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*Dedicated to my  
Mother*

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\*Om Namah Shivay\*

## DECLARATION BY THE CANDIDATE

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I do hereby declare that the thesis entitled, “**Assessment of Zn Based Metallic Nanomaterials for Environmental Application: Evaluating the Significance of Green-Synthetic Routes**” being submitted to the Department of Environmental Science, Tezpur University, in partial fulfillment for the award of the degree of **Doctor of Philosophy in Environmental Science**, is a record of original research work carried out by me under the supervisions of **Dr. Satya Sundar Bhattacharya** and **Dr. Nayanmoni Gogoi**. All help received by me from various sources has been duly acknowledged. I also declare that neither this work as a whole nor a part of it has been submitted to any other university, institute, or other organizations for any other degree, diploma, or award.

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All help received by her from various sources has been duly acknowledged.

No part of this thesis has been submitted elsewhere for award of any other degree.

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All help received by her from various sources has been duly acknowledged.

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## List of Abbreviations

MNP	Monometallic Nanoparticles
BNP	Bimetallic Nanoparticles
QMNP	Quadrimetallic Nanoparticles
G	Gentamycin
DPPH	2,2-Diphenyl-1-Picrylhydrazyl
ALE	Aqueous Leaf Extract
TPC	Total Phenolic Content
IC <sub>50</sub>	Inhibitory Concentration 50
MDA	Malondialdehyde
LPO	Lipid PerOxidation
FTIR	Fourier Transform InfraRed Spectroscopy
VC	VermiCompost
BET	Brunneur-Emmett-Teller
FE-SEM	Field Emission Scanning Electron Microscope
TEM	Transmission Electron Microscope
DAS	Days after sowing
C	Carbon
RBD	Randomized block design
SOC	Soil organic carbon
CFU	Colony forming units
FYM	Farmyard Manure
TCA	Trichloro acetic acid
P	Phosphorus
N	Nitrogen
ICP-OES	Inductively Coupled Plasma Optical Emission Spectrometry
POD	Peroxidase
SOD	Superoxide dismutase
ANOVA	Analysis of variance