TOLERANCE OF SOME OLIVE STRAINS TO SALINITY STRESS

By

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B.Sc .Agric. Sci.(Pomology), Fac. Agric., Cairo Univ., 1999
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THESIS

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APPROVAL SHEET

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Date: 29 / 08 /2018

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Tital of Thesis: Tolerance of Some Olive Strains to Salinity Stress
Supervisors: Dr. Mohamed Ahmed Fayek
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Dr. Emtithal Hassan El Sayed
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ABSTRACT

Potted experiment was conducted on transplants of five olive cultivars "Picual, Hamed, Arbiquena, Kalamata and Toffahi" besides four F1 hybrids "H61, H138, H107 and H69"to investigate the impact of salinity (6000& 9000 ppm and SAR-12) and possibility of alleviating salts hazarda through application of some recovering substances (magnetite, potassium silicate and kitasal). Results showed that, survival (%) and vegettive growth parameters (stem length & diameter, laterals&leaves numbers/ plant, leaf area, assimilation area/ plant and fresh & dry weight) were significantly varied depending on the studied salinity level, wherease; all parameters were significantly decreased as salt concentration increased. The physiological parameters revealed two confilected trends, whereas ossmotic potential was increased by salinity, but the reverse was found with transpiration rate. The chemical composition (leaf chlorophyll A & B, carotenoids, Cl, Na, K, Ca, N, P, total soluble sugars and proline) contents, showed two opposite trends i.e., (Cl, Na, Ca, total soluble sugars and proline) increased by salinity, while, the reverse was detected with (chlorophyll A & B, carotenoids, K, N and P). Meanwhile, hybrid 61 behaved as the highest salt tolerant genotype as compared with its relatively salt tolerant parents (Picual & Hamed cvs.), while; hybrid 69 recorded the lowest ones in both seasons. However, such salinity disorders were relatively allayed by any recovering treatments, wherease magnetite were the most effective followed by K-silicate while kitasal had the least effect. In addition, leaf blade thickness upper and lower epidermis and spongy tissues of the olive transplant clearly increased in plants received the high saline water (9000 ppm) compare to the control transplants irrigated with tap water. The highest increase due to saline treatment was recorded for H61 and the least for H69 compared to their maternal parents Hamed and Toffahi. Meanwhile, thickness of palisade tissue, midrib, xylem, phloem and fibers thickness clearly reduce as salinity treatment. However,the salt tolerant of olive genotypes under investigation could be identified by cultivar-specific ISSR markers. Some ISSR markers may be linked to salt tolerance. The TE primer revealed polymorphism in relation to the salt tolerance of the highest salt tolerant genotype (61 hybrid).

Keywords: Olive, genotypes, salt stress, magnetite, K-silicte, kitasal, anatomy, ISSR-PCR, salt tolerance.

DEDICATION

I dedicate this work to my husband for all the support he lovely offered during my post-graduate studies.

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