شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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HOSSAM MAGHRABY

GRAFTING AS MEANS FOR SALINITY ALLEVIATED ON TOMATO

By

HODA RAMADAN LOTFY

B.Sc. Agric. Sci. (Vegetable Crops), Fac. Agric., Cairo Univ., 2017

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

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APPROVAL SHEET

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Date: 24/5 /2021

SUPERVISION SHEET

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ABSTRACT

This study aims to determine the efficiency of grafting to improve growth and production of tomato ***(Solanum lycopersicum.)*** under salinity stress condition. A commercial tomato hybrid (cv. Bark) and eight wild tomato accessions were evaluated at molecular, physiological and agronomic levels. At the molecular level, two powerful gene-targeting marker systems (Conserved DNA-Derived Polymorphism; CDDP and Start Codon Targeted Polymorphism; SCoT) were employed. Besides, Bark cv. was grafted as a scion onto the roots of the four tomato genotypes as stocks. The rootstocks effect was evaluated by growing plants at two NaCl concentrations plus the control (0, 100, and 200 mM NaCl). Plant vegetative growth, fruit yield, fruit quality, and minerals content in leaves were determined. In addition, several antioxidants, hormones, and proline were evaluated to better understand of the physiological changes induced by salinity and grafting. Our results showed that grafting enhanced plant shoots and roots growth (plant height, number of branches, plant fresh weight, root length, and root fresh and dry weight), fruit yield (total yield, number and weight of fruits), fruit quality (Vitamin C, firmness, and total soluble solids) in Bark on most tested rootstocks. In conclusion, our consistent results from the three approaches (molecular, physiological and agronomical) revealed that the five genotypes (LA1995, LA2711, LA2485, LA3845, and Bark) were found to be grouped and exhibit better performance under salinity stress conditions. Furthermore, grafting could be a low-cost alternative method to improve salt tolerance in tomato sensitive genotypes.

Keywords: *Solanum lycopersicum*, plant hormones, NaCl, bioactive compounds.

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In the name of Allah most gracious, most mercifulIt, is nice for a person to set a goal in his life, and it is more beautiful for this goal to bear fruit, an ambition equal to an ambition.

Therefore, my professors ***Dr. MOHAMED MOHAMED ELMOGY,*** *Professor of Vegetable Crops, Faculty of Agriculture, Cairo University*

Dr. EMAD ABDELHAMEED, *Assistant Professor of Vegetable Crops, Fac. Agric., Cairo University*

and Dr. MOHAMED ATTIA OMAR , *Agriculture Research Center, Genetic Engineering Center deserve to be evacuated all the expressions of thanks and praise For their great guidance and push me in the right direction My best efforts were to help me complete this useful work and get the best results.*

I hope that my dear colleagues will benefit from this work.

In the end, I would like to thank my parents for their constant support and encouragement.

God grants success

LIST OF ABBREVIATIONS

Conserved DNA-Derived Polymorphism	(CDDP)
Start Codon Targeted Polymorphism	(SCoT)
Inter-simple sequence repeats	(ISSR)
Random amplified polymorphic DNA	(RAPD)
Ascorbate peroxidase	(APX)
Peroxidase	(POD)
Dehydro ascorbate reductase	(DHAR)
Principal component analysis	(PCA)
Ascorbic acid	(AA)
Total soluble solids	(TSS)
Gibberellic acid	(GA_3)
Super face drip irrigation	(SDI)
Glutathione peroxidase	(GPX)
Monodehydroascorbate reductase	(MDHAR)
Catalase enzyme	(CAT)
Unweighted pair group technique of the arithmetic averages	(UPGMA)
Interactive tree of life	(iTOL)
Millimolar	(mM)

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