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I, **Ankita Rani**, declare that the thesis entitled “**BIO-REMEDIATION OF MONOCROTOPHOS PESTICIDES BY ACTINOBACTERIA**” is my own work conducted under the supervision of Dr. Sanjay Gupta and Dr. Abhishek Mathur at Himalayan School of Biosciences, Swami Rama Himalayan University, approved by D.R.C.

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by Ankita Rani

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Submission ID: 2235802730

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**“BIO-REMEDIATION OF
MONOCROTOPHOS PESTICIDES BY
ACTINOBACTERIA”**



**Thesis Submitted in Partial Fulfillment of The Award
Of Degree of Doctor of Philosophy
In The Faculty of Biotechnology**

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**"BIO-REMEDIATION OF MONOCROTOPHOS
PESTICIDES BY ACTINOBACTERIA"**

Submitted by

Ankita Rani

For the degree of

Doctor of Philosophy in the faculty of

Biotechnology

is evaluated and approved by

CO-SUPERVISOR

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Undertaking for submission of Ph. D. thesis

I solemnly declare that research work presented in the thesis titled "**BIO-REMEDICATION OF MONOCROTOPHOS PESTICIDES BY ACTINOBACTERIA**" is solely my research work with no significant contribution from any other person. Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me.

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ACKNOWLEDGEMENT

First and foremost, I thank God Almighty for granting me the strength, knowledge, ability and opportunity to undertake this research study and to persevere and complete it satisfactorily. Without His blessings, this achievement would not have been possible.

I would like to express my sincere gratitude to my Supervisor, Dr. Sanjay Gupta, for his invaluable guidance, support, and encouragement throughout my PhD journey. His immense knowledge and plentiful experience have been instrumental in shaping my research skills and this thesis. I am incredibly grateful for the countless hours he spent discussing my research, reviewing my work, and providing constructive feedback that helped improve the quality of this thesis.

I am very grateful to my co-advisor, Dr. Abhishek Mathur, for his insightful comments and suggestions. His questions and critiques compelled me to think more deeply about my research and approach it from different perspectives. I am thankful for his thought-provoking inputs that broadened my horizons.

I thank my research committee members for taking the time to read my thesis and provide valuable feedback. I am grateful for their interest in my research and their perceptive questions during my defence that enhanced the strength of this work.

I would also like to acknowledge the Department of Biosciences, Swami Rama Himalayan University, for providing the resources and facilities that supported my PhD study and research.

My profound thanks to my Prof. (Dr.) Rattandeep Singh for his vital guidance and assistance during my thesis work's final critical stages. His domain expertise and steadfast direction were instrumental in enabling me to complete this milestone.

Finally, I express my heartfelt gratitude to my lovely family, my parents, Mr Ajay Shrivastav & Mrs Ajeeta Shrivastav, Mr Anjani Shrivastav & Mrs Anju Shrivastav, my Grandparents for their blessing, love, patience and support.

I am incredibly grateful to my elder brother, Abhinav Shrivastav, for his constant love and care. Thank you for selflessly managing my financial requirements. Your help in navigating the banking paperwork allowed me to focus on my academics. I fondly recall your heartwarming welcome each time I returned home, receiving me at the airport with a cheerful smile. I am blessed to have a sibling bond as special as ours. I would also like to thank my mentor sincerely, Dr. Ranjeet Mehta. Your wisdom and insights have shaped me tremendously. You taught me to think critically and guided me to become the person I am today. I am deeply grateful for your mentorship.

My dear friend Usha Rani, I cannot thank you enough for your friendship over the years. We have shared so many memories, and you have never failed to make me

laugh and lift my spirits when I was feeling low. Thank you for always being by my side.

Last but not least, I extend my heartfelt thanks to my dear friend Akshay Pandita for his emotional support and motivation, especially in the initial days of my PhD. He encouraged me to pursue this path, and I will always be grateful for his belief in me. I also want to thank my childhood friend Akash Sharma for his invaluable help in compiling my thesis. As an engineer, he assisted me tremendously when I struggled with the basics of using a computer. His support made the thesis writing process much smoother. Thank you, Akshay and Akash, for being true friends and always being there when I needed you.

Once again, I thank all of you from the bottom of my heart. This journey would not have been possible without your love and support. I am truly blessed to have you all in my life.

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LIST OF ABBREVIATIONS

S.no.	Abbreviations	Full form
1.	AL-KAO	Alginate-Kaolin
2.	Amp ^R	Ampicillin Resistance
3.	oC	Degree Celcius
4.	CAS	Chrome azurol sulphonate
5.	CB	Carbamate
6.	CC-CMC	Calcium Carbonate and CMC (Carboxymethyl cellulose)
7.	Ch1	Specific channel(1)
8.	CFU	Colony Forming Units
9.	DNA	Deoxyribonucleic Acid
10.	E. coli	Escherichia coli
11.	Etc.	Et Cetera

12.	FAO	Food and Agriculture Organization
13.	FLO-KAO	Flour-Kaolin
14.	G+C	Guanine and Cytosine content
15.	GDP	Gross Development Product
16.	HCN	Hydrogen Cyanide
17.	HPLC	High-Performance Liquid Chromatography
18.	IAA	Indole Acetic Acid
19.	ISP2	Extract-Malt Extract Agar
20.	ISP3	Oatmeal Agar
21.	ISP4	Inorganic Salts-Starch Agar
22.	ISP5	Glycerol-Asparagine Agar
23.	LB	Luria Bertani
24.	MCP	Monocrotophos pesticides
25.	ml	Milliliter

26.	mm	Millimeter
27.	MSM	Mineral salt media
28.	mRNA	messenger Ribonucleic Acid
29.	nm	nanometers
30.	OC	Organochlorine
31.	OP	Organophosphorus
32.	opd	Gene encoding PTE and OPH enzyme
33.	OPH	Organophosphorus hydrolase
34.	ori	Origin of replication
35.	PAHs	Polycyclic Aromatic Hydrocarbons
36.		
37.	pBR322	A commonly used bacterial plasmid in genetic engineering.
38.	PCR	Polymerase Chain Reaction

39.	PGPR	Plant Growth Promoting Rhizobacteria
40.	PTE	Phosphodiesterase
41.	Q1	Quarters 1
42.	Q2	Quarters 2
43.	Q3	Quarters 3
44.	Q4	Quarters 4
45.	rDNA	Recombinant DNA
46.	RE (BamHI, Sal I, Hind III, Pvu I, Pst I)	Restriction enzymes (or restriction endonucleases
47.	rop	Repressor of primer
48.	rRNA	ribosomal RNA
49.	RT	Retention Time
50.	RSM	Response Surface Methodology
51.	SPSS	Statistical Package for the Social Sciences

52.	Tet ^R	Tetracycline Resistance
53.	TLC	Thin Layer Chromatography
54.	WHO	World Health Organization
55.	YIM6	A type of starch-casein agar medium
56.	μg	Micrograms