Acknowledgement

It is a pleasure to present this piece of work which could not be possible without the guidance and fabulous supervision of my respected supervisor Dr. Anupam Das Talukdar, Assistant Professor, Department of Life Science and Bioinformatics, Assam University, Silchar, who with his vast erudition and patient mind as a Research Guide sailed me through all obstacles – both academic and administrative – to accomplish the project successfully. Moreover, the help I got from him and the discussion with him were motivations to do better each time. I thank him for the lessons learnt in the process which will me in the future also.

I express my sincere and heartiest gratitude to my co-supervisor Prof. Manabendra Dutta Choudhury, Professor, Department of Life Science and Bioinformatics, Assam University, Silchar for providing me all the guidance and splendid supervision in the current work. I am ever grateful to him for his valuable suggestions in focusing the research towards specific objectives and identification of uniqueness of the current work. I express my heartfelt gratitude to my co-supervisor Prof. Potsangbam Kumar Singh, Professor, Department of Life Sciences, Manipur University, Canchipur for providing me all the facilities while working there. I am also grateful to him for being the strong guiding force behind my Ph.D. work and encouraging me through all the obstacles faced during the project.

I convey my gratitude to Hon’ble Vice Chancellor, Assam University, Silchar for supporting my endeavor whole heartedly.
I am also thankful to Head of Department, Department of Life Sciences and Bioinformatics, Assam University, Silchar for providing me with all the facilities required for the research work. I am also grateful to Dean, School of Life Sciences for providing me all the facilities and encouragement provided during the research work.

I convey my gratitude to all the teachers of the Department of Life Sciences and Bioinformatics, Assam University for encouraging me through the research work.

I am grateful to Mrs. Yensememb Chandrasakhi Devi, Principal, Ghanapriya Women’s College, Imphal, Manipur for providing me the permission and facilities during my research work. I am also thankful to Mr. Thongbam Jayantakumar Singh, Head, Department of Botany, Ghanapriya Women’s College, Imphal, Manipur for encouraging me in my endeavor and constant support during the research work. I would like to extend my gratitude to all the teachers of the Department of Botany, Ghanapriya Women’s College for their continuous support during the research work.

I am also grateful to Mrs. Gaithaolui Thaiimei, Divisional Forest Officer, Forest Department, Government of Manipur, for providing me facilities of the Geographic Information System Laboratory of the Forest Department. I convey my heartfelt gratitude to staffs of the GIS for extending cooperation during my research work.

I offer my heartfelt gratitude to Dr. Pankaj Chetia for offering me and providing assistance in using resources of Bioinformatics Centre, Assam University, Silchar during my research work.

I am also thankful to Mr. Ngasepam Romen Singh, Research Scholar, Department of Life Sciences and Bioinformatics, Assam University for constant cooperation and encouragement during the research work. I am grateful to Mr. Salam Manoranjjan Singh, Research Scholar, Department of Ecology and Environmental
Science, Assam University, Silchar for cooperation and constant support during the research work.

I extend my heartfelt gratitude to Mr. Thingujam Bhogen Singh, Deputy Director, Department of Environment, Government of Manipur for constant cooperation and support during the research work. I offer my warm gratitude to Mr. Nambam Chandrakumar Singh, Field Staff, Department of Environment, Government of Manipur, for accompanying me and guiding me through the field survey in the Jiribam. I am also grateful to Mr. Thoudam Jibankumar Singh, Producer, Educational Multimedia Research Centre, Manipur University, Canchipur and Mr. Wangkheimayum Ranjit Singh, Videographer, Educational Multimedia Research Centre, Manipur University, Canchipur for extending cooperation and constant companionship during the field survey.

I also thankful to Dr. Deshworjit Singh Ningombam, Research Assistant, Department of Life Sciences, Manipur University, Canchipur for helping me in identification of plant materials and constant cooperation during the research work. I offer my warm gratitude to Ms. Konsam Sanjita Chanu, Research Scholar, Department of Life Sciences, Manipur University for helping me in literature survey.

I also offer my heartfelt gratitude to Dr. Oinam Shashikumar Singh, Associate Professor, Department of Zoology, Dhanamanjuri College of Science, Imphal, Manipur for providing me facilities of Bioinformatics Centre and also software tools that are helpful during the research work.

My heartfelt gratitude goes to Mr. Dilip Kumar Roy, Botanical Survey of India and Mr. Jagajit Sahu, Research Scholar, Assam University. I offer my heartfelt gratitude to Ms. Sushmita Nath, Mr. Abhijit Mitra, Mr. Prakash Roy Choudhury, Ms
Priyanka Saha of Department of Life Science and Bioinformatics, Assam University, Silchar for their constant encouragement during the present work.

Last not the least, I offer my heartfelt gratitude to my wife Mrs. Sarita Sorokhaibam, Lecturer, District Institute of Educational Technology, Chandel, Manipur for her ever encouragement and inspiration during the research. Without her support, I could not have accomplished the present work.