

PREFACE

Primary and secondary metabolites of the fungus *Aspergillus* have several applications. While some are enzymes used in food industries, a few like aflatoxins and mycotoxins are detrimental to health. The antibiotics, penicillic acid and mellein obtained from the culture filtrates of *Aspergillus melleus* have also been used to treat infections of *Mycobacterium* and *Staphylococcus*. Though selection of *Aspergillus* strain varies according to the type of application, the commonality of the genome within the species often result in spontaneous expression of undesirable traits.

Majority of microbial enzymes come from a very limited number of genera, of which, *Aspergillus* species predominate. Since, the production of industrial enzymes aims at economizing a process for effectiveness and safety, the strains used are either employed directly or derived from such strains by mutation and selection. This approach defines high-yielding strains that make the enzymes constitutive and secrete them into their growth medium (extracellular enzymes). Ways of enzyme production, generally termed fermentation and downstream processing, assures the users to pay little for the enzymes produced.

The development of microbial strains for commercial enzyme production involves specialized skills by which, organisms are screened for new and improved enzymes, refined for growth in fermentors and conditions developed for enzyme production. During this procedure, the affected fungal cell physiology can also result in the production of newer metabolites. This thesis deals with one such compound identified from *Aspergillus carbonarius* improved for polygalacturonase secretion in shake-flasks by mutation using ultraviolet radiation and temperature selection.