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Seasonal variations in phytoplankton abundance of Ambona lake Maharashtra

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Abstract
Present investigation deals with the quantitative and qualitative information on seasonal variations of phytoplanktons on Ambona Lake in Umarkhed Taluka Yavatmal district. Phytoplankton's play an important role as food for herbivorous animals (primary production) and acts as biological indicators of water quality in pollution studies. Hence the present study was carried out on Ambona lake for a period of one year from Jun 2010 to May 2011. The samples were collected and identified using standard keys of APHA [1]. Altogether twenty one species of phytoplankton's belonged to four class were identified. Out of the 11 species belonged to chlorophyceare, and 5 species belonged to Bacillarophyceae, 4 species belonged to cyanophyceae, and 1 species belonged to Euglenophyceae.

Keywords: phytoplankton, Ambona Lake, water quality, seasonal variations.

INTRODUCTION

Algae contribute a part of the food chain in the aquatic environment and any change in its growth and composition will alter the other living sources including the fishes [10]. phytoplankton respondsimmediately to the surrounding changes and hence it indicates the water quality. Aquatic environment supporting hydrophytic vegetation is endowed with luxurious growth of algae. Considerable work has been carried out in India about systematic survey, distribution, periodicity and ecology of algae in several habitats[8,9] Phytoplankton being the primary producers forms the lowest trophic level in the food chain of freshwater ecosystem, moreover, number and species of phytoplankton's serves to determine the quality of water body [2].

The present study was conducted in Ambona Lake for period of a year from Jun 2010 to May 2011. The samples were collected from four sampling stations of the lakes.

MATERIALS AND METHODS

The samples were collected from four sampling stations of the lakes. The present study was conducted in Ambona lake for period of one year i.e. from Jun 2010 to May 2011. The water samples for phytoplankton population 10L of water was filtered through plankton net made up of bolting silk cloth [15]. Filtered samples were fixed and preserved by adding lugol's iodine solution. For counting planktons a Sedgwick Raftor Plankton Counting Cell was used. The population data was expressed as no / ml.

Phytoplanktons

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Chlorophyceae
Closterium sp
Closterium sp.
Spirogyra Sp.
Oedogonium Sp.
Ulothrix Sp.
Zygnema Sp.
Chara Sp.
Nitrela Sp.
Pediastrum Sp.
Hydrodiction Sp
Chlorella Sp.

Bacillariophyceae
Diatom Sp.
Navicula Sp.
Pinnularia Sp.
Tabellaria Sp.
Nitzchia Sp.
Gyrosigma Sp.

Cyanophyceae
Anabaena Sp.
Nostoc Sp.
Microcystis Sp.
Oscillatoria Sp.

Euglenophyceae
Euglena-phacus sp

RESULTS AND DISCUSSIONS

Algae productivity in the month of March, April was the highest resulting from sufficient nutrient enrichment of water and adequate solar radiations. Water transparency was high during summer season was characterized by absence of flow velocity ,flood, surface run-off suspended particals , which gave rise to high transparency ,increased food abundance and high photosynthetic activity. Most of workers studied the

periodicity and distribution of algae in Indian lotic bodies. Some workers have suggested that total population of algae reached their high density during winter [4,11] on the other hand others showed the maximum total algae during postmosoon, winter and early summer and monsoon [7,17]

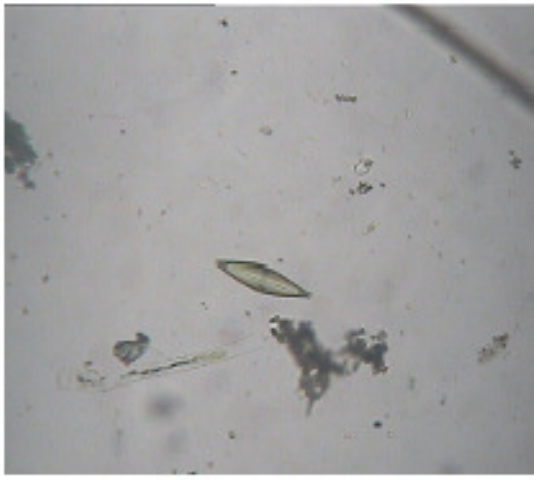
Altogether 21 species or phytoplankton belonged to class chlorophyceae, Bacillariophyceae, cyanophyceae and Euglenophyceae were identified. Out of the 11 species belonged to chlorophyceare, and 5 species belonged to Bacillarophyceae, 4 species belonged to cyanophyceae, and 1 species belonged to Euglenophyceae. Among chlorophyceae numerical superiority was found in case of spirogyra maxima, and closterium, Among the Bacillarophyceae Navicula and Diatoms abundant, Microcystis repeated abundance among cyanophyceae. Euglena was the only species of Euglenophyceae observed in Ambona Lake. High density of phytoplankton species diversity during the study period except the rainy season (June, July, August). This may be due to cloudy weather, low transparency & heavy flood caused decline of phytoplankton density. The chlorophyceae population was abundant during the summer months (March, April, and May). These results are consistent with Devika [6] also recorded high population during summer & suggested that this might be due to physical rather than chemical conditions in which the water temperature and transparency had a direct relationship with phytoplankton population. Ven Den Hoeck [16] reported that higher chlorophyceae are a large and important group of freshwater algae. Pulle and Khan [12] studied on seasonal variation in primary production in Isapur Dam Maharashtra. The Bacillariophyceae represented the second most dominant group in phytoplankton population. The minimum density of Bacillariophyceae was recorded in the month of July while the maximum density was recorded in the month of January.

