Research Article

[Sharma & Tiwari, 2(1):Jan., 2011]

ISSN: 0976-7126

INTERNATIONAL JOURNAL OF PHARMACY & LIFE SCIENCES

Studies on Zooplanktons of fresh water reservoir at Lony Dam Theonther Rewa (M.P.)

Chandan Sharma and Rohini Prasad Tiwari

Department of Zoology, Janata P.G.College, Rewa, (M.P.)-India

Department of Zoology, Saraswati Vigyan Mahavidyalya, Nirala Nagar Rewa, (M.P.)-India

Abstract

The information contributed by this investigation will be highly significant and useful in order to create a general awareness in the people to prevent further water pollution and improve aquaculture and other uses of such valuable water sources in the near future. The quantative analyses of zooplankton has revealed the fact that rotifers, protozoan, cladoceran and copepode were the major components of its total bulk in lony dam the maximum abundance of total zooplankton was appeared in summer month and its minimum was noted in early monsoon months. The values of number of zooplankton species indicating the pattern of bio diversity have exhibited a different dominating trend of its major subgroups as given rotifera > protozoa>cladocera>copepoda. The lony dam had moderate biodiversity of total zooplankton with 29 species belonging to four taxonomic group out of 29 species 6 belonged to protozoa, 11 to rotifera, 8 to cladocera and 4 to copepod. Rotiferan species have show a high magnitude of bio diversity in comparative to other zooplankton subgroups.

Key-Words: Lony Dam, Fresh water, Zooplanktons

Introduction

Aquatic ecosystem is the most diverse ecosystem in the world. The first life originated in the water and first organisms were also aquatic where water was the principal external as well as internal medium for organism. Limnology has come a long way since the time[1] in understanding the dynamic of a lentic water bodies subsequently. Limnology was studied with reference to the organism especially plankton[2-3]. Zooplanktons are important in an environmental impact study. They are extremely responsive to change in the environment and thus indicate environmental changes and fluctuations that may occur. Zooplankton acts as a biological indicator of water pollution.

The present investigation was carried out to studies of zooplanktons of lony dam theonther tehsil Rewa district M.P. This dam was constructed on 1895 under minor dam irrigation scheme at lony river. It is importance water body of Rewa District. It is mainly rainfed dam of district, that is 85 km away from Rewa town on Jawa Garhi Sankargarh Road.

*** Corresponding Author:**
Mob. 0927438261

To study seasonal variation of zooplankton in three seasons i.e. summer, rainy and winter. Number of species studied in reservoir during 2004-05, 2005-06. The water of this dam is used mainly for agriculture purpose but it is also utilized by the people of the surrounding colonies for their day to day activity of taking bath and cloth washing etc. Dam being also used for fishing purpose.

Material and Methods

The three sampling sites namely A.B. and E were taken from littoral zone and two sampling sites namely C and D were taken from limnetic zone in the dam. For zooplankton collection water was collected from the surface with minimal disturbance and filtered in a No 25 bolting silk cloth net of mesh size 63 μ and 30 cm diameter. The final volume of the filtered sample was 125 ml which was transferred to another 125 ml plastic bottle and labeled mentioning the time date place of sampling. The samples were preserved by adding 2 ml of 4% formalin. Quantitative analysis of zooplankton was done by using Sedgwick rafter cell and by lackey's drop method under research microscope. The zooplankton was identified up to a taxonomic precision of species level in rotifera, genus level in protozoa, cladocera & copepoda using standard identification

ISSN: 0976-7126

keys[4-7]. The species belonging to each group were noted down and number of individuals in each species was counted. Species diversity of zooplankton of a lony dam was determined by Shannone Weaver index[8] (H^-) which reads as follows.

$$H^- = -\sum^{s} pi \text{ X log pi}$$

Where, i=1, Pi= Proportional importance of each species (n^1/N), S=number of species.

Results and Conclusion

The zooplankton community in surface water of lony dam is comprised of protozoa. rotifera, cladocera and copepoda during investigation on 2004-05 & 2005-06. Total of 29 species of zooplankton is obtained in this study which belonging to four taxonomic group out of 29 6 belonged to protozoa, 11 to rotifera, 8 to cladocera and 4 to copepoda. Seasonal mean values of two years 2004-05 & 2005-06 of zooplanktonic species of lony dam at different sampling sites are given in table No .1 Maximum potential of protozoan counts were appeared in summer moderate to low in monsoon and winter. In rotifera maximum concentration in summer low to moderate in monsoon and low in winter noted at all sampling station. The seasonal data of cladoceran have shown its high potential in summer days, low to moderate in monsoon and low in winter. The seasonal changes of copepode zooplankton have also shown its high potential in summer and rainy days, moderate to low in winter were noted at all sampling station.

