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Study of Zooplankton Diversity in Vadsar Village Pond at Gandhinagar District of Gujarat

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ABSTRACT

Vadsar Village pond is situated in gandhinagar district. Zooplankton is maintain proper equilibrium between biotic and abiotic components of the aquatic ecosystem also it important component of aquatic flora serve as a major component of aquatic food chain. The present investigation deals with study of diversity zooplankton of Vadsar Village pond. The work was carried out for the period of one year that is October 2016 to September 2017. The zooplankton of Vadsar Village pond water is represented by five different groups like Protozoa, Rotifera, Cladocera, Copepoda, Ostracods with 19 different species were identified and recorded in Vadsar Village pond. Rotifera dominant among zooplankton and this indicates the polluted nature of the pond water.

Keywords : Zooplankton, Diversity and Vadsar Village pond.

I. INTRODUCTION

Zooplankton play an integral role in transferring energy to the consumers hence they form the next higher trophic level in the energy flow after phytoplankton. Ecological environment and mode of reproduction zooplanktons have attracted the attention of several workers throughout the world.

Biodiversity refers to variety and variability among living organism and the ecological complexes in which they occur. Human induced activities pose series threats to the biodiversity which ultimate leads to environmental degradation. Zooplankton is microscopic organism which move at the mercy of water currents. Rotifera, cladocera, copepoda and ostracods constitutes the major groups of zooplanktons. These groups occupy an intermediate position in the food web. The earliest studied on zooplankton diversity have been made by researchers like Arora (1962), Chandra Mohan and Rao (1976), Verma and Dutta Munshi (1987) Sharma (1980), Kodarkar (1994), Mishra and Saksena(1998), Dhanpathi and Rama Sarma(2000),Trivedy(2000), Baghela (2006), Pandit et al (2007).

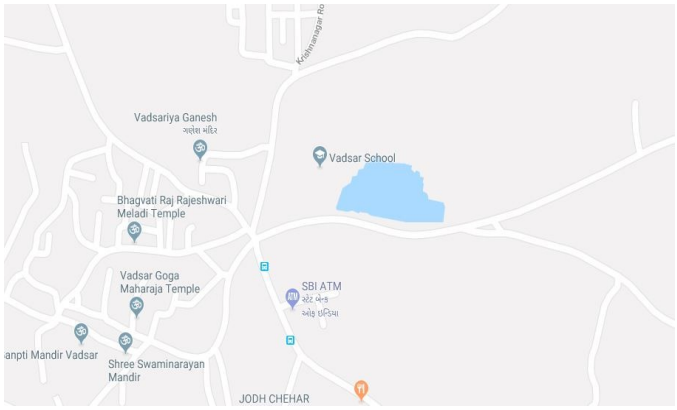
The pond provide the moisture near agriculture side by percolation of the water being the eutrophic pond large numbers of migrating birds visit throughout the year, with this view the present investigation has been carried out regarding the diversity of zooplankton in Vadsar Village pond of gandhinagar district.

II. METHODS AND MATERIAL

The pond selected for the present investigation is situated on the vadsar village in kalol taluka 25 km away gandhinagar districts in Gujarat. The lake is surrounded by marginal weeds, trees and agricultural land.

The water samples for biodiversity of Zooplankton analyzed were collected once in a month during the

period of October 2016 to September 2017. The surface water samples were collected from the collection site between 8.00 am to 10.00 am in plastic bottles. The different physicochemical characteristics (table.1) were analyzed as per the procedure given in APHA (1998), Theroux et.al.(1943) and Trivedy & Goel (1986). In order to study the zooplankton biodiversity samples were collected from surface water by filtering 50 litres of lake water through nylon bolting silk cloth. The samples were fixed using 4% formaline and the identification of zooplankton was done in laboratory Tonapi (1980).



III. RESULTS AND DISCUSSION

Zooplankton of the most important food items of the aquatic organisms. Almost all the fishes in their larval stages were dependent on it and some of them exclusively feed on planktons. Monthly variation of Zooplankton species were presented in table. 1. The zooplankton pollution observed has been composed of Protozoa, Rotifera, Copepods, Cladocera and Ostracods .

