

Screening of salinity tolerant rice cultivars at seedling stage

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Abstract

Rice is the staple food for more than a billion people worldwide, which includes twenty million people in Sri Lanka. Currently about 100,000 hectares of paddy lands in Sri Lanka are affected by salinity which limiting the crop production in worldwide. Therefore selection of rice cultivars which are tolerant to salinity is an important requirement for paddy cultivation in Sri Lanka too. In this study fifteen rice cultivars *Masuran*, *Poththalai*, *Kahamala*, *Puspharaga*, *Heteda wee*, *Beheththeenati*, *Rathkandu*, *Suwandel*, *Dickwee*, *Kahawanu*, *Weedaheenati*, *Kirinaran*, *Rathsuwandel*, *Rathdel* and *Godaheenati* were collected from the Anuradhapura district to screen the salinity tolerant rice cultivars. To fix the treatments, soil samples were collected from different places in Jaffna district and the highest salinity 154 μ s/cm and lowest salinity 51.6 μ s/cm were recorded by using electrical conductivity meter. The salinity range was selected from 50 - 155 μ s/cm. From this preliminary study, five treatments 0, 50, 85, 120 and 155 μ s/cm were selected and maintained by adding different concentration of salt solution in sixty pots. Seed germination percentage under different treatments and seedling height, shoot length, flag leaf width, flag leaf length were measured at 20, 25, 30, 35 and 40 days after planting. Complete randomized design was used to analyze the agronomic characters of cultivars and the mean was separated by DMRT. All the results were analyzed by using SAS statistical package, version 8.0. Germination percentage of the tested rice cultivars were not significantly different from the control at all salinity levels tested in this experiment except *Beheththeenati* and *Dickwee* cultivars. Flag leaf length and girth length of all cultivars increased with increasing salt level. Plant height and root length of all cultivars reduced with increasing salt level. Germination, root growth, shoot growth of all rice cultivars tested were not significantly different at 50 μ s/cm and were significantly lower at 120 μ s/cm and above salt level from the control. *Poththalai* shoot and *Godaheenati* root development were significantly higher than other cultivars at all salinity levels tested. *Beheththeenati* and *Dickwee* cultivars had poor performance in tested agronomic characters and were susceptible even at 50 μ s/cm salt level. Agronomic characters of *Godaheenati* were significantly higher and this cultivar performed well even in 155 μ s/cm salt level and is the best salinity tolerant cultivar among the tested cultivars.