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STUDIES ON PHYTOPLANKTON DIVERSITY IN VADUVUR LAKE AT THIRUVARUR DISTRICT, TAMILNADU, INDIA

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ABSTRACT

Diversity of phytoplankton was analyzed in Vaduvur lake (10.4°N; 79.19°E) water situated in Thiruvarur District, during the period of October 2010 to September 2011. Qualitative and Quantitative estimation of phytoplankton from study site was carried out with help of Sedgwick Rafter counting cell and identified using standard literature. The study period totals of 32 genera were observed in phytoplankton. Those genera, were present in different divisions were Bacillariophyceae (15 species), Cholorophyceae (10 species) and Cyanophyceae (7 species). Total number of phytoplankton 8325 Nos /lit were observed in throughout the year. The maximum phytoplankton population was found during the month of February 2011 and minimum phytoplankton population was found during the various month of December 2010, April 2011 and August 2011, (Chlorophyceae, Bacillaiophyceae and Cyanophyceae).

KEYWORDS

Phytoplankton, Vaduvur Lake, Monthly variations.

INTRODUCTION

The Vaduvur Lake is oldest and largest Lake of Tamil Nadu. This is very significant lake in South India. This lake is important ecosystem for fishes and birds. The lake being used for multipurpose utility such as irrigation, migratory birds, fish catching washing and bathing. Biodiversity means the variability among the living organisms from all source including terrestrial, lake, marine and other aquatic ecosystem and ecological complex of which they are part (Ali, 1999). Phytoplankton is a predominant type of a plant found in most lake water. The quality and quantity of phyto plankton is a good indicator of water quality. The high relative abundance of chlorophyta is a indicator of productive water (Boyd, 1981).

Phytoplankton forms the vital source of energy as primary producers and serves as a direct source of food to the other aquatic plants and animals (Saha *et al.,* 2000). Systematic and ecological studies on chlorophyceae of North India and their relationship with water quality were made (Dwivedi *et al.,* 2005). In these systems phytoplankton is of great importance as a major source of organic carbon located at these bases (Gaikwad, *et al.,* 2004). Phyto plankton is small organisms that play a crucial role in the food chain. While increased amounts of phytoplankton provide more food for organisms at higher tropic levels, too much phyto plankton or toxin producing phyto plankton can harm the over health of the Bay (Jana, 1973: Garcia and Lopez, 1989).

MATERIALS AND METHODS

The present study was carried out on Vaduvur Lake which is situated (10.4°N; 79.19°E) 21 km East of Thanjavur and 21 km west of Mannargudi, Thiruvarur District. This study was conducted during October 2010 to September 2011. Plankton sample were collected from the lake water on monthly basis. The collection of plankton was made by plankton net. Plankton samples were collected by filtering about 200 liters of the surface through the net. Immediately after collection of plankton samples were preserved in 10% formalin 10cc formalin diluted to 10cc of distilled water. Qualitative and quantitative estimation of phytoplankton from study site was carried out with the help of Sedgwick Rafter counting cell and identified using standard literature (Edmonson, 1959; Anand, 1998).

RESULTS AND DISCUSSION

In the present study on the qualitative and quantitative analysis of phyto plankton of Vaduvur lake water taken monthly pattern and the density of phyto planktons identified. They belongs to the family of *Bacillario phyceae* (15 species), *chlorophyceae* (10 species), *Cyanophycea* (7 species). The phyto plankton analysed from the lake water samples were identified and listed (**Table. 1**).

The maximum number of *chlorophyceae* was 350 nos/lit was found in the month of February 2011 and the minimum was found 100 nos/lit was found in during the month of December 2010. The totals number of chlorophyceae of 2350 nos/lit were analyzed from the lake water during October 2011 to September 2011 (**Table. 2**).

The maximum number of *Bacillario phyceae* was 300 non/lit found in the month of December 2010. The minimum 100 nos/lit was found in the month of April 2011. The total number of *Bacillario phyceae* 2450 nos/lit were analysed from the lake water during the period of October 2010 to September 2011 (**Table. 2**).

The maximum number of Cyanophyceae was 375 nos/lit found in the month of December 2010 and minimum number of cyanophyceae 200 nos/lit was found in the month of August 2011. The total number of cyanophyceae 3525 nos/lit were found in the period of October 2010 to September 2011 (**Table. 2**).

The population density trend showed gradual increase during post monsoon period and monsoon season (Sukunan, 1980), Chlorophyceae, Bacillario phyceae and Cyanophyceae were recorded in large numbers during the study period and the Bacillariophyceae was dominant. There are several reports available on the distribution, density, species diversity and ecology of plankton in different water bodies (Fritsch, 1961; Rawson, 1956).

Hence based on the diversity of phyto plankton population highly abundance in the month of December (Monsoon). The phyto plankton density due to the presence of high photo synthetic activity in the lake waters. Many reports are available on the plankton diversity of Indian lakes (Zafaar, 1986; Mani, 1992; Eswari, 2002; Rajasekar, et. al., 2005; Tiwari and Chauthan, 2006).

Table 1: Showing the major groups of phytoplankton in Vaduvur lake (October 2010 to September 2011)

PHYTO PLANKTONS			
S. No	***Bacillario phyceae***	***Chloro phyceae***	***Cyano phyceae***
1	*Fragillaria Crotonesis*	*Pediastrum boryanum*	*Anabea*
2	*Fragillaria Capunia*	*Polycedriopsis*	*Oscillatoria putrida*
3	*Synedra acus*	*Selenastrum*	*Merismopedia*
4	*Synedra vaucheriae*	*Pleurosigma*	*Spirulina*
5	*Aequalis sp.,*	*Pediastrum duples*	*Nostoc*
6	*Nitxshia diosipata*	*Clostecidium tumdum*	*Oscillatora putrida*
7	*Nitzhiapalea*	*Spirogyra*	*Oscillatoria chlorine*
8	*Navicula anglica*	*Euglena*	
9	*Navicla gracilis*	*Volvox*	
10	*Navicula gastrum*	*Pandorina sp.*	
11	*Pinnularia undulate*		
12	*Navicula cuspidate*		
13	*Gomphonema consrictum*		
14	*Cymbella tumida*		
15	*Syndera ulna*		

Table 2: Monthly Variation of Phytoplankton (nos /lit) in Vaduvur lake During October 2010 to September 2011

S. No	Month and year	Major Taxonomic Groups		
		Chloro phyceae	***Bacillario phyceae***	***Cyano phyceae***
1	**October 2010**	130	250	350
2	**November 2010**	120	200	350
3	**December 2010**	100	300	375
4	**January 2011**	150	170	300
5	**February 2011**	350	150	350
6	**March 2011**	250	250	250
7	**April 2011**	200	100	300
8	**May 2011**	150	150	250
9	**June 2011**	150	250	350
10	**July 2011**	200	150	250
11	**August 2011**	250	200	200
12	**September 2011**	300	280	250
13	**Total number of phytoplankton (nos/lit)**	2350	2450	3525

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