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Bio-diversity and seasonal variation in protozoan (ciliates) of Sanjul lake situated at Phulambri, Dist. Aurangabad (M.S.)

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ABSTRACT

The present paper deals with study of physico-chemical parameters along with the diversity of protozoan (Ciliates) populations in 2013-14. The fluctuations in some physico-chemical parameters were noted during the study period (2013-2014). Seasonal fluctuations in the protozoan (Ciliates) were also observed.

INTRODUCTION

Earth consists of 3% of fresh water which is to be utilized very preciously. Water is the one of the natural resource which man has exploited more than any other resources. It is an essential constituent of all animal and plants. Water of good quality is required for living organisms. The industrial growth, urban section of cities and pollution let into the fresh water system are a challenge for the freshwater ecosystem. Man has polluted the water by the anthroprogenic activities Which affect the physical, chemical and biological nature of the freshwater system[1-2].

The water pollution is a severe problem. The input of increasingly load of pollutants and toxic substance into the surface water has been the causing serious disturbance in the aquatic ecosystem.[3-4]

The physico-chemical methods are used to detect the effect of population on the water quality. Changes in the water quality are reflected in the biotic community structure as shown by occurrence, diversity and abundance patter of species[5-8]

Protozoan, are the tiny creature which plays indicator of pollution as they are very much sensitive to the environment in which they live and any alternation in them leads to change in the communities in terms of tolerance, abundance, diversity and dominance in the habitat, therefore protozoan population may be used as reliable tree for biomonitoring studies to assess the populations status of aquatic system.[9]

The present attempt has been made for the study of fluctuations in population density of ciliates in relation to some physico chemical parameters.

MATERIALS AND METHODS

The study was done on Sanjul Lake which is situated at Phulambri, Dist. Aurangabad (M.S.) approximately 22 Km. away from Aurangabad city. During the period of the work, the water samples for the analysis were collected from the fixed points about 15 – 20cm below the surface of water during February 2013 to January 2014. The samples were collected after 15 days at monthly intervals of every month around 9am. The atmospheric temperature and water temperature was recorded with the help of the digital portable kit. The estimation of physico-chemical parameters was carried out with the help of APHA.[10-11] The movements of ciliates were solved down by using methyl cellulose for observation and counting. Counting was done with the help of Sedgwick rafter counting chamber.

The population was calculated on the basis of total number of ciliates present. The identification of ciliates is based on Brick and Corleis.

Table 1: Monthly values of various physico-chemical parameters of water from February 2013 – January 2014

Parameters	Periods											
	Feb. 2013	March 2013	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013	Nov. 2013	Dec. 2013	Jan. 2014
Atmospheric temp (^{0}C)	38.9	35.2	36.0	37.2	31.0	31.0	29.0	28.1	30.0	29.2	29.9	27.0
pH	7.1	69.1	71.2	72.0	7.6	7.1	7.5	7.8	6.7	7.0	6.5	7.1
DO (ppm)	7.0	8.0	8.2	9.0	8.7	9.8	8.7	8.2	8.4	8.3	8.9	9.8
Total Alkalinity ppm	58	63	62	56	68	83	77	62	75	78	77	83
Total Hardness	60	74	46	38	72	68	66	52	52	60	44	55

RESULTS AND DISCUSSION

The table I shows the findings of various physico-chemical parameters. For all the determination of parameters standard methods were used. The distribution and abundance of ciliates like other microbial communities is governed by a variety of ecological factors. The physico-chemical parameters vary from place to place and inter act with each other.

In the present study, we have observed considerable variation in the air and surface water temperature was observed. Seasonal variations were observed in the water temperature. Values which also exhibited a correlation with temperature.

Dissolved oxygen content fluctuated during the study. According to the observed value DO was more in winter and less in summer[12-13].

The pH showed and alkaline range throughout rarely. It was acidic. The observed value also showed that Alkalinity was maximum in Monsoon and minimum in winter. The CO_2 was inversely related to DO. The hardness was more in summer, moderate in winter and less in monsoon.

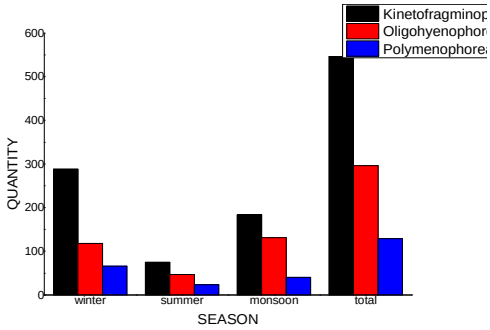

Fig.1- Seasonal Variations of Protozoa

In the present study, it showed great variations of the species seasonwise (Fig.1). It deals with the fluctuations of the population densities of ciliates. All the three classes kinetofraymenophorea, polymenophorea and ligohymenophores were represented. The class kineto fragmenophorea was represented by *Didiniumnasutum*, Dileptus anser, Lacrymaria olor. Litonotus lamella and litonotius farcoils. The class polymenophorea was represented by Euplotes affinis, Euplotes patella, Frontonia accumineta, Paramaecium Caudatum and Oxytricha Fallar.[14-15]

Didinumnasultum showed a very poor population density. Paranaecium candatum and paranaecum hursaria was present and showed maximum population density.

Kinetofragmenophorea happened to be the group represented by a maximum variety and population density.

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