Acknowledgements

The successful completion of this journey is due to the combined efforts of many people. Ph. D. is a long and complicated journey. During this journey, I was helped by many and I would like to show my gratitude to all of them. This work would not have been finished without their help.

Primarily, a very special thanks to my supervisor and mentor, Dr. Pushpa Robin, whose help, stimulating suggestions and encouragement helped me continuously right from the initiation of my work. Your guidance has been invaluable. Thank you for your patience, understanding, excellent discussions, and challenging me every day. She made me learn the intricacies of how to do keen and critical analysis of each experiment. Words are not enough to describe her generous nature. I will always remember her for her understanding and positive attitude towards everything.

I sincerely thank the Head of Department, Prof. G. Naresh Kumar for giving access and providing me with the necessary infrastructure and other departmental facilities for my research purpose. I express my gratitude to former Head, Prof. Sarita Gupta for all encouragement during her tenure as head. A special thanks to her is also due for allowing me to use the fluorescence microscope in her laboratory for my experiments.

I am indebted to my M. Sc research guide Prof. Rasheedunnisa Begum, for sowing the seeds for research in me.
I am sincerely obliged to all the teachers of the department Prof. Tara Mehta, Prof. S. S. Katyare, (late) Prof. S. D. Telang, Dr. M. D. Jani, Dr. Jayashree pohnerkar, Dr. C. RatnaPrabha, Dr. S.R. Acharya, Dr. N. Laxmipriya and Dr. D. Suthar for their help and encouragement. Their helpful suggestions and comments especially during annual progress presentations helped me a lot.

I thank the Divisional Railway Manager, Vadodara, India for allowing me to use their Jatropha plantation for my experiments. I would also extend my gratitude to Dr. Bhaskar Vyas for extending help and allow to planting Jatropha for experiment in his land.

The happiness during my Ph. D days was to seek the company of friends, who brought about joy during toughest days of my life. I gratefully acknowledge the support of some very special individuals. They helped me immensely by giving me encouragement and friendship. My Ph. D. would not have attained this shape without their help, especially Iqbal (Dabang), Hemendra (a great science troubleshooter), Hiren Modi (Financer), Hina, Aditi, Niraj bhatt (great advisor) and Jyotika with whom I shared some memorable times. I thank them for their help with experiments, discussions and umpteen cups of tea. I truly cherish the company of friends like Chirayu, Gopit, Keyurbhai, Shajilbhai, Vikasbhai, Prashantbhai, Maulikbhai with whom I shared tea at circle. Thanks are also due to the present batch of Research Scholars, Nidheesh, Anubha, Tushar, Krishna, Akhilesh, Mitesh, Muskan, Radha, Mrinal, Rushikesh, Swapnali, Hiral, Supriya, Divya, Prashant, Jitendra, Chanchal, Hemanta, Kavita, Sonal madam and Praveena madam. My special thanks to my lab mates Purna and Ashutosh for their help in the lab. I cannot forget the valuable contribution of all M.Sc.
dissertation students Keyur Battiwala, Priya, Brijesh Dabhi, Shweta, Bhavita, Rucha and Pramod who worked with me. Keyur helped me identifying Jatropha plantations and in many other ways.

Thanks are due to the office staff including Pethe Sir, Akshitaben, Bhartiben, Shaileshbhai, Manishbhai, Vyasbhai, Rameshbhai Kamle and Babukaka all other staff members for their standing help and guidance. Thanks a lot, Rameshbhai (Nare) for keeping the Store open for me any time whenever wanted. I also thank Milindbhai for all help at the main office.

I thank University Grant Commission, India for providing research fellowship, without which I could not have thought of doing Ph. D.

Lastly, and most importantly, I wish to thank my entire extended family for providing a cool and loving environment for me. My father who always insisted on meditation and taught me the benefits of a spiritual life. My mother and sister deserve special thanks for their love and for always giving me special consideration and keeping me in high spirits.

