

ACKNOWLEDGEMENTS

Thanks's giving is a pleasure job, but it is nonetheless difficult when one sincerely tries to put it in words. These humble words, expression and gratitude cannot really convey the deep feelings of the heart.

The satisfaction that accompnies the successful completion of any task would be incomplete without mention of the people who made it possible with constant guidance, support and encouragement that crows all effort with success.

*At this moment of accomplishment, first of all I consider it as great privilege to express my heartfelt gratitude and my sincere thanks to my esteemed supervisor **Dr. Raj Kumar Salar**, Professor, Department of Biotechnology, Chaudhary Devi Lal University, Sirsa. Mere word cannot express the extent of gratitude I owe to my co-supervisor, **Dr. Subhash Kajla** , Senior Scientific Officer I,Center for Plant Biotechnology,Hisar. This work would not have been possible without his guidance, support and constant encouragement. He has inspired me in many ways, and I have learned from his attention to detail, his focus on quality of research, writing, and ability to tackle immense problems scientifically. Under his guidance, I successfully overcame many difficulties and learned a lot. His unflinching courage and conviction will always inspire me, and I hope to continue to work with his noble thoughts.*

*I take this golden oppurtunity to express my heartfelt gratitude and respect for **Prof. S.K. Gahlawat, Prof. Priyanka Siwach, Dr. Joginder Singh Duhan and Dr. Suresh Kumar** Department of Biotechnology, Chaudhary Devi Lal University, Sirsa, for their constant valuable dedicated guidance, endless encouragement, inspiration and support throughout my research work.*

*I wish to express my heartfelt thanks to **Department of Biotechnology, Chaudhary Devi Lal University, Sirsa**. It has been a great experience to be part of this Department. My acknowledgement also goes to **Mr. Sunil** and other office staff of Department of Biotechnology for their friendly nature and for their timely help.*

*I would also like to thank specially **Megha, Sheetal, Amit , Ravinder and Dr.Naresh Kumar** as my good friends were always willing to help and give their best suggestions. They spent their time and shared their knowledge for helping me to complete my thesis with the best possible results. My research would not have been possible without their help and support.*

*I would also like to thank specially **Mr. Anil Poonia** and other staff members from Centre for Plant Biotechnology, for their help and time to complete my thesis.*

*I am forever grateful to my family, especially my my mother **Smt. Balesh Panwar** , my sister **Shikha Panwar** , my husband **Mr. Ankit Dev** for their encouragement and love that served as a source of inspiration, strength at each and every front of my life to transport my dreams in to reality. My heartfelt thanks to father- in-law Mr. Devendra and mother-in-law Mrs. Bimlesh .*

Last but not the least; I would like to thank all my friends and well-wishers for their moral support and encouragement during my study. It would not have been possible to write this thesis without the help and support of the kind people around me, to whom it is possible to give particular mention here. It is a pleasant task to express my thanks to all those who contributed in many ways to the success of this study and made it an unforgettable experience for me.

Date:

Place: Sirsa

(Swati Panwar)



Dedication

I wish to dedicate this thesis to my Late Father Sh. Sushil Kumar Panwar. He taught me that discipline and knowledge are the bridge between goals and accomplishment. He was the constant source of positivity in my life. Although he is not here to give me strength and support but his blessing constantly enlighten my journey to walk along.

I always feel his presence that motivates me to achieve my goals in life.

