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Phytoplankton Diversity of Canalwater at Rangampalayam in Erode District, Tamilnadu

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Abstract: ***The present studies were carried out on the phytoplankton diversity of Rangampalayam Canal in Erode district, Tamilnadu. This work period of five months (June 2015 to July 2016).The phytoplankton were identified as sixty nine species and belonging to the four major classes Cyanophyceae, Chlorophyceae, Bacillarophyceae, Euglenophyceae and noticed throughout the study period. Phytoplankton can act as a biological indicator to assess the qualities of the canal water.***

Keywords: Phytoplankton diversity, Rangampalayam canal, Biological indicator

1. Introduction

Phytoplankton is the most important producer of organic substances in the aquatic environment and the rate at which energy is stored by the set in organisms determine the basic primary productivity of the ecosystem. The plankton is heterogeneous assemblage of minute organism which occurs in natural water and float about by wave action and movement of water. Phytoplankton and Zooplankton movements and distribution in the water column are influenced largely physical forces. Phytoplankton functions as the primary producers in the food chain and fixing solar energy into Vitamin D. Moreover, it deoxygenates the water, when they are growing and mainly used as food and feed to the aquatic organisms in aquaculture field. There are two major groups, i.e. phytoplankton and zooplankton (Venkateswarlu, 2006).

Phytoplankton, the microscopic floating algae, increase its growth in the aquatic ecosystem with sufficient nutrient and suitable ecological conditions which play an important role in their availability and abundance. It results in increased fish production (Shah, 2000). Their role in food web is to provide proteins, carbohydrates, fats, minerals and vitamins to other organisms. The phytoplankton community changes with the change in the environmental condition such as nutrient levels, light intensity, temperature, predators and the type of water sources (Reynold and Joworcki, 1981). Phytoplanktonsatisfyconditionstoqualifyassuitablepollutioni ndicatorsin that they are simple, capable of quantifying changes in water quality (Naiketal., 2005; Zargar and Ghosh,2006).Majority of phytoplankton comprises the algal groups like Chlorophyceae, Bacillariophyceae, Cyanophyceae and Eugleophycean. In the present work has been made to assess the phytoplankton and water quality of canal water.

2. Material and Methods

This canal occur more or less around 5km length, 5meters in wide and 2 meters in depth. The water runoff from south to north direction. The main source of water is harvesting of rain water, agricultural runoff from the nearby fields and continuous discharge of sewage water. In each and every year water continuously run off in two monsoon period (from June to October). The remaining season the water seems to be in stagnant condition.

Plankton Samples Collection

Water samples were collected from selected habitats for five months from June to October 2016.Samples were collected periodically every month during morning hrs between 4.00 and 6.00 A.M. 50 litters of surface water was filtered through standard plankton net. The collected plankton samples were transferred to polyethylene bottles and preserved with 4 % formalin.

Phytoplankton diversity indices

A totally 69 species of phytoplankton were recorded in canal at Rangampalayam in Erode. The species were belong to four orders (Table-1), namely

% of Phytoplankton diversity indices

Cyanophyceae- 40%
Chlorophyceae- 35%
Bacillarophyceae - 16%
Euglenophyceae-9%

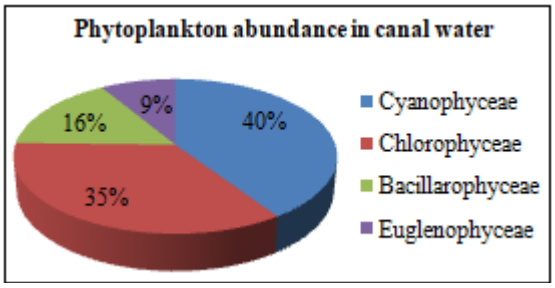
Table 1: Phytoplankton species observed in canal water