During this journey, I cannot forget the sacrifices made by my wife…Kiran and my son…Gotu (Ravi). She proved to be supportive and caring and provided me comfort, during those never-ending delays. She is the one who knows me more than I do, which makes me more confident about my journey onwards. Thanks a lot for her patience. I thank them a lot for their immense patience and confidence in me.
Acknowledgement

First and foremost I offer my gratitude to my Ph.D supervisor Dr. Pushpa Robin, who has supported me throughout my Ph.D with her patience and knowledge whilst giving me the liberty to work in my own way. I attribute the completion of my degree to her encouragement and effort and without her guidance this thesis, too, would not have been completed or written. One simply could not have wished for a better mentor. Madam, I truly adore you as a perfect human being and there is so much to learn from the vast ocean of knowledge, experience, patience and compassion that you possess for everyone around you.

I sincerely thank Prof. G. Naresh Kumar, Head of the Department, for providing me with an opportunity to climb the steps of my much desired higher education and being a facilitator in my journey in attaining the higher degree. Sir, your questions have raised the bar for the multiple perspectives any problem could have. I also take this opportunity to thank former head, Prof. Sarita Gupta for all the encouragement during her tenure as head and also her active participation in trouble shooting the problems presented during my annual progress presentations.

I am indebted to Dr. Jayshree Pohnerkar for her continuous support during that nth number of time when I ran to her with a problem which looked insurmountable; she easily solved it by her great problem solving ability and practical outlook.

I sincerely thank Prof. Rasheedunissa Begum and Dr. C. Ratna Prabha for being actively involved in the progress of my work and trouble shooting.

My sincere thanks to Dr. M.D. Jani, Dr. S.R. Acharya, Dr. N. Laxmipriya and Dr. D. Suthar for their help and encouragement. Their help and suggestions during annual presentations helped me a lot.

Let me take this opportunity to thank Dr. Prashant Bhatt and Dr. Daksha Bhatt, Sun Agrigenetics, Vadodara, for providing me with an atmosphere to work in a commercial tissue culture set up and also entrusting upon me the in-charge ship of their newly opened Research and Development facility. It was a great learning experience.

I gratefully acknowledge the kind help extended by Prof. Jay Shockey, Southern Regional Research Center, USDA-ARS, New Orleans, USA for providing me with DGAT constructs used in the present study. I sincerely thank Dr. Ganesh Ram, Tamilnadu Agricultural University for his help and keen interest in troubleshooting.
RAPD related work. Sir your forthcoming approach and scientific temperament is something to be learnt by every new researcher. I thank Prof. K. C. Upadhyay, Jawaharlal Nehru University, New Delhi for being kind to me and allowing me to be trained in his laboratory. I am thankful to Dr. R. S. Phogat, Anand Agricultural University for his kind help in providing accessions of Jatropha curcas used in RAPD studies. I thank Dr. Dipa Kandpal, Statistics Department, The M. S. University of Baroda, for her valuable inputs in statistical analysis of my data.

My thanks are due to Dr. Aruna Joshi, for letting me use her tissue culture facilities during my initial days. Thanks are also due to Prof. Yogesh Jasrai for sparing his valuable time and giving vital suggestions pertaining to my work. I am grateful to Dr. Sudeshna Menon for her ever helping nature and support for my tissue culture experiments.

