

## Root morphological traits of selected rice varieties exposed to salinity at the seedling stage

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The root morphological traits in plants can be used as a proxy to determine the varietal performance under varying environmental conditions. Our study aimed to identify root morphological traits that can impact the salinity susceptibility of rice varieties at the seedling stage. The study compares the root morphologies of salinity-tolerant (Bg 369, At 354) and salinity-susceptible (Bg 360, Bg 352) rice varieties under two conditions (saline stress:12 dS/m, without saline stress). The rice varieties were grown in a hydroponic (Yoshida) medium under non-stress and saline stress. The standard evaluation score for visual salt injury was taken using visual observation 5, 10, and 15 days of salinity induction. After 16 days, the treated roots were extracted and scanned using WinRHIZO root scanner (2015) to obtain root morphological parameters including root average diameter (AD), root surface area (SA), root volume (V), and total root length (TL). Analysis of variance was conducted using STAR 2.0.1 (IRRI, Philippines) using a 5% significance level followed by turkey pairwise comparisons. The percentage reduction for each trait was calculated. The reduction percentages of the root traits due to the salinity treatment are significantly lower in salinity-tolerant varieties compared to the salinity-susceptible varieties with regard to V, SA, and TL. Under non-stress conditions, the AD of the salinity-susceptible varieties was significantly different from the AD of the salinity-tolerant varieties. Our findings indicate that the root morphological traits investigated can be used to distinguish between the selected salinity-tolerant and susceptible rice varieties under saline-stress and non-stress conditions.

**Keywords:** Rice varieties, root morphology, salinity- tolerance, salinity-susceptible

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