



## SURVEY OF PHYTOPLANKTON DIVERSITY OF SAKHARWAHI LAKE FROM CHANDRAPUR DISTRICT, MAHARASHTRA STATE (INDIA).

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### Abstract:

In present paper survey of phytoplankton diversity from Sakharwahi lake of Chandrapur District of Maharashtra state, India shows 28 species of phytoplankton diversity recorded. Phytoplankton recorded from four taxonomic groups namely Chlorophyceae (15 species), Bacillarioaceae (06 species), Cyanophyceae (05 species) and Euglenophyceae (02 species). Chlorophyceae group shows dominance over all other groups. Chlorophyceae group shows 53.57 % of phytoplankton and Bacillariophyceae possess 21.43%, followed by Cyanophyceae possess 17.86% and very least number of Euglenophyceae groups possess only 7.12%. As the Euglenophyceae groups shows only two species namely Euglena Spe. and Phacus Spe.

**Keywords:** Phytoplankton diversity, Sakharwahi Lake, Chandrapur District, Maharashtra state, India

### Introduction

Phytoplankton grows in aquatic ecosystems and which includes the microscopic, unicellular free floating and colonial autotrophic organisms. Their movement more or less controlled by water currents. (Millman *et al.*, 2005). They are pioneer of an aquatic ecosystem and play a significant role in food chain. Productivity in aquatic ecosystem is directly depends on density of phytoplankton. The phytoplankton diversity and density is controlled by water quality and other biotic communities in a water bodies (Reid and Wood, 1976). Phytoplankton is the base of most of the reservoir food webs and forms the basic link of food chain in aquatic ecosystem. Plankton constitutes the vary basis of nutritional cycle of an ecosystem (Kaushik *et al.*, 1991; Misra *et al.*, 1992). They form a bulk of food for zooplankton, fishes and other aquatic ecosystem dependant on the abiotic characteristics of water and the biological diversity. (Harikishan *et al.*, 1999).

Phytoplankton are the important component of ecosystem as they responds to ecosystem alterations very rapidly and they play a key role in the changing of organic matter and energy through the ecosystem (Telesh, 2004). Phytoplankton play important contribution to the biological diversity in lakes and reservoirs. Its community structure is important to higher trophic levels because it influences the efficiency of carbon and energy transfer between trophic levels in any given system (Mallin *et al.*, 1991). They maintaining equilibrium between abiotic and biotic components of aquatic ecosystem and functions as an important component of aquatic flora (Pandey *et al.*, 2004).

Phytoplankton population and distribution are greatly affected by physical and chemical properties of water (Sharma and Diwan, 1997). Number of researchers studied phytoplankton from different parts of India like (Raut and Pejaver, 2005; Telkhede *et al.*, 2008 and 2009; Tapashi and Mithra, 2011; Vasantha *et al.*, 2012; Sarwade and Kamble, 2014; Jitesh and Radhakrishnan, 2015). The present survey was carried out to document diversity of phytoplankton from Sakharwahi Lake of Chandrapur district.

### Material and Methods

#### Study Area

Sakharwahi is a Village in Chandrapur Taluka in Chandrapur District of Maharashtra State, India. The latitude 20.01 and longitude 79.16 are the geocoordinate of the Sakharwahi at an elevation 194 meters above sea level. It belongs to Vidarbha region. It is located 22 KM towards west from District head quarters Chandrapur. 19KM from Chandrapur. Sakharwahi is surrounded by Chandrapur Taluka towards East, Wani Taluka towards west, Ballarpur Taluka towards East, Warora Taluka towards North (Figure 1).

#### Plankton analysis

Phytoplankton was collected and studied during frequent visit to the Sakharwahi Lake. Water sample were collected at morning between 8.30 am. to 10.30 am. once in a month during Jan - Nov. 2015 from Sakharwahi Lake for phytoplankton study. The samples were collected by filtering 50 liters of water through plankton net. The plankton mesh of size 56.00 µm made up of bolting silk cloth. The samples were allowed to settle by adding Lugol's Iodin, centrifuged and the concentrate was made up to 50 ml with preservation of 4% formalin.

Preserved samples were examined under binocular microscope and identified by available literature Prescott (1982) Fritsch (1965); Hutchinson (1957); Biswas (1980); Sarode and Kamat (1984) and Edmondson (1963).

## Results and Discussions

Result of preliminary survey of phytoplankton diversity of Sakharwahi lake given in Table.01. In present survey total 28 phytoplankton recorded from four taxonomic groups namely Chlorophyceae (15 species), Bacillariophyceae (06 species), Cyanophyceae (05 species) and Euglenophyceae possesses 02 species. (Fig.2). Chlorophyceae (53.57%) groups shows dominance on Bacillariophyceae (21.43%), Cyanophyceae (17.86%) and Euglenophyceae (7.12%) respectively ( Fig.3.) (Table.01).