This is now the time to thank those special individuals who have made a lot of difference by their presence. Much of the journey of Ph.D was made memorable owing to their presence. Swapnali deserves a special mention as she succeeded none other than my guide in being my friend, philosopher and guide (I truly raked her brains with all my molecular biology experiments). It would be hard to miss to mention Iqbal, who with his ever jovial nature, jokes and self-appreciation (which was imposed upon us) would keep us all cheered up. It was never realized when and how Hina and Jyotika turned out to be tea time buddies from seniors at work. Their keen observation and eye for detail is something contagious. Hemendra sir has always been our trouble shooter no matter how small the problem is. It was fun to have Hiren bhai, Niraj sir, K. C bhai, Maulik sir and Aditi around as seniors in the department. Aditi’s ever chirpy nature and her songs always kept tension at bay and lunch time was always looked forward to. Though a little scary, it was nice to know the soft heart behind a rough tongue in Vikas sir. The advantage of being the students of a fresh batch is double benefits of befriending your seniors, batchmates and juniors alike. It was fun to be in the company of all the bhai’s of the department namely Hemant, Nidheesh, Mrinal and Rushikesh (Each one has a color code for easy identification!).

While mentioning Krishna, there is a sisterly feel which is also true for Radha, Supriya, Hiral and Divya. Any time there is a discussion about food, the first name to come to anybody’s mind would be Tushar, a big time foodie with great taste. Thanks are due to Purva, Akhilesh, Anubha, Muskan, Mitesh, Prashant, Jitendra, Chanchal, Kavita, Sonal madam and Praveena madam. The late additions to the gang were Varsha, Ankita, Brinda and Ujjwal who kept us elated with their own styles.
My lab mates deserve a special mention here. Ashutosh sir, Vijay, Tabassum, Amruta, Parth, Hemant and Sejal made the lab complete with their presence. Ritu Mihani was someone with highly infectious cool composure and great talent. How can I forget M.Sc. students who worked with me for the short duration of about a year which actually was a few months but lightened up the lab atmosphere with their jokes, pranks and leg pulling. Mamata being the first M.Sc. student will always be special to me, more so for her polite nature and great scientific acumen. I was fortunate to have a nice association with Jadu, Disha (our long tea sessions), Krisha, Nandini, Payal, Shruti, Bhavisha, Neha and Unnati. The three musketeers, as they were called were Nikunj, Rudri and Bhrugu and would bring a riot of laughter in the lab with their jokes and live commentary and keep the lab environment lighter. The latest addition was that of Palak, Ritu Bhanu and Nirali who immediately gelled with all in the lab.

Thanks are due to the office staff including Pethe sir—the trouble shooter, Akshita ben—the organiser, Bhartiben, Shaileshbhai, Manishbhai, Vyashbhai and Babukaka. Thanks are due to Rameshbhai Kamble for his help in fixing electricity related problems. Rameshbhai Nare deserves a special thank as he was always willing to help with the store requisites. Every student would wish to have one Milindbhai in every office for his ever helping nature and support to students. I take this opportunity to thank Piyush bhai and the entire workshop staff for their help and co-operation. Chirag bhai in the University office was always our trouble shooter with fellowship related confusions and I thank him for his help. Kaushik bhai in the faculty office would always be remembered for regularly irregular fellowship that I received during my tenure.

I am greatly indebted to the University Grants Commission, India for providing Research Fellowship (UGC RFSMS).

This Ph.D is a result of the seeds sown by my parents during my formative years. I thank my late father, my mother, my sisters, brother and my maternal uncles for being there for me whenever required. They have been great morale boosters.

Last but not the least, I wish to thank my extended family members, without whose support this endeavor would not have been possible. I thank my in-laws for their encouragement and support throughout my Ph.D tenure, especially lucky for being ever supportive.

Someone needs a very special mention here, my husband… Bimal for being my pillar of strength and an eternal optimist with regards to my studies. Had it not been for him this dream of mine could have never seen the light of the day. I owe him a lot for the sacrifices he made with a smiling face during my studies and salute him for his never
ending patience. While I am penning this down, a new guest awaits his/her addition to our family and with great affection I thank our bundle of joy for bearing with me as I wrote my whole thesis with him/her around.

**I dedicate this thesis to my parents for shaping me become what I am today.**

It’s only by the grace of God that any attempt of human being is successful and I cannot agree more to this. I thank the ‘ALMIGHTY’ for blessing me with this life full of challenges, learning and success.

Purna Shukla