AN ESTIMATION OF PLANKTON POPULATION OF GODAWARI RIVER WITH REFERENCE TO POLLUTION

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ABSTRACT

Evaluation of Godavari riverNashik District Maharashtra was made assess the quality of water from april 2009 to april 2010 the qualitative and quantitative evaluation of the variation in river water showed high quality of zooplankton population throughout the study period. Rotifers formed dominated group over other group of organism. The present study revealed that the water of River Godavari is contaminated of sewage and other industrial effluents at some stations C and D Gangapur reservoir at Nashik

Keywords: Zooplankton, pollution , Godavari river

INTRODUCTION:

Zooplankton has short life span and they respond more quickly to environment leads to change in plankton communication in terms of tolerance, abundance, diversity and dominance in the habitat. Therefore zooplankton communities of numerous reservoirs, lakes and shallow water bodies have been used as indicators for the status of the lake (Christoferson *et al.,* 1993; Jeppensen *et al.,* 1999; Ramchandra *et al.,* 2002). The variability observed in the distribution of zooplankton is due to abiotic parameters (Roff *et al.,* 1988; Christou 1998; Escribano and Hidalgo, 2000; Beyst *et al.,* 2001).

Hence the present investigation was carried out on the surface zooplankton population in the aquatic ecosystem of Godavari The industrial effluents from various industries in and around the Ramkund downstream and sewage discharge at Tapowan area affecting the water quality as a consequence, the zooplankton population of Godawari River has been affected in terms of abundance and diversity.

MATERIALS AND METHODS

Zooplankton samples were collected for qualitative and quantitative analysis in between 8 a.m. to 10 a.m. by standard methods (APHA, 1985) two sampling sites over period of May 2009 to April 2010. The collected samples were fixed in 3-4 % formalin and brought to the laboratory for zooplankton analysis; counting and identification were done as per, (1992) Species diversity index was obtained by following Shannon were methodology (Nath, 1997).

RESULTS AND DISCUSSION:

Station I (Gangapur Dam) : Species encounter at station I and their month wise distribution were presented in table 1 and figure 3. A total no of species were recorded from this station, of which 13 species belongs to rotifer, 6 species belongs to cladocera and 2 species of copepoda. The maximum population density 113 was observed in June and minimum September. The annual mean percentage composition of different groups of zooplankton shows the rotifer contribute 41.01 %, copepod 22.79 % and cladocera 36.18% fig. 3.

Station II (Ramkund Down stream) : A total 23 species encounter from this station of which 12 to rotifera, 4 belongs to cladocera , 2 belongs to copepoda the monthly variation of various zooplankton species during the present study were shown in table 2 and fig. 2 total zooplankton population density varied from 26, during septmber to 174, during Dec. The annual mean percentage composition of zooplankton groups showed that rotifercontributed 71.24 %,cladocera 12.37% copepod16.37% fig. 4

Table – 1: Population composition and monthly fluctuation of Zooplankton at station 'A' (Oraganism/ ml) from May 2009 to April 2010

Month	Rotifers	Cladocera	Copepoda	Total
MAY	35	12	20	67
JUNE	62	20	31	113
JULY	28	20	25	73
AUGUST	37	14	17	68
SEPTEMBER	12	12	27	51
OCTOBER	14	20	25	59
NOVEMBER	28	8	33	69
DECEMBER	24	16	23	63
JANUARY	22	14	25	61
FEBRUARY	18	25	22	65
MARCH	44	12	29	85
APRIL	16	16	23	55
MEAN	**28.33**	**15.75**	**25**	

Table – 1: Population composition and monthly fluctuation of Zooplankton at station 'B' (Oraganism/ ml) from May 2009 to April 2010

Month	Rotifers	Cladocera	Copepod	Total
MAY	20	12	8	40
JUNE	45	10	12	67
JULY	33	4	8	45
AUGUST	10	4	12	26
SEPTEMBER	32	12	31	75
OCTOBER	43	4	25	72
NOVEMBER	48	10	21	79
DECEMBER	162	8	4	174
JANUARY	79	6	12	97
FEBRUARY	102	12	2	116
MARCH	116	29	25	170
APRIL	41	16	8	65
MEAN	**60.91**	**10.58**	**14**	

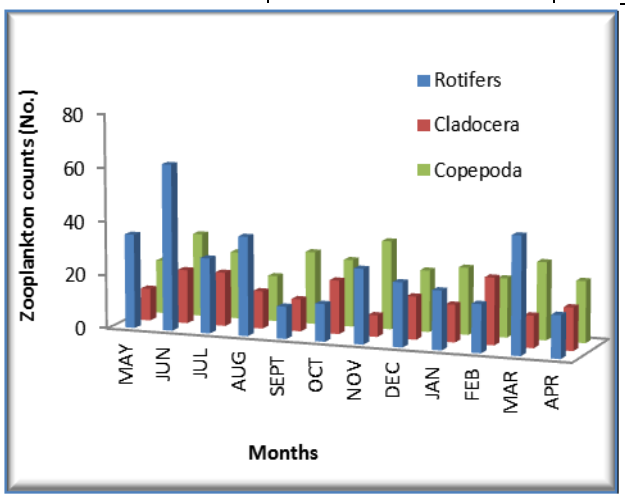

Fig 1: Month wise Zooplankton Population in Godavari River at station A May 2009 to April 2010

