Effect of salinity on Na+ and K+ compartmentation in salt tolerant and sensitive wheat genotypes

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ABSTRACT
In order to investigation of Na+ compartmentation in different wheat tissues under salinity stress, 20 different wheat genotypes including salt tolerant, semi-tolerant and sensitive ones was studied in the greenhouse condition. A factorial experiment was carried out as based on completely randomized design (CRD) in three replicates in normal and salinity conditions with 12 dS m⁻¹ electrical conductivity (EC). Soil was salinized with calculated amount of NaCl salt to develop level of salinity (12 dSm⁻¹) while control has the same EC as that of original soil. 20 pure wheat genotypes were selected from 100 genotypes during the same experimental method and condition. Higher K+/Na+ ratio and more dry weight were two criterions for selecting of tolerant genotypes. Na+ and K+ content was measured in the root, internodes, flag leaf and its sheath blade to assess the mechanism of salt exclusion. The results showed that Na+ accumulated in the root and leaf sheath of tolerant genotypes and this mechanism prevented to transfer Na+ to leaf blade. Whereas, K+ could be transferred to leaf blade more than Na+. These results were vice versa in sensitive genotypes. Leaf sheath was detected as a storage tissue that prevented to transfer of Na+ to leaf blade and this mechanism involved in improving of salt tolerance. Moreover, significant negative correlation between Na+ and K+ content was announced in most tissues due to transfer of K+ to above ground tissues and excluded Na+ in tolerant genotypes.

Keywords: Ions, K+/Na+ ratio, NaCl, wheat tissue