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STUDIES ON SOME FREE LIVING PROTOZOAN FROM PAWAI LAKE, MUMBAI (MAHARASHTRA)

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ABSTRACT

Protozoa are the single celled animal found worldwide in most habitats. Most species are free living, but all higher animals are infected with one or more species of protozoa. Infection protozoa range from asymptomatic to life threatening, depending on the species strain of parasite and the resistance of the host. Present study deals with the free living protozoa inhabiting fresh water bodies. The factor which influences 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 various environmental changes.

Key Words: *Protozoa, Pawai Lake, Mumbai*

INTRODUCTION

Protozoa are microscopic unicellular eukaryotes that have a relatively complex internal structure and carry out complex metabolic activities. Some protozoa have structure for propulsion or other types of movement. The protozoa are considered to be a sub kingdom of the kingdom protista, although in the classical system they were placed in the kingdom animalia. More than 65,000 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 people are infected with one or more species throughout their life. Some species are considered commensalism, i.e., normally not harmful whereas others are pathogens and usually produce disease. Protozoan diseases range from very mild to life-threatening. Individuals whose defenses are able to control but not eliminate a parasitic infection become carrier 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 re-infection. The organelles of protozoa have functions similar to the organs of higher animals. The plasma membranes enclosing the cytoplasm also cover the projecting locomotory structures such as pseudopodia, cilia and flagella. The ciliates are a group of protozoan's 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 habitats and their capacity to remain viable in the encysted condition, probably account for the wide distribution of the protozoa throughout the world. Finlay (1988) studied 50 species of fresh water protozoa to various concentrations of sea waters, either by direct transfer or by the gradual addition of the sea water. He found that *Bodoucinatus*, *Uronemamarinium*, *Pleuronema Jaculans* and *Copodaaspera* are able to live and reproduce even when directly transferred to sea water, that *Amoeba verrucosa*, *Euglena*, *Cyclidium*, *Euplotes*, *Litonotus*, and *Paramecium* etc. tolerate only low salinity when directly transferred, but if the salinity is gradually increased, they live in 100% sea water

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and that Arcella, Cyphoderia, Blepharisma etc. could not tolerate 10% sea water even when the change was gradual.

MATERIALS 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 generalizations 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 Pawai Lake, Mumbai. During the month of summer, monsoon and winter (2011-2012). Estimation of different physico-chemical parameters was done as per standard method for the examination of water and observation on free living ciliates were done after their movements were slowed down with 10% 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 protozoa from water bodies of Pawai Lake, Mumbai. During the study total number of 10 species has been recorded. 07 species of ciliate, 02 species of flagellate, 01 species of rhizopod have been reported from water bodies.

Ciliates: *Chilodonella*, *Coleps*, *Euplotes*, *Litonotus*, *Paramecium*, *Epistylis*, *Vorticella*.

Flagellate: *Euglena*, *Ostia*.

Rhizopods: *Amoeba*.

Table 1: Percentage of Prevalence (%) of Fresh Water Protozoa during the Period Dec-2011 to Nov-2012

1	December	10	08	80.00
2	January	12	08	66.67
3	February	10	05	50.00
4	March	08	03	37.50
5	April	07	01	14.29
6	May	06	00	0.00
7	June	12	08	66.67
8	July	14	12	85.71
9	August	10	06	60.00
10	September	10	07	70.00
11	October	13	10	76.92
12	November	10	09	90.00
Total		122	77	63.11

During the year Dec. 2011 to Nov. 2012 total 122 water samples were collected, of which 77 samples were found to be positive for protozoa and total percent of prevalence was 63.11. The maximum percentage of prevalence was recorded in the month of November (90%) which gradually decreases up to April (14.29%). In the month of May there was no protozoa recorded from the sample and hence the prevalence reaches to zero. Then it again gradually increases from June (66.67%) to July (85.71%) and gradually decreases in the month of August (60%).

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