

## Screening traditional rice accessions for salinity tolerance at the seedling stage in a hydroponic solution

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### Abstract

Salinity is one of the worst abiotic stresses that restricts the cultivable paddy-land areas in the tropics. Sri Lanka inherits a traditional rice gene pool that contains the most important traits. This study was carried out to screen 25 traditional rice accessions for salinity tolerance at the seedling stage in Yoshida solution. Dormancy broken, surface-sterilized seeds were germinated in distilled water for 3 days and germinated seeds were transferred to Yoshida solution with EC 3 dS/L for 3 days. After 3 days, seedlings were transferred to Yoshida solution with EC 6 dS/L and seedlings were kept in the same solution for 16 days. On the 10<sup>th</sup> day and 16<sup>th</sup> day at salinity treatment, plants were evaluated according to the visual scoring system adapted by IRRI. The control experiment was carried out in the Yoshida solution. Two Pokkali accessions were used as positive controls. At the end of the experiment, shoot and root dry matter reduction rates compared to that of control plants were recorded. Data were analyzed using SPSS. Among the tested 25 traditional rice accessions Kaluwee (3728), Pokkali (3573, 3567), Rathuwee (3905), and Rathu heenati (4992) were highly tolerant while Heenati (3998), Kaluheenati (4621), Murungakayan (3489), Polayal (93661), Ratawee (3466, 3473), and Suduhenati (7799) were tolerant at the 10<sup>th</sup> day of the stress treatment. By the 16<sup>th</sup> day of the salinity stress, Rathu heenati (4992) accession was highly tolerant, and Kalu wee (3728), and Pokkali (3573, 3567) accessions were tolerant. Two principle components (PC) were extracted in factor analysis that explained 51% and 32% variance, respectively. According to the hierarchal cluster analysis, four different clusters were identified at the cluster distance 5. Fifty-four per cent of the visual score, 85.4% of root dry matter reduction rate and 70.8% of shoot dry matter reduction rate contributed for PC1. The present findings are very much important for utilizing traditional rice accessions for future rice improvement programs for salinity tolerance.

**Keywords:** Salinity tolerance, Seedling stage, Traditional rice

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