

ACKNOWLEDGEMENT

The writing of this dissertation has been one of the most significant academic challenges I have ever had to face. Without the support, patience and guidance of the following people, this study would not have been completed. It is to them that I owe my deepest gratitude.

I would like to gratefully and sincerely thank **Dr. N. Jayabalan** for his guidance, understanding and patience during my Ph.D. programme at Bharathidasan University. His mentorship was paramount in providing a well rounded experience consistent my long-term career goals. He encouraged me to not only grow as an experimentalist and a biologist but also as an instructor and an independent thinker. For everything you've done for me, thank you sir.

I express my gratitude to **Dr. M.H. Mohamed Iiyas**, Assistant Professor, Jamal Mohamed College, Trichy. And **Dr. S Shajahan**, Assistant Professor Jamal Mohamed College, Trichy. who was my doctoral committee member, his critical comments and suggestions are valuable.

I would also like to thank **Dr. B.D. Ranjithakumari**, Head of the Department, Department of Botany, when I entered the department, he was the person asked my guide to take me as a Ph.D. student.

I would like to express my sincere thanks to **Dr. Nam In Hyoung**, Dean Faculty, Department of Plant Science, Sangmyung University, South Korea.

I would like to tell my sincere thanks my Department faculty members , **Prof. M.B. Vishwanathan** Head of the Department i/c, **Dr. A. Lakshmiprabha**, Associate professor, **Dr. M. Sathiyabama**, Assistant Professor, **Dr. T.Senthil Kumar** Assistant Professor, **Dr. S.R. Sivakumar**, Assistant Professor, Assistant Professor, Department of Botany, Bharathidasan University, Tiruchirappalli.

It is a great pleasure to express my thanks to **Dr. M.J. Abdul Hameed**, Associate Professor, Department of Botany, Govt. arts and Science College, Krishnagiri. **Dr. J.H. Franklin**, Scientist-B, Botanical Survey of India, Coimbatore, for his valuable comments and suggestions on this thesis, not only on the thesis my laboratory experiments and social life.

I acknowledge my thanks to my seniors, **Dr. A. Muthusamy**, Associate Professor, Department of Biotechnology, University of Manipal, Karnataka, **Dr. P. Baskaran**, Post Doctoral Fellow, University of Petermaritzburg, Republic of South Africa, **Dr. M. Ganesan**, JSPS, Japan, **Dr. B.R. Chandrasekar**, **Dr. P. Durai**, Scientist, NRCB, Tiruchirappalli, **Dr. K. Ganesh kumari**, **Dr. A. Raja**, **Dr. P. Gurusaravanan**, **Dr. S. Dr. Vinoth**, **Dr. S. Sivakumar**, **Dr. G. Siva**, **Dr. Sakthivel** and **Dr. B. Sudakar** and **Fr. Roy John**, without their suggestions and valuable comments this thesis could not be perfect.

The working atmosphere should be very pleasant when you are working, in this criteria I am very lucky to have the working atmosphere provided by my colleagues **G. Premkumar**, **M. Vigneswaran** and project student **S. Manikandan**.

A quote by Ralph Waldo Emerson is "A man's growth is seen in the successive choirs of his friends." In this regard I am very lucky to have friends such as **Arun Mozhi Varman**, **Rudhravel Moorthy**, **Manimaran**, **Rajendran**, **Sundar**, **Solaraj**, **Ganesh kumar**, **Malaiappasami**, **Pradeep kumar**, **Boopathi**, **Gopi** and **Jacob**.

I thank **Shiva** New Digital Studios, **Joe Sun Studios** and **Shafi ASP Computers**, for providing their valuable talent to make this thesis beautiful and attractive one.

Finally, I would like say my sincere thanks to Bharathidasan University for providing me the financial assistance as University Studentship.

Above all without the blessings of the **God almighty** this thesis would not be possible.

M.Muthuvel