ACKNOWLEDGEMENT

“… The Lord your God will bless you in all your work and in everything you put your hand to. Deuteronomy 15: 10”.

Accomplishment of this thesis is the result of the blessings of the Almighty, teachers and love of my family and friends. I take this opportunity and pleasure to thank and acknowledge everyone who has made indispensable contribution to the existence of my thesis.

My foremost indebted gratitude is conveyed to my Research Supervisor, Dr. G. Kathiravan for giving me the opportunity to undertake this study and also extend my cordial thanks for his support during thesis writing. I also thank Dr. K. Rajagopal, HOD and other staff members at Department of Biotechnology, Vels University for their kindness and constant support.

I am also thankful to Prof. P. T. Kalaichelvan and Prof. R. Rengasamy, Director at Centre for Advanced Studies in Botany, University of Madras for having provided me with the lab and instrumentation facilities to carry out the research work. I appreciate their constant support. Their advice and feedback was constructive and enlightening, and their guidance over the last four years was invaluable.

I am very thankful to the Registrar, Vels University and others staff members in the Administrative Department for their immense guidance and help throughout the tenure.

I thank K. Ghanapriya, Saba A. Mahdy, C. Krishnaraj, K. Priyadarsini and Manjumeena Rajarathinam at Centre for Advanced Studies in Botany, University of Madras for training me, providing high quality technical support and assisting me with my experiments. I also thank them for their constant kindness and positive attitude. I would also like to thank all other laboratory colleagues there for their motivation.

My second home at the National Phytotron Facility and Division of Nematology, Indian agricultural Research Institute, Pusa, New Delhi was a warm place and had positive atmosphere, and I was fortunate to have had the opportunity to work there.
Acknowledgement

I would like to thank The Officer-in-Charge, Dr. K. V. Prabhu, National Phytotron Facility, IARI for have permitted me to carry out the experiment in the facility.

I would also like to thank Dr. Rajender Singh for his sincere guidance and help provided to us throughout the work. I extend my genuine thanks to Dr. Sharad Mohan and Dr. Anju Kamra who permitted me and entrusted me with the laboratory facilities to carry out my research work.

My IARI colleagues, particularly SRFs Anupam Singh, Neha Praveen Tiwari, Biswajit Mondal, Vivek Singh and Akansha Upadhyaya generously helped me with technical support and training whenever I requested it.

I would also thank Dr. G. Sekaran, Chief Scientist at Centre for Leather Research Institute for permitting me to use instrumentation facilities. I also extend my sincere thanks to SRFs Mohanapriya, Karthikeyeann and Maharaja for being kind to me and helping me with the facilities.

Returning to school and college was a daunting task but I received nothing but encouragement from friends and colleagues. My fellow students at Centre for Advanced Students in Botany, University of Madras cheered me enormously; our conversations together provided me with warmth and a good spirit.

In particular, I was sustained by the friendship of my M. Sc fellowmates of Guru Ghasidas University and encouragement for taking up research by my teachers Prof. B. N. Tiwary and Dr. Pratima Gupta. My friends from B. Sc, Guru Nanak College, Chennai and my teachers particularly, Prof. Dr. S. Natrajan, Retrd. Prof. D. Alphonse, Dr. V. Umarani, Asst. Prof. Sethuraman, Dr. M. G. Ragunathan were equally encouraging. I would like to extend my special gratitude to Dr. J. Jayanthi who motivated me to take up research since then. My steadfast friends Vijay Raghavan, Shalini Pandian, Rajitha Arun, T. D. Arun Kumar, Vasundhara Gogineni, R. Sarath Kumar, Arvind Sriram, Shipra Tiwari, Sathya Priya and Aswin Kumar Gopan were second to none.

The small but useful helps contributed by the technical and non-technical staff cannot be ignored. I thank all technical and non-technical staff at Centre for Advanced Studies in Botany, Indian Agriculture Research Institute and Department of Biotechnology, Vels University, for their assistance.
Many other people have supported me during my studies, and I hope they know how much I appreciated them.

I am heavily indebted to Rohit Girijadharan for his unconditional everlasting love and support that he has provided all the time from the beginning till date.

My genuine gratitude goes to my brother Somraj Kumar Rana and sister Shylendri Rana, who supported me unwaveringly as I inconsiderately focused on my studies. Everything could have been more difficult without their love and support.

My earnest credits go to my parents Shri. Prabhas Kumar Rana and Smt. Rajasri Rana, who enormously supported me in every way they could. Without their constant support and encouragement, I wouldn’t have made it up. I dedicate this PhD Thesis to them.

And once again, I would like to thank the Almighty for bestowing me with confidence, patience, will power and the inner strength to move on always to accomplish this research work.

“Everybody has not been mentioned, but nobody has been forgotten”.

Sachindri Rana