ISSN: 0976-7126

INTERNATIONAL JOURNAL OF PHARMACY & LIFE SCIENCES

Studies on Cladoceran zooplanktonic population and their correlation coefficient with some physicochemical factors of Lony dam Theonthar, Rewa (M.P.)

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Abstract

Among *Cladoceran* the members of family *Daphnidae, Chydoridae, Sididae* and *Moinidae* were noted to be the most dominating forms with a wide range of occurrence at all the sampling sites. It was dominated by the members of *Alona, Chydorus, Pleuroxus, Ceriodaphnia, Daphnia, Simocephalus, Moina* and *Daphanosoma*.

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Key-Words: *Cladoceran*, Zooplanktonic population, Lentic water, Correlation coefficient, Littoral Zone.

Introduction

Cladoceran are a crucial group among zooplankton and form the most useful and nutritive group of Crustaceans for higher members of fishes in the food chair. *Cladoceran* are normally covered by the chitinous covering termed as the carapace. The two large second antinae are responsible for giving the *Cladoceran* their common name *Cladoceran* are highly sensitive against even low concentration of pollutants. The food source of this group is smaller zooplankton, bacterioplankton and algae. Murgan (1998).

This group of zooplankton belonging to the well known phylum Arthopoda and class Crustacea. In healthy habituate where in external influences of pollution are absent or at least low, members of the group constitute a sizeable population.

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 Theonthar,Rewa M.P. during first week of every month between 8:00 am to 12:00 noon from March 2005 to February 2006.

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In order to estimate the quantitative values of physicochemical parameters the water sample were taken to laboratory and were analysed by applying the standard method. APHA (1975). The quantitative estimation of dissolved O_2 , Free CO_2 , Calcium hardness and Magnesium hardness, Nitrate and alkalinity were done in laboratory by using standard method as suggested by APHA (1985), Trivedi and Goel (1986-87).

Cladoceran zooplanktonic population collected from surface with minimum disturbance and filtered in a number 25 bolting silk cloth net. The final volume of filtered sample was 125 ml which was transferred to an other 125ml plastics bottle were preserved by adding 2ml of 4% formalin. The quantitative analysis of *Cladoceran* zooplankton was done by using sedgwick rafter cell and by lackeys drop method.

Correlation coefficient was calculated for all the characters combination at genotypic. Phenotypic and environmental level by the formula given by miller et al (1958,1986).

$$r\, x_i\, x_j = \frac{\text{cov}\, x_i\, x_j}{\sqrt{(\text{var}\, x_i)\,(\text{var}\, x_j)}}$$

Where, r xi, xj = coefficient of correlation between xi and xj traits, cov xi xj = covariance between xi and xj traits, var xi = variance of xi traits, var xj = variance of xj traits

Results and Conclusion

The monthly population and seasonal and spotial variation of total *Cladoceran* zooplankton of Lony dam are given in table no.1 and correlation cofficient among physicochemical factors and *Cladoceran* are given in table no. 2. Maximum population of *Cladoceran* zooplanktons were observed in month of may and minimm population was in September. Maximum density of *Cladoceran* zooplankton was appeared in summer season moderate in winter and minimum was in monsoon season. Zooplankton of Lony dam have shown positive correlation with water transparency. water transparency this dam shown negative correlation with pH value. Most of the *Cladoceran* zooplanktion inhabited in limnetic water. The *Cladoceran* community is comprised of 8 speces. Therfore the sampling station D had large number of species in comparative to sampling station A,B,E and C.

The high value of transparency was the most valuable parameter that have effected the dencity of *Cladoceran* zooplanktion qualitatively and quantitatively. Therefore this factor usually govern the seasonal growth and distribution of zooplankton communities in fresh water. (1986). Bais etal (1993), Kumar etal(2001-2004)

According Chaurasia and Adoni (1985) Brooks (1959) The species of *Daphnia* noted to be the most dominating *Cladoceran* not only quantitavely but also quantitatively at present water body. Whereas the species of *Ceriodaphnia* and *Moina* have exhibited a more sensitive nature with the changes of seasons and ecological conditions. The quantities and qualitative variability of *Cladoceran* documented in present water not only with season but also with site.

Acknowledgements

We are thankful to Dr. (Smt.) S. Shukla Retd. Prof. & head of zoology Deptt. Govt. Model Science College Rewa (M.P.) for his valuable suggestions and support and I am also thankful to Dr. R.S. Sharma Retd. A.D. Rewa (M.P.).

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ISSN: 0976-7126

Table 1: Monthly data of total Cladoceran zooplankton (Units/L.) of lony dam (2005-2006)

S/No.	Month	Littoral sites			Limnetic sites		Mean value
		A	B	E	C	D	
1.	Mar	18	19	18	15	22	18.4
2.	Apr	25	45	30	40	40	36
3.	May	35	40	38	45	47	41
4.	Jun	18	12	10	12	06	11.6
5.	July	13	06	04	09	37	13.8
6.	Aug	10	06	10	04	04	6.8
7.	Sep	06	05	05	07	05	5.6
8.	Oct	05	08	06	06	06	6.2
9.	Nov.	13	11	08	03	07	8.4
10.	Dec.	12	29	09	28	34	22.4
11.	Jan.	18	20	30	18	20	21.2
12.	Feb.	06	05	04	04	10	5.8
		Seasonal Variations					
1.	Summer	24	29	24	28	28.8	26.7
2.	Rainy	8.5	6.2	6.2	1.6	13	7.1
3.	Winter	12.2	16.2	12.7	13.2	17.7	14.4

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

	pH	Water temperature	Water transparency	Total hardness	Protozoans
pH	1				
Water temperature	0.541479	1			
Water transparency	-0.578583*	0.174943	1		
Total hardness	0.103077	-0.49643	-0.41763	1	
Cladoceran	-0.45068	0.232777	0.598538*	-0.67202	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