Preface

Plant tissue culture technique offers large-scale production of plants through micropropagation or clonal propagation. Small amounts of tissues can be used to raise hundreds or thousands of plants in a continuous process. This is being utilized by industries for commercial production of ornamental plants like orchids and fruit trees. This method has, therefore, become an alternative to vegetative propagation. Shoot tip propagation is exploited intensively in horticulture and the nurseries for rapid clonal propagation of many dicots, monocots and gymnosperms.

There are two ways to produce entire plants under *in vitro* conditions; a) organogenesis and b) somatic embryogenesis. In the first case, shoot and root are formed in response to different cultural conditions. But in plant tissues culture, few somatic cells have the potentiality to produce embryos, the process of somatic embryogenesis. Somatic embryogenesis can occur via two distinct pathways: (a) direct embryogenesis (embryos directly develop on the explant surface, (b) indirect embryogenesis through intervening callus phase. The main advantage of somatic embryogenesis over organogenesis is its unlimited potentiality in producing clones. Somatic embryos can also serve as an efficient vehicle for genetic engineering. Induction of somatic embryogenesis is a complex process involving specialized chemical and physical milieu. There is also relative expression of specific groups at specific developmental stages of the embryo. Therefore, each plant has its own requirements to respond. Over the years while working in the area of plant tissue culture, we have realized that there is always an inflow of fresh information on the subject. The present book is an attempt to bring update information on investigations related to the induction of somatic embryogenesis and the factors involved in the process. Individual examples have been included to help researchers utilize the conditions required by specific plants. The book, as far as possible, covers the entire gamut of embryogenesis. It is our sincere hope that the chapters would be of great help to both, researcher as well as students.

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