Acknowledgements

I acknowledge my indebtedness, deep sense of gratitude and sincere regards to my respected supervisor, Prof. A. R. Khuda-Bukhsh, Department of Zoology, University of Kalyani, for his kind help in selecting the problem, affectionate guidance, constant supervision, untiring effort and inspiration, throughout the course of the present work.

My sincere regards are also due to Dr. (Mrs) Amiya Khuda-Bukhsh for her motherly affection and inspiration during the course of my investigation.

I am grateful to the authorities of BOIRON Laboratory, Lyon, France, for providing financial assistance to carry out the present work and also to the consecutive Heads of the Department of Zoology for providing laboratory facilities.

I am also grateful to all the teachers and non-teaching staff members of this Department for their kind co-operation and inspirations.

My sincere regards are due to my respected teachers Late P. Dasgupta, Sri Harinarayan Mukherjee, Sri Suniti Kumar Khan, Sri Pradip Kumar Mukherjee, Dr. Gobinda Chandra Sadhukhan, Dr. Nemai Chandra Saha, Dr. Madhusudan Dey, Dr. (Mrs) Sheela Roy, Dr. Dipankar Sengupta, Prof. Dipak Roy, Prof. Dipak Ranjan Mandal, Dr. Sanjib Kumar Das, for their blessings and constant inspirations during the whole period of my investigation.

I express my sincere gratitude to Dr. T.C. Nag, and other technical officers and staff, Department of Anatomy, Electron Microscope Facility, AIIMS, New Delhi for their valuable suggestions, and co-operations during my EM works at Delhi.

Grateful acknowledgements are made to staff members of National Medical Library, New Delhi for providing library facilities. I also acknowledge the assistance rendered by Mr. Mrinal Das, Senior Lab Assistant, Bose Institute, Kolkata in recording Densitometric Scanning of Protein Gels.

I am highly grateful to Dr. Arunava Goswami, Lecturer, Indian Statistical Institute, Kolkata, Dr. Biswapati Mondal, Professor and In-Charge, AICRP on Soil Test Crop Response Correlation, Directorate of Research, B.C.K.V., Kalyani, Prof.
Amalesh Choudhury, Ex-Prof. and Head, Deptt. of Marine Science, Calcutta University, Kolkata, for their valuable scientific suggestions and encouragements.

My thanks are due to Dr. Tapas Kumar Bandyapadhyay, Head, Deptt. of Biotechnology and Molecular Biology, University of Kalyani, Dr. Arindam Bhattacharyya, Lecturer, Deptt. of Environmental Science, University of Kalyani for their inspirations and kind help.

My heartfelt regards are also due to Dr. (Mrs) Alpana Sadhukhan, Mrs Tapasi Saha, Mrs Sudipta Khan, Mrs Pratima Mukherjee, Sri Parimal Kumar Dasgupta, Mrs Binita Dasgupta, Sri Amar Das, Sri Samar Kanti Nag, for their blessings and inspirations during the course of my investigation.

I am thankful to Dr. Saiful Haque, Dr. Debarshi Das and Dr. S.C. Dutta for their valuable support and encouragements.

A special word of thanks to my laboratory colleagues Dr. Surjyo Jyoti Biswas and Ms Antara Banerjee for their lively company, suggestions and help in certain aspects of my research work. Thanks are also due to Dr. Surajit Pathak, Dr. Jayanta Kumar Das, Dr. Bibhas Guha, Dr. Rupak Pathak, Mr. Sandipan Chaki Choudhury, Ms Nandini Bhattacharjee, Mr. Pathikrit Banerjee, Ms Saili Paul, Mr. Sushil Kumar Mandal, Mr. Soumya Sundar Bhattacharyya, Md. Sapiul Molla, for rendering support during times of need. I would also like to thank Mr. Rajkumar Sarkar and Mr. Nandalal Jha for their help for various services rendered throughout the course of investigation.

My thanks are also due to Mr. Nithar Ranjan Madhu, Mr. Sanjoy Sarkar, Mr. Joydeep Ghosal, Mr. Abir Lal Dutta, Mr. Sajal Kumar Dey, Mr. Sourav Kundu, Ms Sanjukta Mukherjee, Mr. Debashis Roy, Mr. Biplab Behra, Mr. Koushik Pramanik, Mr. Partha Mallik, Ms Adrita Chakraborty, Mrs Roli Ray (Shukla), Mrs Sonia Roy (Mukherjee), Mrs Susmita Lahiri (Ganguly), Dr. (Mrs) Supriya Mondal (Roy), Ms Antara Kar, Mr. Sujoy Kumar Bag, Mr. Sukanta Rana, Mr. Sagar Chatterjee, Mr. Chiranjiv Pradhan, Dr. Biplab Bhowmik, Dr. Jatindra Nath Bhakta, Ms Manashi Debnath, Mr. Koushik Mondal, Mr. Tapan Kumar Pal, Mr. Tulshi Dey, Mr. Sanjib Kumar Chattopadhyay, Mr. Srijan Biswas, Mr. Sourav Bhattacharya, Mr. Sounak Ghosh, Mr. Sangram Sinha, Mr. Shakti Prasad Chakraborty, Mrs Baishali Ray (Roy), Dr. Javid Ahmed Bhat, Mr. Manik Chandra Kundu, Dr. (Mrs) Bidisha Bhattacharya (Majumder), Dr. Dibyendu Sarkar, Mr. Dipankar Kar, Mr. Sukanta
Chakraborty, Mr. Jibananda Basu, Mr. Biplab Tarafder, Mr. Pathikrit Dasgupta, Mr. Dyutiman Mukherjee, Mr. Debiprasanna Dutta, Mr. Kishor Dhara, Mr. Chandan Kundu, Mr. Santanu Paul, Mr. Suman Ghosh, Mr. Prasenjit Biswas, Mr. Tanmoy Sanyal, Mr. Soumitra Roy, Mr. Buddhadeb Mallick, Mr. Mrinal Dasgupta, Mr. Shyamal Majumder, Ms Ishita Khan, Mr. Nandeswar Mukherjee, Mr. Prijat Dasgupta, for their cooperation and lively company during the whole period of my investigation.

Thanks are also due to Mr. Surojit Sengupta for taking the pains of typing the thesis.

I would like to thank Mr. Subrata Roy for his hospitality during my visit to AIIMS, New Delhi.

Lastly no words can express the sense of gratitude, I owe to my parents, wife, father-in-law, mother-in-law, elder brothers and sisters, brothers-in-law and sisters-in-law without whose co-operations, blessings and constant inspiration, it would not have been possible to complete this piece of work.

Finally I express my affectionate love to my little daughter (Sangbrita) whose silent inspirations helped me a lot to overcome all the hurdles of life during the whole period of my investigation.

Kalyani.
Dated,

............., 2007.