Acknowledgements

I am forever thankful to the almighty for the blessings he has showered upon me throughout my life, for it is to him that I owe all my happiness today.

This thesis grew out of a series of dialogues with my supervisor Dr. Y. Sreenivasulu, Sr. Scientist, CSIR-IHBT. His ideas and tremendous support had a major influence on this thesis. His persistent nature, keen interest in problem solving, scientific temperament and focused vision, constructive criticism, forbearance of my mistakes and shortcomings has made this study indeed a rewarding experience. The intellect he shared with me is a treasure worthy of a lifetime.

I would like to take this opportunity to extend my thanks to Dr. P. S. Ahuja, Director, CSIR-IHBT for being an immense source of inspiration and for giving me opportunity to come in research. I owe my gratitude to him for allowing me to work in such prestigious and one of the best places in India for pursuing my PhD dissertation and ponder my scientific temperament.

I am utmost indebted to Dr. Anil Sood, Chief Scientist and Head Biotech Division, CSIR-IHBT for providing me adequate facilities to carry out my work here and to always back-up me in difficult times. With profound respect, I would like to thank Dr. S. Rajkumar, for guiding and teaching me the research temperament and providing an opportunity to work with him and travel the remote areas of Himachal Pradesh which is an unforgettable experience. I pay my sincere thanks to Dr. Sanjay Kumar for his guidance in deciding the work title and acting as my supervisor during my registration interview. I would take this opportunity to thanks Dr. Ram Kumar Sharma who always appreciated and guided me as and when needed. I also thank Dr. Anil Singh for his guidance and help for real time PCR analysis. I extend my thanks to Dr. Som Dutt, Dr. Sudesh, Dr. Shashibhushan, Dr. Bikram Singh, Dr. Madhu, Dr. Aparna and Dr. Anita for their valuable help and suggestions during my PhD work.

I would like to express my gratitude to faculty members of Deptt. of Biotechnology, GNDU, during my PhD course work, who taught me during PhD course work and guided me for a quality research Prof. Gurcharan, Prof. Prabhjeet, Dr. Pati, Dr. Ramandeep, Dr. Prakash Chand Mishra sir and Bhupesh sir for inculcating strong foundation of Molecular Biology & Biochemistry in me. My thanks are due to all the office staffs of Deptt. of Biotechnology, GNDU for their kind help and support. I would also thank my School and College Teachers for inculcating interest and fascination towards science in me.

I would also like to thank Sanjoy Chanda, Mr. Manoj and Rakesh for their help provided to me during the lab work. The help provided by library and administrative staff is duly acknowledged.

I also extend my sincere thank to Dr. S. R. Bhat and Prof. Srinivasan from NRCPB, New Delhi for their guide and support which helped me a lot in planning and conducting the experiments to fine tune the research work. I also extend my thanks to Dr. Vajinder for his kind help during my experiments conducted at NRCPB, New Delhi.

The work conducted is the part of NAIP, project entitled “Unraveling molecular processes involved in adventive polyembryony towards genetic engineering for fixation of heterosis” and is duly acknowledged. The CSIR SRFship is gratefully acknowledged. International travel grant from DST for attending 24th International Conference on Arabidopsis thaliana, held at Sydney, Australia is also acknowledged.
My thanks to my friends and colleagues for the great time I had in our group. I enjoyed the atmosphere, their friendship and support. Thanks to my labmates Dr. Tejpal, Pitamber, Vivek, Akshay, Amita, Bindu, Isha, Bishrutee, Pratibha, Rimpy, Shikha, Shweta, Amrina, Babita, Swati, Mohina; seniors Drs. Praveen, Ajit, Arun, Hitesh, Vivek, Rakesh, Ravishanker, Karan, Awadesh, Prianka, Kiran, Rupali; and friends Ramesh pal, Rajbardhan, Shailesh, Sudip, Rahulmohan, Saurabh, Rajesh, Surender, Sunny, Himanshu and all my dear IHBTians for their never-ending, unconditional support and encouragement.

Finally, I am forever indebted to and bow my head in extreme reverence to my loving mother Smt. Malti Devi and father Shree Bhrigunath Singh, for their undemanding love and for raising me to the person that I am today. I dedicate this thesis to their holy feet. I would appreciate the never ending support from my brothers Manoj Kumar Singh and Manish Kumar Singh and sisters Baby and Priya for their understanding, endless patience and encouragement when it was most required and their uncountable and unseen sacrifices. I extend my thanks to my Jija Santuji and my in-laws, Nitu, Rajesh ji, Brajesh, Pratyush, Rubi, my mother-in law Rija Singh, who always inspired me with his discussions. I extend my thanks to my bhanjas Pottu and Kitti, my bhatija Ashu who brought joy and colour to my life. A special thanks to my Son “SAGAN” who spent his one year of his childhood by with their grand parents and allowed me to continue my research work though this sacrifice is beyond the arena of thanks.

Words can never express my feelings towards my friend and my better half, my wife Pritu Pratibha who has been my strength throughout.

(Sunil Kumar Singh)