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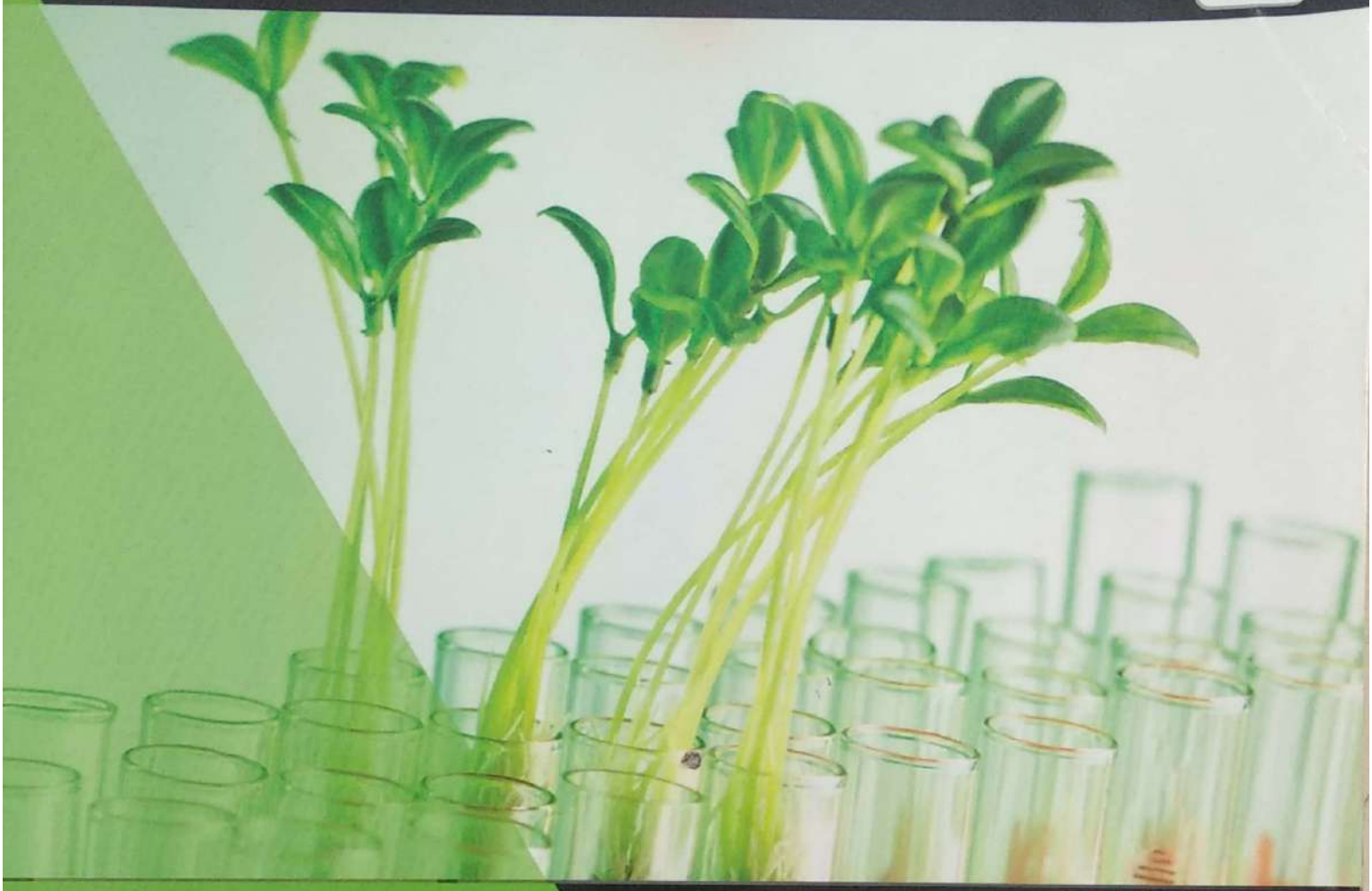

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LIST OF FULL LENGTH PAPERS

STUDIES ON THE PHYSIO-CHEMICAL PROPERTIES OF THE OOTY LAKE

R. Christy Shaila,* M. Manimegalai and P. Kathireswari

Abstract

All human civilizations have evolved in close proximity to natural sources of water, especially fresh water. Water is not only the most important essential constituent of all animals, plants and other organisms (Sharma and Sarang 2004). The present work has been carried out on the water quality of Ooty Lake, and the physico-chemical characteristics and primary productivity was studied for a period of twelve months. Due to the waste water from the neighborhood, the South end of the lake is more polluted than the other parts of the lake.

Keywords: Ooty lake, physio-chemical characteristics, primary productivity.