Species diversity of zooplanktons at different experimental sites of lony dam is given in table 2 during 2004-05 & 2005-06.

The present water body has exhibited a significant seasonal changes and species biodiversity of zooplankton species with their maximum values during summer and minimum in winter. The main bulk of total zooplankton was found to be contributed by rotifera, protozoa, cladocera and copepoda. Present data of zooplankton communities agreeably coincide with the views given[9-13]. They noted bimodal peak of zooplankton in Kashmir lake and has noted the first peak in summer and second one in winter. The quantitative variability of zooplankton documented in present study has highlighted their mesotrophic nature. The remarkable seasonal changes of zooplankton species at present water body were registered.

Acknowledgment

We wish to thank to Dr. R.S. Saini, Retd. Prof. & Head, Department of Zoology, University of Sagar, Dr. (Smt.) S.S. Shukla, Retd. Prof., Science College Rewa, Dr. Rajeshwari Singh Saini, Retd. Prof., Science College Rewa, Dr. S.D. Sharma Retd. A.D. Rewa for their valuable help encouragement and criticism during preparation of this note.

References

1. Forel F. A. and Leman La (1892). Monographic limnologique tome I. geographic, hydrographic, geologic, hydrologie, 543 pp. tome II (1895) macaniques hyinrauloque, climatic thermique. Optique acoustique 651 pp. tome III (1904) Biologic historic navigation peache, 715 pp Lausannef Rouge reprinted Geneva.
2. Hensen V. (1887). Uber die Bestimmung dues planktons order des in meera treibenden matarials an pflazen and thieren Ber Komm Wiss. Unters Deutschen meera. *Kiel,* **5**: 1-107.
3. Fritsch F. E. (1907). The sub aerial and fresh water flora of the tropics: A phyto-graphical and ecological study. *Amm. Bot.,* **21**: 235-275.
4. Altaff K. (2003). *A manual of zooplankton,* Department of Zoology, The New College Chennai.
5. Edmondson W.T. (1959). *Fresh Water Biology*, 2nd edition. John Wiley & Sons. Inc. Newyork.
6. Battish S.K. (1992). *Fresh water zooplankton of India*, Oxford and IBM publications.
7. Dhanapathi M.V.S.S.S (2000). Taxonomic notes on the rotifers from India (from 1889-2000) *Indian Association of Aquatic Biologists* (IAAB) Hyderabad.
8. Shannon C.E. and Weaver (1949). *The Mathmetical theory of communication urbora*. University of Luinois, 117.
9. Michel (2001). Zooplankton on the more first results on the quantification of dispersal of zooplankton in a set of interconnected ponds. *Hydrobiologia,* 442.
10. Alam Altab and Khan Asif A. (1996). Dynamics of plankton communities in four freshwater lentic ecosystem in relation to varying dominant biota. *Pollan Res*., **15(3):** 287-291.
11. Masood (1987). Bimodal peak of zooplankton in kashmir lake. *Hydrobiologia*, **128**: 8-9.
12. Chaurasia S.K. and Adoni A.D. (1985). Zooplankton dynamics in a shallow eutrophic lake. Proc Nat Symp. Pure and Appl. Limnology (Ed) Adoni A.D. *Bull Bot. Soc*., Sagar, **32:** 30-39.
13. Michel R.G. and Frey D.G. (1983). Assumed amphi atlantic distribution of oxyurella tenuicaudis Cladocera chydoridae denied by a new species from North America. *Hydrobiologia*, **106:** 3-35.