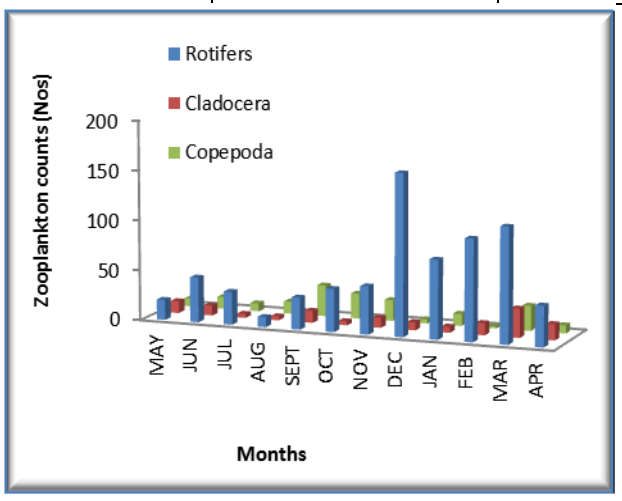

Fig 2: Month wise Zooplankton Population In Godavari river at station B May 2009 to April 2010

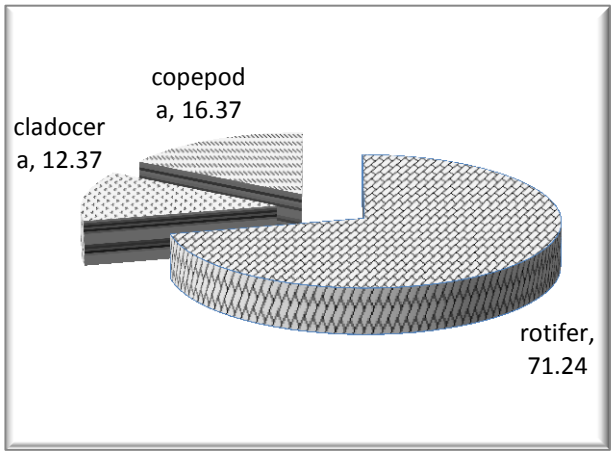

Fig: 3 Station A Zooplankton population

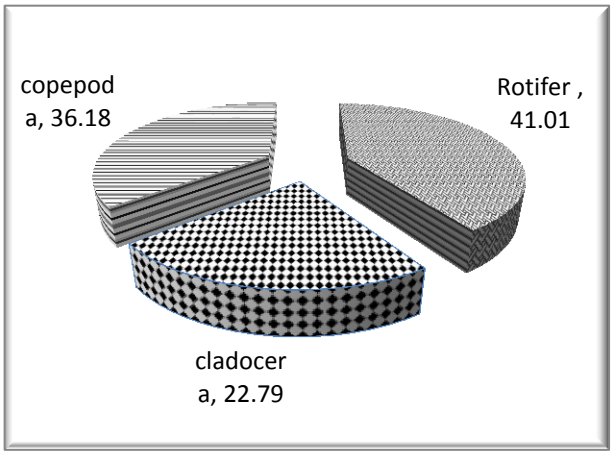

Fig: 4 Station B and Zooplankton population

Fig. 3 and 4: Annual mean percentage composition of Zooplankton at Station A and B during May 2009 to April 2010

It is concluded from this study that the zooplankton population of Godavari River at NashikDistict is highly influenced by the discharge from different industrial effluents. The shift in the zooplankton community structure and dominance of pollution tolerant forms at discharge zone indicated deterioration of water quality in this stretch of the river.

In the present investigation, the zooplankton fluctuates monthly and its productivity was according to Rajshekhar *et al.*, (2010), the composition and relative abundance of species in the aquatic communities is influenced by the variation in tropic state and seasonal changes of physicochemical variables of water body. Dirican *et al.,* (2009) permanent dominancy of rotifer species such as Brachionus and Keratella are indicative of eutrophic condition of lake. They studied Camligoze dam lake, Turkey and stated that rotifer are more abundant than other zooplankton groups and account for major portion of food chain. Chattopadhyay and Barik (2009) studied composition and diversity of net zooplankton from Krishnasayar lake and recorded high scores of species diversity and low scores of species richness amongst net zooplankton. They also recorded maximum relative abundance for rotifer and minimum for Decapoda.

According to Sousa *et al*., (2008) changes in water quality of water body have significant effect on structure of zooplankton assemblages that can potentially affect the functioning of ecosystem. Seasonal distribution of the population structure of zooplankton in connection with physicochemical parameters Sarkar and Chaudhary (1999). Hence, Zooplankton communities of numerous reservoirs, lakes and shallow water bodies have been used as indicators for the status of the lake (Christoferson *et al.,* 1993; Jeppensen *et al.,* 1999; Ramchandra *et al.,* 2006) and related with the concentration of total nitrogen, total phosphorus, algal biomass and the density and size of individuals (in the Central American lakes, Giselle and Bruce, 2007). The variability observed in the distribution of zooplankton is due to abiotic parameters (e.g. climatic or hydrological limitation) and biotic parameter (predation, competition) or combination of both (Roff *et al.,* 1988; Christou, 1998; Escribano and Hidalgo, 2000; Beyst *et al.,* 2001). Hence, the use of zooplankton for environmental characterization of water body is potentially advantageous as the quality of water affects the species composition, abundance, productivity and physiological conditions.

Ferdous and Muktadir (2009) reviewed the potentiality of zooplankton as bio-indicator. They conluded that potentiality of zooplankton as bio-indicator is very high. Ramchandra *et al*.,(2006) emphasized role of plankton in aquatic food chain and discussed zooplankton as bio-indicators. They carried hydrobiological investigation in selected Bangalore lakes.

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