MICROALAGAL DIVERSITY OF MUKKADAL RESERVOIR IN KANYAKUMARI DISTRICT

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ABSTRACT

Fluctuations of phytoplankton densities in the reservoir were monitored along with temperature, pH, dissolved oxygen, biological oxygen demand, phosphate, nitrate and sodium. Samples were collected periodically from October 2007 to May 2008. Nitrates and phosphates were generally low throughout the study while dissolved oxygen remained high and pH ranged from 6.7 -8.2. About 43 microalgal genus were reported in which 22 species belonged to Chlorophyta, 8 species to Cyanophyta and 16 species to Bacillariophyta. Species of *Amphora, Microcystis, Oscillatoria, Navicula* and *Chroococcus* were reported as pollution indicators.

Key words: Parameters, Phytoplankton, Diversity,

INTRODUCTION

Reservoirs are man made eco-systems in which a dynamic diversity is reported. Algae are involved with water in a number of ways and reservoirs receive water from dams, tributaries and by natural flow from hills. It resulted in the growth and population of number of phytoplankton. Many workers used algae as indicators of pollution (Sankaran, 2005; Devakar and Deshmukh 2006). Algal biodiversity of different rivers, reservoirs from India had been studied by many workers (Sharma and Sarang 2004, Sanap *et al.*, 2006). However algal diversity of Mukkadal reservoir at Tittuvilai Village of Kanyakumari District remained untouched. Therefore present studies were undertaken to investigate the phytoplankton diversity and to assess the water quality.

MATERIALS AND METHODS

Water samples for physico-chemical analysis and phytoplankton studies were collected from the two stations (S_1 and S_2) of the reservoir using standard methods (APHA, 1985). Phytoplankton samples were collected monthly and fixed in 4% neutralized formaldehyde. They were identified using relevant literatures (Desihachary, 1959, Prescott, 1978, Anand, 1980).

RESULTS AND DISCUSSION

Physico-chemical parameters are showed in table 1. The temperature shows lower values during Northeast monsoon season ranging from the mean values of 23^0C to the maximum of 29^0C (non-monsoon). The pH value remained alkaline throughout the study period, and the report coincides with the earlier observation of Das *et al.,* (1997), Asmon (2006) also reported similar observations in the Thirparappu

reservoir. Dissolved oxygen concentration of the reservoir also remained higher during northeast monsoon season as a result of fresh water enter from the hilly sides and from Pechiparai Dam.

In the present investigation there are 43 algal genus belonging to 3 classes viz, Bacillaricphyceae, Cyanophyceae and Chlorophyceae which are listed below (Table 2).

i. Chlorophyta (Green algae)

The Chlorophyceae was the dominant group reported from the reservoir. Twenty one genus with twenty two species were observed. *Draparnaldiopsis indica* is reported as a rare form. Nearly 48.84% of green algae were contributed to the total density.

ii. Bacillariophyta (Diatoms)

This class of algae is represented by the species of *Amphora, Caloneis Cocconeis, Cymbella, Diploneis, Cyclotella, Fragillaria, Mastogloia, Navicula, Pinnularia, Pleurosigma and Surirella.* The percentage contribution was 32.55% to the total phytoplankton. *Surirella robusta* is reported as a rare alga.

iii. Cyanophyta (Blue green algae)

Eight genus of blue greens were reported. The genus *Oscillatoria* is found with 6 species and *Chroococcus* were three species. The percentage contributions of blue greens are only 18.61%. During non-monsoon season pollution indicating algae like *Chroococcus, Microcystis* and *Oscillatoria* were reported.

Seasonal variation of phytoplankton is reported and was previously noticed by Jhingran (1986). During non-monsoon season the distribution of phytoplankton increases to the maximum level and similar to other fresh water ecosystem (Iwona and Lauri 2003). Chlorophytawere observed as dominant group and most of the fresh water ecosystem explains the dominance of Chlorophycecan members in this district (Ida, 2004). Environmental fluctuations create a rich diversity which was maximum during October month and the present result coincides with the reports of Thirparappu reservoir (Asmon, 2004).

