

PREFACE

Microalgae comprise the microscopic photosynthetic plant components in the aquatic ecosystem. These organisms play an important role in the biosynthesis of organic matter (primary production) in aquatic systems which directly or indirectly serves all the living organisms of a water body as food.

Past few decades witnessed extensive researches on the various aspects of phycology which established the potentiality of algae as food, feed, fodder and manure and their role in public health problems of fast-developing civilization. Recent studies have shown that some unicellular algae like *Chlorella* contain more protein, fat and less indigestible matter, which can be used as a source of protein for human and animal consumption. Not only *Chlorella*, but other algal species like *Scenedesmus*, *Spirulina* etc. are also found to be possessing high nutritive value. Extensive investigations in this field are necessary to bring out the economic potentials of thousands of other algal species.

Unlike conventional food crops, these organisms can be cultivated throughout the year and have the capacity to trap maximum solar energy, thus indicating the relevance of these organisms in the present era of food and energy shortage. The cultivation of algae continuously under partially or fully controlled conditions is known as "controlled photosynthesis" and this has become an important development with great economic possibilities in various fields like food production, agriculture, waste disposal, water supplies, seaweed utilisation, medicine, power production etc.

Further more, algae by their structural simplicity and functional complexity have become the vehicles for important experiments and discoveries in diverse fields as taxonomy, morphology, physiology, biochemistry, tissue culture *etc.*

The large-scale cultivation of any algal species for various purposes demands a thorough understanding of its nutritional requirements. According to Bertrand's law promulgated by Gabriel Bertrand in 1912, "A plant cannot live with a deficiency while an excess is toxic". Not much work has been done so far for determining the species specific requirements of nutrients by various algal species. In this context, the proposed work "A study on the mineral nutrition and biochemistry of some freshwater phytoplankters" was undertaken where an attempt has been made to evaluate the influence and requirements of six essential elements by three freshwater phytoplankters.

The thesis has been divided into seven chapters. Chapter I, the introductory chapter explains the relevance of the research work undertaken. Chapter II, gives a detailed description of the materials and specialised methods followed for the study. The observations made in the experiments related to the effects of selected nutrient elements on growth and other physiological activities are presented in Chapter III. In Chapter IV, an attempt has been made to discuss the results of the present work in the light of previous literature. The conclusions derived from the results of the study are described in Chapter V. Chapter VI, the summary chapter, gives a brief account of the proposed work. Relevant literatures related to the present study are included in chapter VI as a detailed list of References.