrated sulphuric acid and mixed well till the precipitate goes in to the solution it is titrated against standard

sodium thiosulphate solution using starch as indicator.

$DO, \text{mg/l} = (\text{Normality of thio} \times \text{Volume of thio} \times 8 \times 1000) \div \text{volume of sample.}$

Determination of BOD

Procedure:

Collected samples in two 300ml BOD bottles using DO sample of which one is fixed on the spot by adding Manganese sulphate and alkali-iodide azide solutions and shaken well. The other is well Stoppard and kept in a BOD incubator for 5 day at 20°C. The fixed DO is estimated iodometrically using starch as indicator. After 5 days incubated samples

Were taken outside and fixed DO using the reagent manganese sulphate and alkaline iodide azide solutions and shaken well. Kept it for some time until it reach room temperature. The fixed DO is estimated iodometrically using starch as indicator

Salinity

Salinity was determined by using salinity meter.

Nitrite-N

Stock nitrate solution, Intermediate nitrate solution, Stock nitrite solution, Intermediate nitrite solution, Working nitrite solution were the reagents used

Phosphate- P

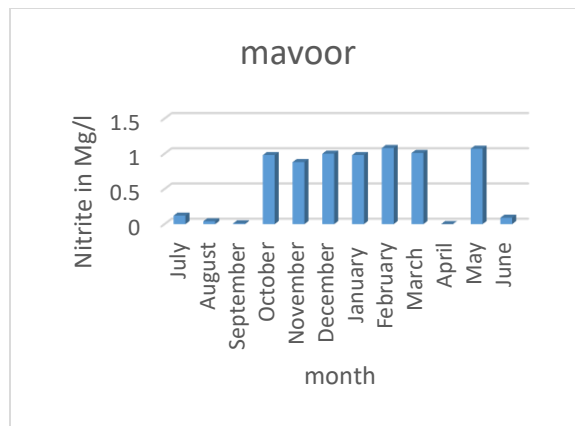
Procedure: 50ml sample solution were taken, and added 2ml ammonium molybdate solution and 5 drops of stannous chloride solution. After 10 minute but before 12 minute measured the color using spectrophotometer at 690nm. The Method were used as Stannous Chloride Method and used apparatus was Spectrophotometer

RESULT AND DISCUSSION:

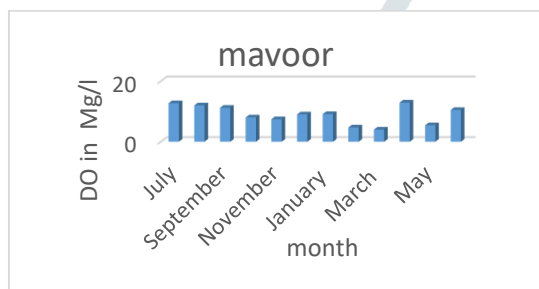
WATER QUALITY PARAMETERS (from July 2016-june 2017) :

Monthly variation of Dissolved Oxygen in Water Samples of Mavoor (Mg/l) 2016-2017

Month	Mavoor
July	12.71
August	12.02
September	11.21
October	8.02
November	7.42
December	9.02
January	9.14
February	4.71
March	4.02
April	12.94
May	5.45
June	10.51



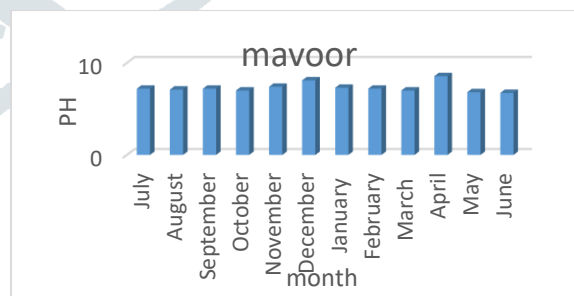
Monthly variation in pH Water Samples of Mavoor 2016-2017



Month	Study area	Mavoor
July		7.2
August		7.1
September		7.2
October		7
November		7.41
December		8.1
January		7.3
February		7.2
March		7
April		8.56
May		6.82
June		6.74

Monthly variation in Nitrite in Water Samples of Mavoor (Mg/l) 2016-2017

Month	Study area	Mavoor
July		0.12
August		0.04
September		0.01
October		0.98
November		0.88
December		1.00
January		0.98
February		1.08
March		1.01
April		BDL
May		1.57
June		0.09



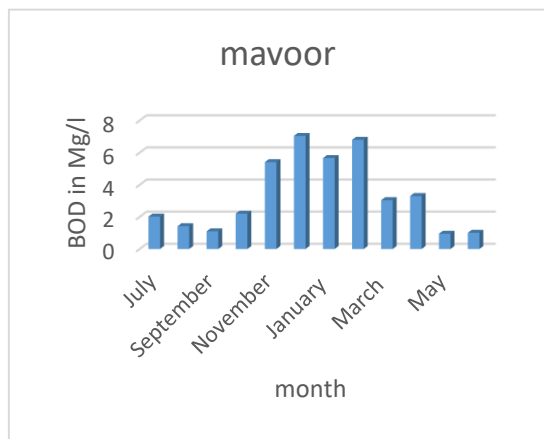
Monthly variation in Biological Oxygen Demand of Water Samples of Mavoor in (Mg/l) 2016-2017

Month	Study area	Mavoor
July		2.02
August		1.42

September	1.10
October	2.2
November	5.41
December	7.04
January	5.66
February	6.8
March	3.04
April	3.30
May	0.95
June	1.01

