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Phytoplankton Composition of Different Fresh Waterbodies of Bhopal

Mahima Dixit
Department of Botany, Rajeev Gandhi College, Bhopal (M.P.)

Abstract: ***In the present study the area of investigation confined to the four lakes of Bhopal, which are Upper lake, Lower lake, Shahpura lake and Motia lake. Samples were collected monthly from December 2008 to November 2010 from two sampling stations at different depth: epilimnion and hypolimnion layer. During the study period different composition of algal group were observed. In the study period 115 genera of algae belonging to five major groups viz., 60 genera of Chlorophyceae, 22 genera of Cyanophyceae and 27 genera of Bacillariophyceae, 4 genera of Euglenophyceae and 2 genera of Xanthophyceae were identified in upper lake, 63 genera belonging to three major groups viz, 29 genera of Chlorophyceae, 20 genera of Cyanophyceae and 14 genera of Bacillariophyceae were identified in lower lake, 53 genera belonging to three major groups Viz., 28 species of Chlorophyceae, 13 genera of Cyanophyceae, 12 genera of Bacillariophyceae were identified in shahpura lake and 43 genera belonging to three major groups viz., 21 genera of Chloraphyceae, 12 genera of Cyanophyceae and 10 genera of Bacillariophyceae were identified in motia lake.***

Keywords: Epilimnion, Hypolimnion, Chlorophyceae, Bacillariophyceae, Cyanophyceae, Euglenophyceae, Xanthophyceae.

I. INTRODUCTION

Phytoplankton constitute the first circle of the food chain in aquatic systems, producing high-energy organic compounds from carbon dioxide and inorganic substances by photosynthesis with the aid of light. The food chain starts with phytoplankton and continues with zooplankton, small fish, big fish and ends with a human. Because of these functions, phytoplanktonic organisms have very important role in the feeding of animals that sustain their life in freshwaters and seas, and they form the basis of primary production in aquatic environment.

Also, they are one of the biological indicator organisms which are used extensively in many water pollution investigations all over the world. It is known that Cyanobacteria, Bacillariophyta and Chlorophyta members are used as available taxonomic groups for determination of biological conditions in aquatic system (Yilmaz *et al*.,2018).

Present area of study is confined to the four lakes of Bhopal, which are-Upper lake, Lower lake, Shahpura lake, Motia lake. Dominant presence of colonial blue-green algae like *Microcystis* and *Anabaena* genera shows that these water bodies of Bhopal are highly eutrophicated.

II. MATERIAL AND METHODS

The study of Lakes was carried out for a period of two years between December 2008 to December 2010. Samples were collected on monthly intervals from 4 lakes (8 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.

Qualitative and Quantitative enumeration of phytoplankton-

1) *Qualitative Analysis:* Qualitative analysis of phytoplankton 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.
2) *Quantitative Analysis:* Quantitative enumeration of phytoplankton 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 indentification of phytoplankton was done with the help of standard works viz ., ward and Whipple (1966), Phillipose (1967), Adoni (1975), Palmer (1980) etc.

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III. RESULT AND DISCUSSION

During the period under study, 115 genera of algae belonging to five major groups viz., 60 genera of Chlorophyceae, 22 genera of Cyanophyceae and 27 genera of Bacillariophyceae, 4 genera of Euglenophyceae and 2 genera of Xanthophyceae were identified in upper lake, 63 genera belonging to three major groups viz, 29 genera of Chlorophyceae, 20 genera of Cyanophyceae and 14 genera of Bacillariophyceae were identified in lower lake, 53 genera belonging to three major groups Viz., 28 species of Chlorophyceae, 13 genera of Cyanophyceae, 12 genera of Bacillariophyceae were identified in shahpura lake and 43 genera belonging to three major groups viz., 21 genera of Chloraphyceae, 12 genera of Cyanophyceae and 10 genera of Bacillariophyceae were identified in motia lake.

A. Cyanophyceae

The following genera were found:-

Aphanocapsa, Aphanothece, Aphanizomenon, Anabaena, Anabaenopsis, Arthrospira, Chroococcus, Cylindrospermum, Dactylococcopsis, Gleotrichia, Gomphosphaeria, Lyngbia, Merismopedia, Microsystis, Nostoc, Osillatoria, Phormidium, Rivularia, Scytonema, Spirulina, Tolypothrix, Trachelomonas.

