Acknowledgement

It is a pleasure to thank the many people who made this thesis possible.

It is difficult to overstate my gratitude to my Ph.D. supervisors, Dr. S.F. D’Souza (at BARC, Mumbai) and Dr. B.B. Chaugule (at Dept. of Botany, University of Pune, Pune). With their enthusiasm, inspiration, and great efforts to explain things clearly and simply, helped to make Ph.D. fun for me. Throughout my thesis writing period, they provided encouragement, sound advice, good teaching, good company, and lots of good ideas. I would have been lost without them.

I would like to thank the many people who have been my teachers, my mathematics teacher Sh. A.K. Bhat (at Noorpora, Kashmir), my school Principal Sh. Abdul Rashid Andrabi (at Jawahar Navodaya Vidyalaya, Pulwama, Kashmir), my undergraduate teachers Mrs. Pragati Abhyankar, Dr. Patwardhan, and Mrs. Sonia Ambade (at H.V. Desai College, Pune), and my graduate teachers Dr. R. L. Deopurkar, Dr. B.P. Kapadnis and Dr. B.A. Chopade (at Dept. of Microbiology, University of Pune, Pune).

I wish to thank Dr. Aditi pant (at Department of Botany, University of Pune), Dr. J.S. Melo, Mr. Kuber C. Bhainsa, Mr. Jitendra Kumar and Mr. T. Chalapathi (at BARC, Mumbai) for the kind assistance, giving wise advice, helping with various applications, and so on.

I am indebted to my many student colleagues (Mahadev Gaikwad, Balu Meshram, Kajal Mulani, Surekha Meher, Sharad Chavare, Supriya Baikar, Pradhniya, Sonia, and M.Sc. and M.Phil. students) for providing a stimulating and fun environment in which to learn and grow. I am especially grateful to Renuka Diwan, and Amit Shinde
who have always been there for me, in my difficult times. I would like to thank my friends Sagar Godambe, Siddharth Roy, Sachin, Yogesh, Anup, Sadanand, Polash and Kailash (at BARC, Mumbai) for the entertainment, fun and comraderie we shared together.

I wish to thank my friends Rassel, Sonu, and Jassi for helping me get through the difficult times, and for all the emotional support, comraderie, entertainment, and caring they provided.

I am grateful to the teaching and non teaching staff at Department of Botany, University of Pune, for helping the department to run smoothly and for assisting me in many different ways.

I wish to thank my entire family for encouraging me throughout. My sisters (Anupama, Amrita and Monita) and my loving brother (Ajay) deserve a special mention. The prayers of my nephews Master Eishan Ra ina, Master Aaryan Raina, and niece Baby Diya Koul have undoubtedly helped me to accomplish my objectives.

I wish to thank Sh. Munish Raina and Sh. Raj Kumar Koul for all the emotional support and caring they provided. I would like to thank for all the blessings and emotional support from my grandmother Smt. Kamla Wati Bhat, which she provided to me, every day with out fail, and right from my childhood.

Lastly, and most importantly, I wish to thank my parents, Sh. T. N. Bhat and Smt. Nancy Bhat. They bore me, raised me, supported me, taught me, and love me. To them I dedicate this thesis.