ISSN: 0976-7126

Table 1: Sesonal mean Values of two years (2004-05 and 2005-06) of Zooplanktonic species of Lony dam at different sampling sites

	A			B			E			C			D		
Name of Species	**S**	**R**	**W**	**S**	**R**	**W**	**S**	**R**	**W**	**S**	**R**	**W**	**S**	**R**	**W**
Diffugia sp	23.5	18	15.5	24	20.5	15	20	18	17	19	15.5	14.5	14	9	11.5
Actinophrys sp	12.5	9.5	7.5	22.5	7.5	7	9.5	8	8.5	8	8	7	7.5	4.5	5
Vorticella sp	27	21.5	19	25.5	20	18.5	24	19	19.5	18	16	14.5	19	11	16
Paramicium sp	31.5	30	27	35.5	23.5	19.5	29	24	14.5	22	20.5	17.5	20	14.5	17.5
Arcella Sp	17.5	14	16	25	185	14	15	10.5	12.5	12.5	9	12	13	9.5	12.5
Stentor Sp	11.5	8.5	7	10	8.5	7.5	9	6.5	6	7	5	5.5	5	5.5	6
Rotifera															
Brachionus angularis	45.5	39	19	40	30	19	46.5	36	19.5	31	19.5	13.5	24	24.5	14.5
Brachionus Falcatus	21.5	15.5	9.5	19.5	15	10.5	30.5	18.5	8	16	32	8	16	13	5
Brachionus caudatus	43.5	31	13	36	25	16	48.5	41.5	16	24	21	11	24.5	22	12
Brachionus diversicornis	23.5	20.5	11.5	26	19.5	16	21.5	18.5	9	15	12	7.5	17	12	6
Brachionus forficula	22	16.5	10	22	16	10	32	26.5	13	30.5	20.5	10	23	18.5	11
Keratella tropica	31.5	24.5	13	30.5	23	17	27.5	25	13	15	13.5	9.5	15	18.5	7
Keratella procurva	22.5	20.5	13	19	15	11	22.5	18	13	15.5	15	9.5	14	13	8.5
Trichotria sp	19	15.5	8.5	17	13	10	18	14.5	10.5	15	16	8	15	13.5	7
Microcodides chlaena	21	14	9	17.5	11.5	6	18.5	10.5	9.5	28.5	25.5	9.5	25.5	18.5	9
Polyarthra indica	24.5	17	10.5	30.5	25.5	14	35.5	20.5	14.5	17	20.5	9	17	11.5	6.5
Asplanchna Periodonta	15.5	11	9	14	10	7	17.5	9.5	9.5	13	21	9.5	16	10.5	7.5
Cladocera															
Alona-sp	24	14.5	11	13	6	6.5	14	4	6	13.5	5	6	12.5	9.5	9
Chydorus-sp	22	14.5	8	13	5.5	6	9	4.5	5	12.5	6.5	5	13	8.5	5.5
Pleuroxus-sp	21.5	11.5	8.5	11	4	5	10.5	2.5	5	5.5	3	5	12	6.5	5
Ceriodaphnia-sp	28.5	20	14.5	15	8	7.5	20	7	7.5	14.5	7.5	12.5	16.5	7	6.5
Daphnia-sp	28.5	19	16	19	8	8	17	9	7.5	28	13	10	19.5	14	6
Simocephalus-sp	21.5	15	11	12	5.5	7	10	5	5.5	21.5	8	5.5	20	14.5	7.5
Monina-sp	24.5	18.5	15	14.5	3.5	6.5	8	3.5	5	9.5	6.5	6.5	16	10	7.5
Daphanosoma-sp	21	16.5	13.5	11	6	8	11	5.5	5.5	22.5	7.5	7	18.5	11	11
Copepoda															
Daptomus sp	10.5	6.5	8	3.5	1.5	1	2.5	1	1	3.5	1.5	2	4.5	1.5	1.5
Para Cyclops sp	11	6	7.5	4.5	2	1.5	3.5	1.5	1	4.5	3	2.5	4.5	3	1.5
Clanoid sp	11	9.5	8.5	4.5	3	3	5.5	4	2.5	7	4.5	3.5	6.5	5	4.5
Cyclo poid sp	15	11.5	11	4.5	3	3.5	5.5	4	3	6	5	3.5	6.5	4	4

Abbr. S=summer, W=winter, R=rainy

ISSN: 0976-7126

Table 2: Species diversity at different sampling sites of lony dam

S/N.	Sampling Sites	Summer		Rainy		Winter	
1.	A	29	2.0727	29	1.7059	29	1.3677
2.	B	29	1.7865	29	1.3193	29	1.2505
3.	E	29	1.7584	29	1.3347	29	1.3959
4.	C	29	1.6047	29	1.2996	29	1.0416
5.	D	29	1.5771	29	1.2682	29	1.0005