EFFECT OF SOME MICROELEMENTS AND BIOSTIMULATORS ON GROWTH AND CHEMICAL COMPOSITION OF *Dracaena surculosa* Lindley AND *Zamioculas zamiifolia* Engl. PLANTS

By

NADIA ALI ALI HASSAN KAMAL

B.Sc. Agric. Sci. (Ornamental Horticulture), Fac. Agric., Cairo Univ., 2012

THESIS
Submitted in Partial Fulfillment of
Requirements for the Degree of

MASTER OF SCIENCE

In

Agricultural Sciences
(Ornamental Horticulture)

Department of Ornamental Horticulture
Faculty of Agriculture
Cairo University
EGYPT

2018

APPROVAL SHEET

EFFECT OF SOME MICROELEMENTS AND BIOSTIMULATORS ON GROWTH AND CHEMICAL COMPOSITION OF *Dracaena surculosa* Lindley AND *Zamioculas zamiifolia* Engl. PLANTS.

M.Sc. Thesis
In
Agric. Sci. (Ornamental Horticulture)

By

NADIA ALI ALI HASSAN KAMAL

B.Sc. Agric. Sci. (Ornamental Horticulture), Fac. Agric., Cairo Univ., 2012

APPROVAL COMMITTEE

Dr. IBRAHIM EL-ABASERY HABBA ……..……
Researcher Professor of Ornamental Plants and Woody Trees ,NRC, Egypt .

Dr. ABDEL-GHAFOUR AWAD EL-SAYED…..……
Professor of Ornamental Horticulture, Fac. Agric., Cairo University

Dr. MOHAMED ABD EL-KHALEK EL-KHETEEB……
Professor of Ornamental Horticulture, Fac. Agric., Cairo University

Date: 17 / 7 / 2018

SUPERVISION SHEET

EFFECT OF SOME MICROELEMENTS AND BIOSTIMULATORS ON GROWTH AND CHEMICAL COMPOSITION OF *Dracaena surculosa* Lindley AND *Zamioculas zamiifolia* Engl. PLANTS.

M.Sc. Thesis
In
Agric. Sci. (Ornamental Horticulture)

By

NADIA ALI ALI HASSAN KAMAL

B.Sc. Agric. Sci. (Ornamental Horticulture), Fac. Agric., Cairo Univ., 2012

SUPERVISION COMMITTEE

Dr. MOHAMED ABD EL-KHALEK EL-KHETEEB
Professor of Ornamental Horticulture, Fac. Agric., Cairo University.

Dr. AMAl ABDO Mohamed NASR

Assistant Professor of Ornamental Horticulture, Fac. Agric., Cairo University.

DEDICATION

To all those without whom this thesis might not have been written. Great appreciation for their inspiration, supporting and patience.

*To my wonderful parents "and my brothers "**Hassan**" **Hussain ,** and to my best friend **Fatma**".*

ACKNOWLEDGEMENT

*Thanks to "**ALLAH**" the merciful and clement God for everything especially completing this work.*

*Deep gratitude and appreciation are due to **Dr. Mohamed Abd EL-Khalek EL-Khateeb**, Professor of Ornamental Horticulture, Fac. Agric., Cairo University, for his supervision, encouragement during the course of this study and his valuable guidance throughout this work.*

*Deep gratitude and appreciation are due to **Dr. Amal Abdo Mohamed Nasr** Assistant Professor of Ornamental Horticulture, Fac. Agric., Cairo University, for her supervision, encouragement during the course of this study .*

*Deep gratitude and appreciation are due to **Dr. Abou El Dahab Mohamed Abou El Dahab** god rest his soul Professor of Ornamental Horticulture, Fac. Agric., Cairo University, for his help.*

Name of Candidate : Nadia Ali Ali Hassan Kamal **Degree:** M.Sc.

