

Phytoplankton diversity of Gaurala lake in Bhadrawati, Dist. Chandrapur, Maharashtra, India

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ABSTRACT

The present study was carried out on Phytoplankton diversity of Gaurala Lake in Bhadrawati, dist. - Chandrapur, Maharashtra state, India during 2015-2016. The present paper reveals the phytoplankton diversity in Gaurala Lake. During this study, 40 genera of phytoplanktons were recorded, out of 40 genera, 12 genera recorded for cyanophyceae, 23 genera for chlorophyceae and 5 genera for bacillariophyceae amongst three family members, chlorophyceae members found dominant and then cyanophyceae & bacillariophyceae. In case of chlorophyceae members, amongst them *Vaucheria*, *Cosmarium*, *Spirogyra*, *Volvox*, *Chara* and *Oedogonium* were found to be dominant. In case of cyanophyceae members, amongst them *Nostoc*, *Anabaena*, *Oscillatoria*, *Anacystis*, *Microsystis* were found to be dominant. In case of bacillariophyceae, *Diatoms* was found to be dominant. This indicates that the plenty of phytoplanktons are available in the lake and maintaining the ecological balance of the particular lake and will be helpful for the feeding zooplanktons and fishes which will maintain food chain and sustainable ecological balance of the lake.

Keywords: Gaurala Lake, Phytoplankton diversity, Bhadrawati, Chandrapur.

INTRODUCTION

Gaurala Lake is located near Gaurala locality, near Vinayak Mandir on the way to railway station in Bhadrawati, Dist.- Chandrapur. It is approximately 2 km. from Nilkanthrao Shinde Science & Arts College, Bhadrawati. The present investigation as an attempt to study the phytoplankton diversity of the Gaurala Lake in Bhadrawati, Dist. Chandrapur of Maharashtra state during 2015-2016. They are of great importance as a source of live food for zooplanktons and fishes. Phytoplankton are the primary producers, which forms the base of an autotrophic food chain.

METHODOLOGY

The samples of phytoplankton from three sampling sites were collected once in a month from the Gaurala Lake in Bhadrawati during 2015-2016. The samples were collected from surface water. The phytoplanktons were counted by drop count method (Lackey, 1957). The phytoplankton species were identified following Edmondson (1966), Needham and Needham (1978) and

APHA (1998). The results were expressed as number of organisms/ml.

RESULTS AND DISCUSSION

During the present investigation, 40 genera of phytoplanktons belonging to cyanophyceae, chlorophyceae and bacillariophyceae were recorded.

Table 1: Phytoplankton diversity of Gaurala Lake in Bhadrawati

Sr. No.	Genera / Species	Months (2015- 2016)				
		Sept	Oct	Nov	Dec	Jan
A	CYANOPHYCEAE					
1	<i>Gloeocapsa sp.</i>	3	8	14	19	16
2	<i>Microcystis sp.</i>	13	18	17	25	14
3	<i>Nostoc sp.</i>	15	18	24	40	55
4	<i>Spirulina sp.</i>	1	3	10	12	16
5	<i>Oscillatoria sp.</i>	19	25	28	34	53
6	<i>Anacustis sp.</i>	16	22	29	15	37
7	<i>Gleotrichia sp.</i>	6	9	12	4	8
8	<i>Anabaena sp.</i>	12	15	19	25	48
9	<i>Rivularia sp.</i>	8	9	15	3	15
10	<i>Scytonema sp.</i>	3	2	9	4	6
11	<i>Cylindrospermum sp.</i>	4	8	12	15	14
12	<i>Tolypothrix sp.</i>	4	10	9	7	12
B	CHLOROPHYCEAE					
1	<i>Chlamydomonas sp.</i>	9	3	12	6	5
2	<i>Eudorina sp.</i>	2	6	8	4	10
3	<i>Scenedesmus sp.</i>	12	10	11	8	12
4	<i>Draparnaldia sp.</i>	8	12	14	18	23
5	<i>Fritschiella sp.</i>	9	3	6	8	7
6	<i>Oedogonium sp.</i>	14	15	10	23	18
7	<i>Zygnema sp.</i>	3	10	8	12	6
8	<i>Cosmarium sp.</i>	13	18	23	33	30
9	<i>Hydrodictyon sp.</i>	3	14	17	10	12
10	<i>Spriogyra sp.</i>	20	18	23	28	14
11	<i>Vaucheria sp.</i>	14	20	33	38	35
12	<i>Chara sp.</i>	16	14	19	22	24
13	<i>Nitella sp.</i>	6	8	4	2	13
14	<i>Volvox sp.</i>	12	14	18	30	32
15	<i>Pediastrum sp.</i>	8	10	13	18	16
16	<i>Pithophora sp.</i>	3	8	1	1	2
17	<i>Cladophora sp.</i>	8	10	3	2	8
18	<i>Protococcus sp (pleurococcus sp)</i>	4	9	12	16	3
19	<i>Stigeoclonium sp.</i>	5	13	15	19	3
20	<i>Coleochaete sp.</i>	3	8	12	15	18
21	<i>Chateophora sp.</i>	4	2	1	8	10
22	<i>Ulothrix sp.</i>	3	4	8	20	3
23	<i>Chlorella sp.</i>	4	8	3	13	10
C	BACILLARIOPHYCEAE					
1	<i>Diatom sp.</i>	18	19	30	35	38
2	<i>Cyclotella sp.</i>	3	14	10	6	8
3	<i>Navicula sp.</i>	9	2	3	1	1
4	<i>Nitzschia sp.</i>	9	3	6	4	1
5	<i>Rhopalodia sp.</i>	6	12	3	2	4

*The numbers in table indicates no. of organisms recorded per ml.

