ACKNOWLEDGEMENT

As a research scholar, I have worked with a great number of people whose contributions in assorted way to research and the making of the thesis deserve individual mention. I take this opportunity with much gratification to express thank all the people who have helped me during the course of my expedition towards this thesis.

I bow my head to the Almighty God, showing me inner peace, blessings and providing me the opportunity to step in the excellent world of science and guided me to accomplish the great task of research and without which I could never have overcome the hurdles and complete this endeavor successfully.

I feel great pleasure in expressing my sincere gratitude to my supervisor Dr. Anita Yadav, Associate Professor, Department of Biotechnology, Kurukshetra University, Kurukshetra. Her overly enthusiasm and integral view on the research and her mission for providing high quality work has made a deep impression on me. Above all and the most needed, she provides me unflinching encouragement and support in various ways. Her truly science intuition has made her a constant oasis of ideas and passion in science, which exceptionally inspire and enrich my growth as a researcher. I am obliged to her for her invaluable guidance, wholehearted interest and total involvement at each step of my work.

I am grateful to the Vice Chancellor and Registrar, Kurukshetra University, Kurukshetra for providing me all necessary amenities for the smooth running and successful completion of my doctoral programme. I am also grateful to the Dean, Faculty of Life Sciences, for her kind interest and cooperation. I wish to extend my sincere thanks to Dr. Jitender Kumar Sharma, Chairman, Department of Biotechnology, Kurukshetra University, Kurukshetra for his kind cooperation, instructions and encouragement.

I offer my sincerest gratitude to my co-supervisor, Dr. B. P Mishra, Head of Department, IVRI, who has supported me throughout my thesis with his patience and knowledge whilst allowing me the room to work in my own way. I attribute the level of my degree to his encouragement and effort and without him this thesis, too, would not have been completed or written.

It is a great privilege for me to express my esteem and profound sense of gratitude to Dr. R. K Vijh, NBAGR, Karnal for his constant encouragement and guidance during the research work.
I convey my heartiest thanks to Dr. R. S Kataria for his support, guidance and encouragement during my research work. I would also like to acknowledge the help provided by Mr. Naresh Yadav and Mr. Anil Kumar.

The help extended by my colleagues *viz.* Kabita Panda, Dr. Amit Kishore, Dr. Poonam Yadav, is also duly acknowledged. Their suggestions during my research programme were invaluable.

The endless love, affection, sacrifice, blessings and constant inspiration from Papa (Sh. Shiv Kumar Aggarwal) and Maa (Smt. Suman Aggarwal) have enabled me to reach the footsteps of my long cherished aspiration. My father in the first place is the person, who rose and fundament my learning character with a love of science and supported me in all my intellectual pursuits. My mother is the one who showed me the joy of intellectual pursuit since my childhood and whose care, love, teachings and support have brought me this far.

My vocabulary utterly fails in expressing my love and respects to my affectionate brother (Dipanshu Aggarwal) for his unstinted support during all the years of study.

No words are enough to express my heartiest gratitude to Ashutosh Mohan who has been the pillar of my strength, for having faith in me and encouraging me in all my endeavors.

I would like to thank everybody who was important to the successful realization of thesis, as well as expressing my apology that I could not mention personally one by one.

Thank you all.


**Date:**

**Place:** Kurukshtera (Jigyasa Aggarwal)