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Title of Thesis

Isolation And identification of endophytic bacteria and their role in salt stress amelioration in *Carthamus tinctorius*

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ABSTRACT

Eight halotolerant endophytic bacterial species were isolated from root, stem, and leaf of *carthamus tinctorius* (Safflower) plant. The eight isolates were selected according to further examination of their salt tolerance, and using 1-aminocyclopropane-1-carboxylic acid (ACC) as a sole nitrogen source. Two isolates from the total were able to utilize ACC as a sole nitrogen source and they were tested for (ACC) deaminase activity. The bacterial isolates were characterized and identified using 16S ribosomal DNA technique as *Bacillus cereus* and *Bacillus aerius*. This study suggested that the bacterial strains *B. cereus* (LB1) and *B. aerius* (SB1) are valuable biological plant growth promoters that could enhance salt tolerance in safflower plants under 100, 200, and 300 mmol l⁻¹ NaCl levels resulting in an increase in plant growth and chemical composition, in comparison with the non-inoculated controls. Seedling irrigated with different concentrations of NaCl showed significant decreases fresh and dry weight compared to the control. In our studies the used bacterial strains have the ability to achieve systemic tolerance via production of ACC (1-amino cyclopropane-1-carboxylase) deaminase which has the ability to reduce the production of stress hormone ethylene. Our findings reported that the co-inoculation the seeds by endophytic bacteria alleviated the harmful effects of salt stress, promoted plant growth and biomass yield.