

Studies on phytoplankton diversity in Samutharam lake Tiruvannamalai district, Tamil Nadu

R. THANGADURAI, T. RAVIMYCIN AND P.S. SHARAVANAN

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See end of the article for authors' affiliations

Correspondence to :

R. THANGADURAI

Department of Botany,
Annamalai University,
ANNAMALAINAGAR
(T.N.) INDIA

SUMMARY

In the present study surface water sample of Samutharam Lake were collected in the second week of every month during October 2007 to March 2008. 97 species of phytoplankton were identified under Cyanophyceae, Chlorophyceae, Bacillariophyceae and Euglenophyceae. It accounted for a contribution of 40.02% Bacillariophyceae, 22.22% Chlorophyceae, 32.14% Cyanophyceae, and 5.62% Euglenophyceae.

Key words :

Phytoplankton,
Samutharam lake,
Bio-diversity

Biodiversity means the wealth of life forms found on earth in the form of million of different plants, animals and microorganisms. At the world convention for biological diversity, the definition for biological diversity was recommended (UNEP, 1992). Phytoplankton which includes blue – green algae, green algae, diatoms, desmids, euglenoids etc. are important among aquatic flora. They are ecologically significant as they form the basic link in the food chain of all aquatic animals (Misra, 2001) when they are in large numbers they make the water greenish.

MATERIALS AND METHODS

Study area:

Samutharam Lake is located 76° 22'N latitude and 14° 13'E longitude. The lake receives the water by rainfall only and the total area of this water body is about 1 hectare. The temperature of this region varied from a minimum of 16.6° C in winter months to a maximum of 41° C during the summer months. The average rainfall is about 424 – 590 millimeter.

Surface water samples were collected from different spots of the lake in the second week of every month during October 2007 to March 2008. Waters samples were analyzed in the laboratory for important physico – chemical parameters like temperature, pH, DO, total alkalinity, chloride, calcium, total hardness, BOD, EC, TDS, free CO₂, nitrate and phosphate. Analysis was done according to the

methods described by APHA (1998) and Trivedy and Goel (1986). A liter of water sample was collected every month separately for the qualitative and quantitative estimation of phytoplankton study. Phytoplankton was identified by referring to the standard keys of Desikachary (1959), Cox (1966) and Anand (1998). Sedimentation of water was made in Lugol's iodine and Phytoplankton was counted in 1 ml sample by Sedgewick-Rafter cell method and identified according to Fritsch (1975).

RESULTS AND DISCUSSION

The physico – chemical analysis of Samutharam Lake water has been shown in (Table 1). The phytoplankton communities of the present water body represented mainly 4 groups Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae (Table 2).

Cyanophyceae:

It was the most significant group having a contribution of 32.14% to the total phytoplankton population. This group included *Nostoc* sp. *Oscillatoria* sp. *Anabaena* sp. *Microcystis aeruginosa*, *Gloeocapsa* sp. *Aphanocapsa* sp. and *Merismopedia* sp. (Table 2).

Chlorophyceae:

Chlorophyceae was encountered as the

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Table 1 : Physico – chemical parameters of Samutharam Lake from October 2007 to March 2008

Parameters	Oct. 07	Nov. 07	Dec. 07	Jan. 08	Feb. 08	Mar. 08	Range
pH	8.4	8.6	8.5	8.7	8.7	8.9	8.4-8.9
Water temp. °C	28	28	29	30	32	34	28-34
Calcium (mg/l)	17.63	18.43	16.83	12.82	12.02	22.44	12.02-22.44
Total hardness (mg/l)	72.00	96.00	76.00	80.00	80.00	90.00	72.00-96.00
DO (mg/l)	10.78	9.18	8.78	5.58	5.27	4.38	4.38-10.78
BOD (mg/l)	2.0	2.8	3.2	3.6	4.8	6.0	2.00-6.0
Phosphate (mg/l)	0.145	0.022	0.036	0.005	0.040	0.048	0.005-0.145
EC (mg/l)	290.00	290.00	280.00	260.00	370.00	390.00	260-390
TDS (mg/l)	0.185	0.185	0.179	0.166	0.106	0.249	0.106-0.249
Chloride (mg/l)	31.20	49.64	51.05	53.89	65.24	66.65	31.20-66.65
Alkalinity (mg/l)	98	106	108	112	110	196	98-196
Free CO ₂ (mg/l)	0.45	0.80	0.95	1.2	1.55	2.50	0.45-2.50
Nitrate (mg/l)	0.025	0.002	0.001	0.008	0.009	0.045	0.001-0.045

Table 2 : Diversity of phytoplankton in Samutharam Lake

<i>Cyanophyceae</i>	<i>Chlorophyceae</i>	<i>Bacillariophyceae</i>	<i>Euglenophyceae</i>
<i>Nostoc</i> sp.	<i>Closterium</i> sp.	<i>Synedra ulna</i>	<i>Euglena</i> sp.
<i>Oscillatoria</i> sp.	<i>Pediastrum simplex</i>	<i>Navicula hustedtii</i>	
<i>Anabaena</i> sp.	<i>Cosmarium tumidum</i>	<i>Cymbella tumida</i>	
<i>Microcystis aeruginosa</i>	<i>Spirogyra</i> sp.	<i>Melosira granulata</i>	
<i>Gloeocapsa</i> sp.	<i>Scenedesmus acuminatus</i>	<i>Nitzschia</i> sp.	
<i>Aphanocapsa</i> sp.		<i>Pinnularia major</i>	
<i>Merismopedia</i> sp.			

third most significant group of phytoplankton with a contribution of 22.22% to the total population. The group included *Closterium* sp., *Pediastrum simplex*, *Cosmarium tumidum*, *Spirogyra* sp. and *Scenedesmus acuminatus* (Table 2).

Bacillariophyceae:

It accounted for a contribution of 40.02% to the total phytoplankton population. This group included *Synedra ulna*, *Navicula hustedtii*, *Cymbella tumida*, *Melosira granulata*, *Nitzschia* sp. *Pinnularia major* (Table 2).

Euglenophyceae:

This group contributed 5.62% to the total phytoplankton production and was only represented by *Euglena* sp. (Table 2).

The main aspect of this investigation was to study the phytoplankton flora as affected by the drainage of the domestic waste. The results indicate that different ecological factors have influenced the plankton abundance.

The present study ensures that variation in the abundance of plankton can be best explained when environmental factors jointly influence.

Authors' affiliations

T. RAVIMYCIN AND P.S. SHARAVANAN,
Department of Botany, Annamalai University,
ANNAMALAINAGAR (T.N.) INDIA

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