

# **Abiotic Stress Response and Flavonoid Biosynthetic Pathway in Rice: Role of the Transcription Factor, C1-MYB, in Gene Expression**

A thesis submitted for the degree of  
*DOCTOR OF PHILOSOPHY*

**By**  
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## CERTIFICATE

This is to certify that **Nagabhushana Ithal** has carried out the research work embodied in the present thesis entitled "*Abiotic Stress Response and Flavonoid Biosynthetic Pathway in Rice: Role of the Transcription Factor, Cl-MYB, in Gene Expression*" for the degree of **Doctor of Philosophy** under my supervision in the Department of Plant Sciences, School of Life Sciences, University of Hyderabad.

This work has not been submitted for the award of any degree or diploma of any other University or Institute.

A handwritten signature in black ink, appearing to read 'A Reddy'.

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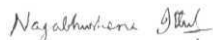
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## DECLARATION

I hereby declare that the work presented in this thesis entitled "*Abiotic Stress Response and Flavonoid Biosynthetic Pathway in Rice: Role of the Transcription Factor, Cl-MYB, in Gene Expression*" has been carried out by me under the supervision of **Prof. Arjula Ramachandra Reddy** in the Department of Plant Sciences, School of Life Sciences, University of Hyderabad, Hyderabad- 500 046, and that this work has not been submitted for any degree or diploma of any other University or Institute. All the assistance and help received during the course of the investigation have been duly acknowledged.



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## Abbreviations

ABA	Abscisic Acid
<i>Abi</i>	ABA Insensitive mutant
ABRC	ABA Responsive Complex
ABRE	ABA Responsive Element
ANS	Anthocyanidin Synthase
Apx	Ascorbate Peroxidase
bZIP	Basic Zipper protein
CBF	C-repeat Binding Factor
CE	Coupling Element
CHS	Chalcone Synthase
Cor	Cold Responsive
CRT	C-repeat
DFR	Dihydroflavonol Reductase
DRE	Dehydration Responsive Element
DREB	Dehydration Responsive Element Binding protein
EDTA	Ethylenediamine Tetra Acetic acid
ERD	Early Responsive to Dehydration
GA	Gibberellic Acid
GR	Glutathione Reductase
GST	Glutathione-S-transferase
HSP	Heat Shock Protein
<i>Lea</i>	Late Embryogenesis Abundant
LTRE	Low Temperature Responsive Element
MOPS	4-Morpholinepropanesulfonic acid
<i>npt</i>	Neomycin phospho transferase
PAGE	Poly Acrylamide Gel Electrophoresis
PAL	Phenylalanine Ammonia Lyase
PEG	Polyethylene Glycol
RD	Responsive to Desiccation
ROS	Reactive Oxygen Species
SOD	Superoxide Dismutase
TEMED	N,N,N,N (Tetramethyl) Aminomethyl ethylene Diamine
UFGT	UDP Flavonoid Glucosyl Transferase