B. Chlorophyceae

The following genera were found:-

Actinastrum, Ankistrodesmus, Asterococcus, Botryococcus, Chara ,Characium, Chlamydomonas Closteridium, Chodatella, Chlorella, Chlorococcum, Cladophora, Closteriopsis, Closterium, Coccomonas, Coelastrum, Cosmarium, Crucigenia, Dictyosphaerium, Dimorphococcus, Euastrum, Eudorina, Glaucocystis, Gloeocystis, Golenkinia, Gonatozygon, Gonium, Hydrodictyon, Kircheneriella ,Lobomonas, Micractinium, Microspora, Myrmecia, Nephrocytium, Oedogonium, Oocystis, Palmella, Pandorina, Pediastrum, Phormidium ,Pleurotaenium, Rhizoclonium, Rhopalosolen, Scenedesmus, Schroederia, Selenastrum, Sorastrum, Sphaerocystis, Sphaerozosma, Spirogyra, Staurastrum ,Stigeoclonium, Tetradesmus, Tetraedron, Tetrastrum ,Trochiscia, Ulothrix, Uronema, Volvox ,Zygnema

C. Bacillariophyceae

The following genera were found:-

Achananthes, Amphora, Attheya, Chaetoceros, Cocconeis, Cyclotella, Cymbella, Diatoma ,Diploneis, Epithemia, Eunotia, Fragilaria, Frustulia, Gomphonema, Gyrosigma, Hantzschia ,Mastogloia, Melosira, Navicula, Nitzschia, Pinnularia, Pleurosigma, Rhopalodia, Rhizosolenia, Surirella, Synedra, Tabellaria.

D. Euglenophyceae

The following genera were found:-

Euglena, Lepocinclis, Phacus, Trachelomonas

E. Xanthophyceae

The following genera were found:-

Ceratium, Peridinium

In the present study, different group of phytoplankton showed seasonal variations. The maximum density of phytoplankton was observed during summer, while minimum during winter. This may be due to high macrophytic growth during winter season. The maxima during summer has been supported by many researchers viz., Sharma (1980), Singhai (1986), Saxena (1990), Khare (1993) and Tamot (1996), Nawange (1993) have observed phytoplankton minima during winter supporting the present findings.

