

# QUANTITATIVE AND QUALITATIVE ANALYSIS OF PLANKTONS FROM NANDED REGION, MAHARASHTRA.

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## ABSTRACT

From site A Monthly fluctuations were observed in plankton number. Maximum count of plankton was found in summer (257 plankton per ml in May) and minimum number of plankton was found in September (65 planktons per ml) in rainy season. Average number of plankton was found during study period was (149.2 plankton per ml). From site B Monthly fluctuations observed in plankton number. Maximum number of plankton was found in summer i.e. (88 plankton ml in May) and minimum was found in August 42 plankton per ml in rainy season. Average number of plankton found during study period was (60.9 plankton/ml).

## INTRODUCTION

The plankton are microscopic organisms floating on water, consist of diatoms, protozoan, small crustaceans, and the eggs and larval stages of larger animals. Phytoplankton are the microscopic plants act as the primary producers in an aquatic ecosystem, convert acquired light energy into carbohydrates through photosynthesis. Energy not used by the phytoplankton for maintenance is available as food for the animals that consume it. Zooplanktons are heterotrophic organisms that consume phytoplankton and they become food for larger, secondary consumer animals such as bivalves, fish etc. Planktons are considered the main natural food for aquatic animals. Fertilization of pond is directly related with the plankton production (Touliabah 1992).

## MATERIAL & METHODS

### I. PLANKTON ANALYSIS

Two sites were selected for the study from site A was constructed farm lake near CIDCO, Nanded. Site B was a cement tank situated in N. E.S. Science college Nanded. Water samples were collected from Jan 2013 to Feb 2014 in between 6:30 am to 9:30 am. Sample were collected in plastic bottles by using plankton net made of blotting cloth and preserved in 2% formalin solution. Quantitative and qualitative analysis was carried out by using Sedgwick Rafter cell method (**Trivedy and Goel, 1986**). It is most common device used for counting phytoplankton and zooplankton. One ml of sample was taken and transferred it on cell, and then cover slips placed over it carefully. Plankton counted under the microscope. Two to five replicates were run for each sample. Plankton count was done with the help of following formula

$$\text{No. of Plankton / ml} = \frac{\text{No. of Organism Counted}}{\text{No. of Replica taken}}$$

## RESULT & DISCUSSION

### Site A

Monthly fluctuations were observed in plankton number. Maximum count of plankton was found in summer (257 plankton per ml in May) and minimum number of plankton was found in September (65 planktons per ml) in rainy season. Average number of plankton was found during study period was (149.2 plankton per ml). (Table No. 1.1)

In plankton analysis 14 classes, 20 order and 26 species were found. Out of them 7 classes were of phytoplankton and 7 classes of zooplankton. Phytoplankton species were *Oscillatoria Sp.*, *Arthospira Sp.*, *Scytonema Sp.*, *Chroococcus Sp.*, *Ectocarpus Sp.*, *Volvox Sp.*, *Pediastrum Sp.*, *Scenedesmus Sp.*, *Oedogonium Sp.*, *Cladophora Sp.*, *Spirogyra Sp.* *Cosmarium Sp.*, *Ulotrix Sp.*, *Vulgaris Sp.*, *Fragilaria Sp.*, *Navicula Sp.* and Zooplanktons species were *Leishmania Sp.*, *Histolytica Sp.*, *Caudatum Sp.*, *Branchipus Sp.*, *Daphnia Sp.*, *Cypris Sp.*, *Cyclops Sp.* *Herbstii Sp.* *Gochidium larvae of unio* and *Nauplius larvae* (Table No. 1.2)

### Site B

Monthly fluctuations observed in plankton number. Maximum number of plankton was found in summer i.e. (88 plankton ml in May) and minimum was found in August 42 plankton per ml in rainy season. Average number of plankton found during study period was (60.9 plankton/ml). (Table No. 1.1).

Phytoplankton species from site B, were *Chroococcus Sp.*, *Volvox Sp.*, *Scenedesmus Sp.*, *Oedogonium Sp.*, *Cladophora Sp.*, *Spirogyra Sp.* *Cosmarium Sp.*, *Ulotrix Sp.*, *Vulgaris Sp.*, *Fragilaria Sp.*, *Navicula Sp.* Zooplanktons species were *Histolytica Sp.*, *Daphnia Sp.*, *Cypris Sp.*, *Cyclops Sp.* *Herbstii Sp.* *Gochidium larvae of unio*, *Nauplius larvae*. (Table No. 1.2). Figure 1.1 and 1.2 showed the photographs of phytoplankton and zooplanktons found during study period from site A and site B.

