## <u>Acknowledgments</u>

The journey of Ph. D. is long and eventful for which there is a contribution of many people that I would to like acknowledge for their goodwill, assistance, and encouragement. I could not able to complete this journey without them. Today, I grab an opportunity to express my gratitude for all those people who have directly or indirectly helped me to achieve this goal.

First and foremost, I owe a deep sense of gratitude to **Prof. G. Archana**, my Research Guide, and present Head of the Department of Microbiology and Biotechnology Centre for giving me an opportunity to work on the Geomicrobiological aspect, entering into the Ph.D. (Research) world and also for her amiable guidance, sagacity and motivation. It couldn't be possible to accomplish the journey of Ph. D. without her continuous encouragement and suggestions throughout the research work. She gave me a free working environment and build up my scientific carrier. Despite her busy schedule she is ready to give time for scientific discussion and helped me to develop my skills as a professional researcher. The whole experience was wonderful, I have learned a passion for discovering and researching from this journey.

I express my sincere gratitude to Prof. T. Bagchi, the former Head of the Department of Microbiology and Biotechnology Centre to for selecting me as a part of this department during my Master's degree and for giving me the necessary permission to carry out the research work in the beginning.

It is also a matter of great pleasure for me to express my sincere regards to **Prof. D. M. Maurya** for his valuable help in site selection, the drilling process of sample collection, further to carried out subsampling according to lithology (Stratigraphic sequences) and for data discussion. I valued my conversations and scientific discussion I had with Sir. These discussions help me a lot to understand the Geological aspects. I also thank sir for pushing me toward the end of this journey.

I express my thanks to **Prof. L. S. Chamyal,** Head, Department of Geology, for his motivation, for being a member of my Doctoral Advisory Committee, and also for giving valuable suggestions during the annual presentations.

I express my special thanks to **Dr. Anupam Sharma,** Scientist F, Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow for his valuable guidance to understand the geochemistry of sediment, permitted me to carry out work at the

Geochemistry Lab of BSIP. I thank Sir also for arranging accommodation in the BSIP guest house whenever I went there for work or scientific discussion.

I would like to thank **Prof. G. Naresh Kumar** for his help and support whenever needed, for being a member of my Doctoral Advisory Committee, and also for giving valuable suggestions during the annual presentations. His in-depth knowledge always inspired me to dwell deeper into the subject of research.

I express my deeps sense of gratitude to all teaching members of the department for their help in various ways during the tenure of the present investigation. My Special thanks to **Prof. Anuradha Nerurkar** for advising me to apply for a travel grant to attend an international conference, for being a member of my Doctoral Advisory Committee, for giving valuable suggestions and affectionate cooperation. I also thank Dr. Nandita Baxi, Dr. Pushpendra Singh, Dr. Pranav Vyas, and Prof. Sanjay Ingle for their timely support and for extending help as and when required.

I express my sincere gratitude to Dr. Prasanna Aiyer, for teaching me a basic concept of Microbiology during my B.Sc. days, also for her inspiration, affection, and unflinching encouragement.

I also acknowledge Dr. Vinod R. Rao (Collector of Vadodara district during tenure of 25-09-2014 to 24-02-2015) for permitting core drilling.

I am pleased to express my thankfulness and sincere gratitude to Mr. Shirish Nagarkar for assistance in all office work and Ms. Aparna Shirshat for the incredible support. I thank Nirmal Mandwekar sir and Bharat Talati sir for providing needed chemicals and consumables available in the store, Praveen sir and Seema ma'am for providing distilled water and glassware. I thank Harsukh sir for his valuable support. I should not forget to thank Jayesh Bhai, Nîlesh Bhai, Chiman Bhai, and Pradeep Bhai who had play role in maintaining the cleanness of the lab. I also express my gratitude to the university office staff and Faculty office staff for timely support in administrative work.

I sincerely acknowledge the invaluable help, assistance, and cooperation extended by Ms. Shazi Farooqui (Ph. D. student and Project fellow at BSIP). We discussed lots of basic theories related to the present work. I also thank her for taking care and help me in arranging lunch and dinner, giving me good company whenever I was at Lucknow. I extend my thanks to Dr. Biswajeet Thakur (Scientist 'D', BSIP) and Dr. Kamlesh Kumar (Scientist 'C', BSIP) for their valuable suggestions and timely support whenever needed.