Chlorophyceae groups possess *Chlorella* Spe., *Chlorococum* Spe., *Chlymadomonas* Spe., *Closterium* Spe., *Hydrodictyon* Spe., *Oedogonium* Spe., *Pediastrum* Spe., *Scenedesmus* Spe., *Spirogyra* Spe., *Tetraedron* Spe., *Tribonema* Spe., *Ulothrix* Spe., *Volvox* Spe., *Zygnema* Spe. and *Cosmarium* Spe. shows dominance and flourishingly present in lake. Similar results like Chlorophyceae showing dominance also shown by other researchers ( Khanna and Singh, 2000; Fule et al.2012).

Another important group Bacillariophyceae groups shows 06 species like *Diatom* Spe., *Navicula* Spe., *Pinnularia* Spe., *Tabellaria* Spe., *Nitzchia* Spe. and *Gyrosigma* Spe.. This Bacillariophyceae group is second largest group after Chlorophyceae. Cyanophyceae groups possesses only 05 species namely *Anabaena* Spe., *Nostoc* Spe., *Microcystis* Spe., *Oscillatoria* Spe. and *Spirulina* Spe.. Euglenophyceae groups possesses very less 02 species namely *Euglena* Spe. and *Phacus* Spe.. Similar results also observed in Nal-Damayanti reservoir (Fule et al.2012). Euglenophyceae groups least number indicates that water is not organically polluted. (Pawar et al,2006).

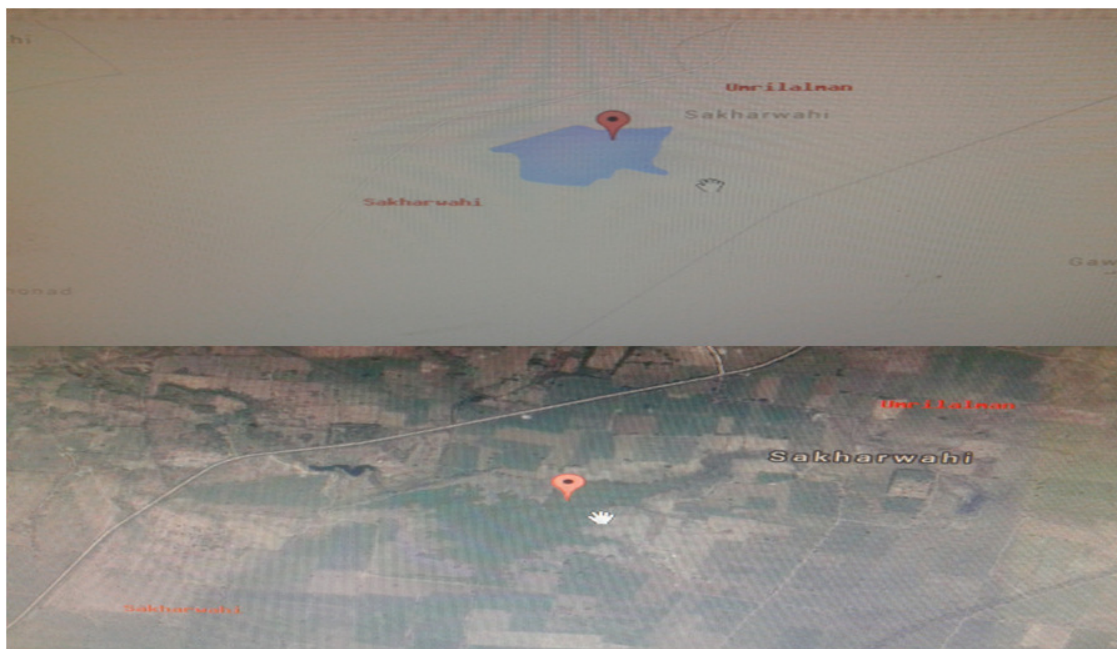
Distribution of phytoplankton and their variation at different zones of water body is

known to be influenced by physicochemical parameters of water. Phytoplankton study provides a relevant and convenient point of focus for research on the mechanism of eutrophication and its adverse impact on aquatic ecosystem (Shinde et al,2012). Phytoplankton study is a very useful tool for the assessment of water quality in any type of water body and also contributes to understanding of the basic nature of general economy of the lake (Pawar et al., 2006).

