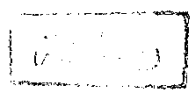
SOME GROWTH REGULATORS IN RELATION TO GERMINATION, GROWTH AND METABOLIC CHANGES IN TOMATO PLANTS AT DIFFERENT STAGES OF GROWTH

THESIS

Submitted for a Partial Fulfilment of the Degree of
MASTER OF SCIENCE
in
BOTANY (PLANT PHYSIOLOGY)



BY

SAMIA MOHEB HAFEZ EL-KHALLAL
B.Sc. in Botany (1986)

AIN SHAMS UNIVERSITY
FACULTY OF GIRLS
BOTANY DEPARTMENT

CAIRO

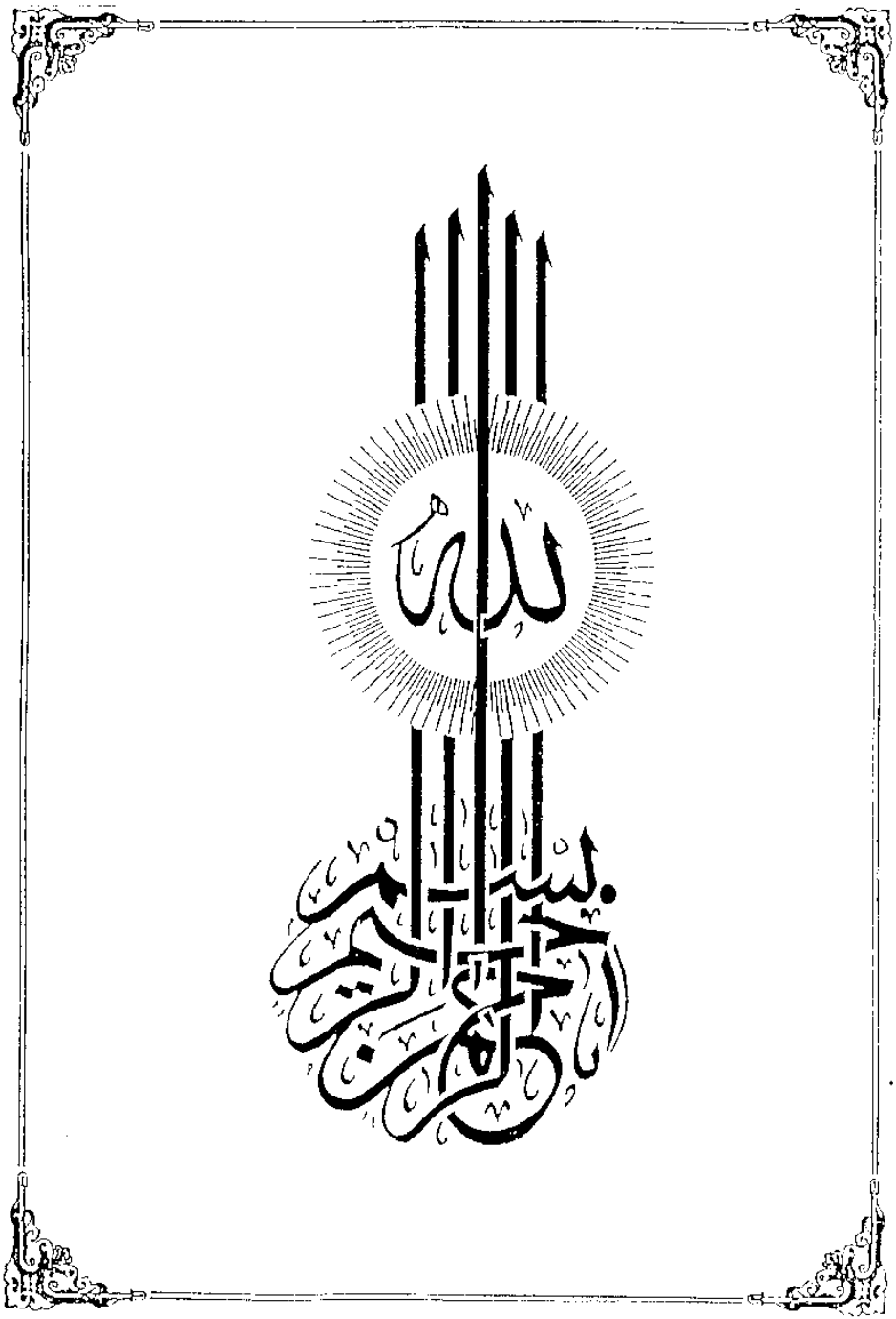
1991

بسم الله الرحمن الرحيم

« وما أوتيتم من العلم إلا قليلا »