I thank Mr. Abhishek Kumar (Ph. D. student at Department of Geology, MSU) for helping me in particle size analysis of samples that were used for microcosm study, Mr. Sanjay R. Makwana, Shri. Ramesh M. Parmar and Shri. Dinesh R. Rana (Lab Attenders at Department of Geology, MSU) for assisting in subsampling work and for preparing tea or coffee during the time of subsampling work. I am thankful to Ms. Naimisha Vanik for helping me to prepare cross-sections and lithologs.

I am indebted to my lab members (RL-2 Family) Dr. Vihang Thite (senior-most person of my lab) for helping me in statistical analysis and learning various software, Ms. Mansi Agrawal (MA) for homemade jalebi, kheer, and other sweets. Mr. Mihir Sarang for discussing basic concept of physics theory, Ms. Swati Telang for homemade sev-usal and Vada pav party, Ms. Roshni Patel (junior-most person of the lab) for discussing lab work and sharing each and every basic stuff during tea time, helping me in thesis correction. I always recalled my initial working days when I talk with her. I also thank new members (Ms. Shivani Rawal and Mr. Ajinkya Thakre) of RL-2.

I am thankful to **Ms. Siddhi Vora** for frequently asking me "Tare haji ketlu work baki che ane ketlu thayu?" and reminding me oh! Still, I have to do all that things... I also extend thanks to Mr. Jeetendra Gosai, Ms. Jaswinder Saini Dr. Sweta Talreja, Ms. Reshma Shaikh, MS. Yessasvini Manchiraju, Ms. Juliya Thomas, Mr. Anand Dave, Ms. Shubhangi Pandey, Ms. Khyati Mehta, and all other research scholars of the department for their moral support and precious help throughout my research work.

My special gratitude to my seniors Dr. Gangavarapu Subrahmayam, Dr. Ruchi Chaturvedi, Dr. Murali Sharaff, Dr. Priya Pillai, Dr. Rakesh Sharma (post-doctoral fellow) for their help, constructive suggestions.

I would like to thank Vaibhav Kayasth and Bhavesh Sharma (M.Sc. Dissertation student of Geology department, MSU) for helping me in the labeling, packaging of pipes during the drilling process and also helping me in pipe cutting and subsampling. I enjoyed their company during my fieldwork.

I am fortunate to have such good M.Sc. dissertation students (students of Department of Microbiology and Biotechnology Centre, MSU) as Sarita Giri, Parwat Singh Shekhawat, Priya Paithankar (Gossip queen), Akangkshya Borkotoky, and Priyank Chavda. M. Sc. students are younger people of this department and provide an energetic working atmosphere in the lab. I thank all of them. I also thank B.Sc. trainee student Shiksha Sharma.

Friends are like a pillar of strength, through all the phases of this journey. I am thankful to my friends, **Dr. Janki Patel (friend and senior)**, Sanket, Nidhi, Vinita-Binita (twin sisters), Dharmesh Sherathia for their ever-encouraging support, co-operation, being around me to cheer up, and their inspiration.

The financial assistance and fellowship provided by the **Department of Science & Technology - Science and Engineering Research Board** (DST-SERB), New Delhi is gratefully acknowledged.

Life is nothing without parents. I have no words to express my thanks to my father Mr. Parimalkumar N. Shah for his affection, inspiration, and moral support, and my mother Ms. Diptiben P. Shah for her incredible love and for doing whatever she could do best in taking care of mine. Without their blessings, the present investigation was not possible. Both of them understand the value of education and allow me to do a Ph.D. irrespective of social beliefs. I express my deeps sense of gratitude to my grandmother Ms. Suryaben N. Shah (Late) for her encouragement and motivation. She is the strongest woman of my life that I came across till day. She always taught me to be strong and independent. Having a sibling is also a matter of great luck. I thank my younger brother Milan for the midnight chit-chat, mid-night food party, giving me company in reading, writing, also for entreating and teasing me whenever I am frustrated or tired.

Last but not least I would like to thank the **Almighty God** for blessing me with strength, health, intelligence, and patience to carry out constant work throughout this journey.

I would like to apologize to people who may have been left in acknowledgment. Thanks to all those who have helped me in all small and big possible manners during this journey.

(Abhí P. Shah)