

Preface

This Ph.D. thesis contains the result of my research work undertaken at the Department of Botany, University of North Bengal, from January, 2013 to February, 2017. During this course of time I had gone through various favorable and unfavorable mental states. Without help, support, motivation & inspiration by others, I would have never been able to finish my research work properly. Therefore I would like to thank those people who have shown me the source of inspiration towards the completion of my research work, and please forgive me if I miss any of them.

First of all I would like to express my deep sense of gratitude and heartfelt thanks to my research supervisor, Prof. Arnab Sen, Department of Botany, University of North Bengal, for his esteemed supervision, invaluable guidance, priceless suggestions and constant encouragement. His scientific knowledge helped me to carry forward my research work from the beginning. I express my sincere thanks and regards to him.

Special thanks to Dr. Malay Bhattacharya, Assistant professor, Department of Tea Science, University of North Bengal for his valuable suggestions, enormous encouragement and support. He has devoted his precious time and helped me a lot to finish this research work.

I am also thankful to the Head of the Department and all the teachers and staff of the Department of Botany, University of North Bengal for their support.

I express my gratitude for all the members of Department of Tea Science, University of North Bengal for supporting me to complete the work.

It would be injustice, if I forget the name, Dr. Dorjay Lama, sir, Department of Microbiology, St. Joseph College, for letting me permissible to use his laboratory all through my research work.

I would like to thank Department of Biotechnology, Govt of India for providing Bioinformatics Facility in North Bengal University and also like

to acknowledge Department of Biotechnology, Government of India, for financial support during my research work.

I am grateful to all my Lab mates, Dr, Subarna Thakur, Dr. Arvind Kr. Goyal, Dr. Tanmayee Mishra, Dr. Ritu Rai, Dr. Debadin Bose, Dr. BC Basistha, Dr. Ayan Roy, Arnab Chakraborty, Pallab Kar, Indrani sarkar, Mousumi Saha, Saroja Chhetri, Reha Labar, Moushikha Lala and Krishanu Ghosh for offering me the necessary help and assistance with their selfless fidelity. I would be remiss if I neglect to acknowledge Abhijit Chettri, research scholar of St. Joseph College and Upashna Chettri, research scholar of University of North Bengal for their help during the course of my research work. I would also like to acknowledge the service of my lab boys Raj and Basu.

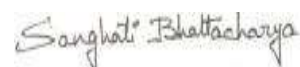
My sincere thanks to my parents, Mr. Madhabendra Bhattacharya and Mrs. Kalyani Bhattacharya for their persistence encouragement, motivation, economical and moral support, which helped me to overcome various hurdles during my research work. I am also thankful to them for supporting my

determination for higher education and being the all-time support system during hard phase of my life. I also grateful to my elder sister Mrs. Oindobi Bhattacharya, my brother in law Mr. Sourav Bhattacharya for their massive support, encouragement, mental boost up in every step of my research work. I also like to thanks my little niece Arjya Bhattacharya.

It would be unfair if I forget the name of Mr. Rakesh banerjee, my husband, who constantly encouraged and supported me since last one year to complete my research work serenely. My earnest thanks to him, for his supportive nature. My sincere thanks to my mother in law Mrs. Mita Banerjee also, to make me feel comfortable to fulfill my research work peacefully.

I would also thankful to many other friends and family members whose name may not appear here but they all helped me morally and in many other ways.

Lastly I am thankful to the almighty for all the blessings.



[Sanghati Bhattacharya]