Introduction

Water is important for the nourishment of our forest and crops, the blue and shinning beauty are the heart of our landscape. Vast reserves of freshwater lay under earth's surface. It is the medium of solutes, raw materials for photosynthesis and sometimes plays an important role in fertilization, pollination and dissemination (Geetha, 1995). Water is most important essential constituent of all animals, plants and other organisms; also it is pivotal for the survivality of the mankind in biosphere (Sharma and Sarang, 2004). Good quality water is essential for all living beings and we are more concerned on this natural resource when it becomes too little, too much dirty (Azni *et al.,* 2003), but most of our natural water bodies are gradually becoming degraded to a great extent due to rapid progress of industrialization and population explosion. All human civilizations have evolved in close proximity to natural sources of water, especially fresh water. The advancement of the technology and urban industrialization has burdened the mother earth in terms of environmental degradation. Water is the most essential commodity for human conception and it is one of the renewable resources, which must be prevented from deterioration in quality. Drinking water is nowadays becoming scarce even though available in abundance due to its improper management (Subhadra *et al.,*2003). The present work has been carried out on the water quality of Ooty Lake. Ooty, the Headquarters of The Niligiris, Biosphere Reserve in the Western Ghats is one of the two mega biodiversity hotspots located at 2240 m above sea level (Venugopal, 1993). Ooty also posses high ethnic value because of the large number of traditional human societies. The present trend of intense agriculture especially, tea and coffee has its serious impact on the environment of Ooty and also on the water bodies. The above said information in view, the present study has been undertaken.

Materials and methods

In the present study, the following factors were taken into consideration viz., Physical factors like color, transparency, atmospheric temperature, water temperature, suspended solids, dissolved solids and total solids. The chemical factors viz., carbonate, bicarbonate, total alkalinity, dissolved oxygen, dissolved carbon dioxide, biological oxygen demand, and chemical oxygen demand. Collection of water samples: For the present study water samples were collected for a period of 12 months. Collections were made once in a month at the same time and same spot throughout the period of study. Surface water of the lake was taken for analysis. Samples were collected in a clean polythene container. Collected samples were brought to the laboratory for further analysis and standardized protocols were used for the analysis.

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Results and discussion

In the present study, the variations in the physical parameters are shown in figure 1 and chemical parameters and nutrients are shown in figure 2 and 3 respectively and figure 4 shows variations in primary productivity. The physicochemical parameters and primary productivity of Ooty Lake was studied for a period of 12 months. The colour of the Lake was pale green throughout the study, which might be due to algal bloom. Minimum light penetration was seen in the month of June, which may be because of increase in turbidity (Siva *et al.,* 2000). Atmospheric and water temperature fluctuated throughout the course of study. The total solid was seen more during the month of August, which might be due to rainfall (Subhadra *et al.,* 2003). The pH level showed slight variations throughout the study. The water was always found to be alkaline. Dissolved oxygen was seemed to be recorded low. The dissolved oxygen decreased with increase in dissolved carbon dioxide, BOD and COD (Abdul, 1998) COD values were found to be more than BOD. In the present study, an attempt has been made to observe different nutrients like calcium, magnesium, sulphate, phosphate and chlorides. Phosphates were found to be very low in the period of study. Chloride content was within the permissible limit. Sulphate values were moderate. Calcium values were slightly higher by which we can say that the water is polluted. The primary productivity increased with increase in temperature and light penetration (Vijay, 1994).

