International Multidisciplinary Research Journal 2012, 2(6):27-29
ISSN: 2231-6302
Available Online: http://irjs.info/

INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL

# Studies on some free living protozoan from Salim Ali lake. Aurangabad

**J.D. Shaikh[1]; T.T. Shaikh[1]; U.P. Kamble[1]; T.J. Jadhav[2] and Malik Kazim[1]**

[1]Department of Zoology, Dr. Rafiq Zakaria Campus, Maulana Azad College, Aurangabad (M.S.), India
[2]Department of Zoology, Shivaji College, Kannad Dist.Aurangabad (M.S.), India

**Abstract**
Protozoa are one-celled animals found worldwide in most habitats. Most species are free living, but all higher animals are infected with one or more species of protozoa. Infections range from asymptomatic to life threatening, depending on the species and strain of the parasite and the resistance of the host. Present study deals with the free living protozoa inhabiting fresh water bodies. The factor which influence their distribution and population in a given water bodies temperature, light, pH, chemical composition, acidity, and amount of food present in water and degree of adaptability of the individual protozoa to various environmental changes.

**Keywords:** Protozoa, Salim Ali lake, Aurangabad.

## INTRODUCTION

Protozoa are microscopic unicellular eukaryotes that have a relatively complex internal structure and carry out complex metabolic activities. Some protozoa have structures for propulsion or other types of movement. The Protozoa are considered to be a subkingdom of the kingdom Protista, although in the classical system they were placed in the kingdom Animalia. More than 50,000 species have been described, most of which are free-living organisms; protozoa are found in almost every possible habitat. The fossil record in the form of shells in sedimentary rocks shows that protozoa were present in the Pre-cambrian era. Anton van Leeuwenhoek was the first person to see protozoa, using microscopes he constructed with simple lenses. Between 1674 and 1716, he described, in addition to free-living protozoa, several parasitic species from animals, and *Giardia lamblia* from his own stools. Virtually all humans have protozoa living in or on their body at some time, and many persons are infected with one or more species throughout their life. Some species are considered commensals, i.e., normally not harmful, whereas others are pathogens and usually produce disease. Protozoan diseases range from very mild to life-threatening. Individuals whose defences are able to control but not eliminate a parasitic infection become carriers and constitute a source of infection for others. In geographic areas of high prevalence, well-tolerated infections are often not treated to eradicate the parasite because eradication would lower the individual's immunity to the parasite and result in a high likelihood of reinfection. The organelles of protozoa have functions similar to the organs of higher animals. The plasma membrane enclosing the cytoplasm also covers the projecting locomotory structures such as pseudopodia, cilia, and flagella.The ciliates are a group of protozoans characterized by the presence of hair-like organelles called cilia, which are identical in structure to flagella but typically shorter and present in much larger numbers with a different undulating pattern than flagella. Cilia occur in all members of the group and are variously used in swimming, crawling, attachment, feeding, and sensation. Their early appearance as living organism, their adaptability to various habitat & their capacity to remain viable in the encysted condition, probably account for the wide distribution of the protozoa throughout the world [1]. Finlay (1988) [2] studied 50 species of fresh water protozoa to various concentration of sea waters, either by direct transfer or by gradual addition of the sea water. He found that *Bodo ucinatus, Uronema marinium, Pleuronema Jaculans and Colpoda aspera are able to* live and reproduce even when directly transferred to sea water, that *Amoeba verrucosa,* Euglena*, Phacus, Monas, Cyclidium, Euplotes, Litonotus, Paramecium, Stylonychia* , etc. Tolerate only a low salinity when directly transferred, but if the salinity is gradually increased, they live in 100 percent sea water and that *Arcella, Cyphoderia, Aspidisca, Blepharisma, Colopoda, Halteria* etc. Could not tolerate 10 pecent sea water even when the change was gradual.

Received: April 03, 2012; Revised: May 10, 2012; Accepted: June 02, 2012.

*Corresponding Author
J.D. Shaikh
Department of Zoology, Dr. Rafiq Zakaria Campus, Maulana Azad College, Aurangabad (M.S.), India

Tel: +91-9960500888
Email: sjulfikar@rediffmail.com

## MATERIAL AND METHODS

Most free-living protozoa ingest their food, that is they are phagotrophic, they may 'eat' bacteria, algae, small organic particles or each other. Again, though each consists of a single cell, the shape and size can differ so much that generalisations are not all that useful. They tend to be abundant in habitats where productivity is high, soft sediments supporting particularly high numbers. Unlike sampling for algae, nets are rarely of any use. Submerging a bottle of about a litre and filling it two-thirds full is a better method. In the present study the water samples were collected from Salim Ali Lake, Aurangabad. during the month of summer, monsoon and winter (2010-2011). Estimation of different physico-chemical parameter was done as per standard methods for the examination of water [3] and observation on free living ciliates were done after their movement were slowed down with methyl cellulose.

## RESULTS AND DISCUSSION

The distribution and abundance of fresh water ciliates is guided like to other microbial communities by a variety of ecological factors. However some of the factors show great variability from place to place and time to time. The environmental conditions in which ciliate can live and multiply, there is always an optimum range for each group.

