Short Communication

Phytoplanktons Variation with Respect to Ichthyofaunal Studies of Bhandardara Dam, MS, India

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Abstract

The Western Ghats is an important biogeographic zone of India and one of the thirty four global hot spots. Variation in the diversified group of phytoplanktons has been observed and depicted in the paper Cyanophyta with 5 numbers of species Chlorophyta with 22 numbers of species Bacillariophyta with 14 numbers of species Xanthophyta with single number of species were recorded from the region.

Keywords: Bhandardara Dam, phytoplanktons, Ahmednagar district.

Introduction

Wilson Dam is located at Bhandardara in western part of the Ahmednagar district in Maharashtra. It is also commonly known as Bhandardara Dam. It is built across the river Pravara, near the village Bhandardara. This is one of the oldest existing dams in the state. The construction of this dam was started in 1910 and it was completed in 1926. The catchment area of dam is 12200 Sq.kms. The live storage is of water is 11.039 TMC and dead storage is 3 TMC. The depth of the dam is 270 feet. The base width of the dam wall is 260.10 feet. The main source of water for dam is streams, rivers, fountains etc. The annual rainfall up to Ghatghar is 5460 mm. and on dam 3225 mm. The total irrigated area under the dam is 23077 hectors.

Algae are the important part of the food web and provide shelter to other organisms. Thus they are the major part in aquatic ecosystems. They play a crucial role in the aquatic ecosystem to absorb nutrients, toxic material, heavy metals and convert it into simplest form. The phytoplankton diversity in relation to the abiotic factors of a pond at Bagalpur, India was recorded[1]. The primary producers are the base of aquatic ecosystem. Therefore the productivity of the aquatic ecosystem is based on primary producers[2]. They occur in the lentic (standing water) as well as lotic water (running water), the diatoms flora of Marathwada, Maharashtra[3]. In the present study diatoms were correlated with these references. The seasonal phytoplanktonic diversity of Kitham lake, Agra[4]. Biological assessment is a useful alternative for assessing the ecological quality of aquatic ecosystems since biological communities integrate the environmental effects of water chemistry, in addition to the physical and geomorphological characteristics of Rivers and lakes[5]. Phytoplankton encountered in the water body reflects the average ecological condition and therefore, they may be used as indicator of water quality[6].

Significant positive correlations were noticed between surface water temperature and total plankton density at all stations in the Lake except at station-4A. Total plankton density at station 4A showed a negative correlation with water temperature. Many reports on positive correlations between density of specific groups of phytoplankton and temperature are available[7,8]. However, the negative correlations of phytoplankton density observed at station-4A might be due to the unidentified interactions of certain factors operating in the region. Correlation analysis of density of different algal classes and temperature at different stations revealed that the relationship of such groups with temperature was positive at certain stations but negative at certain other stations. It may be noted that at station-4A, where *Bacillariophyta* was the dominant group, it showed a positive correlation with temperature but negative correlations of *Cyanophyceae* and *Bacillariophyceae* with temperature. According to various classes as well as individual species of algae have minimum, optimum and maximum temperatures for growth[9]. The author has reported optimum temperature for Diatoms as 18-30^{0}C, for Green-algae 30-35^{0}C and for Blue-green algae 35-40^{0}C. Since the surface water temperature fluctuations in *Periyar* Lake varied from 24 to 29^{0}C, temperature regime in the Lake is not very favourable for *Cyanophycean* and *Chlorophycean* growth.

Material and Methods

Phytoplanktonic samples were collected from surface water samples of identified station of this lake at a depth of more than one foot using polythene cans of two liter capacity. Algal material was preserved in 3-4% formalin at the site of collection. Isolated samples were washed with 2- 3% Acetic acid solution to remove organic impurities along with visible particles. Pure cultures were obtained using serial dilution method and obtained dilution was filtered and introduced in

small growth containers and kept on light table to grow and observed using microscope. The algal forms were further identified by staining with 1% Iodine solution and examined under Research microscope with *Micro Image Projection System* (MIPS) and identified with available literature[10]. The identification of phytoplankton was done with the help of standard books and monographs[11-13]. The study of phytoplankton in 1litre samples were collected from the surface water at all the stations in clean plastic jars and were fixed immediately using Lugol's iodine solution (1ml: 10ml)[14] .

Algal studies are very essential for the assessment and abatement of water pollution. Phytoplankton and its seasonal successions can be a better predictor of long term environmental changes in the aquatic systems than the more usual descriptors of biomass and productivity indices[15].

Results and Discussion

The present investigatory study reveals in the lake have a collection of so many algal genera of different class. It was reported that genus *Anabaena, Nostoc, Spirulina, Phormidium, Merismopedia* that belongs to the class *Cyanophyta* with 5 number of species. Genus *Oedogonium, Mougeotia, Chlorela, Cosmarium, Hydrodictyon Pediastrum, Pithophora Volvox, Eudorina Spirogyra, Scenedesmus, Coleochaete, Staurastrum, Planktospaeria, Quadrigula, Crucigenia*, that belongs to the class Chlorophyta with 22 number of species. Genus *Navicula, Pinularia, Amphiplura, Stauroneis, Epithemia, Hantzschia, Gyrosigma, Tabellariafenestrata, Melosira, Synedra, Anphora*, that belong to class Bacillariophyta with 14 numbers of species. Genus *Chlorobotrys* is belongs to class Xanthophyta with single number of species. The pond also shows the presence of Algal blooms and various algal forms. These algal forms belong to the class Chlorophyta.

Conclusion

The study has revealed that, the pond had a diversified algal flora in which Chlorophycean members were dominant followed by Bacillariophyceae, Cyanophyceae, and Xanthophyceae. Algal studies are very essential for the assessment and abatement of water pollution. Phytoplankton and its seasonal successions can be a better predictor of long term environmental changes in the aquatic systems than the more usual descriptors of biomass and productivity indices. Biodiversity of all systems forms a vital resource that needs to be carefully conserved for our future generation, and planktons are especially important as they form the most sensitive component of the ecosystem and signal environment disturbances. However, biodiversity in aquatic ecosystems remains neglected.

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