

ACKNOWLEDGEMENT

On the first place, I thank All Mighty for His immense blessings for such a great opportunity to my academic career. My deepest sense of gratitude and indebtedness to my parents for all the sacrifices and compromises they made to reach me up to here.

I earnestly feel privileged to express my immense gratefulness to my honourable supervisors Dr. Bijay Kumar Behera, Principal Scientist (Animal Biotechnology), FREM division, ICAR - Central Inland Fisheries Research Institute (CIFRI) and Dr. Sagar Acharya, Assistant Professor, Department of Zoology, Vidyasagar University, Midnapore, West Bengal for their guidance, patience and knowledge. They inspired me to give my best at all steps of my Ph.D. work. I am obliged for their sincere and generous help and valuable suggestions, sustained interest and encouragement and also for providing facilities to the work in reputed institute.

I express my humble submission and gratefulness to Professor. Ranjan Chakrabarti, Hon'ble Vice-Chancellor, Vidyasagar University, West Bengal and Dr. Basanta Kumar Das, Director, ICAR – Central Inland Fisheries Research Institute (CIFRI), for their approval & providence with all necessary facilities for the completion of my work.

I owe sincere appreciation and gratitude to my parents Late. Jayanta Das and Smt. Subrata Das who have silently borne with me the ups and downs during the course of this study, with their affection, encouragement, valuable suggestions and help.

I owe sincere appreciation and gratitude to my wife 'Tanusri' who has silently borne with me during the busy schedule of my work during the course of these studies and with her affection, encouragement, valuable suggestions and help, I was able to complete this study.

My sincere acknowledgement to my brothers Prasenjit Paria, Hirak Jyoti Chakraborty, Sudip Pakrashi, Kampan Bisai, Niladri Prasad Mishra and Surjya Kumar Mishra and my sister Nabanita Chakraborty, Shreya Bhattachaya, Poulomi Chatterjee and Sristi Biswas who helped me to accomplish my field works, collection of fish samples and my thesis preparation.

Special thanks to my elder brothers Dr. Manojit Bhattacharya of Vidyasagar University for his continuous support for this thesis preparation and submission.

I also extend my heart full thanks to Mr. Asim Kumar Jana, Senior technical officer, ICAR- CIFRI, Barrackpore who had always helped and assisted me in both field and laboratory related work for the completion of my thesis.

I am highly grateful to Mr. Sujit Chowdhury, Assistant Chief Technical Officer; Manabendra Roy Sr. Technical Assistant; and Dr. Sanjoy Bhowmick, Chief Technical Officer for their constant support for preparation of thesis.

Last but by no means least, I owe to all my seniors, friends and juniors of ICAR – CIFRI and Vidyasagar University who assisted me in versatile aspects during this period.

Thanks for all the consistent support. It was a great journey indeed!!!!



Abhishek Das