Ameliorative effects of Ca^{2+} on deleterious effects of salinity on nutrients uptake and some morphological traits of two genotypes of lentil (*Lens culinaris* M.)

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Abstract

This experiment was conducted with two genotypes of lentil (MLC321 and MLC323), two levels of calcium (0 and 5 mM Ca^{2+} as $CaSO_4$) and five salinity levels (0, 4, 8, 12 and 16 dS/m) as a factorial experiment, based on completely randomized design with three replications. Seeds were sown in plastic pots and sampling of seedlings was done after 6 weeks. Results showed that in both genotypes, plant height decreased at all salinity levels ($P \leq 0.05$). At higher salinity levels (more than 4 dS/m), total root area and root length were decreased in both genotypes. In both genotypes, significant reduction in leaf dry weight was observed at 12 and 16 dS/m salinity levels, and root dry weight at all salinity levels (except 4 dS/m in MLC323 genotype). Salt stress increased the concentration of sodium in leaves and roots of both genotypes. Potassium and calcium concentrations of leaves increased at some salinity levels; while the concentration of these elements decreased in the roots. In MLC321 genotype, calcium treatment significantly ($P \leq 0.05$) increased plant height and leaf area and dry weight at 4 dS/m salinity level. In MLC323 genotype, calcium treatment significantly ($P \leq 0.05$) reduced sodium concentration of roots at 8 dS/m and leaf potassium at 4 dS/m salinity level. In both genotypes, calcium treatment at high levels of salinity (12 and 16 dS/m) was unable to offset the negative effects of salinity. It seems that using calcium sulfate, due to its role in osmoregulation, can limit the damages caused by low salinity (4 dS/m) in lentil.

Keywords: Sodium, Root characteristics, Osmoregulation.

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