

## Quantitative analysis of phytoplankton and zooplankton of Masala lake, Masala, Distt. Chandrapur, Maharashtra

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### Abstract

Quantitative analysis of both phytoplankton and zooplankton have greater importance in limnological studies, Masala lake is situated at 6 km north east from Chandrapur city. The phytoplankton and zooplankton samples were collected from sampling site  $S_1$ ,  $S_2$  and  $S_3$  in month of September 2006. At site  $S_1$  the phytoplankton were found in larger number in comparison to sites  $S_2$  and  $S_3$ , however at site  $S_3$  the species variation is noted. About zooplankton the larger amount of zooplankton were reported at site  $S_2$ . Along with all these zooplankton some Nematode species were also noted, these species were *Diplogaster fictor* and *Rhabdolaimus minor*. In the present study the result of the quantitative analysis of both phytoplankton and zooplankton noted at different collection sites are discussed.

**Keywords:** *Quantitative, Phytoplankton, Zooplankton, Lake*

### Introduction

Amongst the aquatic ecosystems the lake ecosystem have unique characteristics and importance. The lake water at many places used for drinking as well as for domestic purposes. Besides studying the physico-chemical parameters of lake water, the study of phytoplankton and zooplankton have equal importance. Various workers contributed their studies on this aspect such as Hutchinson, 1967; Prasad, 1977; Jyoti and Sehgal, 1979; Balki *et al.*, 1984; Kaur *et al.*, 1999; Khanna and Bhutiani, 2003; Sawane *et al.*, 2006 and Veerendra *et al.*, 2006. Masala lake is situated at 6 km north east from Chandrapur city, Maharashtra. This lake has greater importance for its domestic use, so the study of biological parameters as quantitative analysis of phytoplankton and zooplankton were attempted at 3 collection sites.

### Materials and Method

Lake Masala having earthen embankment from one side and have a additional attached depression site. The samples were collected in the month of September 2006 from collection stations,  $S_1$ ,  $S_2$  and  $S_3$ . For studying the quantitative analysis of phytoplankton and zooplankton at each collection site separately, 70 liters of water was passed through the plankton net. The plankton samples were preserved in 4% formaldehyde and brought in the laboratory for quantitative and qualitative analysis. With the help of broad mouth dropper the sample was transferred to the Sedgwick Rafter cell and the plankton were counted. The identification was made with the help of available current literature (Penak, 1978). The quantitative analysis are presented in Table 1.1 and Table 1.2.

## Observation

In the present study 12 species of phytoplankton and 7 species of zooplankton with their quantitative estimates were noted at collection station  $S_1$ ,  $S_2$  and  $S_3$ . The result of quantitative analysis of phytoplankton is presented in Table 1.1 and zooplankton is in Table 1.2.

**Table 1.1: Quantitative analysis of Phytoplankton at collection stations  $S_1$ ,  $S_2$  and  $S_3$**

S.No.	Name of phytoplankton	Number of phytoplankton		
		$S_1$	$S_2$	$S_3$
1	<i>Spirogyra</i>	76	23	32
2	<i>Acanthes lanciolate</i>	67	16	21
3	<i>Anabaena</i>	69	74	88
4	<i>Nostoc linekia</i>	102	98	83
5	<i>Spirulina</i>	87	39	56
6	<i>Diatom vulgare</i>	103	78	94
7	<i>Phacus succica</i>	20	37	18
8	<i>Geodinium montanum</i>	37	46	30
9	<i>Closterium</i>	18	17	12
10	<i>Chlorocloster pirenigera</i>	22	188	24
11	<i>Dinobryon stipitatum</i>	-	-	7
12	<i>Volvox</i>	-	3	11

**Table 1.2: Quantitative analysis of Zooplankton at collection stations  $S_1$ ,  $S_2$  and  $S_3$**

S.No.	Name of Zooplankton	Number of zooplankton		
		$S_1$	$S_2$	$S_3$
1	<i>Cyclops</i>	4	6	5
2	<i>Brachionus forficula</i>	12	14	17
3	<i>Keratella tropica</i>	9	11	7
4	<i>Asplanchnopus</i>	4	3	4
5	<i>Lepadella oralis</i>	1	4	3
6	<i>Diplogaster factor</i> (Nematode)	4	5	6
7	<i>Rhabdolaimus minor</i> (Nematode)	3	6	2



## Results and Discussion

The phytoplankton were found more in number at collection station S<sub>1</sub>, however the species variation is more at station S<sub>3</sub>, where *Dinobryon stipitatum* was noted as well as more number of Volvox were noted. Khanna and Bhutiani, 2003 reported 3 genera of Cynophyceae, Oscillatoria, Anabena and Nostoc. These were recorded highest in winter in Sitapur pond at Hardwar. Veerendra *et al.*, 2006 identified 34 species of phytoplankton under 4 classes, among them maximum density was recorded under Bacillariophyceae, Chlorophyceae, Cynophyceae and Euglenophyceae, in Mani reservoir, Hosangar, Karnataka. In the present investigation the phytoplankton Nostoc and Anabena are noted, the findings agrees with the findings of Khanna and Bhutiani, 2003, and Veerendra *et al.*, 2006. In the quantitative analysis of zooplankton 7 species of zooplankton were noted these includes *Cyclops*, *Brachionus forficula*, *Keratella tropica*, *Asplanchnopus*, *Lepadella oralis*, *Diplogaster ficator* (Nematode) and *Rhabdolaimus minor* (Nematode). Hutchinson, 1967 and Prasad, 1977 noted presence of Cladocerans in lower profile in both annual cycle and such as no definite pattern of their variations were observed. However they are mostly abundant in winter and summer seasons.

Jyoti and Sehgal, 1979 and Balki *et al.*, 1984 observed Rotifera form the dominant zooplankton fauna in many aquatic habitats, Kaur *et al.*, 1999 identified 6 taxas of Protozoa, 12 Rotifers, 11 Crustaceans, 14 Insects, 7 Annelids, 8 Mollusca, 2 Nematodes, 1 Nemartina, from 6 sites of Kanjali lake from Nov. 1996 to March 1997. In the present work the Nematode species *Rhabdolaimus minor* and *Diplogaster ficator* are noted. Pathak and Mudgal, 2002 reported 19 species belong to Protozoa, Cladocera, Ostracoda, Copepoda and Rotifera. Sawane *et al.*, 2006 noted the 8 zooplankton species in Irai dam Chandrapur. These are *Diffugia*, *Cyclops*, *Diaptomus*, *Chydorus*, *Moina*, *Brachionus calyciflorus*, *Brachionus fulcatus* and *Cypris*. The density of zooplankton were noted more in winter and less in summer. The present study showed that the phytoplankton *Nostoc linekia* and *Diatoms vulgare* are abundant in number and *Dinobryon stipitatum* are least. The species variation is more at collection station S<sub>3</sub>. Amongst zooplankton *Cladoceras* are absent. *Brachionus* are found more in number and *Lepadella oralis* are least in number. It was noted that the Rotifers were present in larger number as well as the algae like Anabena and Nostoc were present, this shows the lake water may be contaminated with domestic pollutants. The plankton both phytoplankton and zooplankton were considerable present in good amount, it may be due to favorable physico-chemical conditions in the month of September or approaching winter as many worker noted abundance of plankton in the winter season.

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