

PREFACE

Professor Harish Chandra Arya—a visionary scholar and a plant biologist had established, in the early 60s, plant cell and tissue culture laboratories at the Department of Botany, University of Rajasthan, Jaipur and brought forward the idea to study *in vitro*, nutrition and plant development by employing cell and tissue culture techniques. This was a novel approach for research in plant sciences at that time. However, under the prevailing academia and economic conditions in India it was a challenging task. Professor Arya's thoughts were certainly inspired by his academic mentors Professors A.C. Hildebrandt and A.J. Riker of University of Wisconsin, USA.

During the next 25 years Professor Arya and his team studied metabolism of normal and tumor-derived cell/cultures, secondary metabolite production in culture, host pathogen interaction employing dual cultures, plant cell differentiation, growth regulation and regeneration in culture with special reference to plants of stressed ecosystems. *In vitro* and *in vivo* studies were carried out on the effect of hormonal, nutritional and physical factors influencing the formation of organs and somatic embryos. The development of chloroplasts and the function of the photosynthetic system in cultured cells was also one of the areas of his

interest. In the field of development and application micropropagation technology for woody plants and trees Professor Arya did pioneering work. He probably was ahead of time who realized not only the importance of the technology but its constraints too. As early 70s, he took initiatives in Rajasthan to even think of research on renewable energy sources including petro-biodiesel crops, their biology and application of biotechnology. Research at Jodhpur on *Calotropis procera* was part of his initiatives.

The present volume "Plant Tissue Culture and Molecular Markers and Their Role in Improving Productivity in Agriculture" in honor and sweet memories of Professor H.C. Arya and his scientific contributions covers the topics of plant cell and tissue culture techniques to biochemical, molecular genetic aspects and how they can be used for improving plant productivity for agricultural, horticultural and medicinal plants.

Working with Professor Arya was a rewarding and memorable experience for his students and collaborators. He promoted independent thinking and encouraged development of his students and colleagues but with strong and silent vigilance. Commitment to science and laboratory work, stringent

regulations/discipline was part of personality of Janab (Professor Arya) but full of love, humanity and tender care for his students, many of these came from humble and rural backgrounds and geographical parts of the country. He provided opportunities to every one but believed in team work. His contributions can be realized by the facts that many of his students became responsible and committed scientists and teachers serving the nation.

We are all deeply indebted to him and dedicate this volume to Professor Harish Chandra Arya, our Guruji. We gratefully appreciate all the authors/scientists recognized in fields of their specialization that shared results of their scientific research and contributed the papers that make this volume in loving memories of Professor Arya.

EDITORS