Among cyanophyceae, total 6 genera were identified throughout the study period, such as Anabaena sp, Nostoc sp, Oscillotaria sp and Microcystis sp the minimum density of Cyanophyceae was recorded in the month of June while the maximum density was recorded in the month of March throughout the study period. The maximum density of Euglenophyceae was recorded in the month of June while the maximum density was recorded in the month of October.

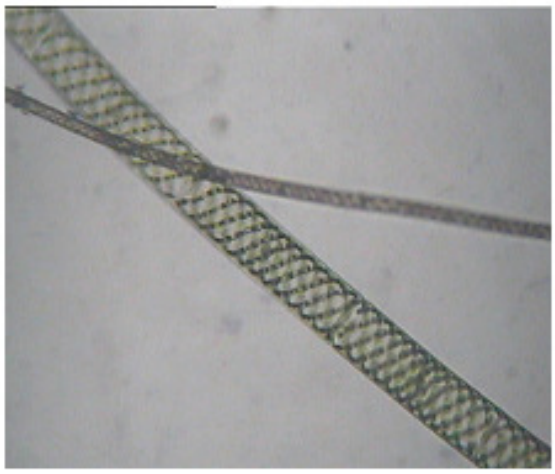
The high rate productivity during summer months was due to increase in temperature and high transparency. Such parameters speed up the photosynthetic activity of phytoplankton. Ambona Lake phytoplankton also shows a high density of Chlorophyceae members dominated by spirogyra sp. Pediastrum sp. and Euglena sp. which is an indication of organic pollution. These findings are in agreement with those of Chaturvedi [5].

The selected species of phytoplankton's were show in following photograph.

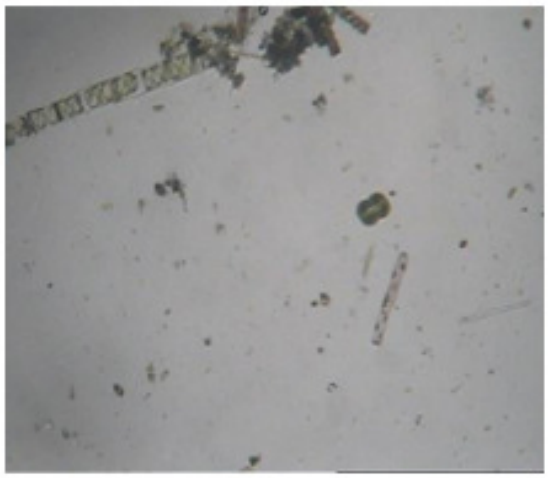
Closterium sp.



Navicula sp.

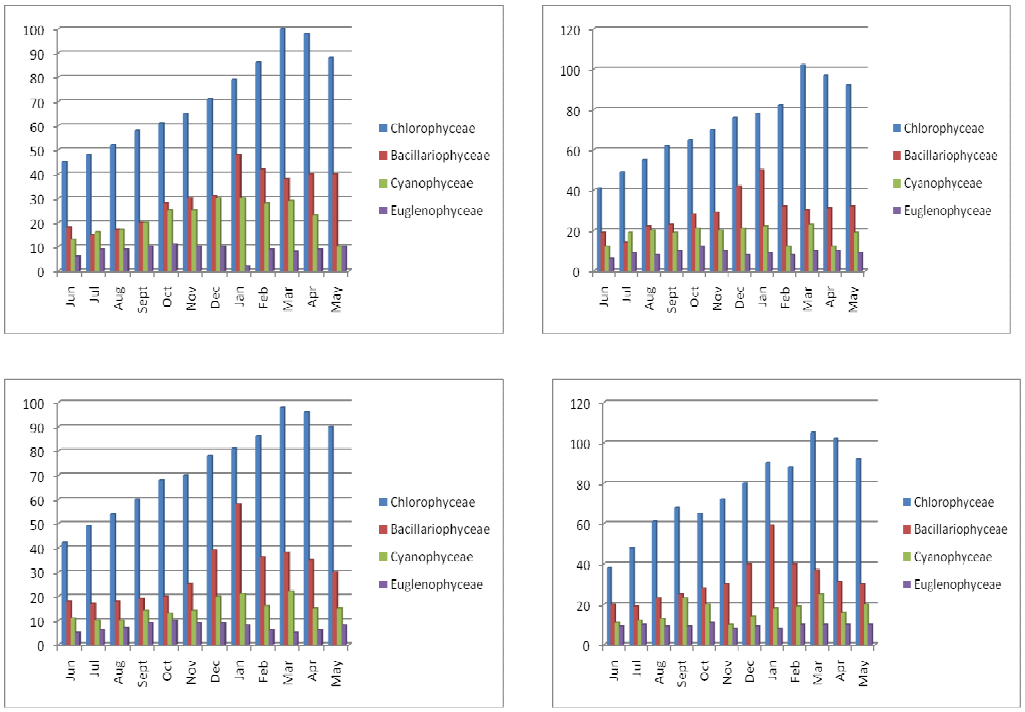


Spirogyra Sp.



Cosmarium Sp.

Monthly variation of Phytoplankton /mL during 20010-11



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