صدق الله العظيم

(من سورة الأسراء)



APPROVAL SHEET

Name: SAMIA MOHEB HAFEZ EL-KHALLAL

Title: SOME GROWTH REGULATORS IN RELATION TO GERMINATION, GROWTH AND METABOLIC CHANGES IN TOMATO PLANTS AT DIFFERENT STAGES OF GROWTH

This thesis has been approved by:

Professor Dr. MAHMOUD A. NOSSEIR
Professor of Plant Physiology,
Faculty of Girls,
Ain Shams University

Assist. Professor Dr TAHANI A. HATHOUT
Assistant Professor of Plant Physiology,
Faculty of Girls,
Ain Shams University

Lecturer Dr. SOAD A. SHETAWI
Lecturer of Plant Physiology,
Faculty of Girls,
Ain Shams University

Head of Botany Department

Prof. Dr. AMAL SHEHAB

I grant my thesis to the spirit of my Father

Sincere thanks to my Mother, Brothers and Sisters

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Thank for my Merciful compassionate God for help in carrying out this work.

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Beside the work carried out in this thesis, the candidate has attended and passed successfully the following post graduate courses as a partial fulfilment of the requirements for the degree of Master of Science during the academic year 1987 - 1988:

1. Growth regulators.
2. Mineral nutrition
3. Enzymes.
4. Biochemistry
5. Nitrogen fixation.
6. Methodology.
7. Biostatistics.
8. English language.

Head of Botany Department

Prof. Dr. AMAL SHEHAB

"DECLARATION"

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

Signed
SAMIA M. HAFEZ

CONTENTS

AIM OF THE
WORK

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The present dissertation embodies studies on the effect of two growth regulator solutions namely Indole-acetic acid (IAA) and nicotinamide on some physiological aspects in tomato plants Indole-acetic acid belongs to phenyl acetic acid group while nicotinamide belongs to a sixth heterogenous group characterized with their biological effects.

Part I of this thesis deals with the study of the effects of different concentrations of IAA or nicotinamide on germination of tomato seeds throughout a test period of 12 days and on the growth of the seedlings at the end of that period.

Part II is devoted for the study of some morphological criteria, growth, metabolism and endogenous hormone contents of tomato seedlings supplied with different concentrations of IAA or nicotinamide via roots using sand cultures.

Part III of this work, however, is devoted for the study of some morphological criteria, growth, metabolism, flowering, fruiting and endogenous hormone contents of tomato plants at different ages supplied with different concentrations of IAA or nicotinamide via shoot spraying of plants grown in loamy clay soil.

Consequently the following introduction includes the available reviews that are related to the above mentioned aims.

INTRODUCTION

(I) EFFECT OF IAA OR NICOTINAMIDE CONCENTRATIONS ON THE RATE OF GERMINATION OF SEEDS UNDER DIFFERENT CONDITIONS

Trying to search for any plant to give more fruit production, we began from seed germination. Germination of seeds includes growth and development of the embryo. During germination the seed must absorb an adequate amount of water before it can germinate successfully. Seeds of different species or even of different varieties imbibe varied amounts of water for germination. The initial stages of water absorption is affected by imbibition of the colloidal hydrogels of the embryo. Later on the protoplasm of the embryo cells is transformed into hydrosol, the cells enlarge and become vacuolated. When the vacuoles are formed, the osmotic forces due to the presence of osmotically active substances in the sap began their role in the absorption of water. From this time onwards the plant cells get all their needs of water by imbibition as well as osmosis.

Among the factors restricting germination, growth and development of plants are the naturally produced growth regulators which might be stimulatory, inhibitory or can alter the physiological activities of plant organs. Indole-acetic acid (IAA) the well recognized nitrogen - containing growth regulating substance is subjected to a good deal of work. This growth regulator is certainly produced by oxidative deamination of the amino acid tryptophan, The yield of this auxin is always proportional to the amount of tryptophan present and also proportional to the extent