Table.1: Physico – chemical parameters in the Reservoir

Parameters	Northeast monsoon		Non-monsoon	
	S_1	S_2	S_1	S_2
pH	7.12 ± 0.38	7.3 ± 0.5	7.47 ± 0.2	7.3 ± 0.4
Temperature	24.32 ± 0.37	23.6 ± 1.2	29 ± 1.2	27.22 ± 07
DO (mg/L)	4.15 ± 0.3	4.2 ± 0.6	3.45 ± 0.2	3.8 ± 0.6
BOD (mg/L)	0.97 ± 0.3	0.93 ± 0.16	1.4 ± 0.2	1.18 ± 0.09
PO_4 (mg/L)	0.13 ± 0.04	0.14 ± 0.03	0.32 ± 0.18	0.14 ± 0/04
Chloride (mg/L)	1.46 ± 0.72	1.45 ± 0.94	0.76 ± 0.4	1.02 ± 0.18

Sodium (ppm)	1.26 ± 0.42	1.15 ± 0.31	0.96 ± 0.07	1.0 ± 0.09
Nitrate (ppm)	0.05 ± 0.02	0.25 ± 0.01	0.08 ± 0.04	0.07 ± 0.05

Table 2: Name of the algae reported from the Reservoir during the study periods

CYANOPHYTA	
1	*Anabaena ambigua* C.B Rao
2	*Aphanocapsa banaresensis* Bharadw *Aphanocapsa pulchra* (Kuetz.) Rabenh
3	*Chroococcus turgidus* (Kuetz.) Naeg *Chroococcus mintus* (Kuetz.) Naeg *Chroococcus tenax* (Kirch.) Hieron
4	*Eucapsis alpina* Clements
5	*Gleocapsa nigrescens* Naeg.
6	*Microcystis flos-aquae* Wittr.
7	*Oscillatoria laetevirens* (Crouan) Gom. *Oscillatoria boryana* Bory *Oscillatoria limnetica* Lemm. *Oscillatoria brevis* (Kuetz) Gom. *Oscillatoria subbrevis* Schmidle *Oscillatoria amphibia* Ag.
8	*Spirulina meneghiniana* Zanard.
CHLOROPHYTA	
1	*Ankistrodesmus falcatus* (Corda) Ralf
2	*Chlorella vulgaris* Beji
3	*Chlorococcum humicolo* (Naeg.) Raben
4	*Cladophora glomerata* (L.) Kuetz

5	*Closterium acerosum* (Schr.) Her
6	*Cosmarium portianum* Archer
7	*Desmidium grevillei* (Kuetz.) De Bary
8	*Draparnaldiopsis indica* Bharadwaj
9	*Oedogonium* sp
10	*Oocystis eliptica* West and West
11	*Pandorina morum* Bory
12	*Pediastrum boryanum* (Turp.) Meneghini
13	*Pithophora mooreana* Collins.
14	*Rhizoclonium hieroglyphiarum* (Ag.) Kuetz
15	*Scenedesmus quadricauda* var *longispina* G.M., Smith *Scenedesmus dimorphus* (Turp.) Kuetz.
16	*Selenastrum gracile* Reinsch
17	*Spaerozosma wallichi* Jocobs
18	*Spirogyra* sp
19	*Tetraedron regulare* Kuetz.
20	*Ulothrix zonata* (Web et Mohr.) Kuetzing
21	*Zygnemopsis saravatiensis* Lying
BACILLARIOPHYTA	
1	*Amphora ovalis* Kuetz.
2	*Caloneis bacillum* (Grun.) Cleve
3	*Cocconeis placentula* Ehr.
4	*Cyclotella meneghiniana* Kuetz.
5	*Cymbella cymbiformis* Kuetz

6	*Diploneis subovalis* Cleve
7	*Fragillaria intermedia* Grun.
8	*Mastogloia smithii* Grun.
9	*Navicula cuspidata* Kuetz. *Navicula rhyncocephala* Kuetz. *Navicula* sp
10	*Nitzchia palea* Grun. *Nitzchia amphibia* Grun.
11	*Pinnularia borealis* Ehr.
12	*Pleurosigma angulatum* (Quek) Smith
13	*Surirella robusta.* Ehr.
14	*Synedra uina* (Nitz.) Ehr.

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