Acknowledgment

I feel exuberantly lucky, blessed and elated to have reached this stage of my doctoral research. From impulsive highs to sudden lows, stagnant sessions to rapid flows, from comfortable paces to anxious blows, this journey has altogether been a bumpy ride. Nearing the end, as I take a look back at the path I have been walking down all this while, memories flash by. This profound task could have never been possible to accomplish all by myself. There was, are a bunch of people who were always there to guide, help, motivate, encourage, enlighten and understand me. It is for these people that my work could cascade in the right direction.

With great reverence, I would like to express my sincerest gratitude to my mentor, Prof. Veena Garg, Professor, Department of Bioscience and Biotechnology, Banasthali University, Rajasthan; for her keen interest, admirable guidance, constructive suggestions, sincere criticism, sustained encouragement, moral support and valuable knowledge. It is often said, ‘Even a person with eyes will be able to see in darkness only with the help of a lamp’; ma’am has played the role of that lamp for me at all stages of the research. Besides, her painstaking supervision, the fact that she always lent a hearing ear to all the worries and problems hovering over me was very imbibing. There was always a lot to be learnt from her. Thank you so much ma’am for being there to support me through everything.

I would humbly like to offer my profound feeling of gratefulness to Prof. Aditya Shastri, Vice Chancellor, Banasthali University, Rajasthan, for blessing me with the opportunity to work under the acreage of this esteemed university and utilizing its vital facilities which helped me not only to complete my doctoral research but also to display it at a large platform.

I owe my sincere thanks to Prof. Vinay Sharma, the Head and Dean of Department of Bioscience and Biotechnology, for his support and providing all possible facilities for carrying out my research work.

I must specially thank Dr. Rajeev Garg for his paternal concern added a glitter to my confidence. His encouraging attitude always overwhelmed me with motivation.

I cordially thank my special thanks to botanist Dr. Ishwar Singh, Associate Professor, Agricultural Research Institute, Mandore, Jodhpur, Rajasthan for helping me with the collection and identification of plant.

I would also like to submit my token of gratitude to Prof. Dharam Kishore, Secretary, Banasthali University, Rajasthan; Dr. Jaya Dwivedi, HOD of Department of Chemistry, Banasthali University, Rajasthan; Prof. Sarvesh Paliwal, HOD of Department of Pharmacy and Dr. Swapnil Sharma, Banasthali University, Rajasthan; for the
permission to work in their premises, use instruments and help whenever I sought guidance.

My sincere thanks to Gargi Tyagi ma’am, Department of Mathematics, Banasthali University, Rajasthan for helping me with statistical tools.

I am also extremely thankful to entire staff of the Department of Bioscience and Biotechnology, Banasthali University, Rajasthan; especially Jain sir, Raju sir, Soni sir, Anil sir, Kuldeep sir, Chowdhary sir, Amit sir, Kiranshanti ma’am, Shivcharan sir, Surender sir, Raju bhaiya, Jeetender bhaiya, Bansi bhaiya, Giriraj bhaiya, Raheem bhaiya, Behru bhaiya, Lakman bhaiya, Surender bhaiya; Lallu bhaiya (Department of Chemistry, Banasthali University, Rajasthan); Amit sir and Lalit sir (Department of Mathematics, Banasthali University, Rajasthan); Kavi sir (Rajasthan University, Jaipur) and Avtar sir (Panjab University, Chandigarh) for their never ending help and cooperation without which my investigation work could not have been complete.

I would extend my heartfelt thanks to my seniors Dr. Nidhi Sharma, Dr Sunanda Singh, Dr. Deepak Yadav, Dr. Sheetal Gupta, Dr. Rachna Jain, Dr. Nidhi Mishra, Dr Pracheta, Dr. Ritu Paliwal, Dr. Anupama Sharma and Dr. Nidhi Mahendru for their constructive guidance.

A sisterly concern along with academic excellence in the lab environment extended to me by Dr. Annu Yadav was surely very overwhelming. The completion of my work without her was unthinkable.

‘A friend in need is a friend indeed’. I would like to express my heartiest gratitude to Dr. Anu Jalpot, Pankaj Samuel, Dr. Harsimran Siddhu, Dr. Shivanki Aggarwal, Dr. Sonia Saklani for being there whenever the hour of need struck.

Sharing reduces grief and aggravates happiness. This is what I realized all this while with Dr. Swaati Sharma, I definitely cannot amiss thanking her more for always being there.

Thanks is just a small word for my friends Dr. Rashmi Gupta, Dr. Manu Singh, Dr. Deepti Arya and Dr. Swati Upveja who always endured for making the unfavorable conditions favorable by sticking around.

‘Appreciation and recognition by people of noble character instills into one, a belief in one’s own good qualities’. Besides the academic front I am blessed with a handful of close friends and a bunch full of family members who left no effort un-appreciated, no achievement uncelebrated.

First and foremost, with great love and respect I would like to thank my grandparents Shri C.D. Verma ji, Shri M.L. Verma ji, Shri Satyavan Dhupper ji, Shri K.K Verma ji for
always believing in me that I could accomplish just any task, appreciating and motivating me in all spheres of my life. I would also like to mention late, Smt. Satya Verma ji and late Smt. Sheelvanti Verma ji my grandmas who would have been extremely happy on the completion of my work.

With pleasure I would express my deep sense of regards to my aunt Dr. Renu Dhupper, Associate Professor, Amity University, Noida for being a fountainhead of inspiration that instilled me to endeavor this herculean task.

My passionate thanks to my uncles Dr Ravinder Kumar, Er. DP Sahdev, Dr. Y P Verma, Grp. Capt. Rajive Sharma, Dr. Maneesh Dhupper and brothers Mr. Sanjay Gogna, Er. Sumit Sahdev who stood by me rock solid through all the stages.

I feel immensely happy to express my love and affection in acknowledging my cousins, Nishtha, Nikita, Suraj, Yatharth, Kunal, Garima bhabi, Tushar chachu and my friends Amarjot, Nobel, Shweta, for their valuable presence near or far in pacifying, appreciating, boosting and believing in me.

I would like to specially thank my brother Nikhil Verma without whose support my work would stand incomplete. The love and positivity he exuded. Whenever I was tired from my work his benign company enlivened the environment. With his articulate talks he helped me refresh my mind to excel further in work making me happy.

Where emotions are involved words cease to mean; words don’t seem adequate to express my deepest feeling for the effable love, care, affection, concern and support rendered by my parents Dr. Rajni Verma and Dr. Vineet Verma. Above all, I am indebted to them for immutable source of inspiration and strength to undertake and successfully complete this doctoral study. I am proud to have them to be my parents and there are only feelings to honorably pay my regards to them for their seamless perspiration, encouragement, moral support and univocal help have overwhelmed me. A big, big thanks to them from the bottom of my heart for the care and friendship they share with me.

I am sure there aren’t enough words to evoke my unfettered joie de vivre for what you all have done for me.

Last but not the least, my humble and absolute obeisance to the Almighty for all the blessings that he has showered upon me. Thank you for keeping me in your halo.

Dated: Nitika Verma