

Acknowledgement

It gives me an immense pleasure to thank my supervisors, Dr. Dipanwita Saha and Dr. Pardeep Kumar Bhardwaj for their guidance during the entire course of my study. I am highly indebted to Dr. Bhardwaj for introducing me to the field of molecular biology. His sound expertise and profound knowledge of the subject along with the persistent effort to improve the quality of my research deserve an everlasting gratitude. I would like to express my highest gratitude to Dr. Saha for helping me with Ph.D. registration. Your rich experience, readily supportive attitude and a thorough knowledge of the subject carried me through difficult times.

I am highly indebted to Dr. Dinabandhu Sahoo, Director, Institute of Bioresources and Sustainable Development (IBSD) for the magnanimous support rendered by him to my study and career. I would also like to extend my gratefulness to our ex- Director, Dr. N. C. Talukdar for his concerns about my work and career.

My sincere gratitude to the faculties of Department of Biotechnology, University of North Bengal (NBU), Dr. Shilpi Ghosh, Associate professor and HOD and Dr. Ranadhir Chakraborty, professor and former HOD for their generous support and guidance. I also extend my acknowledgement to the non teaching staffs of the department.

I am thankful to Professor N. Sathyanarayana, Department of Botany, Central University of Sikkim, for allowing me to use HPLC for my ginsenoside quantification studies. Similarly, I would like to express my gratitude to Dr. Dilli Ram Dahal, Assistant Professor, Rhenock Government College, Sikkim for helping me with the maps used in the thesis.

All the scientific and non scientific staffs of IBSD, Sikkim Centre deserve my gratitude for their support. Dr. Laishram Shantikumar Singh, Dr. Jitendra Shukla, Dr. Shiva Kumar Sharma, Dr. Amit Kumar Rai and Miss Prasanna Pradhan, you all have been pillars of support to me. I would like to thank Mr. Bikash Rai, Mr. Padam Lal Sharma, Mr. Praveen Kumar and Mr. Sanatano Nayak for their ever ready helping hands.

Many thanks to my IBSD, Sikkim Centre colleagues, Sandhya Thapa, Hemant Sharma, Preeti Dhakal, Madhusmita Mahapatra, Samurailatpam Sanjukta, Shweta Rai, Subecha Rai and Bikash Bhattarai for their wonderful company through all seasons. I am also thankful to my friends and seniors at NBU for their constant help and guidance. Kiran Sunwar, Bhumika Pradhan, Deepti Pradhan, Anand Sharma, Sourav Moktan, Kumar Basnett, Preeti Mangar and Smriti Pradhan made my Ph.D. lot easier.

It is unthinkable to proceed forward without thanking good Samaritans whom I met during my field tours. Mr. J. L. Limbo and his family, Mr. P. L. Subba from Sopakha and Mr. N. B. Subba from Uttarey and my cousin Mr. Robin Gurung from Dentam, West Sikkim cannot be thanked enough for their help and hospitality. You all are the true guardians of biodiversity.

I would like to take this opportunity to acknowledge Department of Biotechnology, Government of India for providing infrastructure and financial assistance during the study. I am also indebted to Forest, Environment and Wildlife Management Department, Government of Sikkim for the research permits.

I would also like to thank my entire family members, relatives and well wishers for their love, support, good wishes and extraordinary patience. My brother, Mr. Milan Gurung, deserves my sincere thanks for being by my side during difficult times. Last but not least, I would like to thank all my friends whose names I couldn't mention here as the list is too long. As usual you guys will have to understand this one too.