Acknowledgements

It is a pleasant task to express my thanks to all those who contributed in many ways to the successful completion of this thesis.

I would like to express my deep and sincere gratitude to my supervising guides Dr. Rosamma Philip and Prof. Dr. I.S. Bright Singh, for conceptualization of the subject and guidance, motivation and patience all the way through my doctoral research. I was extraordinarily fortunate in having the opportunity to work under them. They have supported me not only by providing research guidance over years, but also academically and emotionally through the rough road to finish this thesis. The encouragement, moral support, caring, and the freedom they showered helped me to overcome all the hurdles and achieve my goals. The joy and enthusiasm they have for research was contagious and motivational for me. Sir and Ma’am... your valuable contributions will always be treasured.

I thankfully acknowledge Director and Dean, Faculty of Marine Sciences, for all the support provided in the smooth conduct of my research.

I sincerely place on record my thanks to the head, Department of Marine Biology, Microbiology and Biochemistry for facilitating my research under the department and for all the support rendered.

My warm thanks are due to Prof. Dr. Mohandas for his kind support and guidance in this study.

I owe my deep gratitude to all the teachers in the past and present, Dr. Damodharan, Dr. N.R. Menon, Dr. Kuttiamma, Dr. Mohammed Sahli, Dr. C.K. Radhakrishnan, Dr. Babu Philip, Dr. A.V. Saramma, Dr. Mohammed Haata, Dr. Bijoy Nanadan, Dr. Aneykutty, Dr. Nandini, Ms. Maya, Ms. Rosamma, Ms. Valsala, for the way they molded my life.

I warmly thank my statistic teacher, Mr. H. K. Krishna Iyer, Retd., Scientist (CIFT) for his excellent guidance in statistical analysis and for his concern, love and fatherly affection.

I owe a great deal of appreciation and gratitude to Dr. Herbert Schweizer, Colorado University, USA for providing me the Pseudomonas specific vector, pUCP24 for the study.
My most sincere gratitude to Dr. Prathapan, Department of Applied Chemistry, CUSAT, for his valuable suggestions, encouragement, and help rendered when I approached him during the research.

I gratefully acknowledge the funding sources that made my Ph. D work possible. This work was funded by the Department of Biotechnology, Government of India under the Program Support in Marine Biotechnology (BT/PR4012/AAQ/03/204/2003). I acknowledge the financial support in the form of Junior and Senior Research Fellowships.

Many thanks to the administrative staff of the Department of Marine Biology, Microbiology and biochemistry, for their timely help and support.

I express my thanks to Mr. Saji, STIC - CUSAT for the great help he provided in the structural analysis of pyocyanin.

I thank the management and staff of M/s Abad Hatchery, for supplying me with the larval samples for experimentations.

This thesis has been kept on track and been seen through to completion with the support and encouragement of numerous people including my well wishers, friends and colleagues.

Words are short to express my thankfulness to my dear chechi, Dr. Valsamma Joseph for the affection she showered, generous care and the homely feeling she gave me for the past many years since I was away from home. She was always there when I really needed and her ideals and concepts have remarkably influenced me.

I sincerely thank Dr. Sajeevan for his suggestions and warm friendship.

The road to my Ph. D started at National Centre for Aquatic Animal Health (NCAAH) and I am fortunate to have been a part of NCAAH family. The facilities and the ambiance here were on par with the best to say and all my colleagues made it a convivial place to work during the long hours I spent in the lab.

It’s my fortune to gratefully acknowledge the support of some special individuals. Words fail me to express my appreciation to my friend, Mr. Jayesh for his untiring support, understanding and valuable contributions in shaping the entire thesis. Thank you doesn’t seem sufficient but it is said with appreciation and respect for his support, affection and
friendship. His truly scientific intuition has made him with a constant oasis of ideas and passion for science, which exceptionally inspire and enrich me as a researcher.