## REFERENCES

- Bhuiyan, A.S. and Q. Nessa 1991:** A quantitative study of zooplankton in relation to the physicochemical conditions of a freshwater fish pond of Rajshahi. Univ. J. Zool. Rajshahi Univ., 17: 29-37.
- Chowdhury, S.H. and A. Mazumder 1981:** Limnology of Lake Kaptai,-1. Physicochemical features. Bangladesh J. Zool., 9(2): 59-72.
- Gajanan K. Sontakke and Satish S. Mokalsh. 2014.** Seasonal variation in primary productivity of two freshwater lakes of Aurangabad district, Maharashtra, India. International Journal of Fauna and Biological Studies 1 (6): 07-10
- Manjare S. A. (2015):** Qualitative and Quantitative Study of Zooplankton from Fresh Water Tanks of Kolhapur District, (Maharashtra).
- Munwar, M. 1970:** Limnological studies on freshwater ponds in Hyderabad, India. I. The biotype. *Hydrobiol.*, 35: 127-162.
- Needham, J.G. and R.P. Needham 1972:** A guide to the study of freshwater biology. Holden-day, Inc Cali., 94 (III), USA.
- Patra, R.W.R. and M.A. Azadi 1987:** Ecological studies on the planktonic organisms of the Halda River. Bangladesh J. Zool., 15(2): 109-123.
- Qasim, S.Z. 1977:** Contribution of zooplankton in the water environments. Proc. Symp. Water Zool. P. Goa. India, 700-708p.
- Trivedy R.K . and Goel P. K. 1986:** Chemical and Biological methods for water pollution studies. *Environmental publication*, Karad, 250p.
- Touliabah H. S. 1992:** Relations between fertilization and phytoplankton composition and productivity in serw fish farm. M. Sc. Girl Coll. Ain Shams Univ. p-213.

Table No 1.1 - shows month wise variations in plankton analysis from Jan – Dec during the year 2013 at site A and site B.

Month	Site A (plankton count / ml)	Site B (plankton count / ml)
Jan	166	65
Feb	187	70
Mar	210	72
Apr	223	75
May	257	88
Jun	112	55
July	110	50
Aug	70	42
Sep	65	46

Oct	98	48
Nov	133	55
Dec	160	65
Average	149.2	60.9

Table No 1.2 - shows identified phytoplankton and zooplankton from Jan – Dec during the year 2013 at site A and site B.

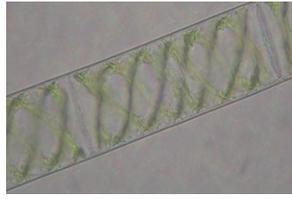
Sr. No.	Class / order / genus	Site A	Site B
	<b>Phytoplankton</b>		
<b>I</b>	<b>Cyanophyceae</b>		
<b>A</b>	<b>Oscillatoriaceae</b>		
1	<i>Oscillatoria Sp.</i>	+	
2	<i>Arthospira Sp.</i>	+	
<b>B</b>	<b>Nostocales</b>		
3	<i>Scytonema Sp.</i>	+	
<b>C</b>	<b>Chroococcales</b>		
4	<i>Chroococcus Sp.</i>	+	+
<b>II</b>	<b>Phaeophyceae</b>		
<b>D</b>	<b>Ectocarpales</b>		
5	<i>Ectocarpus Sp.</i>	+	
<b>III</b>	<b>Chlorophyceae</b>		
<b>E</b>	<b>Volvocaceae</b>		
6	<i>Volvox Sp.</i>	+	+
<b>F</b>	<b>Chlorococcales</b>		
7	<i>Pediastrum Sp.</i>	+	
8	<i>Scenedesmus Sp.</i>	+	+
<b>G</b>	<b>Oedogoniales</b>		
9	<i>Oedogonium Sp.</i>	+	+
<b>H</b>	<b>Cladophorales</b>		
10	<i>Cladophora Sp.</i>	+	+
<b>VI</b>	<b>Zygnemophyceae</b>		
<b>I</b>	<b>Zygnematales</b>		
11	<i>Spirogyra Sp.</i>	+	+
12	<i>Cosmarium Sp.</i>	+	+
<b>V</b>	<b>Ulvophyceae</b>		
<b>J</b>	<b>Ulotrichales</b>		
13	<i>Ulotrix Sp.</i>	+	+
<b>VI</b>	<b>Trebouxiophyceae</b>		
<b>K</b>	<b>Chlorella</b>		
14	<i>Vulgaris Sp.</i>	+	+

<b>VII</b>	<b>Bacillariophyceae</b>		
<b>L</b>	<b>Pennales</b>		
15	<i>Fragilaria Sp.</i>	+	+
16	<i>Navicula Sp.</i>	+	+
	<b>Zooplankton</b>		
<b>I</b>	<b>Zoomastigophora</b>		
<b>A</b>	<b>Kinetoplastida</b>		
1	<i>Leishmania Sp.</i>	+	
<b>II</b>	<b>Lobosea</b>		
<b>B</b>	<b>Amoebida</b>		
2	<i>Histolytica Sp.</i>	+	+
<b>III</b>	<b>Ciliata</b>		
<b>C</b>	<b>Hymenostomati</b>		
3	<i>Caudatum Sp.</i>	+	
<b>IV</b>	<b>Branchipoda</b>		
<b>D</b>	<b>Anostraca</b>		
4	<i>Branchipus Sp</i>	+	
<b>E</b>	<b>Cladocera</b>		
5	<i>Daphnia Sp.</i>	+	+
<b>V</b>	<b>Ostracoda</b>		
<b>F</b>	<b>Podocopida</b>		
6	<i>Cypris Sp.</i>	+	+
<b>VI</b>	<b>Maxillopoda</b>		
<b>G</b>	<b>Cyclopoida</b>		
7	<i>Cyclops Sp.</i>	+	+
<b>VII</b>	<b>Malacostraca</b>		
<b>H</b>	<b>Leptostraca</b>		
8	<i>Herbstii Sp.</i>	+	+
9	<i>Gochidium larvae of unio</i>		+
10	<i>Nauplius larvae</i>		+

