

Preface

Physiology is one of the fundamental subjects of life science and knowledge of its practical aspects, particularly the biochemical aspect(s) is absolutely essential for the post graduate students as well as for researcher. We have always felt the necessity for a manual on orientation towards biochemical aspect of practical plant physiology. The present book is written in simple language covering the various aspects of basic and a clear-cut practical concept has been offered in the manual in respect of all quantitative experiments.

Biochemical methods are used in all branches of biological science including agriculture. Biochemical aspect is an integral part of plant physiology and this aspect is used to explain nearly all the phenomenon of physiological aspect of plant and/or crop. Technology and Methods for Biochemical Aspects of Plant Physiology is mainly intended for Post Graduate students and Researchers of Universities and of different Research Institutes. As it covers a broad range of subjects on the basic as well as the practical aspects of biochemical part of Plant Physiology, it is likely that it will be also useful for any student attending different theoretical or practical Plant Physiology as well as Biochemistry courses. The book builds on pre-existing knowledge obtained at under graduate classes for different aspects of Biochemistry and Plant Physiology. It assumes a solid background and experience in handling of chemical as well as biochemicals. This book discuss the theoretical principles and the practical. This book has the description of different biochemical estimations, and it contains detailed experimental protocol(s) to perform experiments. It rather contains a collection and description of principles that will help the students perform successful experiments on biochemical aspect of plant physiology on their own during their future carrier. The experience of the author gathered during several years of service at the Indian Institute of Pulses Research, Kanpur resulted in a material that enables students to efficiently use practical on Biochemical Aspects of Plant Physiology later during their training. Moreover, the present book also provides a solid background on basic aspects biochemical estimations, a prerequisite for successful experimental design.

By going through this book students will acquire practical knowledge regarding the techniques used and methods applied to investigate the properties of macromolecules. Students will become familiar with commonly used laboratory ware and instrumentation of a biochemical and molecular biological laboratory, learn the requirements for biochemical aspect(s). They learn how to correctly use biochemical units of measure and to make solutions and buffers for basic biochemical experiments. They will be able to determine the charge of weak acids, bases and macromolecules by taking into account their chemical environment. They learn how to measure the macromolecular concentration of solutions by spectrophotometry. They will be able to design protocols for the purification of proteins from cell cultures or tissues. They will become familiar with the physico-chemical background of enzyme action and the fundamentals of enzyme kinetics.

The method(s) given in this book will be useful for conducting practical classes of undergraduate and post graduate students in Plant Physiology, Biochemistry, Biotechnology, Microbiology, Agricultural science, Environmental science, Nutrition, Pharmaceutical science and other biology-related subjects. This book will be a boon for research workers as it covers procedures from the classical micro-Kjeldhal nitrogen assimilation to modern technologies such as PCR and Real Time PCR. We do not claim current furnishings of technology and methodology in any way exhaustive, but we do hope that it may certainly be to value to our readers. Technologies related to biochemical aspect of plant physiological are subject of tremendous interest and importance to plant physiologist, agronomist, horticulturist, ecologist, and biochemists. This book is intended to provide recognised methods related various biochemical processes involved in life processes in a comprehensive form.

Further, one can visualize that technologies and methods used for biochemical basis of plant physiology such as photosynthesis, photorespiration, plant pigments, carbon and nitrogen assimilation, plant nutrients, phenols, secondary metabolites, nucleic acid and vitamins should be very useful to not only post graduate student, but to research workers also. Thus this book is meant to be used in conjunction with a standard text of plant physiology though elementary principles relating to the technologies and methodologies are briefed.

Suggestions and advice are most welcome for the improvements in structural and for additions of current technologies as well as methodologies. We shall feel successful in our efforts publishing this book if we know how this text has become meaningful to our readers in planning their research strategies. We would appreciate suggestions from teachers and students who use the book. Hope this book shall serve the need of students, teachers and researchers. The suggestions and advice are most welcome for the improvements in structural

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We sincerely hope that the manual will meet the requirement of undergraduate and post graduate students studying plant physiology and biochemistry and will be glad to accept constructive criticism and suggestions from the faculty, students and readers to make this manual a better one in future.

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