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ISOLATION OF PHYTOPLANKTON'S FROM THREE URBAN LAKES OF SOLAPUR CITY, MAHARASHTRA STATE, INDIA

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ABSTRACT
For present study, isolating phytoplanktons from three The present paper deals with the plankton diversity of Urban lakes of Solapur, Maharashtra State, in the Decmber 2010 to November 2011. The phytoplankton represented by class chlorophyceae, Cyanophyceae, Euglenophyceae, Dinophyceae and bascillariophyceae.

KEY WORDS: Limnology, Phytoplankton, plankton diversity

INTRODUCTION

Phytoplanktons have long been used as indicators of water quality. Because of their short life cycles, planktonic organisms respond quickly to environmental changes and hence their standing crop and species composition indicate the quality of water. Planktonic algae are represented by green algae (chlorophyta), blue green algae (cyanophyta), the diatoms (bacillariophyta), and desmids (chrysophyta). The utilization of lentic water bodies for domestic purposes and fish culture has assumed importance in developing countries. Plankton has been studied only in a few reservoirs of India by Govind (1963), Chakraborty *et. al.* (1977) and Dhimdhime et al. (2012). The disposal of agricultural waste and untreated sewage into water bodies adversely affect the plant and animal life. Although considerable work has been done on the limnological studies on some lakes of Maharashtra .The three lakes of Solapur city namely Sambhaji (Kambar Talab), Siddheshwar and Hipparga were selected for the present study remains scientifically unexplored.

MATERIALS AND METHODS

Surface water samples were collected from identified stations of the lake at a depth of one feet using polythene cans of two litre capacity for a period of one year, Decmber 2010 to November 2011 at monthly intervals. pH was measured by using pH meter. Transferency and Vertical attenuation coefficient (VAC) was determined by sacchidisc. The chemical analysis was carried out following the methods suggested by Trivedy and Goel (1986) and APHA (1995). For the enumeration of phytoplankton, each site in a 50mL sample bottle by filtering about 50 liters of water through plankton net. Sample was fixed simultaneously with 20 ml of 1% lugol solution for sedimentation. This sedimented sample was observed under microscope. The identification of phytoplankton up to the level of species was made with the help of literature given in paranthesis (Philipose, 1967; Deshikachary, 1959; Gandhi, 1955; APHA, 2005; Ward and Whipple, 1966).The utilisation of lentic water bodies for domestic purposes and fish culture has assumed importance in developing countries. The disposal of agricultural waste and untreated sewage into water bodies adversely affect the plant and animal life. Although considerable work has been done on the limnological studies on some lakes of Maharashtra. The three lakes of Solapur city selected for the present study remains scientifically unexplored.

RESULTS AND DISCUSSION

The Latitude and Longitude of the Lakes present in Solapur are shown in Table-1 and Figure-1, 2 and 3.

Table 1. Lake Latitude / Longitude of Lakes in Solapur

Site	N Latitude	E Longitude
Sambhaji lake	1738.370	7554.370
Shiddeshwar lake	1740.431	7554.271
Ekruk Lake (Hipparga lake)	1744.784	7554.982

Table 2.Physicochemical analysis of Water of three lakes.

Parameter \ Site	Sambhaji Lke	Shiddeshwar lake	Hipparga lake
pH	9.3	5.2	6.5
EC (S/m)	1.2	1.0	1.3
Total Alkalinity	129	132	121
Hardness (mg/lt)	318	342	180
Transparency (cm)	24.18	21.33	18.19
VAC	0.132	0.89	0.87
Air temp	M 35	36	35
Water temp	28	24	27
Dissolved oxygen	7.13	8.15	11.35
Odour	Unpleasant	fishy	fishy
Colour	green	Blue green	Blue

The physiocochemical characters of lake as shown in table 2 . The phytoplankton population was represented by the class chlorophyceae, Cyanophyceae, Euglenophyceae, Dinophyceae and bascillariophyceae. (Table 3). Where scarce and number and poor in forms and hence not considered in the present study. The pH of water Sambhaji Lake is 9.3 indicate water is more polluted due to sewage disposal because three large residential societies dispose their sewage water directly in the lake as compare to Shiddeswar and Ekrukh Lake (Hipparga Lake) having pH. 5.2 and 6.5 respectively. Electrical conductivity is also more in Sambhaji lake ie. 1.2. Total Alkalinity is more in Shiddeswar Lake as compare to Hipparga and Sambhaji Lake. Transparency is more in Sambhaji Lake. Water is more hard in Siddeshwar lake ie. 342 mg/l .DO is less in Sambhaji Lake and odour is also unpleasant and colour of the water is blue due algal bloom and vigorous growth of *Eichroonia crassipes*. The Phytoplankton diversity as shown in Table 3.The diversity of class Cyanophyceae was more in Sabhaji Lake ie 16 as compare Siddeshwar lake and Ekrukh lake ie .16 and 12. Class Chlorophyceae in Sambhaji Lake is more 12 as compare to remaning two Lakes. Class – Euglenophyceae is found in all lake. Class – Dinophyceae is also found in all lake. Class – Bacillariophyceae member are more in Sambhaji Lake ie .12 as compare remaining Lakes. The results are compaired with the data observed by Bhosale (2010); Smitha (2007) and Shashi (2008).

