Reduced Na^+ Accumulation as Affected by Ammonium Nutrition in Sorghum Plants Under Salt Stress

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INTRODUTION: Ionic homeostasis has been cited as essential for salt tolerance of plants. Low Na⁺ accumulation may arise from Na^+ exclusion and/or compartmentalization, as well as from the control of Na^+ accumulation and distribution in the tissues. **OBJECTIVES:** This study aimed to analyze if external nitrogen source, as NO_3^- or NH_4^+, imply changes in the Na^+ accumulation control in sorghum plants. **MATERIAL AND METHODS:** *Sorghum bicolor* seeds were sown in vermiculite for four days. Thereafter, uniform seedlings were grown in nutrient solutions containing NO_3^- or NH_4^+ as only nitrogen source for eight days. The plants were submitted to salt stress by adding 75 mM NaCl, for 24 h, and the analyzes of Na^+ loading xylem, root and shoot Na^+ concentrations and activities of plasma membrane (SOS1) and tonoplast (NHX) Na^+/H^+ antiporters were measured. **RESULTS AND DISCUSSION:** SOS1 and NHX activity was improved by salinity in roots of both nitrogen treatments; however, NH_4^+-treated plants exhibited SOS1 activity higher than NO_3^--treated ones, suggesting that NH_4^+ in the growth medium induces Na^+ exclusion in the sorghum roots. This idea is supported by analyzing the loading of Na^+ in xylem, where a lower Na^+ loading was registered in NH_4^+-fed plants. Also, the presence of inhibitors for plasma membrane H^+-ATPase (vanadate) and SOS1 and NHX antiporters (amiloride) in the growth medium severely improved Na+ loading in NH_4^+-grown stressed plants, whereas promoted no alteration in the ones grown with NO_3^-. As a result, although salt stress massively increased Na^+ accumulation in plant tissues, a low accumulation was observed in plants from NH_4^+ treatments. **CONCLUSION:** Our data clearly evidence that NH_4^+ as nitrogen source restricts Na^+ accumulation in sorghum tissues by activating Na^+ exclusion mechanisms in roots, decreasing its loading and transport trough xylem to the photosynthetic tissues.

Keywords: Ionic homeostasis; nitrogen source; *Sorghum bicolor*
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