Volumes already published

Volume 1: Trees I (1986)
Volume 2: Crops I (1986)
Volume 3: Potato (1987)
Volume 4: Medicinal and Aromatic Plants I (1988)

Volumes in preparation

Volume 5: Trees II
Volume 6: Crops II
Volume 7: Medicinal and Aromatic Plants II
Volume 8: Plant Protoplasts and Genetic Engineering I
Volume 9: Plant Protoplasts and Genetic Engineering II
Dedicated to
Jason and Raju Bajaj
Preface

Two aspects of the biotechnology of medicinal and aromatic plants are of immediate application. (1) Micropropagation under controlled germ-free conditions which enables their fast multiplication and availability throughout the year irrespective of external environment — this is specially useful for elite and rare plants. (2) A large-scale culture and low-temperature storage of cells enables retention of their biosynthetic potential for the production of important secondary metabolites, medicines, flavours and other pharmaceutical products. This book has been compiled with a view to bringing together information and literature on the biotechnology and the present state of the art of plant cell cultures for their potential use in the pharmaceutical industry.

This volume comprises 29 chapters on the biotechnology of medicinal and aromatic plants grouped into three sections, (1) micropropagation, immobilization, cryopreservation, bioreactors, production of secondary metabolites and their impact in pharmacy, (2) production through cell cultures of antitumour compounds, L-Dopa, shikonin, anthraquinone, morphinan alkaloids, caffeine, berberine, valeoptrieates, rosmarinic acid, quinine, tropanes, hypoxoside, ellipticine, paeoniflorin, saponins, cardenolides etc, and (3) distribution, economic importance, conventional propagation, review of the tissue culture work on micropropagation and the in vitro production of compounds of medicinal and pharmaceutical interest in various species of Cannabis, Centaurium, Cinchona, Digitalis, Duboisia, Hypoxia, Lithospermum, Ochrosia, Paeonia, Panax, Papavar, Rehmannia, Rhamnus and Rhaza. The large-scale in vitro multiplication and potential for industrial production of cell cultures by bioreactors, and their storage for the production of secondary metabolites, medicines, flavours and other pharmaceutical products has also been discussed. Through cell culture it is possible to alter chemical pathways by biotransformation to produce compounds previously considered rare. Biotechnology of medicinal and aromatic plants is thus pressed into the service of mankind.

This book will serve as a reference source for advanced students and research scientists in plant biotechnology, pharmacognosy, phytochemistry, tissue culture, botany and agriculture dealing with the medicinal and aromatic plants. The book may also be of special interest, and use for teachers of pharmacy in colleges where new courses in biotechnology for the production of pharmaceutical products are being taught or new curricula being designed.

New Delhi, February 1988

Y. P. S. BAJAJ
Series Editor
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