PHYSIOLOGICAL TRAITS UNDERLYING DIFFERENCES IN SALT TOLERANCE AMONG *GLYCINE* SPECIES

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ABSTRACT

Salinity drastically reduces crop yield by limiting water uptake and causing ion-specific stress. Soybean is sensitive to soil salinity. Previous studies, however, have shown that there is variability among soybean genotypes and wild relatives for salt tolerance, which suggests that genetic improvement may be possible. Objective of this study was to identify physiological traits underlying differences in salt tolerance among accessions of four *Glycine* species. Four NaCl treatments, 0, 50, 75 and 100 mM, were imposed on *G. max*, *G. soja*, *G. tomentella* and *G. argyrea* accessions with different levels of salinity tolerance for 14 days. Salt-induced leaf scorch was high in sensitive accessions and little or none in tolerant accessions. Tolerant genotypes had a greater capacity to prevent Na^+ and Cl^- transport from soil solution to leaves than sensitive genotypes. Magnitude of leaf injury per unit increase in Na^+ or Cl^- concentrations in leaves was lower in tolerant than in susceptible accessions. Salt tolerant accessions had greater chlorophyll-meter readings than sensitive ones at all NaCl concentrations. Leaf, stem and root dry weight and stem length were reduced in sensitive genotypes, but there was no significant change in tolerant genotypes. *G. argyrea* and *G. tomentella* accessions possessed higher salt tolerance than *G. soja* and *G. max* genotypes. Identification and understanding of traits differentially expressed in salt tolerant and sensitive genotypes and their inclusion in the breeder's toolbox will allow further improvement in breeding salt tolerant soybean.