

## Analysis of cyanophycean biodiversity in Munshi Hussain tank, Bhopal

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### Abstract

The present study focused on cyanophytic diversity of Munshi Hussain Tank. In this study an attempt has been made to identify the taxa of Cyanophyta in Premonsoon, monsoon, summer and Post monsoon seasons *i.e.* from July 2007 to June 2009. A total of 61 species of cyanophyta were observed during the course of study. Oscillatoria, Microcystis and chlorococcus were found as dominant genera.

**Keywords:** *Cyanophyta, Bhopal, Munshi Hussain tank, Biodiversity*

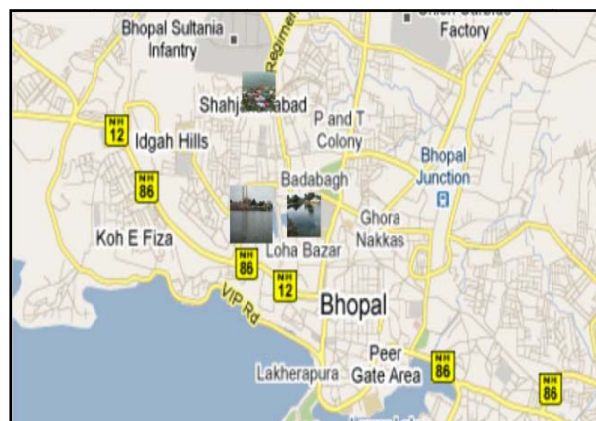
### Introduction

Plankton are primary producers responsible for a large part of the Earth's global primary photosynthetic production. These organisms are thus the objects of intensive multidisciplinary studies at different levels of organization, from molecular genetics and physiology to population dynamics and community ecology. The success of these photosynthetic organisms lies in their ability to use solar energy and nutrients and to cope with a fluctuating environment. Thus, light, nutrients, and water mixing plays a key role in the evolution of their life history traits, their physiology and their ecology. Moreover, in recent decades, ecologists have considered to an increasing extent their interactions with other biological communities, as herbivores or decomposers.

Cyanophyta is a very old group of organisms and represent relics of the oldest photoautotrophic vegetation in the world that occur in freshwater, marine and terrestrial habitats. Cyanophyta have been identified as one of the most promising group of prokaryotes from which various biologically active natural products were isolated. Cyanophyta from local habitats seem to be a source of potential new active substances that could contribute to reduction of the number of bacteria, fungi, viruses and other microorganisms. Recently compounds from cyanophyta have been isolated which display inhibitory effects on bacterial growth, on mycobacterium species on fungal growth, on cancer cells and against viruses and enzymes.

Munshi Hussain Tank is situated amidst the old city of Bhopal near Taj-ul-Masjid on the northwest of the Bhopal City. This Tank is one of the important aquatic reservoirs. It is situated at longitude 77°23'45''E, latitude 23.15°55'' N having the catchment's area 2 ha., Submergence area 1.1 ha., Gross storage 1.4 m cum, live storage 4.11 meters, Maximum depth 3.23 meters, Minimum depth 2.03meter, Lowest still level 0.46 ha., Full reservoir level 7.13 m, Water spread at FRL Approx. 0.58 ha. It is a part of the exemplary water management system constructed by Muslim rulers, which resembles the water management system of Islam Nagar fort.

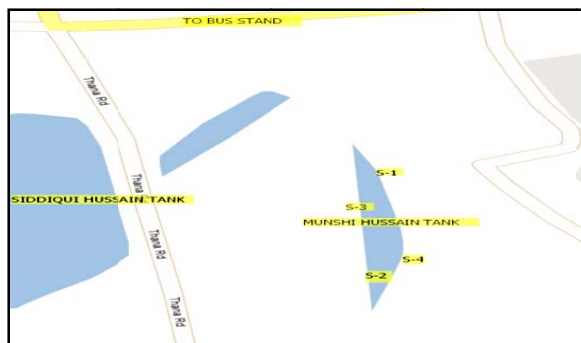
On earlier days, the rainwater flowing down the Idgah Hills was collected at a point for supply to the Benazir palace. The wastewater from the palace used to join the Motia Tank, which subsequently trickled down to Munshi Hussain Khan Tank. Thus a level was maintained in the Tank.



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*salina*, *O. sancta*, *O. subbrevis*, *Phormidium calcicola*, *Lyngbya magnifica*, *L. majuscula*, *L. spirulinoides*, *Anabaenopsis arnoldii*, *Cylindrospermum indicum*, *C. sphaerica*, *Nostoc commune*, *N. sphericum*, *Anabaena ambigua*, *A. aphanizominoidea*, *A. flos-aquae*, *Raphidiopsis indica*, *R. mediterranea*, *Aulosira fritschii*, *Scytonema coactile*, *S. pascheri*, *Tolypothrix nodosa*, *Calothrix castelii*, *Rivularia aquatica*, *R. baccariana*, *R. dura*, *Gloeotrichia kurziana* and *G. raciborskii*.

