PREFACE

Jute is a long, soft, shiny vegetable fibre. Jute is a rain-fed crop and presently jute cultivation is suffering from differnet problems. In the present scenario, it is urgent need to increase productivity of jute by using biological products in integrated eco-friendly management practices. Considering the importance of beneficial microbes- plant growth promoting rhizobacteria as plant growth promoters as well as biocontrol agents, the present study has been undertaken to focus on the mechanism of action by PGPR strains related to increase crop productivity and suppress diseases of jute plants.

In this context, I take this opportunity to thank all those who made this thesis possible. At the very outset, I would like to pay my utmost sense of gratitude to my supervisor, Prof. U. Chakraborty, Plant Biochemistry Laboratory, Dept. of Botany, North Bengal University for her guidance, undivided attention, kind and valuable suggestions and wise counselling throughout the execution of this endeavour.

I would like to offer my sincere thanks to Prof. A. Saha, Head, Department of Botany, Prof. B. N. Chakraborty, Prof. P. K. Sarkar, Prof. A. P. Das, Prof. A. Sen, Dr. S. C. Roy, Dr. P. Mandal and Dr. M Chowdhury and members of the Department for their unconditional help and co-operation.

I record my gratitude to the programme co-ordinators (DRS-I, II & III) of UGC-SAP, Department of Botany for availing the instrumentation facility.

I take this opportunity to express my earnest gratefulness to Credora Life Sciences, Bangalore, Microbial Type Culture Collection, Chandigarh, Central Research Institute for Jute and Allied fibres, Barrackpore and the Director of Sophisticated Analytical Instruments Facility - Scanning Electron Microscopy Unit, Burdwan University, Burdwan and Delhi University, North Campus, Delhi for identifying, supplying and taking the scanning electron microscopic photographs of the bacterial and fungal cultures.

I shall be failing in my duty if I do not acknowledge the enormous support and assistance received from Dr. Deepti Pradhan, Dr. Rohini Lama, Dr. Bhumika Pradhan, Dr. Arka Pratim Chakraborty, Dr. Swarnendu Roy, Dr. Nishika Jaishee, Ms. Jayanwita Sarkar, Mr. Sandip Dev Chowdhury, Mr. Jayanta Chowdhury, Dr. Pannalal Dey, Dr. Kiran Sunar, Dr. Utanka Kr. De, Dr. Sanjita Allay, Ms. Pushpanjali Ray, Ms. Amrita Acharya, Mr. Somnath Roy, Mr. Shibu Barman and other research scholars of the Department of Botany throughout this endeavour. I wish to thank field man specially Sambhu Banik for maintaining plants in good condition.

I owe special thanks to my colleagues Prof. Vivekananda Mandal, Dr. Sudipta Kumar Sil, Dr. Abhijit Sarkar, Mr. Chandan Barman and Dr. Swarnendu Roy working in the Dept. of Botany, University of Gour Banga for their co-operation.

Last, but not least, I wish to acknowledge my family for their constant encouragement and being there for me through my thick and thin.

Sukanta Majumdar

Plant Biochemistry Laboratory ----------

Dept. of Botany, N.B.U. (SUKANTA MAJUMDAR)

Date: 02/05/2017