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PHYTOPLANKTON OF TEHRI DAM RESERVOIR GARHWAL HIMALAYA

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ABSTRACT

Present study gives an account of phytoplankton of the Tehri Dam reservoir during 2003- 2004, when the reservoir was 40 m deep and spread over 2.2 sq km. A total of 43 species of phytoplanktons were recorded from the three study sites. Maximum number of phytoplankton belonged to diatoms (22) which were followed by Chlorophyceae with 12 species. Cyanophyceae had the minimum number of phytoplankton (9). The number of genera belonging to phytoplankton groups, Chlorophyceae, Cyanophyceae and Diatoms were 10, 6 and 11 respectively.

Keywords: Phytoplankton, Tehri Dam, Reservoir, Algae, Diatoms

INTRODUCTION

There is an uneven distribution of water resources on this planet. Only 30% of the global water is found in the continents and the rest is present in oceans. Out of this 30%, about three fourth is found in the icebergs and glaciers. Thus, the source of water available to the human is less than one percent in the lakes, streams and ground (Verma, 2002). Therefore, we should realise the value of water and there is a need to preserve the water bodies free from pollutants.

The untreated domestic and industrial waste, and agricultural run-off carrying pesticides adversely affect quality of water and consequently the flora and fauna of the water bodies. A number of physico-chemical, biological and environmental circumstances acting simultaneously must be taken into consideration in understanding the fluctuation of plankton population.

Phytoplankton which comprise algae and blue green algae are photosynthetic plants that float passively in water (Michael, 1984). Their distribution largely depends on aquatic environment in which they live and pollution impregnation brings about qualitative and quantitative changes in algal composition. Usually sensitive species disappear while the tolerant ones are well sustained in polluted environments. More than thousand

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algal species have been found to be pollution tolerant (Palmer, 1969). Studies on the lake water have been conducted by Das (1978) and Thorat and Masarrat (2000) who reported the pollution of lake in Nanital and Salim Ali Lake, Aurangabad respectively, on the basis of biological indicators.

Algae are frequently found in polluted and unpolluted water, and due to this behaviour they are generally considered useful in determining the quality of water. Cairn *et al.* (1979) stressed the need for biological analysis because pollution changes the environments. Different groups of species have been identified as being tolerant to various degrees of pollution.

Algae are natural inhabitants of water. They are involved in water pollution in a number of significant ways. Certain forms of algae may be toxic or may ecologically modify the physical and chemical environment sufficiently to retard or prevent growth. Certain algae may be stimulated to increase growth and multiply. The total population of algae may increase or decrease due to the oxygen production, and utilization of nutrient substances by algae may greatly modify the colour, odour or taste of the water. Most of water resources are gradually becoming polluted by the addition of foreign materials from the surroundings. These include organic matter of plant and animal origin, land surface washing and sewage effluents. The addition of these materials not only influences the microflora and fauna of freshwater but also favours the development of a variety of new biota, rendering it unfit for human consumption (Nandan and Mahajan, 2002).

Algae can be useful as indicators on which major water management practices, pollution studies and water quality analysis are keyed. The importance of algal dynamics particularly their response to environmental changes and nutrient fluctuations have been suggested by several workers. Green algae live in low pH due to inability of algae to live at lower level of nutrient supply (Metting, 1983). Blue-green algae live in high pH due to increased ability of organic and inorganic nutrients (Mitra, 1961). Phytoplankton succession is influenced by light fluctuation, temperature and availability of nutrient. Growth of macrophyte, low pH, DO, high CO_2 and NH_3 is responsible for low algal production.

Algae have been responsible for few problems directly affecting humans but their toxicity, increased loss of water, changes in colour, odour production and spread of allergic diseases are on record from well investigated lotic river waters. The effect of

by winter temperature. Algae contribute to self-purification process by oxygenation of the water. The most common species were *Spirogyra setiformis*, *Zygnema stellinum*, *Cladophora glomerata*, *Lyngbya limnetica* and *Anabaena circinalis*. The dominance of diatoms in a lake is indicative of the eutrophic nature of the water body (Lund, 1962; Reynolds and Allen, 1968).

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