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Effect of different Salinity and Potassium Levels on Saffron (*Crocus sativus* L.) Morphophysiological Characteristics

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Abstract

In order to investigate the effect of salinity stress and amount of potassium on root and shoot biomass accumulation of saffron a greenhouse study was carried out in 2008–2009 at Faculty of Agriculture, Ferdowsi University of Mashhad, Iran. The experimental design was factorial of salinity and potassium based on completely randomised block with three replications. Treatments included 4 levels of NaCl (0, 30, 60 and 90 mMol) and 3 levels of potassium (50, 100 and 150 % of Hoagland solution base). Results indicated that salinity imposed a significant effect on different growth characteristics, leaf dry weight, number of leaf, root dry weight, root volume, root density and physiological characteristics of saffron ($p < 0.01$). Potassium significantly controlled the negative effects of NaCl on length and number of roots as well as fresh weight and number of leaves per plant. Potassium and NaCl interactions were also significant. It was also observed that at different levels of NaCl, adding K to the root medium caused an increase in root numbers per plant. But this trend was only observed up to 60 mMol of NaCl, at 90 mMol NaCl potassium showed no modifying effects. Relative water content and electrolyte leakage were drastically decreased by increasing NaCl salinity up to 90 mMol of NaCl as compared to the control. The best growth parameter and root to shoot ratio was found with 30 mMol of NaCl. It seems that the application of extra potassium in the rhizosphere of saffron (up to 150 %) can reduce the damaging effects of NaCl up to 60 mMol of NaCl in soil solution.

Keywords: Electrolyte leakage, morphophysiological characteristics, relative water content, saffron, salinity stress