

Acknowledgement

This work would not have been possible without the help of various people and organizations who provided support, guidance and encouragement in different ways during the course of this study.

I have much pleasure in expressing my deepest sense of gratitude to my supervisor Dr. Dipanwita Saha, Assistant Professor, Department of Biotechnology, University of North Bengal (NBU) for her inspiration, encouragement and guidance.

I would like to thank my co-supervisor Dr. Tapan K. Mondal, Assistant Professor, Biotechnology laboratory, Faculty of Horticulture, Uttar Banga Krishi Viswavidyalaya (UBKV), Cooch Behar, West Bengal, who is presently working as a Senior Scientist, National Research Center on DNA Fingerprinting, NBPGR, Pusa, New Delhi, for his untiring guidance, help and involvement throughout the course of my academic endeavors. His incredible availability and pertinent comments largely improved the quality of the work. I never forget the numerous and passionate hours of discussion on and beyond my study topics with him and his confidence in me. I sincerely cannot express in words, my gratefulness to his tremendous support and able guidance throughout the course of this research work.

I sincerely express my deep sense of gratitude to Dr. Sudripta Das, Incharge, Department of Biotechnology, Tocklai Experimental Station (TES), TRA, Jorhat, Assam for his kind co-operation, help and constructive suggestions during part of my research works at Molecular Genetics Lab of TES. I extended my gratitude to Dr. Swapan Kumar Ghosh, Dean, Faculty of Horticulture and Dean of students' welfare, UBKV, for his help in various ways and providing me hostel accommodation at UBKV during the course of my research works at Biotechnology Laboratory, UBKV, Coochbehar, West Bengal, India.

I am indebted to Vice-chancellor, UBKV, Coochbehar, West Bengal for appointing me as a Junior Research Fellow and subsequently as Senior Research Fellow in the Biotechnology laboratory, Faculty of Horticulture, UBKV. I am also indebted to

Director, TES, TRA, Assam for his kind permission to work at their Biotechnology labs and to stay at the scholars' hostel inside the campus during part of my research works. It is extended to the Director, NBPGR, New Delhi for allowing me to access the library facilities.

I am thankful to the Head, Dept. of Biotechnology, University of North Bengal, Siliguri, West Bengal for his help in the process of registration as a Ph.D student of the Dept. and to the Head, Dept. of PCP, UBKV for permitting me to access the available facilities in the Department. It is extended to the Incharge and staff of Central Instrumentation Centre, UBKV for allowing me to operate various instruments in the centre.

I sincerely express my special thanks and regard to Dr. Aniruddha Saha, Associate Professor, Dept. of Botany, NBU and to Dr. Mohan C. Kalita, Professor, Dept. of Biotechnology, Gauhati University for their valuable suggestions and encouragement during the course of this study.

I would like to express my deep sense of gratitude to all the scientists and staff of Plant Improvement Division, TES, TRA, Jorhat and the staff of Electron microscopy Lab, Sophisticated Analytical Instrument Facility, North Eastern Hill University, Shillong, Meghalaya for their help in ultrastructural studies.

I appreciate the help and support of my senior colleagues namely Dr. Pranay Bantawa, Mrs. Olivia Saha Roy, Mainaak Mukhapadhaya and Pratap Subba.

I gratefully acknowledge the unconditional help and support that I received from Partha, Mayukh, Aditya, Himadri, Swami, Johnson, Saurabhi, Madhu and all members of M. N. Saha Hall of UBKV, Coochbehar as well as from Sangeeta ba, Swarnalee ba, Raju, Tirtha, Bornali, Sushmita, Mayuri, Niraj, Prasenjit, Parveen, Nilakshi, Dhruva da, Debojit, Traloikya during my stay at TES, TRA, Assam.

I am always thankful to some personalities for their valuable time, unconditional help and support that I received in various ways namely Kamal, Mantu, Diganta da, Susheel ji, Himadri Shankar, Chittaranjan and Jyotsna.

I also acknowledge to the Department of Biotechnology, Govt. of India for their financial support for pursuing this work which would not have been possible, otherwise.

It would not have been possible for me to accomplish my PhD work without the constant love, affection and encouragement of my beloved parents, elder brothers, sisters and all of my relatives. They stood by my side throughout the course of this study.

Dated: 11.04.11


(Akan Das)