PREFACE

In India, medicinal plants are widely used by all sections of the population, whether directly as folk remedies or indirectly in the pharmaceutical preparations of modern medicine. More than 2000 types of medicinal plants are recorded in Indian medicinal literature and more than 75 different plant derived secondary metabolites are in use. Plant tissue culture is potentially valuable for studying the biosynthesis of secondary metabolites and may provide an efficient means of producing plant products. In some cases the yield in cell culture is too many fold greater than the whole plant. *Justicia adhatoda* L. is a perennial, evergreen and highly branched shrub with unpleasant smell and bitter taste. It has white, pink or purple flowers. It is a highly valuable Ayurvedic medicinal plant used to treat cold, cough, asthma and tuberculosis. Its main actions are expectorant and antispasmodic (bronchodilator). Moreover the importance of Vasaka plant in the treatment of respiratory disorders can be understood from the ancient Indian saying, “No man suffering from phthisis needs despair as long as the Vasaka plant exists”. Thus the frequent use of *J. adhatoda* has resulted in its inclusion in the WHO manual “The Use of Traditional Medicine in Primary Health Care” which is intended for health workers in to keep them informed of the restorative utility of their surrounding flora. The major alkaloids of the plant namely vasicine and vasicinone, have been found to be biologically active. Here an attempt is being made to explore the possibilities of extracting active ingredients *in vitro* from *J. adhatoda* by developing appropriate techniques. The work has been presented in eight parts. The first chapter deals with direct micropropagation of *J. adhatoda* L., second chapter explains indirect
propagation and elucidates histological studies of calli, third chapter demonstrates the isolation and characterization of vasicine, fourth chapter justifies the effect of elicitors, fifth chapter resolves the salt tolerance, sixth chapter illustrates clonal fidelity, seventh chapter expounds the hairy root induction and eighth chapter demonstrates antimicrobial activity. Each chapter is inclusive of Introduction, Objective, Review of literature, Result and Discussion. In all chapters results are being supported with relevant photographs, tables and figures. The highlights of the work and its future significance are detailed in Summary and Conclusion. The present study is a step towards conserving the medicinal plant, *J. adhatoda* L. as well as to produce the secondary metabolite vasicine through *in vitro* culture.