Preface

The last three decades have been the most exciting period in the history of pollen biology. Integrated studies using diverse techniques particularly of advanced microscopy, cell and molecular biology, and genetics have revolutionized our knowledge of the structural and functional aspects of pollen, leading to the development of a 'new biology' of pollen. This remarkable progress on pollen biology has resulted in the development of a number of effective and viable pollen-based technologies, broadly termed pollen biotechnology, for practical benefit, especially for crop improvement.

The vast knowledge generated on pollen biology and biotechnology is scattered in Journals devoted to a number of disciplines such as morphology, physiology, biochemistry, cell and molecular biology, plant tissue culture, agriculture, horticulture, forestry and plant breeding. The books available at present are confined to the coverage of a few selected areas of pollen biology/biotechnology. It has thus become difficult for teachers, students and researchers to get an overview of recent developments covering the whole spectrum of pollen biology and biotechnology.

The primary objective of the present volume is to give a coherent and concise account of pollen biology and biotechnology with an emphasis on recent developments. The discussion is largely confined to pollen grains of flowering plants. The number of papers published on pollen is so large that the over 1500 references cited had necessarily to be selective and subjective. The reader is able to access most of the literature in the field by referring to the cited papers and reviews. The topics included in the book are interdisciplinary and cater not only to pollen biologists and biotechnologists but also to reproductive biologists, pollination biologists, aerobiologists, plant breeders, horticulturists and foresters. I hope that the book, apart from providing an overview of pollen biology and biotechnology to students, teachers and researchers will facilitate integration of pollen biotechnology into the traditional methods of crop production and improvement.

My involvement with pollen goes back to 1964 when I started my Ph.D. programme under the supervision of Professor NS Rangaswamy. Another dimension was added to my career on pollen when I began, in 1974, collaborative research with late Prof. J Heslop-Harrison FRS, and Dr (Mrs) Y Heslop-Harrison, first at the Royal Botanic Gardens, Kew and then at the Welsh Plant Breeding Station, UK, which has continued over the years. My long association with Professor Rangaswamy and Heslop-Harrisons has immensely benefited my comprehension of pollen; I owe all those a great debt. I also had the privilege of discussing various aspects of pollen during my visits abroad with many

renowned pollen biologists and biotechnologists, in particular Late Prof. RB Knox, Prof. HF Linskens, Prof. M Cresti and Prof. VK Sawhney. I thank them most sincerely for their time, interest and encouragement.

It is a pleasure to acknowledge the help and encouragement received over the years from many of my senior colleagues in the Department in particular Prof. BM Johri, Prof. HY Mohan Ram, Prof. PS Ganapathy and Prof CR Babu. I have greatly benefited in my career from the researches of and discussions with my students on pollen biology and biotechnology for over 25 years. Also, Dr Madhu Bajaj and Dr Rajesh Tandon, my former students, read the entire text of this book and gave constructive suggestions. I convey my deepest feelings of gratitude to all my students. I thank Mr Bhaskar Bhandari for his very able help in preparation of illustrations.

I cannot adequately thank my wife Pramila for her understanding and encouragement throughout my career.

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