**Materials and Method**

Fortnightly collection of water samples was done from all the stations i.e. four sampling station S1, S2, S3 and S4 of Munshi Hussain Tank. Physico-chemical parameters were analysed using standard methods of APHA (1998) and Khanna and Bhutiani (2008). The algal sample collection was carried out with the help of truncated cone shape plankton net. The sample was concentrated by sedimentation method, removing the supernatant by decanting and the desired final volume was obtained. For counting, 1ml of concentrated sample was taken and placed Sedgwick Rafter Counting Cell following the Standard methods of APHA (1998), Trivedi and Goel (1986), Hutchinson (1967) and Khanna and Bhutiani (2008). The concentrate was preserved in 4% formalin for study (Welch, 1952).

Given formula is used to calculate percentage:-

$$Percent = \frac{\text{No. of Taxa}}{\text{Total No. of taxa}} \times 100$$

**Results and Discussion**

The results of percent composition of various genera of cyanophyta in Munshi hussain tank is given in Table-1 and Fig. 1. During course of study a total of 61 species of Cyanophyta were found i.e. *Microcystis aeruginosa*, *M. elongata*, *M. flos-aquae*, *M. protocystis*, *M. pseudofilamentosa*, *Chlorococcus limneticus*, *C. micrococcus*, *C. minor*, *C. minutus*, *C. turgidus*, *Gloeotheca rupestris*, *G. samoensis*, *Aphanocapsa koordersi*, *A. biformis*, *A. pulchra*, *Aphanothece nidulans*, *A. pallida*, *Dactylococcopsis fascicularis*, *D. raphidiodes*, *Gomposphaeria aponica*, *G. lacustris*, *Merismopedia elegans*, *M. glauca*, *M. punctata*, *M. tenuissima*, *Oscillatoria acuta*, *O. amphibian*, *O. amphigranulata*, *O. chalybea*, *O. foreau*, *O. jasorevnsis*, *O. laete-virens*, *O. princeps*, *O.*

**Table-1: Percentage composition of various genera of Cyanophyta in Munshi Hussain Tank**

No.	Genera	No. of taxa	Percentage
1	<i>Microcystis</i>	5	8.19
2	<i>Chlorococcus</i>	5	8.19
3	<i>Gloeotheca</i>	2	3.27
4	<i>Aphanocapsa</i>	3	4.91
5	<i>Aphanothece</i>	2	3.27
6	<i>Dactylococcopsis</i>	2	3.27
7	<i>Gomposphaeria</i>	2	3.27
8	<i>Merismopedia</i>	4	6.55
9	<i>Oscillatoria</i>	11	18.03
10	<i>Phormidium</i>	1	1.63
11	<i>Porphyrosiphon</i>	1	1.63
12	<i>Lyngbya</i>	3	4.91
13	<i>Anabaenopsis</i>	1	1.63
14	<i>Cylindrospermum</i>	2	3.27
15	<i>Nostoc</i>	2	3.27
16	<i>Anabaena</i>	3	4.91
17	<i>Raphidiopsis</i>	2	3.27
18	<i>Aulosira</i>	1	1.63
19	<i>Scytonema</i>	2	3.27
20	<i>Tolypothrix</i>	1	1.63
21	<i>Calothrix</i>	1	1.63
22	<i>Rivularia</i>	3	4.91
23	<i>Gloeotrichia</i>	2	3.27
	<b>Total</b>	<b>61</b>	



In the Munshi Hussain Tank different genera in order of frequency of occurrence were Oscillatoria, Microcystis and Chlorococcus. These were dominant out of total 61 genera and by predominance species of Microcystis, Chlorococcus and Merismopedia in Munshi Hussain Tank. Several workers such as Agarkar (1975), Anand (1988), Hammer (1964), Narayan *et al.* (2006), Oommachan (1981) found similar frequency of algae during their study.

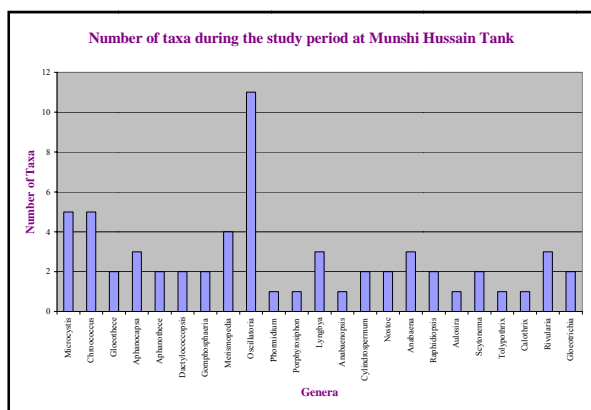


Fig. 1: Number of taxa at Munshi Hussain tank

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