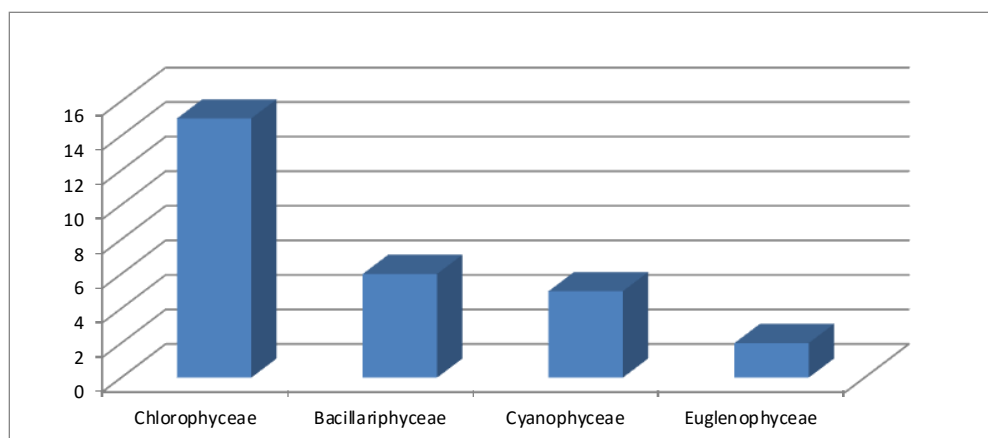
Phytoplankton is the basic members in the aquatic ecosystem and hence changes in the phytoplankton population have a direct correlation with the change of water quality in any aquatic ecosystem.

**Table.01.** Phytoplankton diversity of Sakharwahi Lake from Chandrapur District of Maharashtra (India).

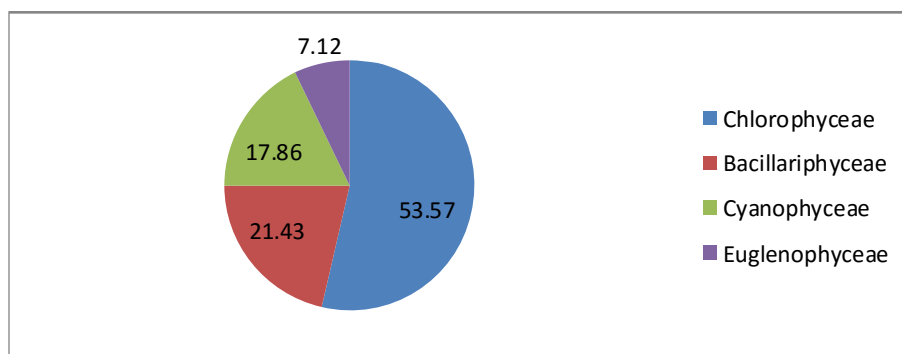
Class	SN	Plankaton name
1. <u>Chlorophyceae</u>	01	<i>Chlorella</i> Spe
	02	<i>Chlorococum</i> Spe.
	03	<i>Chlymadomonas</i> Spe.
	04	<i>Closterium</i> Spe.
	05	<i>Hydrodictyon</i> Spe.
	06	<i>Oedogonium</i> Spe.
	07	<i>Pediastrum</i> Spe.
	08	<i>Scenedesmus</i> Spe.
	09	<i>Spirogyra</i> Spe.
	10	<i>Tetraedron</i> Spe.
	11	<i>Tribonema</i> Spe.
	12	<i>Ulothrix</i> Spe.
	13	<i>Volvox</i> Spe.
	14	<i>Zygnema</i> Spe.
	15	<i>Cosmarium</i> Spe.
2. Bacillariophyceae	16	<i>Diatom</i> Spe.
	17	<i>Navicula</i> Spe.
	18	<i>Pinnularia</i> Spe.
	19	<i>Tabellaria</i> Spe.
	20	<i>Nitzchia</i> Spe.
3. Cyanophyceae	21	<i>Gyrosigma</i> Spe.
	22	<i>Anabaena</i> Spe.
	23	<i>Nostoc</i> Spe.
	24	<i>Microcystis</i> Spe.
	25	<i>Oscillatoria</i> Spe.
	26	<i>Spirulina</i> Spe.
4. <u>Euglenophyceae</u>	27	<i>Euglena</i> Spe.
	28	<i>Phacus</i> Spe.



**Figure 1.** Location of Sakharwahi Lake (Photograph taken Google map.)



**Figure 2.** Comparison of phytoplankton species of taxonomic group's.



**Figure 3.** Percentage wise distribution of taxonomic group's.

## Conclusion

Present survey of Sakharwahi lake shows 28 species of phytoplankton diversity from 04 taxonomic groups namely Chlorophyceae, Bacillariaceae, Cyanophyceae and Euglenophyceae. Chlorophyceae group shows dominance over all other groups. Chlorophyceae group shows 53.57 % of phytoplankton and Bacillariophyceae possess 21.43%, followed by Cyanophyceae possess 17.86% and very least number of Euglenophyceae groups possess only 7.12%. As the Euglenophyceae group shows only two species namely *Euglena* Spe. and *Phacus* Spe.. it indicates that this lake is free from organic pollution. Phytoplankton diversity and distribution can vary along with season and with the physicochemical properties of water.

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