Order	Family	Species
Cyanophyceae	*Cyanophyceae*	*Anabaena aequalis*
		Aphanocapsa delicatissima
		Aphanizomenon flos-aquae
		Anabaena aequalis
		Coelosphaerium sp.
		Gloeotrichia natans
		Lyngbya aestuarii
		Microcystis aeruginosa
		Microcystis wesenbergii
		Merismopedia glauca
		Mougeotia scalaris
		Nostoc caeruleum
		Oscillatoria angusta
		Spirulina laxa
		Synechocystis trididemni
		Anabaena spiroides
		A. circinalis
		A.circinalis
		A. constricta
		Nostoc pruniforme .
		Spirulina major
		S. meneghiniana

		S. princeps
		S. subsalsa
		Oscillatoria subbrevis
		O. curviceps
		O. chlorine
		Arthrospira platensis
		A. jenneri
Chlorophyceae	*Chlorophyceae*	*Askenasyella clamydopus*
		Actinastrum aciculare
		Ankistrodesmus falcatus
		Chlorella vulgaris
		Chara longifolia
		Cladophora glomerata
		Characium gracilipes
		Closterium sphaericum.
		Closterium acerosum
		Closterium dianae
		Closterium lineatum
		Closterium depressum
		Elakatothrix gelatinosa
		Hydrodictyon reticulatum
		N. carneum
		Microspora aequabilis
		Nitella opaca
		Pediastrum leonensis
		Pediastrum simplex
		Scenedesmus annatus
		Spirogyra maxima
		Spirotaenia condensata
		Ulothrix lamellose
		Uronema acutum
		Zygnema caeruteum
Bacillariophyceae	*Bacillariophyceae*	*Asterionella formosa*
		Cocconeis diminuta
		Diatoma vulgare
		Gomphonema acuminatum
		Fragilaria oceanic
		Frustulia rhomboides
		Navicula membranacea
		Nitzschia bilobata
		Pinnularia viridis
		Synedra capitata
		Tabellaria fenestrate
Euglenophyceae	*Euglenophyceae*	*Euglena gracilis*
		Euglena spirogyra
		E. viridis
		Phacus acuminatus
		P. longicauda

3. Result and Discussion

The analysis of phytoplankton for each and every month of water samples. The 69 species of phytoplankton were observed from canal water. Most of species of phytoplankton are present in every month except few species. During October most of the species were absent rainfall and dilution of the water. About 69 species of phytoplankton 28 species of Cyanophyceae, 24 species of Chlorophyceae,11 species Bacillarophyceae ,6 species of Euglenophyceae were observed .In the present study, the diversity indices of phytoplanktons were 40% of Cyanophyceae. 35% Chlorophyceae,16% Bacillariophyceae and 9% Euglenophyceae were observed species are showed in Table-1.Phytoplankton analysis, which includes species count and biomass determination, could be used as an indicator to water quality (Reynolds *et al*., 2000).The Chlorophyceae were identified during the study period. *Chlorella* sp., *Ankistrodesmus*sp., *Closterium* sp and *Closteriumdianae* were the dominant species and other species was not dominant. The highest total number of chlorophyceae were recorded. The phytoplankton fluctuates monthly and its productivity was high during June and low during October as evidenced earlier by Sadguru *et al.* (2002). Abdel Baky (2001) concluded that, organic matter within domestic sewage discharge give a suitable medium for the growth of Euglenophyta.



4. Conclusion

Total 69 species of phytoplankton were identified during the study. Phytoplankton belonged to four groups: Cyanophyceae, Chlorophyceae, Bacillarophyceae and Euglenophyceae. Chlorophyceae was the most dominant family with four species and Bacillarophyceae was the least dominant family during study period. In purity of fresh water indicates and generally grow the Chlorophyceae. The study is analysis of physico-chemical parameters are used to reflect an abiotic status of an ecosystem and the biological parameters and phytoplankton diversity for water quality regulates biodiversity and tropic of an ecosystem. This work account to give awareness among the people about the quality of water and can help reduce the water pollution through housekeeping and management practice.

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