

PLANT TISSUE CULTURE – THEORY AND TECHNIQUES

SHAILESH KUMAR

Rajendra Agricultural University,
Pusa, Samastipur,
Bihar, India

SWETA MISHRA

Sardarkrushinagar Dantiwada
Agricultural University,
Gujarat, India

A.P. MISHRA

N.R.C.R.M., Sear,
Bharatpur, Rajasthan, India



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FOREWORD

This book is an elegant piece of work which combines the research experience in plant tissue culture with the extensive knowledge of the needs of undergraduate and post graduate students for a subject that is increasingly pervading the public and private sector and offers a vast scope for future. This book provides a clearly written, well documented text that covers all the basic and applied aspects of plant tissue culture and enables the students to formulate their experiments independently. The illustrative text and references of this book enables the reader to follow up the points of interest in greater detail.

The coming years will see the spread of plant tissue culture in all the fields of Agriculture, Botany, Genetic manipulations, Environmental science and in varied industrial applications, which requires better understanding of the subject. This book titled “ Plant tissue culture – theory and techniques” by Shailesh Kumar, Sweta Mishra and A.P. Mishra, will undoubtedly contribute significantly by inspiring students in this direction.



Dr. R. C. MAHESHWARI

Vice Chancellor,
Sardarkrushinagar Dantiwada Agricultural University,
Gujarat

PREFACE

The purpose of this book is to introduce a basic experimental method for each of the major areas of investigation involving the isolation and culture of plant cells, tissues and organs. Each chapter is devoted to a separate aspect of plant tissue culture and the chapters are arranged in the order of increasing technical complexity. This book is mainly written for the undergraduates and postgraduate students and also for the research workers working in this area. The book is designed keeping in mind the problems faced by the scientists and research scholars working with plant tissue culture, however, it can be used as a supplementary text for developmental botany and biology.

The opening chapters present a brief historical survey of the field of plant tissue culture, a background in sterilization techniques. Various components of the nutrient medium have been dealt in greater detail. The text deals with the experimental details of each and every technique. Several chapters introduce diverse approaches to plant propagation by in vitro techniques. The protocols have been simplified legibly to include details and notes that we hope will help the user avoid unnecessary errors and confusion. All the applications of plant tissue culture have been very well discussed and the techniques associated with them described in detail. The various sections have been written with safety in mind, but users should ensure that they are fully familiar with all safety requirements of the equipments and media. Plant tissue culture is not without risk to the experimenter.

Tissue culture, however, is still sometimes more art than science. It has been said that the greatest thing that anyone can achieve is to make a difference. We hope that, in writing this book, we will, in some small way, do just that.

The authors acknowledge all the contributions made by the scientists of the present and past era who have been working in the field of plant tissue culture due to which the science has gained such an importance today.

**SHAILESH KUMAR
SWETA MISHRA
A.P. MISHRA**

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Tissue culture involves the use of small pieces of plant tissue (explants) which are cultured in a nutrient medium under sterile conditions. Using the appropriate growing conditions for each explant type, plants can be induced to rapidly produce new shoots, and, with the addition of suitable hormones new roots. The new plants can then be placed in soil and grown in the normal manner. Many types of plants are suitable for use in the classroom. Cauliflower, rose cuttings, African violet