P099

Screening methods for drought and salinity tolerance with transgenic rice seedlings

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Abstract

Abiotic stress is one of the major serious limiting factors in rice (*Oryza sativa*) and caused rice production losses. It is important to precisely screen valuable genetic resources for improving stress tolerance and understanding tolerance mechanism to abiotic stresses. Because there are differences of experiment designs for screening of tolerant plant in several studies related to abiotic stress, this study has performed to provide the rapid and efficiency screening method for selection of tolerance rice to drought and salinity stresses. Two week-old rice seedlings that reached about three leaf stage were treated with drought and salinity stresses and examined tolerant levels with tolerant and susceptible control varieties, and transgenic plants. To determine the optimum concentration for the selection of drought and salinity condition, tolerant, susceptible and wild-type plants were grown under three soil moisture contents (5, 10 and 20% water contents) and three NaCl concentrations (100, 200 and 250 mM) for 10 days at seedling stage. 200 mM NaCl concentration and 5% moisture content soil were determined as the optimum conditions, respectively. The described methodologies in this study are simple and efficiency and might help the selection of drought and salinity tolerance plants at the 3,4-leaf-seedling stage.

This work was supported by a grant from the Next-Generation BioGreen 21 Program (PJ01191601), RDA, Republic of Korea.

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