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Analysis of the Change in Morphological Characters of Algae.

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Abstract

This paper deals with the analytical study of algae during the culturing process. It also includes theoretical observations during the periods of investigation and exploration. The study explain how algae shows growth and hair forming process in *Chaetophoraceae* and what it has functional significance. In this investigation work, the strain of *Stigeoclonium* and *Chetophora* showed all responded by forming hairs, and overall effect was more marked under condition of phosphorous, deficiency. The study shows average response from population of algae.

The heteroginity of individual cell in population can be critical to its peculiar function and nature. The mechanism of changes in population characteristics are given by the behaviour of strains of algae are not well understood. Algae may changes their Physiology and metabolism by changing their morphology in response to stress of environment. In this study development in *Chaetophores* is more extensive during culture at lower rather than higher concentration of nitrate. Hair occur are wide spread in the *Chaetophoraceae* colourless hairs arise at the end of branches occasionally at the end of main axis and development of hair involves loss of Chloroplast and cellular contents. In this experimental study of strains of *Stigeoclonium* and one of *Chaetophora incrasata* showed all responded nitrogen deficiency by forming hairs and overall effect was more marked under condition of phosphorus deficiency. In most of strains Fe deficiency lead to marked hair formation, but other element deficiencies lead to only very slight hair formation or no hairs at all.

Keywords :- Analytical study, Algae, *Chaetophoro*, *Stigeoclonium* , Nitrogen, Phosphorus.

Introduction

The present work was carried out in water body from Rajura taluka in Chandrapur District (M.S). Taluka was vastly polluted by different industries present in this area. So when during exploration period of algae, it is observed that there seen noticeable changes in morphology in algal population. The work was done on two of algal population *Stigeoclonium* and *Chaetophora* species.

The first description of algae described filamentous and irregular clumps of cells [5][6].

The transition between Cell types lead to the suggestion of a life-cycle in which filamentary character gave way to Large groups of polygonal cells [4].

Hair forming members of *Chaetophoroles* are wide spread in nature and *Stigeoclonium* in particular has considerable potential both as monitor.

Hair occurs in particular type of environment and some other morphological and physiological features in *Stigeoclonium stagnite* recorded in this study. A more detailed study of strains of some genera confirmed that hair development was much greater under condition of phosphorus limitation. Showed marked phosphate activity.

Material And Methods: -

For identification of morphology of algae the culturing process was done.

For to do the morphological study two algal strains was selected.

A *Stigeoclonium* were grown in phosphorous free BG-11 medium. It exists more than one recognizable type. In this research work first was observed filamentous form and in second observation seen irregulars hair formed.

The first description filamentous and second irregular form [5][6].

In this investigation it is seen that a terminal portion of filament composed of one or more narrow and elongated cells. In culturing process, the algal morphology shows that in phosphate activity hair formation noticed from forth the day, sixth day, eight day, and tenth day in different buffer were observed.

In Investigation process a culture of *Stigeoclonium* were grown in phosphorus free BG-II medium. After forth day algal culture was harvested by first detaching alga attached to the side of flask and observed under microscope if hair formation starts at the end of branches. Hairs were identified using the idefinition of [8][9]. Algae growing on the rocks of industrial wastewater were removed with forceps and collected. A few part of this material were retained for phosphate assay while other remainder grown in BG-II medium laboratory. Phosphate activity were carried out with 0.5 ml 2.5 mm p-nitrophenol phosphate as a substrate. The assay was incubated at 20^0c. and 85 micromole photon $^{m\text{-}2s\text{-}1}$ for one hour and reaction was stopped by addition of 0.05m NaoH. The influence of P^H on an activity were tested using range of buffer.

And also see whether this activity show variable changes. So dissolving 69.75 mg . p-nitroophenol in 5ml distilled water during growth in phosphate about NaOH-Glyline. Buffer activity increased with increasing phosphate deficiency phosphate activity on 4rth day increased 10^{th}, 12^{th}, 14^{th}, day increased to 0.020, 0.032, 0.078, 0.084 0.130 micromoles p-nitrophenol phosphate activity in absence of hairs were just detectable at 0.005 micromoles. This activity carried out at different pH buffers. Assay shows marked visible difference

and gretest activity. The influence of pH (7,8,9,10,11,12)on phosphate activity showed 0.058, 0.062,0.072,0.101, 0.090, 0.054 rmoles in Borax NaOH respectively.

Result

Phosphate shows activities starting from 4th day and phosphate activity 0.020 µmoles and after 10^{th} , 14^{th} day phosphate activity 0.050 µmoles, 0.078 µmoles, 0.130 µmoles maximum terminal cells have hair formation. The formation of very long hair under P-limited.

Discussion:

The evidences from this experimental studies phosphorus limitations leads to the development of multicellular hairs in species of *Stigeoclonium*. Most of data presented have fit the theory that hair occurs in nature under the condition of relative P-deficiency. The laboratory data presented and the field data of [7]. show marked correlation between the presence of surface phosphate activity. The hairs are the main site of observation of phosphate activity. The behavior of fresh water Chetopharales shows a number similarities and difference in comparison hair forming blue green algae.[1][2]. Phosphate deficiency have greatest effect leading to hair formation in blue green algae [7].

The results are similer to [8] who presented data to fit theory that hairs occur in nature under condition of relatives deficiency of phosphate in p limitation culture 1 $^{mg-1}$ 5 mg and 10 $^{mg-01}$ similar observation recorded by [10]. All strains of *Stigeoclonium* selected. The longest and most typical hairs occurs in both case under condition of phosphorous.

With changes in the morphology of *Colothrix parietina* Addition of phosphorus leads formation of motile vegetative reproductive structure and loss of colorless hair [9] investigated. Effect if light intensity and supply of fixed nitrogen on morphology and structure of C. frits after different times. Differences in Lamellar arrangement were also observed by [3] when C. Frits chi was grown with light intensities varied from 226 to 7560 lux.

Conclusion:- It is conduded that most date presenting have fit and theory says that hairs occur in under natural condition of relative phosphorous (P) deficiency. The addition of phosphorous (P) leads to the formation of motile vegetative reproductive structure and loss of colouless hair.

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