

Salt-responding genes in wheat

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Summary

Salt (NaCl) sensitivity-tolerance was examined among genetic resources of common wheat (*Triticum aestivum*) including modern varieties of various countries as well as land-races collected from China. All wheat plants wilted to die when they were treated with more than 300mM NaCl solution. Sensitivity test was conducted with the selection system where wheat plants of various genetic resources at seedling stage were transferred into a hydroponic system containing culture media supplemented with 150mM NaCl. Salt tolerance was evaluated on the bases of growth rate (DW) in comparison with the control condition. Result indicated that there was a large genetic variation of salt sensitivity-tolerance among common wheat lines, and that tolerant lines were not necessary from land-races but from modern varieties. Several tolerant and sensitive lines were selected as the resource materials for genetic analysis and for salt-tolerant breeding.

Chromosome substitution lines were used to identify the responding gene locations to salt. It was proved that chromosome 3D, 4D, 5D and 6D were responsible for NaCl sensitivity among 21 sets of wheat chromosomes.

By an altered differential display method with PCR, specific gene expression were examined in the leaves and roots for responding to salt, where the seedling plants were treated with 150mM NaCl and the mRNA were isolated after 3 hours of the treatment. Among 32 differential products identified in the display, 6 gene were successfully cloned, and their DNA sequences and expression patterns were examined. All the isolated genes were the not-reported ones for the salt response, while two had sequence homology with G6PD gene and a type of transcription factor. These genes should be examined for the relation to the salt-sensitivity/tolerance in wheat.