PREFACE

The world population is growing day by day and the area of cultivation is also shrinking. To meet out the required demand of food for the world population, it is imperative to protect crop production against predators and pathogens. The legumes plant has some anti-nutrition factors like protease inhibitor, α-amylases and lectins which has insecticidal activity. The genes which code for insecticidal proteins can be exploited after isolation from their native source. Because these are of plant origin they can be mobilized easily to the susceptible crops. The genetic engineering can prove to be useful for the development of transgenic plants with these novel resistant genes. Detailed investigation therefore is required for identification and isolation of protease inhibitor proteins and genes from resistant plants. The toxicity of the protein should be checked on the insect pest and find out the level at which it will become harmful for the insect pest only and not to human beings. Therefore the present study was designed to isolate the protease inhibitor proteins and subsequently its genes from pigeonpea (*Cajanus cajan* L.). The toxicity of protease inhibitor protein was also checked on *Helicoverpa armigera* a polyphagous insect.

There are five sections in the thesis. Introduction covers the insecticidal proteins and their genes especially from legumes. Review of literature provides brief description, methodology of isolation and characterization of protease inhibitor proteins and genes. It also covers the development of transgenic plants with insecticidal genes that confer the resistance. Materials and methods detail the experiments for isolation of protein and its gene. Results and discussions describe isolation and characterization of protease inhibitor proteins and its genes from pigeonpea. It also illustrates about the interpretation with other outstanding results. The tables and figures explain the data better. Summary and conclusions contain the major outcome of present investigation. The references at the end carry the complete bibliography used in this investigation.

(Mukes Kuman)