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Title of Thesis: Mycorhyzae and Rhizobacteria for Mitigating Salt Stress in Some Woody Trees.

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Department: Agricultural Microbiology. **Approval**: 18 / 7/2018

ABSTRACT

This study included the following points: The first one concerning isolation and identification of plant growth promoting rhizobacteria (PGPR). Twelve bacterial isolates were isolated from rhizosphere of taxodium seedlings. Data revealed that six isolates were cocci, three isolates were short rods, two isolates were long rods in chains and one was long rods. All isolates were Gram positive except one isolates was Gram negative bacteria. All isolates tolerate salinity up to 12000 ppm. IAA production in there isolates was ranged from 3.85 to 7.59 mg/L. Polysaccharides ranged from 0.1609 to 12.226 mg/L. The highest two producers were characterized as: G+ cocci; 7.165 mg/L IAA; 12.226 mg/L polysaccharides; followed by G- short rods, 7.592 mg/L IAA, 8.364 mg/L polysaccharides. The two isolates were identified using Biolog as *Kocuria varians* and *Enterobacter cloacae*, respectively. The second point two PGPR isolates were used with or without mycorrhiza to alleviate salt stress on seedlings of three woody tree species (*Taxodium deisticum*, *Khaya senegalensis* and *Balanites aegyptiaca*). Salinity levels were 0.0, 2000, 4000 and 8000 ppm. Data revealed that all *Balanites aegyptiaca* seedlings exposed to 8000 ppm of saline were dead while 25% were able to stilled alive at 4000 ppm when infected with mycorrhizae. Survival percentage of *Khaya senegalensis* and *Taxodium deisticum* seedlings were 69.45% and 54.76%, respectively under 8000 ppm salinity when inoculated with mycorrhizae. All growth parameters (i.e), plant height; number of leaves, fresh and dry weight was decreased by increasing salinity level. Chlorophyll content, sodium, potassium, chloride, nitrogen and phosphorus were also investigated.

Key words: salinity, PGPR, mycorrhiza, *Taxodium deisticum*, *Khaya senegalensis*، *Balanites aegyptiaca*.

ACKNOWLEDGEMENT

*Praise and thanks be to **ALLAH**, for assisting and directing me to the right way.*

*The authoress wishes to express her sincere thanks, deepest gratitude and appreciation to **Dr.Mohamed A. Ali,** Professor of Agricultural Microbiology, Faculty of Agricultur, Cairo University for suggesting the problem, his supervision, kind assistance, continuous guidance and encouragement throughout study. Without his assistance, none of this work would have been possible. My deep thanks to **Dr. Essam Mohamed Abdel Moaty,** Associate Professor of plant Physiology Faculty of Agriculture, Cairo University for his encouragement, support, sincere advices and helpful supervision. I also would like to express my thanks, deepest gratitude to **Dr. Essam Mostafa Abdel Kader,** researcher at Horticulture Research Institute. ARC, Giza.*

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