The present research work covers physico-chemical factors, prevalence of free living protozoan from water bodies of Salim Ali Lake, Aurangabad During the study total number of 10 species has been recorded. 07 species of ciliates, 02 species of flagellate, 01 species of rhizopod have been reported from water bodies (Table 1).

Table 1. Free living protozoan from water bodies of Salim Ali Lake, Aurangabad

| Sl.No. | Name of free living protozoans |
|---|---|
| 01. | Ciliates:- i) Chilodonella |
| 02. | ii) Coleps |
| 03. | iii) Euplotes |
| 04. | iv) Litonotus |
| 05. | v) Paramecium |
| 06. | vi)Epistylis |
| 07. | vii) Vorticella |
| 08. | Flagellate :- i) Euglena |
| 09. | ii) Costia |
| 10. | Rhizopods :- i) Amoeba |

During the year Feb-2010 March-2011,total 112 water samples were collected, of which 48 samples were found to be positive for protozoa and total percentage of prevalence was 46.86.The maximum percentage of prevalence was recorded in the month of Jan (80.%) which gradually decreases up to March(16.6%). In the month of May there was no protozoa recorded from the samples and hence the prevalence reaches to zero. Then it again gradually increase from June (33.3%) to August (54.5%) and gradually decrease in the month of September (35.7%) (Table 2).

In the present study the atmospheric and water temperature showed identical fluctuation. The hydrogen ion concentration is also consistently higher during water and this may be one of the contributing factors. Whereas is summer high temperature and low percentage of ammoniac nitrogen, organic nitrogen and oxidizable organic matter have been noted and this affects the ciliate density. The ciliate densities during monsoon are consistently lower than that of winter but more in summer. The pattern of fluctuations seems to be directly associated with the temperature, ammonical Nitrogen, organic Nitrogen and oxidizable organic matter. The Ciliates are more sensitive to pH and chlorinity. It has been also noted that activation energy for multiplication, an indicator for temperature dependence of microorganism, was higher for protozoa (Table 3).

Table 2. Percentage of prevalence (%) of fresh water free living Protozoa during the period Feb 2010 to Mar 2011

| Month | Total No of Samples Collected | Total No of Samples Positives | Percentage of prevalence (%) |
|---|---|---|---|
| Feb | 10 | 07 | 40.0 |
| Mar | 12 | 02 | 16.6 |
| April | 05 | 00 | 00.0 |
| May | 06 | 00 | 00.0 |
| June | 15 | 05 | 33.3 |
| July | 08 | 04 | 50.0 |
| Aug | 11 | 06 | 54.05 |
| Sept | 14 | 05 | 35.07 |
| Oct | 07 | 04 | 57.04 |
| Nov | 09 | 07 | 77.07 |
| Dec | 05 | 03 | 60.0 |
| Jan | 10 | 08 | 80.0 |
| Total | 112 | 48 | 46.86 |

Table 3. Physico- chemical parameter during summer, monsoon and winter (2010-2011)

| Parameters | Summer | | | | Monsoon | | | | Winter | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec |
| Temp | 29.00 | 29.9 | 31.0 | 35.0 | 28.6 | 27.8 | 28.0 | 30.03 | 26.0 | 28.04 | 26.0 | 25.5 |
| pH | 6.5 | 6.7 | 7.0 | 7.2 | 7.5 | 7.0 | 6.7 | 6.5 | 7.0 | 7.1 | 7.3 | 7.2 |
| Total Hardness | 218 | 220 | 222 | 250 | 236 | 212 | 278 | 258 | 280 | 218 | 200 | 214 |
| Chloride Total | 37 | 25 | 25.2 | 25.4 | 28.2 | 25.7 | 27.0 | 25.1 | 22.2 | 22.8 | 28.00 | 30.00 |
| D.O | 9.0 | 13 | 14.5 | 12.3 | 17.2 | 16.8 | 15.6 | 17.1 | 18.00 | 19.7 | 22.00 | 15.00 |
| Oxy. Org. Matter | 1.42 | 1.50 | 1.54 | 1.5 | 2.10 | 2.28 | 2.20 | 2.12 | 2.55 | 2.66 | 2.80 | 2.70 |
| Ammonical Nitrate | 0.012 | 0.021 | 0.024 | 0.022 | 0.033 | 0.020 | 0.032 | 0.03 | 0.034 | 0.030 | 0.032 | 0.037 |
| Organic Nitrogen | 0.055 | 0.058 | 0.043 | 0.050 | 0.051 | 0.053 | 0.054 | 0.050 | 0.060 | 0.067 | 0.062 | 0.061 |

*Units of are Parameter are in mg/lit, except temperature and PH

**REFERENCES**

[1]Kudo,R.R. 1966. Protozoology 5th ed. Springfield III Thomas.

[2]Finlay B.J. 1988. Freshwater protozoa: Biodiversity and ecological function biodiversity and conservation.7:1163-1186.

[3]APHA .1989. Standard methods for the examination of water, and waste water American Association New York. Pp- 1134.