
Preface

Allelopathy is newly emerging multidisciplinary field of agricultural research. A lot of allelopathy research work has been done in various fields of agriculture and plant sciences. However, standard methods are not being used by workers due to lack of a compendium on the techniques, and hence the results obtained are not easily comparable with each other. This causes problems to researchers working in underdeveloped/third world countries in small towns, where library and research facilities are not available. Therefore, to make available the standard methods for conducting allelopathy research work, this multi-volume book has been planned, with one volume each for each discipline. In all the conferences held since 1990's a need has always been felt for a manual on allelopathy research methods. This book series aims to provide basic information about various methods to research workers, so that they can conduct research independently without the requirement of sophisticated equipments. The methods have been described in a simple way just like a DO IT YOURSELF book.

In allelopathy studies, the allelochemicals first influence the physiological and biochemical processes in cells. Till now there is no book of methods to study allelopathic interactions in the cells. The activity of cells influence various important physiological processes like seed germination, plant growth and development, photosynthesis and respiration, senescence and abscission are included in this volume. To understand the basic mechanisms of various physiological processes, being affected by allelochemicals at the cellular level enzyme activity and metabolite studies are essential.

The book is divided into 3 sections. Section I. Cellular Model Systems, includes 3 chapters (Allelopathy and plant cell diagnostics, Cellular models as biosensors and microalgae for determining the effects of allelochemicals). Section II. New Methods of Microscopy has 5 chapters (Microscopic methods to study morpho-cytological events during the seed germination,

optical coherence tomography and optical coherence microscopy to monitor water absorption, optical coherence microscopy : study of plant secretory structures, laser-scanning confocal microscopy (LSCM) : Study of plant secretory cells and Luminescent cell analysis in allelopathy). Section III. Methods of Analytical Biochemistry and Biophysics consists of 6 chapters (Biochemical approach to study oxidative damage in plants exposed to allelochemical stress: A case study, Cholinesterase activity as biosensor reaction for natural allelochemicals: Pesticides and pharmaceuticals, Effects of allelochemicals on Algae membrane integrity, Total phenolics and phenolic acids in plants and soils, Computational methods to study properties of allelochemicals and modelling of molecular interactions in allelopathy and allelopathic pollens: isolating the allelopathic effects).

This book will serve as ready reference in the laboratory or class room and help to solve many problems of cell studies in agriculture and allied fields including allelopathy. Information provided can be use to determine the effects and mechanism of action of allelochemicals at the cellular levels. It will be useful for undergraduate and graduate students pursuing allelopathic work, plant physiologists, biochemists and other plant science specialists. We have tried to provide appropriate solutions to the problems of cell studies. The users of this book can select suitable methods, according to the available facilities.

We are indebted to the contributors, who have actually used all these methods in their fields of specialization for the last 10 to 25 years, in accepting challenging task to prepare chapters for the present book. All of them have made sincere efforts in presenting the procedure of various methods in very simple language, easily understood by beginners.

We will appreciate to receive valuable suggestions from the students and researchers, to make further improvements in future editions of this book, to make it more useful and meaningful.

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