Members of cyanophyceae viz *Gloeocapsa*, *Microcystis*, *Nostoc*, *Spirulina*, *Oscillatoria*, *Anacystis*, *Gleotrichia*, *Anabaena*, *Rivularia*, *Scytonema*, *Stigonema*, *Cylindrospermum*, *Tolypothrix*, *Oscillatoria* were observed throughout the investigation period, amongst them *Nostoc*, *Anabaena*, *Oscillatoria*, *Anacystis*, *Microcystis* were found to be dominant. Member of chlorophyceae viz. *Chlamydomonas*, *Pandorina*, *Eudorina*, *Scenedesmus*, *Draparnaldia*, *Fritschiella*, *Oedogonium*, *Zygnema*, *Cosmarium*, *Hydrodictyon*, *Spirogyra*, *Vaucheria*, *Chara*, *Nitella*, *Volvox*, *Pediastrum*, *Mougeotia*, *Pithophora*, *Cladophora*, *Protococcus*, *Stigeoclonium*, *Coleochaete*, *Chaetophora*, *Ulothrix*, *Chlorella*, were observed throughout the study period. Amongst them *Vaucheria*, *Cosmarium*, *Spirogyra*, *Volvox*, *Chara* and *Oedogonium* were found to be dominant (Table 1).

Five members of bacillariophyceae viz Diatom, *Cyclotella*, *Navicula*, *Nitzschia*, *Rhopalodia* have recorded. Amongst Bacillariophyceae *Diatoms* was found to be dominant. Similar type of investigation was done by several workers. Kumawat and Jawale (2003) recorded 59 genera of phytoplankton from a fish ponds at Angale. Out of these 14 genera belonged to chlorophyceae. In the same study, eight genera were observed throughout the year. Somani and Pejaver (2003) also reported 14 genera of Chlorophyceae, in the lake Masunda, Thane, Maharashtra. The species such as *Clostridium*, *Cosmarium*, *Oedogonium*, *Ulothrix*, *Zygnema*, *Chara*, *Nitella* were observed throughout the year. The *Chlamydomonas*, *Chlorella*, *Cladophora*, *Pediastrum*, *Scenedesmus* were observed only in monsoon months. *Hydrodictyon* sp. was observed only in the month of June.

Tripathi and Pande (1995) observed maximum blue green population during summer months while minimum during winter. Harris and James (1974), Wetzel (1975) observed the occurrence of *Microcystis*, the toxin producing blue green in blooms is a significant feature of tropical waters the species of *Microcystis* such as *M. protocystis*, *M. incera*, *M. aeruginosa*, *M. lotoralis*; *Oscillatoria*, *O. princeps*, *O. limosa*, *Lyngbya*, *L. majuscula*, *Nostoc* sp. and *Anabaena* sp. were found to be toxin producing algal species. Nasare et al (2009) observed six members of Cyanophyceae viz. *Oscillatoria*, *Microcystis*, *Gleotrichia*, *Anacystis*, *Spirulina*, *Agmenelleum* in Khadki lake of Chandrapur District, Maharashtra.

Rao and Raju (2000) observed the Bacillariophyceae species represented by *Melosira*, *Synedra*, *Navicula*, *Nitzschia*, *Gyrosigma*, *Cymbella* and *Amphora* in fish

culture pond at Nambur near Guntur, Andhra Pradesh. Pendse et al. (2000) observed the Euglenophyceae species *Euglena Phacus* and *Trachelomonas* in percolation tank of Dasane, Maharashtra.

Sirsat et al. (2004) recorded 24 genera of Phytoplanktons from fresh water ponds at Dharampuri in Beed District, Maharashtra. Similarly, Pawar et al (2006) recorded 61 genera of Phytoplankton from Pethwadaj Dam of Nanded district in Maharashtra. Nafeesa Begum and Narayana (2006) recorded 85 species of phytoplankton from four lentic water bodies in and around Davangarere city, Karnataka.

Nasare et al. (2009 a) observed nine cyanophycean members during winter season. Nasare et al (2009 b) also studied the Phytoplankton biodiversity of Vinjan Lake in Bhadrawati town of Chandrapur district, Maharashtra state, India. Darshana Bhosale & Nasare (2010) observed Chlorophyceae members as dominant in the reservoir while Englenophyceae members were found scanty. Cyanophyceae and Bacillariophyceae members were also found in adequate numbers. Nasare (2014) observed Chlorophyceae, Englenophyceae, Bacillariophyceae and Cyanophyceae members in Masanghat Lake of Bhadrawati, Dist.- Chandrapur, Maharashtra state, India. during Jan. 2013 to June 2013.

CONCLUSION

It is concluded that the chlorophyceae members were found dominant than the cyanophyceae and bacillariophyceae members. Bacillariophyceae members were less than cyanophyceae and Chlorophyceae members. The cyanophyceae members were in the moderate range. They are of great importance as a source of live food for zooplanktons and fishes. This indicates that the plenty of phytoplanktons were available in the lake and maintaining the ecological balance of the particular lake and will be helpful for the feeding zooplanktons and fishes which will maintain food chain and sustainable ecological balance of the lake.

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