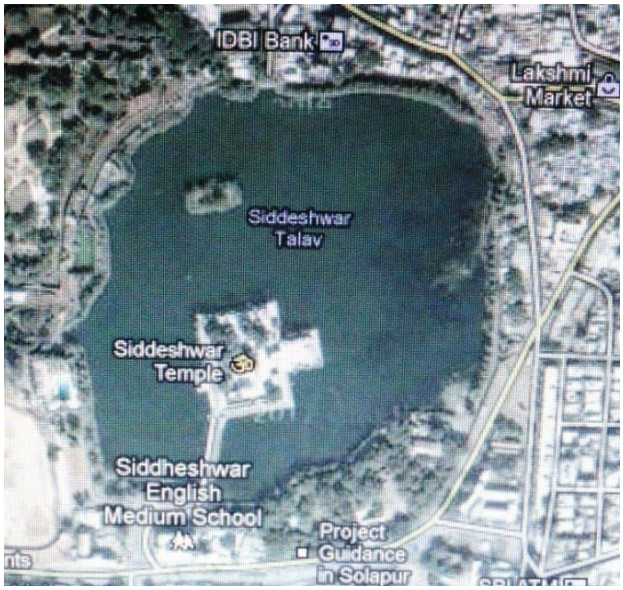
Table 3. Phytoplankton diversity of three lakes of Solapur city

No.	Phytoplankton	Sambhaji Lake	Shiddeshwar Lake	Hipparga Lake
	A. Class – Cyanophyceae			
1.	Oscillatoria raoi	+	+	-
2.	Oscillatoria amoena	+	+	-
3.	Lyngbya commune	+	+	+
4.	Gloeocapsa decorticans	+	+	+
5.	Oscillatoria amphibia	+	+	+
6.	Gloeothece samoensis	+	+	-
7.	Oscillatoria salina	+	+	+
8.	Nostoc linkia	+	+	+
9.	Phormidium fragile	+	+	+
10.	Oscillatoria limosa	+	+	+
11.	Lyngbya corticola	+	+	+
12.	Oscillatoria tenuis	+	+	+
13.	Lyngbya major	+	+	+
14.	Microcystis incerta	+	-	+
15.	Oocystis gigas	+	-	-
16.	Scytonema species	-	+	+
17.	Spirulina species	+	+	-
	B Class – Chlorophyceae			
18.	Cosmarium reniforme	+	+	-
19.	Spirogyra indica	+	+	+
20.	Vovox species	+	-	+
21.	Ulothrix species	+	+	-
22.	ZygnemaClosterium	+	+	-
23.	Desmidium species	+	-	+
24.	Chlorella species	+	+	-
25.	Spirogyra species	+	+	-
26.	Sirogonium species	+	-	+
27.	Chlamydomonas species	+	+	+
28.	Cylindrocapsa species	+	+	+
29.	Cladophora species	+	+	+
	C Class – Euglenophyceae			
30.	Euglena species	+	+	+
	D Class – Dinophyceae			
31.	Gymnodinium species	+	+	+
32.	Peridinum species	+	+	+
	E Class – Bacillariophyceae			
33.	Cymbella species	+	+	-
34.	Navicula species	+	+	-
35.	Pinnularia major	+	-	+
36.	Tabellaris species	+	+	+
37.	Navicula papila	+	+	+
38.	N.palea	+	+	-
39.	Synendra acus	+	+	-
40.	Amphora ovalis	+	+	-
41.	Melosira granulata	+	+	-
42.	Cyclotela species	+	+	
43.	Gomphonema species	+	+	+
44.	Fragilaria species	+	+	+
	Total	43	38	31

+ = Present - = Absent

Figure-1. Lakes in Solapur A. Sambhaji lake B. Shiddeshwar lake C. Hipparga lake

A. Sambhaji lake



B. Shiddeshwar Lake

C. Ekruk Lake

The total phytoplankton diversity is 43 in Sabhaji Lake 38 in Shiddeshwar Lake and Ekruk Lake. From above result it is concluded that the Sambhaji Lake is more polluted than Shiddeshwar and Hipparga Lake because the cloths were washed by washer man, and sewage water is directly released by the residential societies and other anthroporogenic activities are going on.

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