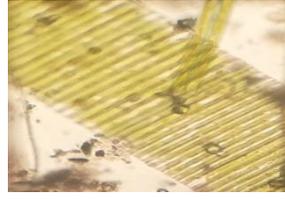
### Fig1.1 Phytoplankton



*Oedogonium Sp.*



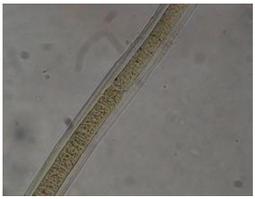
*Spirogyra Sp.*



*Oscillatoria Sp.*



*Ulothrix Sp.*



*Scytonema Sp.*



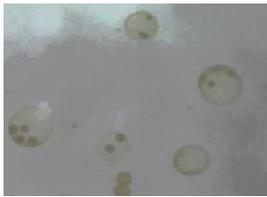
*Ectocarpus Sp.*



*Arthospira Sp.*



*Chroococcus Sp.*



*Volvox Sp.*



*Pediastrum Sp.*



*Scenedesmus Sp.*

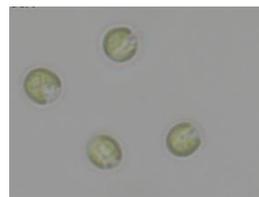


*Cladophora Sp.*

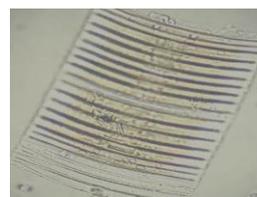
### Fig 1.2 Zooplanktons



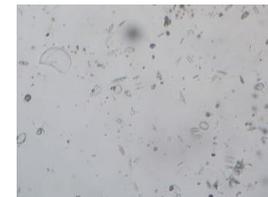
*Cosmarium Sp.*



*Vulgaris Sp.*



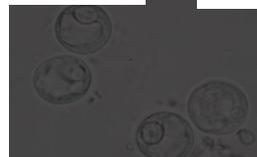
*Fragilaria Sp.*



*Navicula Sp.*



*Leishmania Sp.*



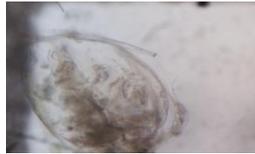
*Histolytica Sp.*



*Caudatum Sp.*



*Branchipus Sp.*



*Daphnia Sp.*



*Cypris Sp.*



*Cyclops Sp.*



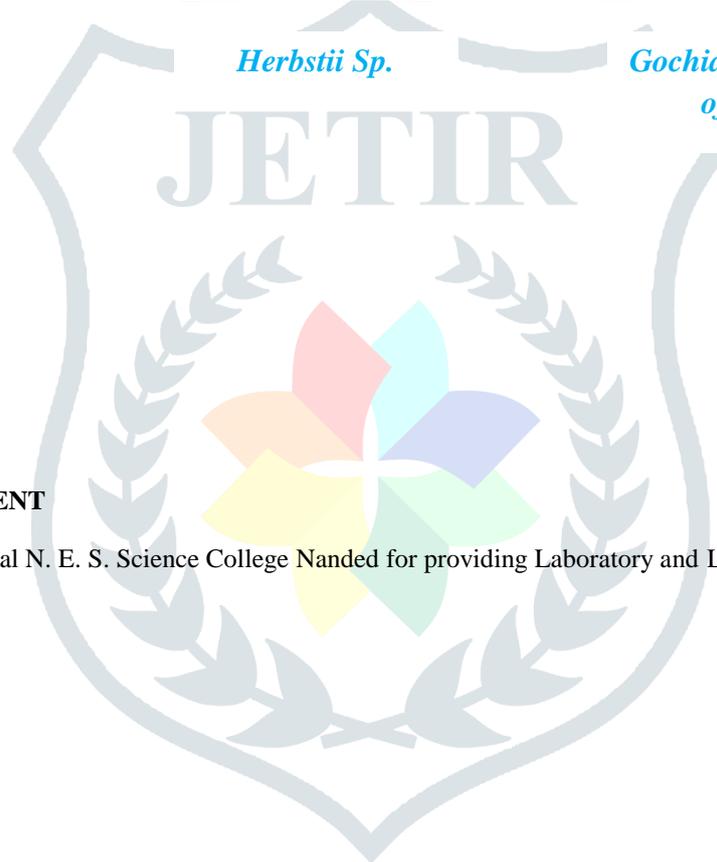
*Herbstii Sp.*



*Gochidium larvae  
of unio*



*Nauplius larvae*



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