

## QTL Analysis of Salinity Tolerance at Seedling Stage in Rice (*Oryza sativa* L.)

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**Abstract:** Salt tolerant QTLs at the seedling stage of rice was studied using green shoot length as a parameter, which was measured after salinity stress. Under salinity stress from electrical conductivity level 4 dS/m, Hyogokithanishiki *Japonica* parent showed more tolerance than Hokuriku-142 *Indica* parent. QTLs associated with salt tolerance were identified using 163 recombinant inbred lines derived from these parents. A linkage map constructed with 95 simple sequence repeat markers was integrated with the bioassay data for QTL analysis. Dormancy broken seeds were surface sterilized. Acceleration of uniform seed germination was performed by keeping surface-sterilized seeds at 35<sup>0</sup>C for 6 days in distilled water. Germinated seeds were grown in 1 ppm Hyponex (N:P:K: 6:10:5) solution for one week. Hyponex solution was refreshed on every other day for better aeration. Saline Hyponex solutions were prepared with electrical conductivity 5 dS/m by adding NaCl and plants were subjected to salinity stress. Green shoot length was measured at the end of the experiment. A salinity tolerant QTL was identified by composite interval mapping with LOD score 9.6 on chromosome 4 after 8-day salinity stress at electrical conductivity 5 dS/m. It indicated that this QTL explained 53.4% of the phenotypic variance and *indica* parent contributed salinity tolerant alleles for the QTL. According to the 1000 time permutation test at composite interval mapping, this QTL exceed the threshold LOD value. Chromosome four has been identified as a candidate chromosome possessing salinity tolerance in this study and in previous studies for different traits.

**Keywords:** *Indica* X *Japonica*, Electrical Conductivity, Recombinant Inbred Lines