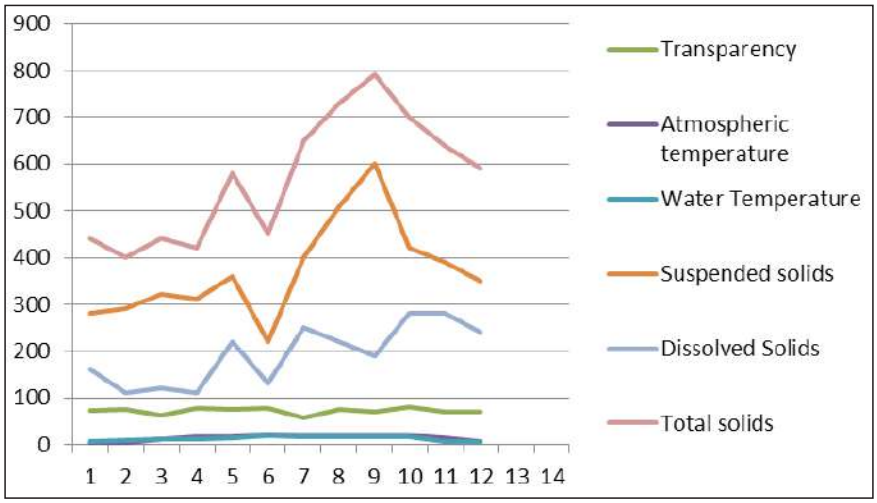

Figure 1: Physical Properties

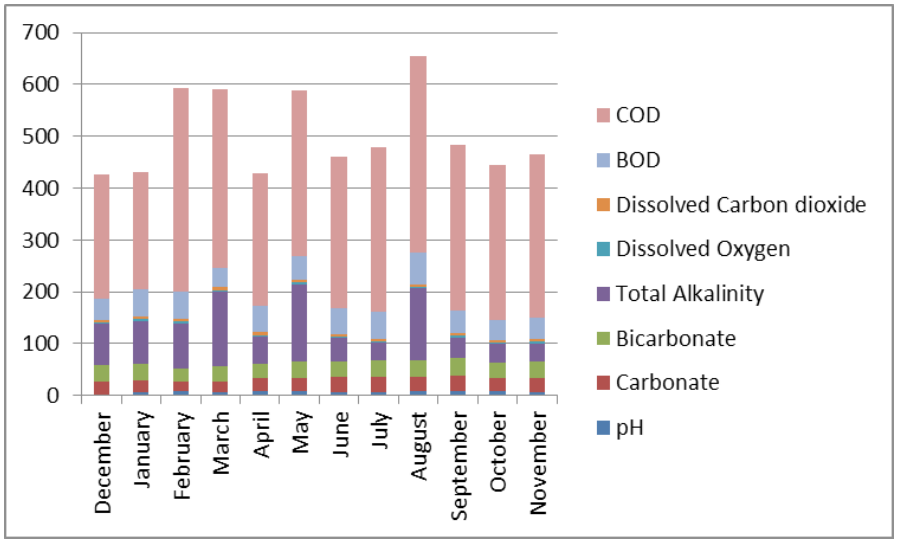

Figure 2: Chemical Properties

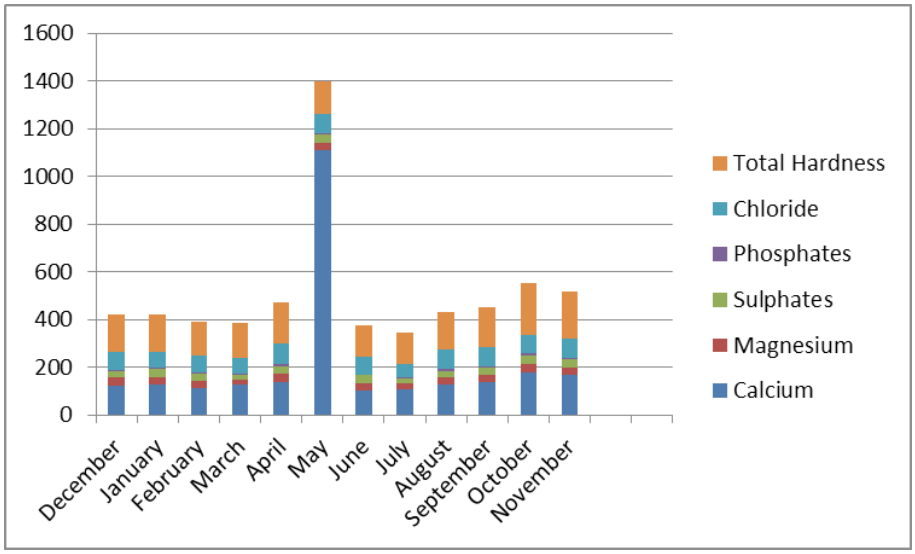

Figure 3: Nutrient Content

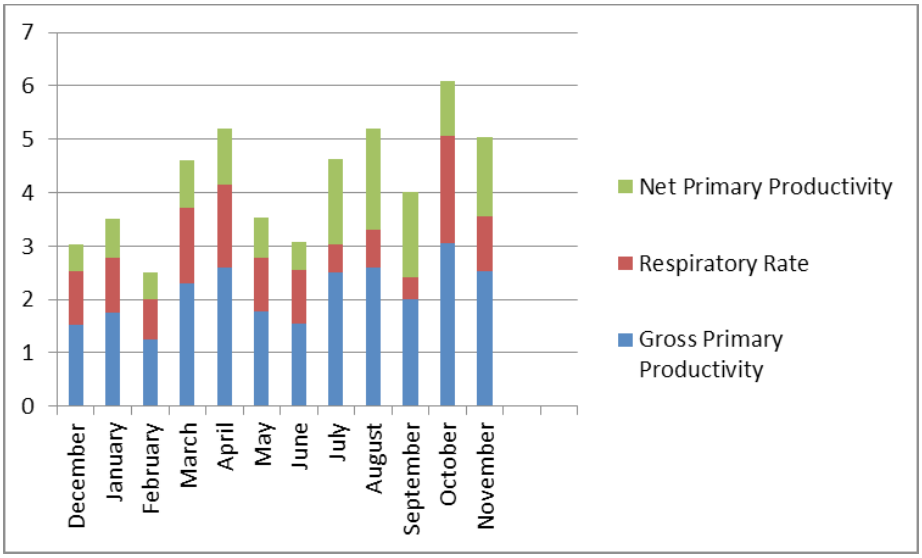

Figure 4: Primary Productivity

Ooty Lake is heavily silted and polluted by sewage overflowing from the drains passing along its shore (Chinmoy, 2000). Due to the discharge of sullage water into the lake, the excessive water hyacinth and algal growth in the water body leads to eutrophication. (Sivakumar *et al.,* 2000) Due to the waste water from the workshops, the South end of the Lake is highly polluted than the other part of the Lake.

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