ACKNOWLEDGEMENTS

First and foremost, I offer my sincerest gratitude to my supervisor, Prof. G.D. Sharma, Department of Life science and Bio-informatics, Assam University, Silchar, Assam (currently on lien as Vice-chancellor of Bilaspur Vishwavidyalaya, Chattisgarh), who has supported me throughout my thesis work with his patience and knowledge and without him this thesis, too, would not have been completed or written. My endeavour would have been a bundle of follies without his esteemed supervision. I am grateful to Dr. O.N. Tiwari (Co-supervisor), Staff scientist, Microbial Resources Division, Institute of Bioresources and Sustainable Development (an autonomous institute of DBT, Govt. of India) Imphal, Manipur for his strenuous guidance and encouragement throughout the research period and will remain a hard earned treasure. His impetus for research work has enkindled my mind for conducting research work and gathering knowledge. I have got the platform to conduct the present study by being appointed as Senior Research Fellow in his major research project in the National Fresh water Cyanobacterial and Microalgal Laboratory, IBSD-DBT, Imphal, Manipur. I would not have achieved the goal without his brisk supervision.

My sincere gratitude to Dr. N.C. Talukdar, Director, IBSD-DBT, Imphal, Manipur and Prof. M. Rohinikumar Singh, former Director IBSD-DBT, Imphal, Manipur for providing laboratories facilities and their kind advices to endeavor my research work. My sincere thanks are due to Dr. K. Jeyaram and Dr. S. Indira Devi Scientist of Microbial Resources Division and other Scientists of the institute namely; Dr. Sudripta Das, Dr. D.D. Joshi, Dr. Asamanja Chattoraj, Dr. H. Sunitibala Devi, Dr. Biseshwori Th., Dr. Sunil S. Thorat, Dr. Ch. Brajakishor, Dr. Jagat C. Borah, Dr. T. Shantibala Devi, Dr. Gusheinzed Waikhom, Dr. Y. Rajashekar, Mr. Bharat Somkuwar and Mr. Lokesh Deb for their continuous supports, encouragement and inspirations time to time.

I am grateful to Dr. D.K. Hore, senior consultant-plant taxonomy, Dr. S.C. Pal, senior consultant-natural product chemistry, Mr. Akbar Mazid (senior administrative officer) and Shri Y. Lalbabu Singh (ex. senior accounts officer) and all the accounts and administrative staffs of IBSD-DBT, Imphal, Manipur for their kind and timely support needed for my research work.

Dr. Sayanika Devi, Post Doctoral Fellow, Ms. Th. Elizabeth, Research Scholar and Mr. Wahengbam Romi, Scientist, IBSD-DBT, Imphal, Mrs. Laxmipriya Koijam, Ms. Gunapati Oinam, Mr. Keithellakpham Ojit Singh, Ms. Thingujam Indrama Devi, Mrs. S. Deepa Devi and Mrs. Jeetu Devi A., Research Scholars of Cyanobacterial and Microalgal Repository Laboratory, IBSD-DBT,
Imphal, Manipur are duly acknowledged for their kind cooperation in carrying out the research and in compilation of my thesis work. My special thanks to Ms. Ch. Silvia, Ms. A. Thadoi Devi, Ms. Y. Dineshwori, Ms. A. Subhalaxmi Sharma, Ms. Romi Kh., Ms. Minerva Sh., Ms. P. Premi, Ms. W. Indira, Ms. Th. Seityapriya, Ms. Th. Bidyababy and Ms. K. Sarabati of our Cyanobacterial and Microalgal Repository Laboratory, IBSD-DBT, Imphal, Manipur for helping me during the tenure of my research work. I am grateful to Mrs. Bichitra Singha, Mr. Ph. Padmakumar Sharma, Mr. K. Chandradev Sharma and Mr. L. Lolen Singh for their assistance and association with the activities of the laboratories at all time.

My sincere thanks to Prof. Sarbani Giri and Prof. Manabendra Duttachoudhury, Assam University, Silchar, Prof. G. Subramanian, Prof. N. Thajuddin, Prof. L. Uma, Prof. D. Prabhaharan, Dr. Priya Balakrishnan and other research scholars from National Facility for Marine Cyanobacteria (NFMC), Bharathidasan University, Tiruchirapalli, Dr. R.B.N. Prasad and Dr. Sanjit Kajilal from IICT, Hyderabad, Dr. Yogesh Shouche, NCCS-DBT, Pune, Prof. G.L. Tiwari and Dr. Richa Tandon, University of Allahabad, Prof. T. Satyanarayan and Prof. Dinabandhu Sahoo, University of Delhi, Dr. Dolly Wattal Dhar, IARI, New Delhi for their kind suggestions and advice for the completion of thesis work.

I would like to express my gratitude to my mother Mrs. Yengkhom Durgabati Devi, my father Mr. Oinam Rajen Singh, my lovely wife Babita Usham, my elder sister Mrs. Neveda Oinam, my younger sister Mona Oinam, my uncle Mr. Manichandra Oinam and Dr. Oinam Gojendro Singh and my son Vedhanta Oinam for their blessings and sparkling support which helped me to strive and conclude my quest.

My sincere thanks to the Department of Biotechnology (DBT), Government of India, New Delhi for financial assistance in the form of Senior Research Fellow which enabled me to complete the research works successfully.

It is impossible to list here, with due acknowledgement, all my friends to whom I am indebted for their incredible help and advice. I can only thank them in general terms, quite inadequately but very sincerely.

Date:

(Oinam Avijeet Singh)