

Evaluation of salt tolerance in selected Qatari halophytes at the two initial growth stages

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ABSTRACT

Scarcity of water and availability of land for agricultural production are the most environmental issues that facing the (GCC) countries and Qatar one of them. Qatar lies in region which characterized by having high evaporation rate and minimum rate of precipitation, so the salt built on the soil in relatively high concentration. The natural vegetation of Qatar is scarce, scattered and limited to certain areas. Halophytes could play a major role to minimize adverse environmental impacts, such as global warming and the enhancement of primary productivity. The present study is kind of the first in screening for local halophytes to quantify their level of tolerance to saline environment. The outcome of this research is expected to serve future research in investigating halophyte economical values and their utilization of the salt effected lands in coastal and in inland areas of Qatar. Seven treatment levels of different concentrations of NaCl including the control treatment (0, 50, 100, 200, 400, 600 and 800 mM NaCl) were used to evaluate both seed germination stage and seedling growth of selected Qatari halophytes. Eight halophyte species were selected for the seed germination experiment those are: *Salsola setifera*, *Halopeplis perfoliata*, *Caroxylon imbricatum*, *Suaeda aegyptiaca*, *Acacia tortilis*, *Limonium axillare*, *Tetraena qatariensis* and *Aeluropus lagopoides*. In general the seed germination experiments showed a decrease in the rate of germination as the salt concentration increased. Most of the studied species had a degree of germination up to 200 mM NaCl. The recovery of seeds subjected to high salt concentration have shown a rapid high percentage recovery up to 94% after being subjected to 600 mM NaCl for *Halopeplis perfoliata*. Five halophytes species were selected to be used for the seedling growth experiments. The two measured parameters used to evaluate the effect of salt concentrations on seedling growth are plant height and dry weight (biomass) for both above and belowground parts. The obtained results from all measured parameters showed no significant differences among seedlings of *Caroxylon imbricatum*, *Suaeda aegyptiaca* and *Tetraena qatariensis*. In respect to different salinity concentrations, Our results indicated that future utilizing of these plants for any commercial product will be valuable to secure drinking water and food in Qatar.

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