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Studies on monthty chages of water temperature and their correlation coefficient with some physico- chemical factors of Lony dam (Teonthar), Rewa, M.P.

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Abstract

The mean values of water temperature Lony dam varied from 16.28 to 35.34^0C. This is significant limiting parameter which plays an important role in deciding the geo chemical and biotic features of the fresh water bodies. In the present work only highly negative co-rrelation with dissolved oxygen were recorded.

Key-Words: Water, Temperature, Co-rrelation cofficient

Introduction

Water temperature is important limiting factor of fresh water bodies. The metabolic spectrum of the lakes is mainly influenced by the parameter of heat budget and storage of heat thermal stratification Hutchison (1975). The values water temperature play important role in Zooplankton of the water body Prasad (1916), Odum (1971).

Material and Methods

The three sampling sites A, B and E were taken from littoral zone and two sampling sites C and D were taken from limnetic zone. The water samples were collected from Lony dam (Teonthar) Rewa (M.P) during first week of every month between 8.00AM to 12.00 noon from March 2005 to Feb. 2006.

In order to estimate the quantitative values of physico chemical parameters of the water samples were taken to laboratory and were analyzed by applying the standard method APHA (1975). Water temperature documented at the dam site. The water temperature was noted help of mercury centigraded thermometer. Co-rrelation coefficient were calculated for all the characters combination at genotypic and phenotypic and environmental level by the formula given by miller *et al* (*1958-1986).

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$$r \, XiXj = \frac{Cov \, XiXj}{\sqrt{(Var. \, Xi)(Var. Xj)}}$$

Where,
r XiXj = Coefficient of Correlation between Xi^{th} and the Xj^{th} traits.
Cov XiXj = Covariance between X i^{th} and X i^{th} traits.
Var Xi = Variance of X i^{th} traits.
Var Xj = Variance of X j^{th} traits.
The correlations were computed by substituting corresponding variance and covariance in the above formula. The estimation of covariance between two traits was derived in the same way as for corresponding variance components.

Results and Discussion

The monthly changes of water temperature at surface and bottom water of Lony dam in 2005-06 given in table 01. The data of this parameter have shown a defnite ascending trend in summer month from march to may. The mode rate temperature was noted in mansoon and decline in winter months from Nov. to Jan. The values of water temperature showed a highly negative correlation with dissolved oxyzen and alkality which were given in table 2.

The Maximum value of water temperature was documented from may. The minimum value was noted in Dec. The variability of water temperature was found to be significant with seasons at the Lony dam. According to Welch (1952) and Prasad (1916), the small and shallow water bodies, more quickly react to the changes in the atmospheric temperature. Therefore hand to hand changes of water temperature in present

dam may obviously confirm the above finding. The similar finding also noted by Zafar (1964), Munnarwar (1970) and Zutshiv (1985). The present investigation has reavealed the fact that Lony dam had shown thermal condition throughout the course of study. No thermocline conditions were recorded. The some findings have also been recorded by Hussainy (1967) and sreenivasam (1963-70). Lony dam exhibited more or less similar pattern of change of water temperature with months and seasons.

A significant negative correlation between water temperature and dissolved oxygen was occured at Lony dam. According to tilakraj and Baloni (1985), it might be happend due to rapid degradation off organic matter with increasing temperature. It further support the negative correlations of water temperature with total alkalinity which was documented from present water. Nayak (1993) has also recorded negative correlations of water temperature with dissolved oxygen and alkalinity.

Acknowledgement

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Table 1: Monthly changes of water temperature at Different experimental sites at Lony Dam (2005- 2006)

S/No.	Month	Littoral sites			Limnetic sites		Mean value
		A	B	E	C	D	
1.	Mar	22.00	21.50	21.00	22.10	21.20	22.56
2.	Apr	28.00	28.30	27.20	28.00	27.60	27.82
3.	May	35.00	35.50	35.10	35.70	35.40	35.34
4.	Jun	31.50	31.80	32.00	32.00	32.20	31.9
5.	July	27.50	28.30	27.20	28.00	27.70	27.74
6.	Aug	28.50	28.80	27.00	28.40	28.00	28.14
7.	Sep	28.00	28.60	27.10	28.10	28.10	27.98
8.	Oct	27.30	27.00	26.00	26.80	26.60	26.74
9.	Nov.	20.80	20.40	19.30	20.10	19.70	20.06
10.	Dec.	15.80	16.30	16.00	16.80	16.50	16.28
11.	Jan.	17.50	17.80	16.10	17.00	16.50	16.98
12.	Feb.	21.10	20.60	20.40	20.60	20.00	20.54
	Seasonal Variations						
1.	Summer	29.12	29.27	28.82	29.45	29.1	29.15
2.	Rainy	27.82	28.17	26.82	34.82	27.6	29.04
3.	Winter	18.8	18.77	17.95	18.62	18.17	18.46

Table 2: Matrix showing the values of correlation coefficients data of physico-chemical factors of Lony dam (2005-06)

	pH	Water temp.	Water transparency	Dissolved oxygen	Free CO_2	Alkalinity	Total hardness	Mg. hardness	Nitrates	Ca. hardness	Total zooplanktons
pH	1										
Water temperature	0.541478542	1									
Water transparency	-0.578582532*	0.174943	1								
Dissolved oxygen	-0.624136513*	-0.827173**	-0.21516	1							
Free CO_2	0.293246835	0.347368	-0.434	0.02755	1						
Alkalinity	-0.597764028*	-0.856383**	0.058721	0.724767*	-0.35019	1					
Total hardness	0.103076933	-0.49643	-0.41763	0.205476	-0.37618	0.467754	1				
Magnesium hardness	-0.53435449	-0.29066	0.591299*	0.068586	-0.636614*	0.357686	0.088595	1			
Nitrates	0.469715842	0.29071	-0.22412	-0.26354	0.329167	-0.27407	-0.19603	-0.66801*	1		
Calcium hardness	-0.268559352	-0.39635	-0.08772	0.518911	-0.22163	0.560521	0.431419	0.183211	-0.45769	1	

df = 10, * Significant at 5% level, ** Significant at 1% level
Table value of r (correlation coefficient) at 5% = 0.564
Table value of r (correlation coefficient) at 1% = 0.764
Ns insignificant