Title of Thesis: Effect of Some Micro Elements and Biostimulators on Growth and Chemical Composition of *Dracaena surculosa* Lindley and *Zamioculcas zamiifolia* Engl. Plants

Supervisors: Dr. Mohamed Abd El-Khalek El-Khateeb
Dr. Amal Abdo Mohamed Nasr
Department: Ornamental Horticulture **Approval:** 17 / 7 / 2018

ABSTRACT

This study was carried out during , 2014/2015 and 2015/2016 at Ornamental Horticulture Depart., Fac. of Agric., Cairo Univ., to study the effect some micro-elements and bio stimulators on growth and chemical. composition of *Dracaena surculosa* Lindley. and *Zamioculcas zamiifolia,* Engl. The results of the three experiments can be summarized as follow:

1-**First Experiment**: Effect of effect some microelement treatments on *Dracaena surculosa* Lind. It was found treating plants with Zn, Mn and B increased significantly the length of plants and Mn at200 ppm.was the most effective. The low level of both Zn and Mn produced the thickest stems. All treatments increased the No. of shoots especially boron at 25 ppm. All treatments increased the shoot length .Spraying plants with Zn at 100 ppm ,Mn at 100 ppm and B at 25 ppm significantly increased the formation of leaves. Zn or Mn resulted the largest leaves. Mn and B produced the heaviest fresh leaves .Boron at 50 ppm and Mn at 100 ppm gave the longest roots. While, Zn at 100 ppm gave the highest No. of roots the plants treated with Mn (200 ppm) and Zn (100 ppm) contained the highest values of Chl-a and Chl-b., respectively. All treatments increased content of carbohydrates especially Zn and Mn at (200 ppm).The treatments of B at 50 ppm and Zn at100 ppm increased N- content in leaves. zinc at 200 ppm increased K and Zn-content in leaves.

2-**Second Experiment**: Effect of bio- stimulants on growth and chemical composition of *Dracaena surculosa* Lind. The obtained results that treating plants with algae at 5 g/l and fulvic acid at 5ml/l. were the most effective on increasing the plant height and stem diameter. Fulvic at 10ml/l resulted the highest No. of shoots. Treating plants with algae at 5g/l or chitosan at 1g/l increased significantly the shoot length and No. of leaves and leaf area. Chitosan at 1g/l produced the heaviest fresh and dry weights of leaves. All treatments promoted the root formation of plants. Algae at 10g/l and chitosan at 0.5g/l were the best treatments for root growth. Plants treated with chitosan at 0.5g/l contained the highest values of Chl-a, Chl-b and carotenoides .All treatments increased the content of carbohydrates in plant leaves especially fulvic acid at 10ml/l. The treatment with chitosan at 1g/l increased N-content. All treatments increased P- and K-content in the leaves of the Dracaena plants.

3-Third Experiment: Effect of some microelement, bio- stimulants on *Zamioculcas zamiifolia,* Engl. The results showed that treating plants with chitosan at 0.5g gave the tallest plants. zinc at 100 ppm produced the thickest tubers. Mn at 100 ppm gave the highest No. of tuberlets / plant. The combined treatment of EM 25ml/l + Mn 100ppm increased tuber length. Zinc at 100 ppm treatment significantly increased No. leaves / plant and Mn at100 ppm produced the highest No. of leaflets/plant, largest leaves and fresh and dry weights of leaves. All treatments promoted the root formation ,especially chitosan at 0.5g + Mn100ppm All treatments increased the contents of chlorophyll a, b. and plants treated with zinc 100 ppm or EM 25ml/l + Zn100ppm contained the highest values of Chl-a and Chl-b., respectively. The highest content of carbohydrates found in plant received EM 25ml/l. The most effective treatments in increasing N- in leaves were EM 25ml/l +Mn 100ppm and chitosan 0.5g. All treatments increased P and K-contents in the leaves.

Keywords: *Dracaena surculosa* Lindley, *Zamioculas zamiifolia* Engl **,** Bio-stimulants, Algae, Fulvic acid, Chitosan, Effective microorganisms (EM), Plant Quality.

CONTENTS