

Screening Commonly Cultivated Rice (*Oryza sativa* L.) Varieties in Jaffna for Reaction to Salinity at Seedling Stage Under Hydroponics

Pradheeban.L.,Nissanka.N.A.A.S.P.,Suriyagoda.L.D.B.

Abstract: Twenty two rice (*Oryza sativa* L.) varieties cultivated in Jaffna peninsula in Sri Lanka were tested for their response to salinity at seedling stage in two factor factorial experiment conducted in a completely randomized design with five replicates. The rice varieties were tested against five EC levels (0, 4, 8, 12 and, 24 dSm⁻¹) using sodium chloride under hydroponics in a poly-tunnel. Based on shoot height, shoot dry weight, root length, root dry weight, root surface area and its % reduction with salt concentration, root : shoot ratio and Na:K ratio, rice varieties were categorized using cluster analysis into four groups namely, highly tolerant, tolerant, susceptible and very susceptible. Values of all tested variables decreased with increasing salt levels except for sodium to potassium ratio in shoots. Percentage reduction increased with increasing salt levels for shoot height, shoot dry weight, root length, root dry weight and root surface area and showed significant differences ($p < 0.05$) among the varieties at 24 dSm⁻¹ EC level. The Osmotic and toxic effects played a major role in growth reduction in seedlings. Osmotic effect inhibited the absorption of water and reduced the growth of shoot and root. Toxic effect due to salt accumulation caused leaf death and reduction in photosynthetic leaf area in addition to the reduced growth of shoot and root. Among the cultivated rice varieties in Jaffna, Pachaperumal, Perivavellai, At 303, Adakari, Bg 406 and CO 10 had comparatively higher shoot height, shoot dry weight, root length, root dry weight, root surface area and lower root: shoot ratio and Na:K ratio in shoots at the seedling stage and were categorized in to “highly tolerant” group. Varieties Bg 250, At 353, At 362, Modaikarupan, H4, Bg 304 and Morungan were in “tolerant” group. Varieties Bg 352 and At 308 were under “susceptible” group due to lower shoot height, shoot dry weight, root length, root dry weight, root surface area and higher root: shoot ratio and Na:K ratio compared to tolerant varieties. Variety Bg 360 was in the “very susceptible” group.