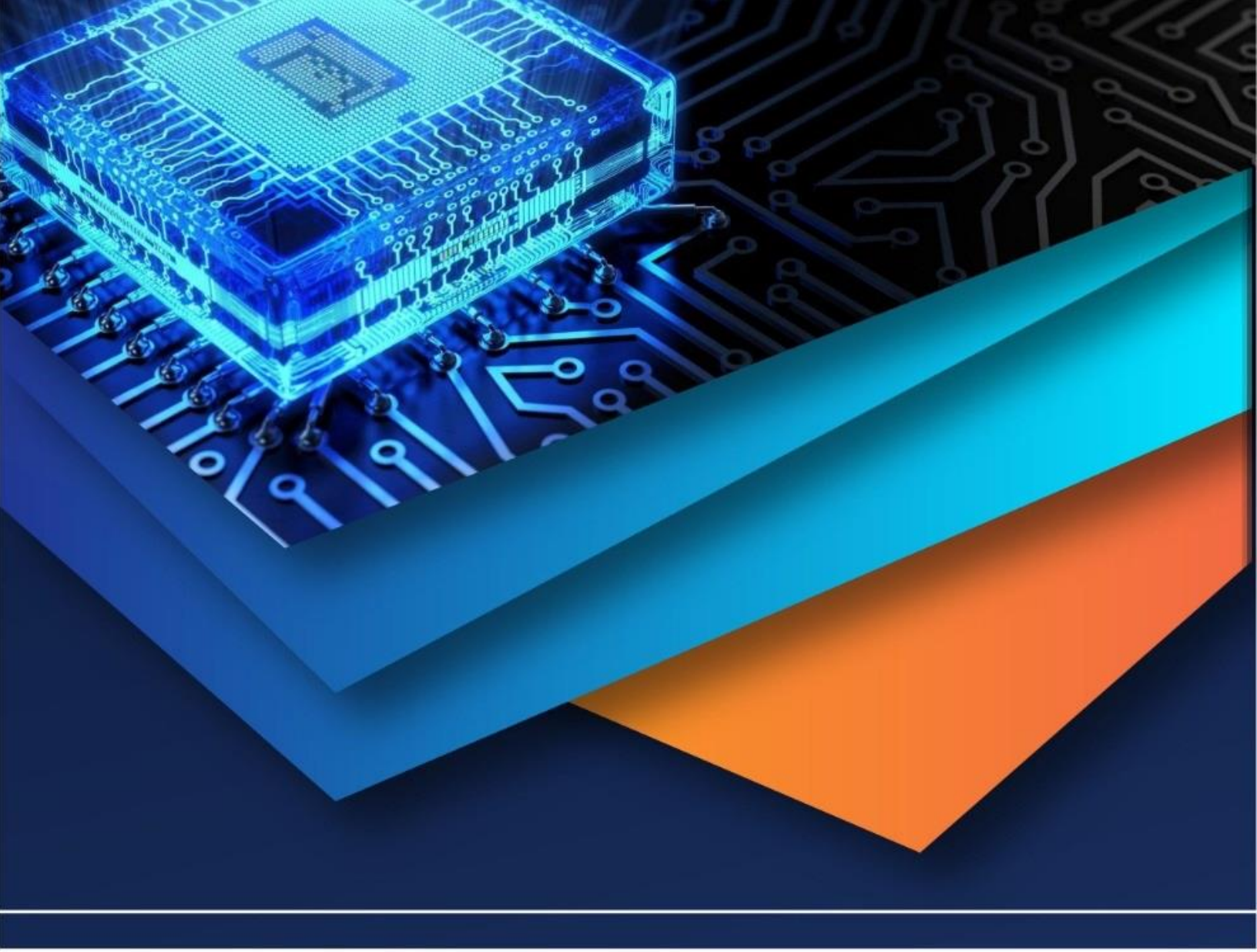
REFERENCES

[1] Adoni, A.D. (1975): Studies on the microbiology of Sagar lake. Ph.D. Thesis, Univ. Of Sagar, Sagar.
[2] Khare, P. (1993): Secondary production in a tropical lentic system with reference to zooplankton and fish feeding of Motia tank, Bhopal.
[3] Nawange, S. (1993): Limnological studies on new mean Surwari Reservoir (Sagar district) and old Upper lake reservoir of Bhopal with special reference to macrophytic vegetation. Ph. D. Thesis, Barkatullah Univ., Bhopal.
[4] Palmer, C.M. (1980): Algae and water pollution. Castle House Pub. Ltd. Pp. 1-96.
[5] Phillipose, M.T. (1967): Chlorococcales. ICAR, New Delhi.
[6] Saxena, R. (1990): Limnological and water quality status of the Lower lake of Bhopal with special reference to certain phytoplankton, microinvertebrates and microbiological components. Ph.D. Thesis, Bakatullah Univ., Bhopal.

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[7] Sharma, M.S. (1980): Studies on planktors and productivity of Udaipur waters in comparison to selected waters of Rajasthan, Ph.D. Thesis, Mohanlal Sukhadia Univ., Udaipur.
[8] Singhai, S. (1986): Hydrobiological and ecological studies of newly made Tawa reservoir of Ranipur. Ph.D. Thesis, Dr. H.S. Gaur Univ., Sagar.
[9] Tamot, P. (1996): Water quality monitoring of Lower lake, Bhopal. Research Project Sp. By EPCO, Bhopal.
[10] Ward, H.B. and Whipple, G.C. (1966): Freshwater biology (ed.). W.T. Edmondson. John Willey and Sons Inc. New York (1948).
[11] Yilmaz, N., Yardimci, C.H., Elhag, M., and Dumitrache, C.A. (2018): Phytoplankton composition and water quality of Kamil Abdus Lagoon (Tuzla lake), Istanbul-Turkey. Water, 1-13.

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