PREFACE

Field-grown plants are often exposed to one or several at a time, unfavourable environmental conditions. Such conditions interfere with the normal growth and development. The unfavourable growth conditions have negative impact on production and quality of food, fibre etc., resulting in substantial reduction in agricultural productivity. In India particularly, which has an agriculture-based economy, unfavourable growth conditions lead to economic losses amounting to crores of rupees annually. Development of plants resistant to diseases and environmentally stresses such as excess salt, drought, high and low temperatures and anaerobiosis is a matter of high priority. Yet, the efforts of breeders for developing the stress resistant varieties have yielded only marginal success.

In recent years attempts have been made to supplement conventional breeding directed toward the production of stress-resistant plants in general and salt-resistant in particular with variability existing in tissue or cell culture. The cell culture approach has been proved effective in obtaining salt tolerant cell lines and plants.

The development of salt-tolerant plants will not only help in evolving breeding strategies, for pushing agriculture farther onto hitherto unarable land but will also make possible crop production based on sea water irrigation along the coast lines of the continent. At the same time, it will also provide an opportunity to study the cellular mechanism(s) associated with salt tolerance.

The present thesis embodies the result of the investigations dealing with *in-vitro* selection and characterization of a salt-tolerant cell lines in an important but salt-sensitive grain-legume - *Vigna radiata* (L.) Wilczek. This thesis is divided into two sections. Section A deals with the *in-vitro* regeneration of plants and section B describes the isolation and characterization of salt-resistant cell lines and plants.

It gives me immense pleasure to express my sincere gratitude to my supervisor, Dr. P.K. Jaiwal, Lecturer in Bio-Sciences, M.D. University, Rohtak, for his benevolent guidance, constant help and inspiration throughout the course of this investigation.

I am grateful to Prof. K.V. Sastry, Head, Department of Bio-Sciences, M.D. University, Rohtak for providing necessary facilities and also to Prof. Ravi Parkash for his generous help.

I am indebted to Prof. J.B. Chowdhary (Haryana Agriculture University), Dr. S.S. Bhojwani and Dr. Anil Grover (University of Delhi), Dr. S. Suneja (Krishi Gyan Kendra, Rohtak) and Dr. S.N. Mishra (M.D. University) for providing facilities and encouragement during the course of this investigation.

I am extremely grateful to Prof. Moshe Tal (Ben-Gurion University of Negev, Israel), Dr. S.S. Bhojwani and Dr. Anil Grover (University of Delhi) and Dr. R.P. Singh (M.D. University) for critically reviewing some of the chapters and offering valuable suggestions. Discussion with Dr. R.K. Jain (Haryana Agriculture University), Prof. V.S. Jaiswal (Banaras Hindu University) and Prof. S.N. Mathur (Gorakhpur University) were extremely useful.

I am thankful to Directors of USDA, NBPGR and Directorate of Pulse Research, Kalyanpur, Kanpur for supplying the seeds of different wild and cultivated species of *Vigna* and to the Head, Pulse Research Laboratory, IARI for the seeds of different cultivars of *Vigna radiata*.

Hearty thanks are extended to my colleagues especially Dr. (Mrs.) Ranjana Jaiwal, Miss Mukta Arora, Ms. Vandana Nasa and Ms. Sunita Dahiya for their kind cooperation.

Last but not least, no words would be enough to record the contribution of my dear parents, brothers and sisters for their understanding, support and patience during the entire period of study.

Finally, the financial assistance from CSIR, New Delhi for the award of Junior and Senior Research Fellowship during this investigation is gratefully acknowledged.

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