Faculty of Science
Botany Department

Physiological Strategies for Improving Defense Mechanisms of Maize Plant (*Zea mays* L.)

By

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2008

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Thesis submitted for partial fulfillment of Master degree of Science in Botany (Physiology)

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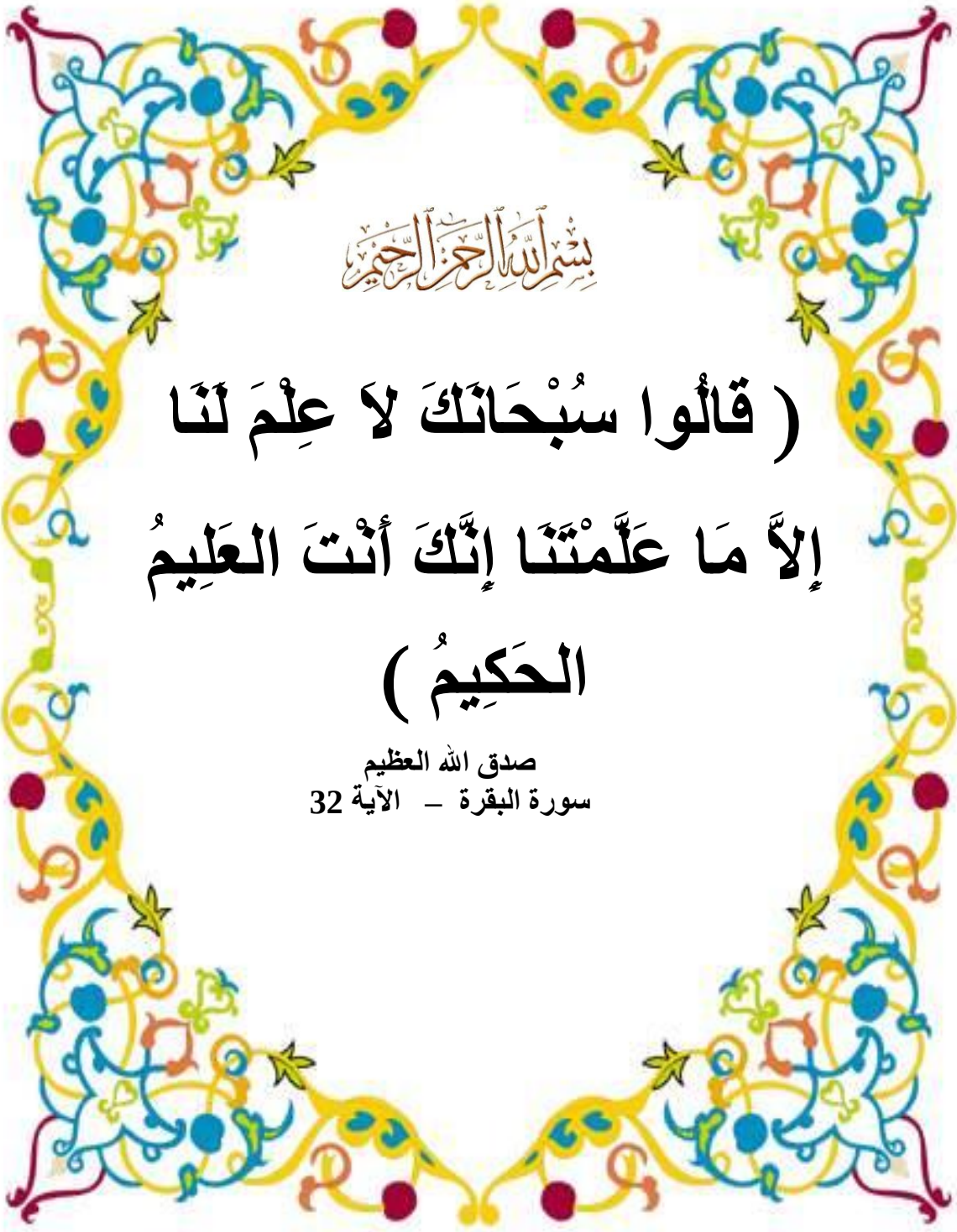

بسم الله الرحمن الرحيم

(قالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ العَلِيمُ الحَكِيمُ)

صدق الله العظيم

سورة البقرة – الآية 32

This thesis has not been previously submitted for any degree at this or any other University.

The references in the text will show specifically the extent to which I have availed myself of the work of other authors.

Abdelaziz Atef Abdelaziz Ramadan

To my lovely parents

And sisters

Abdelaziz Ramadan

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Abdelaziz Ramadan

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List of Abbreviations

12-OPDA : 12-oxophytodienoic acid

13HPL : Fatty acid 13-hydroperoxide lyase

13HPOT : Linolenic acid 13-hydroperoxide

ABA : Abscisic acid

ACC : 1-aminocyclopropane-1-carboxylic acid

Act1 : Actin1 (housekeeping gene)

ADH : Alcohol dehydrogenase

AOS : Allene oxide synthase

CHAT : Acetyl CoA-(Z)-3-hexen-1-ol acetyl transferase

COI1 : CORONATINE INSENSITIVE 1

CR : Control volatile-receiver plants

Cys-PI : Cystatin-like protease inhibitor

DMADP : Dimethylallyl diphosphate

DMNT : (E)-4,8-dimethyl-1,3,7-nonatriene

ET : Ethylene

FACs : Fatty acid amino acid conjugates

FDP : Farnesyl diphosphate

GDP : Geranyl diphosphate

GGDP : Geranylgeranyl diphosphate

GLVs : Green leaf volatiles

HAMPs : Herbivore associated molecular patterns

Hex- : hexenols

Hex-Ac : (Z)-3-hexen-1-yl acetate

Hex-Ac : hexenyl acetate

Hex-al : hexenals

HIPVs : Herbivore induced plant volatiles

HR : HIPV-receiver plants

IDP : isopentenyl diphosphate

IM : Inner membrane

JA : Jasmonic acid

JACs : Jasmonic acid amino acid conjugates

JA-Ile **:** Jasmonoyl isoleucine

JAR1 **:** JASMONATE RESISTANT 1

JAZ **:** Jasmonate ZIM domain protein

JMT **:** Jasmonic acid carboxyl methyltransferase

LOX **:** Lipoxygenase

LP **:** Lipase

MeJA **:** Methyl jasmonic acid

MEP pathway **:** 2-C-methyl-D-erythritol 4-phosphate pathway

MVA pathway **:** Mevalonic acid pathway

OM **:** Outer membranes

OPR **:** 12-oxophytodienoic acid reductase

OR : (*E*)-β-ocimene-receiver plants

PIs **:** proteinase inhibitors

PlOS **:** *Phaseolus lunatus* Ocimene synthase

PPO **:** polyphenoloxidase

SA **:** Salicyilic acid

SAR **:** Systemic acquired resistance