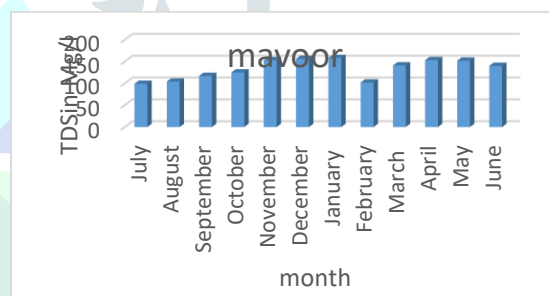
Monthly variation in Total Dissolved solid in Water Samples of Mavoor (Mg/l) 2016- 2017

Month \ Study area	Mavoor
July	99
August	104
September	117
October	125
November	153
December	156.1
January	158
February	102
March	141
April	153
May	152.0
June	140

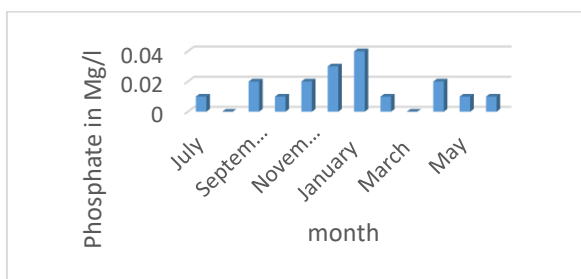
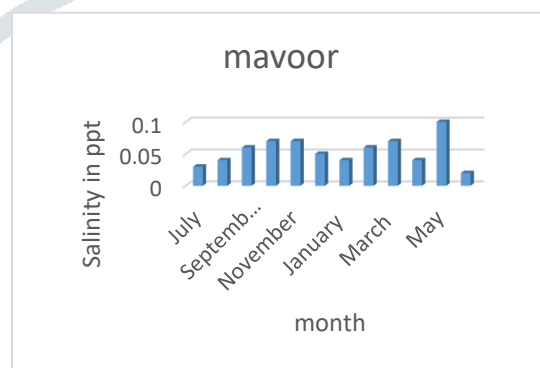


Monthly variation of phosphate in Water Samples of Mavoor (Mg/l) 2016-2017

Month \ Study area	Mavoor
July	0.01
August	BDL
September	0.02
October	0.01
November	0.02
December	0.03
January	0.04
February	0.01
March	BDL
April	0.02
May	0.01
June	0.01



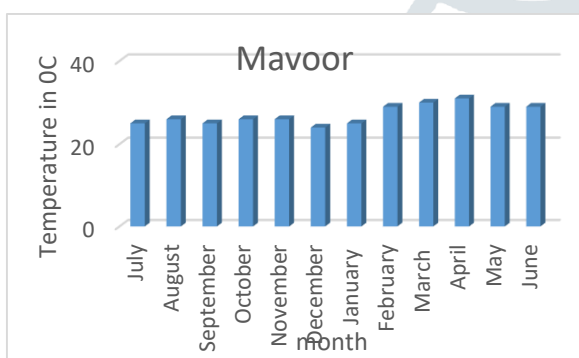
Monthly variation of salinity in Water Samples of Mavoor 2016-2017



Monthly variation of water temperature at Mavoor in 2016-2017

Month \ Study area	Mavoor
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July	25
August	26
September	25
October	26
November	26
December	24
January	25
February	29
March	30
April	31
May	29
June	29



Mavoor is a fresh water habitat, the DO rate is high in monsoon season, and moderately low in February and March, mavoor wetland consists of a plenty number of aquatic fauna and planktonic growth which increases the DO. The correlation coefficient between number of birds and DO of mavoor wetland is moderate degree **Jayson, E.A. (1997)**

In mavoor nitrite concentration is 0 in the month of April as pre monsoon season. and in monsoon showed very less. December month showed maximum nitrite.

Correlation of nitrite with number of birds showed a moderate degree in mavoor

pH value of Mavoor showed in the range between 7 to 8.56. In December pH value showed 8.1. and most basic in the month of April.

Pearson correlation showed a moderate degree In mavoor the BOD was less in May, and high in

the month of December, but there is a least pollution by the presence of increase number resident duck birds.

The correlation of number of water bird with BOD, in mavoor showed moderate degree of correlation

The sample collected from mavoor showed high in January and below detection level in the month of March and August

The correlation of number of birds with phosphate in mavoor has moderate degree of correlation

The sample collected from mavoor showed high in January and below detection level in the month of March and August

The correlation of number of birds with phosphate in mavoor has moderate degree of correlation

Total dissolved solid in mavoor wetland is less in the month of July may due to rain. And showed high in the month of December

The correlation showed low degree of correlation in TDS of water with number of birds in mavoor

In mavoor showed least salinity in June and maximum in the month of May. Due to precipitation, salinity had reduced, but in May, the temperature was high and in absence of rain, salinity became increased.

The correlation of salinity with the number of birds showed a moderate degree of correlation

In mavoor lowest temperature was measured 24, in the month of December and high temperature in March and April.

The correlation of temperature with number of birds showed moderate degree of correlation In mavoor

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	mavoor	
Pearson coefficient	r value	p value
Parameters		
PH	0.14177	0.6603
BOD	0.43076	0.16212
DO	0.19902	0.5352
P	-0.06438	0.84243
N	-0.26391	0.40719
SALINITY	0.002795	0.99312
TDS	-0.56347	0.05641
TEMPERATURE	-0.40975	0.18589
	mavoor	
Pearson coefficient	r value	p value
Parameters		
PH	0.23575	0.46073
BOD	0.63153	0.027618
DO	-0.27559	0.38594
P	0.7009	0.011108
N	0.71093	0.009544
SALINITY	0.56888	0.05357
TDS	0.48209	0.11248
TEMPERATURE	-0.12765	0.69258