SELECTION OF DROUGHT TOLERANCE OLIVE PLANTS

By

ASMAA AHMED ABDEL FATTAH HUSSIEN

B.Sc. Agric. Sci. (Plant Production), Fac. Agric., Cairo Univ., Egypt, 2013

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

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In

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APPROVAL SHEET

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Date: 29/5/2018

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Title of Thesis: Selection of Drought Tolerance Olive plants

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Department: Pomology **Approval:** 29/5/2018

ABSTRACT

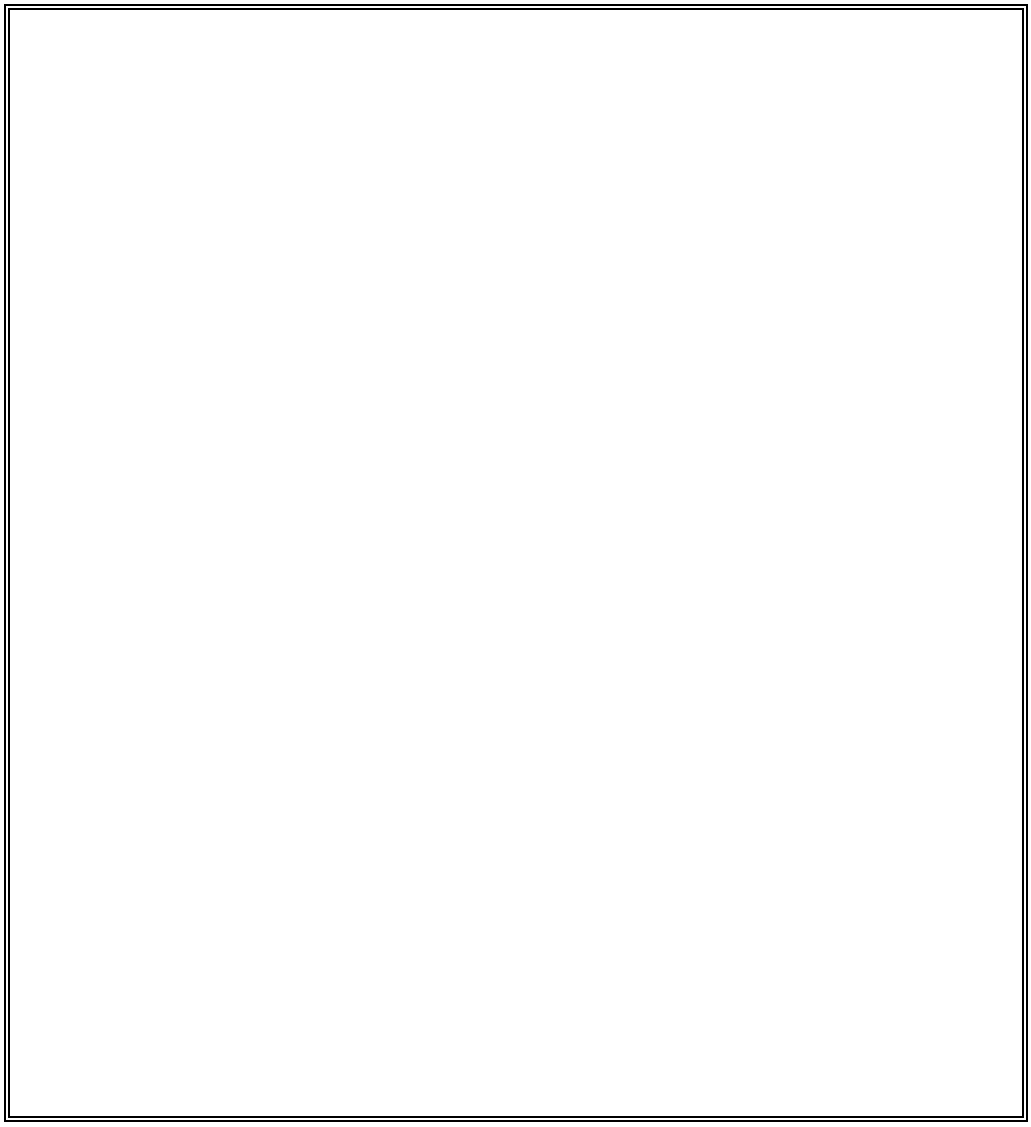
The current study was carried out to investigate the effect of low water potential generated by polyethylene glycol (PEG 6000) on growth of *in vitro* propagated 'Manzanillo' olive cultivar and to identify possible molecular markers for drought tolerance.

The response of 'Manzanillo' olive cultivar to *in vitro* multiplication was studied on Rugini olive and Murshige and Skoog media with three zeatin concentrations. Different levels of water stress were induced using four concentrations of PEG 6000 (0, 2.5, 5 and 7.5%).

The obtained results showed that nutrient media and zeatin concentrations have a slight effect on sprouting% of Manzanillo olive. Plants grown on OM medium recorded higher multiplication rate, leaves number/shoot and shoot length compared with MS media. There was an obvious difference between the used zeatin regarding the shoot length and leaves number/shoot. Plants grown on rooting media supplemented with IBA 2 mgL^{-1} recorded higher rooting percentage compared with rooting media supplemented with NAA 2 mgL^{-1} while the combination of the two auxins gave intermediate results.

Regarding water stress treatments; survival percentage decreased gradually with increasing PEG in growth media. The evaluation of growth reveals a significant reduction in plants length, shoot fresh weight, moisture percentage and chlorophyll pigments of drought stressed plants. Water stress increased defoliation percentage and leaves proline content. Protein profile in olive shoots has been changed under drought stress. Protein profile of stressed and non-stressed plants showed the presence of five protein types. Plant length, leaves number and defoliation percentage showed a high variation among the selected olive seeds (Manzanillo).

Key words: Olive, *in vitro* , Micropropagation, Water stress, Polyethylene glycol, Protein profile.



DEDICATION

I dedicate this work to my father, my mother, my husband, my son, sisters and brother for all the support they offered along the period of my life.

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