

# Study of the Significance of Free-Living Protozoan from Mahad Region

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## ABSTRACT

The present research work covers the systematic study of the prevalence of free-living protozoan (FLP) from Chaudar Tale lake, Mahad, Raigad, Maharashtra. The study reveals a mass of free-living protozoan in which ciliates were dominant over flagellates. The maximum percentage of prevalence was recorded in the month of July that is 90%.

**Keywords :** Free-Living Protozoan, Chawdar Tale, Prevalence

## I. INTRODUCTION

Protozoa are single-celled eukaryotic organisms found in aquatic and terrestrial environments. They occur in trophic or encysted states in virtually any kind of habitat which is temporarily wet. Protozoa are grazers of bacteria increasing mineralization and making nutrients more available to another organism [1]. Protozoa are microscopic organisms. They are abundant in aquatic environments and are responsible for consumption and control of bacteria and another organism. Protozoan communities could be useful in fresh waters. Protest excretions are an important source of demineralized nutrients, and of colloidal and dissolved trace materials such as iron, in the aquatic system [2]. Some protozoa have structures for propulsion or other types of movements. More than 50,000 species have been described, most of which are free-living organisms. Protozoa are found in almost every possible habitat. 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 produces disease [3]. The member of class Prostomeata (Schewiakoff, 1896) of phylum Ciliophora, are more or less ovoid with

cilia in rows. In the individuals of this subclass, cytostome opens directly to the outside, cytopharynx with trichites. Body ciliature is simple, no oral cilia [4]. The genus anoplophrya belong to class oligohymenophorea, subclass astomatia. Order astomatida and family anoplophryidae. Astomatus ciliate commonly found in annelid worms and other invertebrates [5]. They act as bioindicators in fresh waters due to their environmental sensitivity, rapid turnover rate, to detect organic pollutants [6].

Many protozoa resemble structural complexity to that of multicellular organisms they are an important link between food web. Protozoa are sensitive and highly valuable bio-indicator organism in water quality analysis. According to their food habit Protozoa are classified as bacteria eating protozoans and non-bacteria eating protozoans [7]

Free-living protozoa are the excellent model for providing the information about the vital process of life. They play a key role in the ecosystem defining and designing the nature saprobity [8] when appearing in low abundance protozoa has short generation time that allows many species to respond immediately to changing environmental condition.

## II. METHODS AND MATERIAL

The water samples for this study have been collected from various parts of the lake in sterile plastic bottles. Most of the samples were collected in morning time as the temperature affects the abundance of protozoa and they found more abundant at low temperature.

These collected samples were brought to the laboratory and examined under the compound microscope for the further study and observation.

For protozoan analysis, heliber bacteria single round cell was identified. The quantitative analysis was followed by the total count method of Walch (1948). For immobilizing the movement methyl cellulose(2%) was added on the slide.

November 2017	10	05	50
December 2017	10	06	60
January 2018	10	07	70
February 2018	10	06	60
March 2018	10	05	50
April 2018	10	04	40
May 2018	10	03	30
June 2018	10	08	80
July 2018	10	09	90
Total	120	74	61.67

## III. RESULTS AND DISCUSSION

The distribution and abundance of freshwater protozoan are guided like to other microorganisms 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 Genus Coleps was first reported by Nitzsch (1837) and they are widely and abundantly distributed in fresh and salt water [4].

TABLE I

PERCENTAGE OF ABUNDANCE OF FRESH WATER FREE LIVING PROTOZOA DURING THE PERIOD SEP 2017 TO AUG 2018

Month	Number of samples Collected	Number of samples Positive	Percentage of prevalence (%)
August 2017	10	08	80
September 2017	10	07	70
October 2017	10	06	60

Shaikh Unaiza Nazneen et. al. [9] reported 3 genera of the protozoan were identified from Sangvi dam. Shaikh et al. (2012) reported 10 species of protozoa from Salim Ali Lake, Aurangabad and stated that the physic-chemical parameters and the food present in the water and degree of adaptability of protozoa to various environmental changes are the factors which influence the distribution of protozoa. Pawar S.B. et al. reported two species from a freshwater reservoir.

The distribution and abundance of fresh water protozoan are guided by a variety of ecological factors. Although some of the factors exhibit huge variability from place to place and time to time (Vidhya Pradhan et al. 2011). In this study 4 genera of the protozoan have been identified from Chavdar Tale Lake, Mahad, Raigad. In this study period from August 2017 to July 2018 total 120 samples have been collected. In the whole study, 10 numbers of samples were collected in every month with an equal interval, of which 74 samples were found positive for protozoa and a total percentage of prevalence have been recorded at 61.67. The highest percentage of prevalence has been recorded in the month of July i.e. 90% which gradually decreases up to the month of

November i.e. 50% and then increases up to January i.e. 70% and then again decreases up to the month of May i.e. 30%. It is reported in several studies that ciliates dominate by number and types in every type of water body and similar type of observations are found in this study. The Fluctuation depends on the various physic-chemical variables that subsist in the lake ecosystem. Though regarding the nature of the lake, as no fertilizer or nutrients homogenized, in the systems, the inherent productivity of the studied area are very large.

#### IV. CONCLUSION

The surface run-offs and the wastages along the course of water in monsoon season provide nutrient for most of the free-living protozoan. From the estimated account of the Physico-Chemical parameter, it is difficult to understand about the abundance of protozoa but it helps to understand about the optimum limits of nutrient for most of the useful protozoan species. In this study, we reported the prevalence of free-living protozoan optimum in the month of July i.e. 90%.

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