

# Correlation of *in vitro* Phenotype and Molecular Marker Data in Rice Lines for Salt Tolerance

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## Abstract

As a sessile organism, plants often experience abiotic stress factors like drought, heat, cold and salinity which pose a serious threat for overall crop production. Plants show phenotypic plasticity in response to various abiotic conditions by modulating their growth and development with simultaneous physiological and biochemical changes. Rice serves as an important staple food crop for nearly half of the world population and salinity is one of the major abiotic stressor limiting rice productivity worldwide. Effect of salt stress on rice depends on the concentration and duration of salt exposure, plant genotype and other existing environmental factors. In the present study, we selected 12 different salt tolerant genotypes of rice and 13 SSR (Simple Sequence Repeat) primers were used for screening the rice genotypes for salt tolerance at seed germination stage and seedling growth stage using different concentrations of NaCl (100 mM, 150 mM, 200 mM and 250 mM). With increased concentrations of salt, the germination pattern of seeds varied, showing stunted plumule and inhibited root elongation. The seedling development was also affected by increasing salt concentrations, which showed yellowing of leaves and elongated shoot at higher concentrations. The amplification profile is generated using SSR markers for some known genomic regions conferring salt tolerance. Genetic distance among the screened genotypes was calculated using Jaccard index using polymorphism obtained by SSR primers. Maximum distance was observed between genotype 1 and genotype 9, while genotypes 11 and 12 showed the least distance. Subsequent generation of dendrogram using Nei's coefficient showed similar grouping of genotypes which confirms the correlation between the observed phenotypic parameters for the rice genotypes grown under varying salt concentrations.

**Keywords:** Abiotic factor, Seed germination, SSR primer, Genetic distance