A TEXTBOOK ON ALGAE

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A TEXTBOOK ON ALGAE

H D Kumar and H N Singh

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Foreword

The study of algae is a rapidly expanding branch of botanical science. Some of these simple plants are being used as experimental material for advanced research in biochemistry, genetics and molecular biology; others are of great economic importance both as nuisances and as contributors to the productivity of soils and fisheries. Beyond this, most algae are extremely beautiful objects in themselves and perhaps in the ultimate analysis this is the main source of their attraction for scientists. Nevertheless, however good the reasons for studying the algae, they may be nullified if the student is faced with inadequate, uninspiring or intimidating textbooks. I am therefore very glad that two such active and distinguished Indian workers on algae as Professor H. D. Kumar and Dr. H. N. Singh have found time to write this introductory text. By providing a clear and sound background of the morphology which every student of the algae requires but at the same time indicating the other aspects and showing how one may begin practical work on the algae oneself, I believe that they have produced a book which will contribute greatly to the future development of the subject.

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Preface

The need for a suitable textbook on algae for undergraduates has been felt in many universities in recent years. Our main objective in writing this book is to fulfil this need and to present an updated account of morphology and reproduction of the more important genera, supplemented with brief descriptions of recent contributions on their physiology, biochemistry, cytology and genetics.

Any attempt at improving the standard of teaching of algae must begin in practical classes and field studies. One complete chapter is therefore exclusively devoted to field and laboratory techniques. It includes some of the simpler methods for culturing, microchemical study, separation of pigments by chromatographic techniques, preparation of herbarium sheets and permanent slides, estimation of growth and primary productivity, and ecological study of soil and freshwater forms.

The remaining chapters incorporate brief and simple accounts of some important and representative types. The discussion also covers topics of current interest such as the concept of Procaryota and Eucaryota; the ultrastructure of algal cells and their organelles; the developmental cycle and genetic recombination in certain blue-green algae; the physiology and biochemistry of nitrogen fixation and heterocyst differentiation; the nature of sexual substances (gamones) produced by algae; genetics in *Chlamydomonas*; and the physiology of growth and differentiation in synchronous cultures of *Chlorella*. The genera described in Part II are those usually prescribed for undergraduates. Minute variations in structure, reproduction and life history have been avoided so as to give proportionately greater coverage to micromorphology and modern experimental studies. It is hoped that the general comparative topics dealt with in Part I will be equally useful for advanced study.

Test questions and selected references for further reading are incorporated at appropriate places. Exhaustive lists of references have been avoided but care has been taken to include the latest references as far as possible, since the reader can always find most of the earlier works of individual authors in the citations given.

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Varanasi

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