PREFACE

The explosive increase in world population, along with the continuous deterioration of arable land and irregular rainfall pose serious threat to global agricultural production and food security. Genus Brassica includes many economically important vegetable and oilseed crops. Oilseed Brassica contributes to about 13% of world’s edible oil supply. Drought and salinity are the major abiotic stress constraints affecting the productivity of oilseed Brassicas. Although, breeders have been engaged since long in developing stress tolerant Brassica genotypes, success has been limited and rather slow due to various technical reasons. Genetic engineering tools, on the contrary, provide relatively faster approach for improving abiotic stress tolerance by introducing genes involved in stress protection from diverse sources to crop species that lack them. A number of reports on developing transgenic crops tolerant to drought and salt stress have been published. However, in Brassica species, very few reports are available showing tolerance to salt stress and none on drought tolerance. Therefore, present study was undertaken to develop transgenic Brassica juncea tolerant to both drought and salinity.

The thesis compares six sections. Introduction elucidates the present status of Brassica juncea under drought and salinity, and emphasizes upon the importance of objectives undertaken. Review of Literature covers a brief description of molecular basis of abiotic stress tolerance, and in-vitro regeneration and transgenic development in Indian mustard. Material and Methods provides the detailed description of the various experimental procedures. The section on Results describes the development, and molecular and physiological analyses of the transgenic plants. Since Tables and Figures provide a better understanding of the data, the results are presented accordingly. Discussion is a critical evaluation of the findings. Summary includes the major highlights of the present investigation. Literature cited annexed at the end carries the complete bibliography cited in the text.

Deepti Tayal