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Chlorococcales of Bhopal, Madhya Pradesh

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ABSTRACT

Chlorococcales is an interesting order of green algae represented by unicellular, nonmotile, coenobial forms and composed of a wide variety of species. Most are aquatic and microscopoic, and many constitute a major part of the microalgal population of freshwater habitats, important as food for herbivores, fish, and zooplankton. Diverse Chlorococcal assemblages are common in the inland waters (lakes, rivers, reservoirs). The lakes of Bhopal influenced the lake ecosystems with the entry of nutrients and other organic substances due to human activities. Some lake studies showed diffused nutrient sources from land cover changes therefore, Bhopal lakes needed their suitable management plans to control Chlorococcal Green algal blooms from identified factors.

Keeping the view in mind that Chlorococcal green algae contribution in freshwaters bodies of Bhopal Madhya Pradesh is not yet reported and, there is an urgent need not only to report an ecological study of Chlorococcales periodicity and distribution in such lakes but also to develop and improved understanding of the habitat is different forms. Present study will be helpful to assess the selected water bodies qualitatively for anthropogenic changes which resulted nutrient enrichment. It provides a ground for future studies on management of such freshwater lakes of the city with Chlorococcales distruibution. Proposed study will certainly be helpful to manage the targeted Bhopal lakes many years for restoration.

INTRODUCTION

Bhopal the 'City of Lakes and Hills" situated at $23^{0}16$ latitude and 72^{0} 26E longitude, has possession of two Lakes Upper and Lower. The Upper Lake is situated in the midst of Vindhyachal and is an important source of drinking water (almost 50%) for Bhopal City. Upper and Lower Lakes of Bhopal together known as 'BHOJ Wetland' have been identified as Wetland of National Importance by Ministry of Environment and Forests, New Delhi. These lakes are under great environment stress due to Pollution from various sources, eutrophication, silting, organic matter imputs and human encroachment (Kulshrestha, 1988).

Biodireversitical studies of Chlorococcales (Chlorophyceae) in Bhopal during the period from June, 2016 to May, 2018. Algal samples were collected at monthly Interval from four sites of Upper and Lower Lake Bhopal. Microphotograph and line drawing of algal taxa were mad by Digital Camera and Camera-Lucida. Algal texa of Chlorococcales were indentified with help of standard monographs and recent literature.

During the course of the present study which was spread over a period of two years, to the lakes provided a diverse callection of Chlorococcales. A total 67 taxa of 22 genera occurring in different seasons have been collected and identified.

Material and Methods:-

The four sampling sites in Upper and Lower Lake were selected to colleted water sample and algal sample form nearly all the directions. The sampling sites also represented disturbed and least disturbed areas of the lake.

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OBSERVATION:-

A total 67 taxa udner 22 genera of Chlorococcales were identified during the period of investigation.

Division - Chlorophyta
Class - Chlorophyceae
Order - Chlorococcales

Chlorella valgaris Beijerinck
Chllorococcum humicola (Naegeli) Rabenhorst
C. infusionum (Scharnk) Mnengihiv
Goldenkinia radiata Chodat
Chodatella quadriseta Lemmermann
Tetrastrum skt aurogeni from (Schroed) Lenn
Tetraedron trigonum (Naegels) Hansging fa *gracile* (Reinsch)
T. regulate Kuetzing
T. bifurcatum (Wille) Lagerheim
T gracile (Reinsch) Hansgirs a minus Philinose
T muticum (A. br) Hansg.
T minimum (A Braum) Hansging
T. minimum (A Br.) Hansg fa *apiculatum*
T. minimum (A Br.) Hansg fa *tetralobulatum* (Reinsch) De Toni
T. pentaedricum w.et G.S. West
T pusillum (Wallich) West and West
Dimorphococcus lunatus A Braun
Closteridium bengalicum tuner
C. siamensis (Wet G.S. West) G.M. Smith
Schroederia spiralis (Printz) Korsh
S. setigera (Schoreder) Lemmer mann
S. planctonica (Skuja) Philipose
Chaacium angustum A. Braun
C. acuminatium A Braun ex Kuetz
C. orissicum Philipose
C. ambiguum Her mann ex Robenhorst
Pediastrum duplex Meyen
Pediastrum simplex Meyen Lemm.
P. ovatum (Ehr) A. Braun
P. tetras (Ehr.) Ralts
P. duplex var. *subgranulatum*
Sorastrum spinulosume Naegeli
Hydrodictyon reticulatum (Linn.) Lagerherim
Botryococcus braunit Kuetzing
Ankistrodesmus faclatus (Corda) Ralfs
A. convolutus Corda
Actinasturum hantzschii Lagerheim
Selenastrrum gracile (Reinsch)
Kirchneriella lunaris (Kirchner) Moethus
Dictyophaerium ehrenbergianum Naedeli
Westella botryoides (West) de wilde mann
Coelastrum microporum Nacgeli
C. proboscideum Bohtin
Crucigenia crucifera (Wolle) Collins
C. quadrata Morren
Scenedesmus armatus (Chodat) G.M. smith
S. abundans (Kirch chodat var *skujae* Compere)
S. abundans (Kirch) chodat var *brericauda* Smith
S. arcuatus (Lemmermann) Lemmermann
S. bijugatus (Turpin) Kuetzing var. *alternans* (Reinsch) Hansgirg
S. bijugatus (Turpin) Kuetzing Fa *irregulari* Whille
S. bijugatus (Turpin) Kuetzing var *graevenitzii* (Bernard) Phil pose
S. armatus (Chodas) G.M. smith var *boglariensis* Hortobagyi
S. armatus (Chodat) Smith var nov
S. denticulatus Leger heim
S. denticulatus Legerheim var *austraiis* Playfair
S. opoliensis Richter var *mononensis* Chodet
S. diamorphus (Turpih) Kuetzing
S. quadricauda (Turpin) brebisson var *longispina* (hodat)
S. denticulatus Lagerheim var *lunatus* West and West play fir fa nov
S. incrassatulus Bohlin
S. quadricauda (Turpin)
S. quadricauda (Turpin) Brebisson var *vicaudatus* Hansging
S. quadricauda (Turpin) Brebissor var *eualternans* Proscke
S. abundans (Kirchner) Chodat
S. hystrix Lager heim
S. hystrix legerheim var nov

RESULT AND DISCUSSION:-

The lake ecosystem is a very dynamic one, the algal population is never in a state of equilibrium, and it experiences many complex seasonal succession (Hutchinson, 1967) There were considerable seasonal variations in water quality of the lake promoting Chlorococcales population occurence of Chlorococcales in the lake have been elucidated by Gonzalves and Joshi (1946) Rao 1955, Singh (1979), Philidose (1960), Hosmani (2002). The occurrence of

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Chlorococcales were recorded throughout the study period. Genera Scenedesmus considered the most dominant and freaquntly occurring 22 genera of Chlorococcals.

Conclusion :

In present investigation observed that 67 taxa of 22 genera of Chlorococcales present in both the lakes. Genera Scenedesmus was dominating with 22 taxa.

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