ABSTRACT OF THE THESIS

The thesis outlines the results of studies on the composition and distribution of the fauna of freshwater ciliates in relation to various environmental factors at three selected stations in the vicinity of Aurangabad, in Maharashtra State. The study was carried out simultaneously at the three stations through fortnightly sampling over a period of two years i.e. June 1976 to May 1978.

The present study represents the first ever attempt in the Barathwada region to analyse the nature of the freshwater ciliate fauna.

The thesis is presented in four parts.

PART I

This part deals with the topography of the three selected stations namely -

1) Wohar reservoir - A freshwater reservoir and a source of drinking water supply for a part of Aurangabad city.
ii) Streamlet in industrial area (CIDCO) -
carrying effluents from chemical
industries.

iii) Daultabad moat - A stretch of perennial
stagnant water in the moat around
Daultabad fort.

The various methods followed are also outlined
in this part.

PART -II

This part gives details of the physico-chemical
variables at the three stations, over the period of
study. The factors studied include atmospheric
temperature, water temperature, dissolved O₂ and CO₂,
oxidizable organic matter, pH, calcium, magnesium,
bicarbonate, chloride, sulphate, albuminoid nitrogen,
ammonia nitrogen, nitrate nitrogen, nitrite nitrogen,
phosphate and solids - dissolved and suspended. An
analysis is made of the variables season-wise,
station-wise and year-wise.
PART - III

This part outlines the nature of the ciliate fauna and the fluctuations in their population at the three stations over the period of two years. A detailed analysis is made season-wise, station-wise and year-wise of the total ciliate population, the composition of ciliate population, the relative proportions of the sub-classes and the seasonal variations in the sub-classes, orders and species.

The salient features outlined are:

i) The population pattern was:

   a) Station 1 > Station 2 > Station 3
   b) Winter > Summer > Monsoon
   c) Holotrichia > Spirotrichia
      (10 species) > (4 species)
      Peritrichia > Suctorina
      (1 species) > (1 species)

   ii) Station 2 had maximum variety of species
       and station 3 the minimum

   iii) The seasonal variations were more pronounced
       at station 3 than 1 and 2.
PART - IV

This part presents comments on the interrelationship and nature of fluctuation of physico-chemical variables. An attempt is made to correlate the nature of the ciliate population with the nature of ecological conditions. Detailed discussions outlining the correlation are given in relation to the total ciliate population, the composition of ciliates, the relative densities of the sub-classes, the seasonal variation of orders and the seasonal variation of species.

The salient points of the study are:

i) The first group of holotrich ciliates comprising of Coleps hirtus, Colpoda cucullus, Tetrahymena pyriformis and Colpidium colpoda had a greater range of adaptations and were present consistently at all stations during all the seasons.

ii) The second group of holotrich ciliates namely Uronema marinum, Glaucoma scintillans, Paramecium caudatum and Frontonia acuminata were represented
at the first two stations but not at the third, possibly due to the lower content of oxidizable organic matter and albuminoid nitrogen. Of these _h. caudatum_ was extremely dominant, when ammonia level was within the limits of tolerance.

iii) The carnivorous ciliates _Didinium nasutum_ and _Dileptus anser_ were present only when the population of _paramecia_ and other ciliates increased.

iv) The single peritrich species _Vorticella campanula_ was present at all the stations and was better represented at the third station, possibly correlated with the high contents of dissolved _O_₂ and nitrates.

v) _Suctoria, represented by _Podophrya fixa_, was present at the second station only, due to the peculiar environmental complex at this station.
vi) Two species of spirotrichs namely *Halteria grandinella* and *Euplotes affinis* were consistently present at all the stations through all the seasons. *E. affinis* was more at the third station probably due to high level of dissolved $O_2$.

vii) *Stentor polymorphus* and *Spirostomum ambiguum* were at a low level or absent at the second station possibly because of high quantities of Ca and $HCO_3$.

The abundance of these ciliates was thus directly influenced by the abundance and type of food on which they feed and their adaptability and tolerance to various physico-chemical factors.

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