I am much indebted to my friend, Mrs. Blessy, whose dedication, love and support has helped me a lot especially during my hard time with the extraction work. I owe her for being unselfishly helping me throughout the research. She was always beside me during the happy and hard moments to push me and motivate me.

I treasure the friendship and loving inspiration of Dr. Seena for the many years we were together and will always cherish her care and tasteful recipes. My friend, Ms. Vrinda deserves special mention for being a good friend and for her love and moral support. I extend my huge, warm thanks to Dr. Rejish for being with us always like a brother and for his special concern and love. My heartfelt thanks to Dr. Somnath, for providing a good and smooth basis on molecular biology for my Ph.D. tenure, his helpful suggestions and comments and for being a good friend. I appreciate and thank Dr. Sreedharan for his caring friendship and help especially during the final stages of my thesis. My sincere thanks to Mr. Haseeb for his affection, friendship and for all the help provided. My thanks are due to Dr. Sudheer for the help he provided during my experiments.

I am thankful to Dr. Jasmine and Dr. Sabu for their suggestions and encouragement. Thanks to Mrs. Sunitha for sharing the burden of settling the bills of PSMB project. My sincere and loving thanks to all my dear colleagues Mr. Sunish, Ms. Gigi Paulose, Mr. Ranjit Kanjur, Mr. Prem Gopinath, Mr. Deepesh, Ms. Rose Mary Jose, Mrs. Divya, Mrs. Surekha, Mrs. Sreelakshmi, Mrs. Riya, Mrs. Ammu, Mrs. Deepa, Mrs. Preena, and Mr. Vijay for being with me and their support.

I wish to extend my warmest thanks to the new members of NCAEH family, Mr. Christo, Mrs. Remya, Ms. Asha, Ms. Jisha, Ms. Sanyo, Mr. Arun Augustine and Mr. Vipin for their support and friendship.

I would also like to thank people from my early days of research tenure Dr. Ranjith, Dr. Shibu K Mani, Dr. Preetha, Dr. Jayaprakash, Dr. Anas, Dr. Manju who kept me going at the beginning.

I specially thank my M.Sc Classmates Dr. Divya, Dr. Sreedevi, Dr. Feby, Dr. Simi, Mrs. Dhanya, Mr. Neil, Mrs. Shanee, Mrs. Bijji, Dr. Sree, Dr. Febin and Dr. Krishnan for
their friendship and suggestions. A special thanks to Mr. Neil for providing the marine cultures and Divya for helping me through the formatting of references.

I extend my thanks to all NCAAH staff, Mr. Soman, Mrs. Surya, Mrs. Anja, Mr. Jaison, Mr. Biju Mr. Savin, Mr. Anish, Kusumamchechi, and Mrs. Parisa for their support given during my research.

I sincerely thank all the research scholars of Department of Marine Biology, Microbiology and Biochemistry for their help and friendship. Many thanks to Ms. Manjusha, Mrs. Swapna, Dr. Selvan, Dr. Lakshmi, Mrs. Sareen for their support and help.

I fondly cherish the love, care and support of my good friends, Dr. Sincy, Dr. Manjusha, Dr. Meera, Ms. Neena and Ms. Ann Rose.

And most of all, I would like to share this moment of happiness with my loving, supportive, encouraging, family where the most basic source of my life energy resides. The support of my parents and sister has been unconditional all these years and without their encouragement, prayers and understanding it would have been impossible for me to finish this work. I very fondly acknowledge my brother Rajeev, and kids, Kannan and Siddhu for their love and support. I sincerely thank all my relatives who were with me for their love and encouragement……

“Rather than individual souls, we perhaps have one great soul – the soul of the entire Universe, and this is the sum total of all the little particles that makes us what we are”

……………Thomas Edison

I bow before that Universal power at work in our bodies, minds and spirits which tends towards perfection and wholeness…………

This thesis is dedicated to amma………………

Priyaja P