Zooplanktons density and composition exhibit a monthly variation. In the present study the concentration of Zooplankton was recorded in the month May and August exhibited maximum and minimum in January zooplankton per liter respectively. On the whole zooplankton exhibited higher density in summer season. Similar summer maximum of zooplankton population was also reported by George (1970) and Adoni (1985) Joshep B. et. al. (2011).

Monthly variation in the species diversity index of the major zooplankton population was also recorded. Composition and abundance of each zooplankton group varied from time to time and season and depended on limnological characteristics of the water body. Zooplankton consisted of species of Protozoa, Rotifer, Copepoda and Cladocera in Vadsar Village pond. Rotifera dominate among zooplankton and this indicates the polluted nature of the pond water were presented in table 2.

Table.1: Monthly distribution of Zooplankton Vadsar Village pond from October 2016 to September 2017.

MONTHS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Protozoa												
Difflugia	+	+	+ +	+ +	+ +	+	+	+	+ +	+ +	+	+ +
Nebela	+ +	+	+ +	+ +	+ +	+	+	+ + +	+ +	+ +	+	+
Paramecium	+	+	+	+ +	+ +	+ +	+	+ +	+ +	+	+	+ +
Verticella	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Rotifers												
Polyartha	+	+	+	+ +	+ +	+ + +	+ + +	+	+	+	+	+

Keralullo	+	+	+	+ +	+ +	+ +	+ +	+ +	+ +	+	+	++
Rotaria	+ +	+	+ +	+ +	+	+ +	+	+ +	+ +	+	+	+
Gastropus	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Brachionus	+	-	+	+	+	+ +	+ +	+	+	+	+	++
Copepods												
Eyclops	+	-	+ +	+	+ +	+	+ +	+ +	+ +	+	+	+
Diaptomus	+ +	-	+ +	+	+ +	+	+ +	+ +	+ +	+	+	+
Heliodiaptomus	+	+	+	+ +	+ +	+ +	+	+	+	+	+	++
Paracyclops	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Cladocerans												
Bosmania	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Daphnia sp.	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Alona	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Ostracods												
Cyperis	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Steno cypris	+	+	+	+	+	+ +	+	+	+	+	+ +	+
Cyclo cypris	+	+	+	+	+	+ +	+	+	+	+	+ +	+

Table 2. Total Zooplankton of Triveni lake during October 2016 to September 2017.

Zooplanktons	Oct	Nov	Dec	Jan	Feb	March	Apr	May	June	Juy	Aug	Sept
Protozoa (11.21 %)	63.29	22.01	18.81	77.39	117.98	102.75	32,03	32.51	52.68	45.36	70.30	65.20
Rotifera (41.17%)	123.34	167.44	146.15	220.28	324.56	386.39	295.58	127.98	186.71	84.70	135.20	130.12
Copepods (20.06 %)	66.88	51.31	106.91	142.54	242.99	216.16	117.18	9.78	1.63	1.07	70.80	74.01
Cladocera (24.06 %)	14.79	27.67	63.16	250.45	190.34	190.98	145.29	128.24	56.93	109.54	30.79	20.15
Ostracods (03.03%)	8.93	8.43	15.51	24.39	33.31	29.63	23.68	0.83	0.00	0.00	280.80	260.03
Total Zooplanktons	277.23	276.86	350.54	715.05	909.18	925.78	604.76	299.33	297.95	240.67	587.89	550.51

IV. CONCLUSION

Diversity of Zooplankton exhibit a major biotic component of an aquatic ecosystem an emphasis has been given to identify various plankton species as indicates particular type of water pollution. Prasad and Singh (1958) emphasized the importance of biological survey in monitoring water quality which is dependent on qualitative and quantitative composition of aquatic population. The most importance effect of organism pollution in a water body is due to enrichment of nutrients and total number of algal species. Zooplanktons Rotifera were good indicators of water quality.

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