

INVESTIGATION OF CHLOROPHYCEAE FLORA FROM MOTIA LAKE OF BHOPAL

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ABSTRACT :

During the study period distribution of Chlorophyceae in relation to seasonal variation of Motia lake was observed. Samples were collected on monthly intervals from the lake. Total 21 members of Chlorophyceae were identified. The dominant species of this group was *Chlorella*. The maximum density of Chlorophyceae was recorded during summer while minimum was recorded during winter. *Scenedesmus* found as second dominant member during the study course.

INTRODUCTION

The Chlorophyceae are a large and important group of freshwater green algae. They include some of the most common species, as well as many members that are important both ecologically and scientifically. Fresh water lakes are vital resources for any country and have greater prominence as they are linked to human welfare. They regulate the urban climate (Benjamin, 1996) and also have a prominent effect on ground water quality and ground water table. Lakes have environmental significance as source of surface and ground water recharge, maintain nutrient and energy exchange with watersheds and air sheds and support diversified aquatic life (Padma Priya, 2017). Population growth, various human development activities, industrialization, urbanization, improper management of water resources, exploitation of catchment and command areas have led to severe water quality impairment. The present work was done on Motia lake which is a perennial water body. At the present the Motia pond is subjected to great environmental stress from various sources, enrichment of nutrients washer men's activities etc. Resulting in the extra ordinary deterioration of water quality and as such it can be categorized as highly eutrophic oxidative pond. The pollution indicator greenalgae confirm eutrophic condition of this lake.

MATERIAL AND METHODS

The study of Lake was carried out for a period of two years between December 2008 to December 2010. Samples were collected on monthly intervals from the lake (2 selected monitoring stations). The monitoring was usually carried out between 10 A.M. to 4 P.M. For determining the phytoplankton characteristics, samples were collected at different monitoring stations from epilimnion or surface and

hypolimnion or bottom layer. For the monitoring of bottom layer, depth sampler (Ruttner's water sampler) was used the water samples from the hypolimnion layer were collected from nearly 5 feet depth with the help of Ruttner's water sampler, The surficial and bottom water samples were usually collected from the same points.

Site selection

The samples were collected between 10 AM to 4 PM from December 2008 to December 2010. In all two sites were selected. One site was ThalewaliSadak (S7) and the other near the Dhobi ghat region (S8).

Qualitative and Quantitative enumeration of green algae-

Qualitative analysis-

Qualitative analysis of Chlorophyceae flora was done by hauling plankton net horizontally several times in lake to get a random sample, then sample were taken in to plankton bottles and 1 ml lugol was added to them.

Quantitative analysis

Quantitative enumeration of Chlorophyceae flora was carried out by passing 40 litre of lake water through a plankton net from surface and 12 litre of lake water through a plankton net from bottom (hypolimnion).

The filtered sample was collected in plankton bottles of 50 ml after adding 1 ml Lugol's iodine solution. The identification of phytoplankton was done with the help of standard works viz ., ward and Whipple (1966), Phillipose (1967), Adoni (1975), Palmer (1980) etc.

RESULT AND DISCUSSION

Qualitative analysis :

In Motia Lake during the study period 21 genera of Chlorophyceae were identified.

The following genera were found:-

Actinastrum, Ankistrodesmus, Chlorella, Closteriopsis, Closterium, Coelastrum, Cosmarium, Crucigenia, Glaucocystis, Hydrodictyon, Oedogonium, Pediastrum, Scenedesmus, Sorastrum, Spirogyra, Staurastrum, Tetraedron, Tetrastrum, Ulothrix, Volvox, Zygnema.

In Motia Lake, all these 14 genera were present during summer season, while the minimum were recorded as 7 during winter.

Quantitative analysis

In the epilimnion layer the maximum density of Chlorophyceae was recorded as 25410 units/lit during summer (June'2010) at S7 stations, while minimum was recorded during winter. In the hypolimnion layer the maximum density was recorded as 12910 units/lit during summer (June'2008) at S7 station, while minimum was recorded during winter. The dominant species of this group was *Chlorella*.

During the study period Chlorophyceae was the dominant and was represented 21 genera in Motia lake. The dominance of this group was recorded during summer season. Sharma (1980) and Singhai (1986) reported that Chlorophyceae started increasing from spring and reaching maxima during summer in Udaipur lake and Tawa reservoir respectively. Saxena (1998) stated that moderately high temperature appeared to be favourable for the active multiplication of Chlorophyceae. Present study revealed that lakes exhibited a fairly high alkaline water and availability of nutrients during major part of the year hence Chlorophyceae occurred as a conspicuous group among the phytoplankton and second in order of abundance. Chlorophyceae group was mainly represented by the species of *Chlorella*, *Scenedesmus*, *Ankistrodesmus*, *Pediastrum*, *Crucigenia*, *Closterium* and *Spirogyra*. *Chlorella* was abundantly present throughout the study period. *Chlorella* is a good oxygen donor and is commonly found in oxidation ponds. Its occurrence coincided with a high degree of eutrophication of the lake system as reported by Saify (1981) and Adholia (1992). According to Phillipose (1967) *Chlorella* species indicates the presence of organic pollution and was found in sludge. *Scenedesmus* was commonly present during the study course. The presence of *Scenedesmus* species also support the organic pollution of lake water as pointed out by Saxena (1990) and Sarojini (1996).

CONCLUSION

The present investigation elevated the study of Chlorophyceae flora in Motia lake, Bhopal. The abundance of *Chlorella* and *Scenedesmus* green algae found in the lake during the study period confirms eutrophic condition of the lake; these phytoplanktons are indicator of organic pollution and represent pollution tolerant species. The existence of these green algae as bio indicator, pollution tolerant phytoplankton and these phytoplankton representing nutrient rich medium proves polysaprobic and eutrophic condition of the lake.

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