**DEDICATED TO MY**

 **RESPECTED**

 **PARENTS**

 **AND**

 **BELOVED**

 **NEPHEW**

**ACKNOWLEDGEMENTS**

I am ever grateful and indebted to the Almighty Allah without whose grace I would have never been able to pursue my higher studies in this field of science and to complete my research work successfully for the degree of Master of Science (MS) in Microbiology.

There are lots of people I would like to thank for a huge variety of reasons. I owe my gratitude to all those people who have made this thesis possible. I sincerely desire to express my heartfelt respect, deepest sense of gratitude and profound indebtedness to my respected teacher and Research Supervisor **Dr. Kazi M Kamaruddin,** Director, Poultry Research and Training Centre and Co-supervisor **Dr.** **Mohammad Abul Kashem**, Assistant Professor, Department of Microbiology, Chittagong Veterinary and Animal Sciences University (CVASU) for their constant supervision and scholastic guidance. Thank you also for managing to read the whole thesis so thoroughly and for helpful comments on the text. Without your knowledge, perceptiveness and encouragement I would never have finished this thesis. Special thanks to **Professor Dr. Paritosh Kumar Biswas**, Dean, Food Science Technology and **Professor Dr. Md. Masuduzzaman,** Head, Department of Pathology and Parasitology,CVASU for their valuable advice and constant co-operation throughout the entire period of study. It is difficult to overstate my gratitude and I would like to give special thanks to **Dr. Shuvagoto Das,** Assistant Professor, Department of Pathology and Parasitology, CVASU and Shafiqul Islam **Mamun, Lecturer,** Department of Pathology and Parasitology, CVASU for their kind co-operation and scholastic guidance to conduct the whole molecular analysis. I would like to thank to Dr. Md. Inkeyas Uddin Sarwar, Scientific officer, PRTCfor his valuable suggestions and inspiration throughout this research.

I express my cordial appreciation to all the office staffs of the Department of Microbiology, CVASU and PRTC for their technical assistance during the research work.

The research work was financed by **NATP: Phase 1; BARC** project, through the poultry Research and Training Centre, CVASU. I thank all of them of PRTC and other necessary additional logistic supports from the said applied research project.

I would like to express my deep sense of gratitude and thanks to **Dr. A. S. Mahfuzul Bari the Vice Chancellor,** Chittagong Veterinary and Animal Sciences University.

I express heartfelt gratitude and gratefulness to my beloved parents, mother **Mrs. Lutfun Nahar** and father **Late A. Z. M. Solaiman** for their blessings, inspiration, sacrifice and moral support which opened the gate and paved the way to my higher studies and also for providing me with the best of everything in my life. Finally I am extending my cordial thanks to all of my friends, relatives and well wishers, although it is not possible to mention everyone by name.

**The Author**

**Statement of Candidate**

I, Ripatun Nahar Ripa, declare that this thesis is submitted in fulfillment of the requirements for the Degree of Master of Science (MS) in Microbiology, Department of Microbiology, Faculty of Veterinary Medicine, Chittagong Veterinary and Animal Sciences University. It is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

**The Author**