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Assessment of submergence tolerance of traditional rice cultivars at post germination stage

M J Hewage, A L Ranawake* and S Subasinghe

Department of Agricultural Biology, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya

Fifty two Sri Lankan traditional rice cultivars were screened for level of submergence tolerance at post germination stage. The experiment was carried out according to the randomized complete block design (RCBD) with 4 replicates. Twenty seeds were included in each replicate. Dormancy broken surface sterilized seeds were first kept for germination at 35 °C under dark condition for 7 days and the length of seed hypocotyl was measured. Germinated seeds were submerged in a 10 cm deep water height in test tubes (15 cm long, 2 cm diameter) and kept for 10 days under complete submerged conditions. After the 10 day complete submergence stress, the hypocotyl length was measured again. The submerged seedlings were planted in soils and survival percentage was calculated. A control experiment was also carried out at the same time. *Kaluhandiran, Kotathavalu, Dena wee, Kirinaran, and Madoluwa* acquired the highest survival percentage (100%). *Thunmarhamara* (95.46%), *Yakada wee, Madael, Gunaratna* (95%) *Lumbini, Tissa wee, Handiran, Murungakayan, Madael, Matara wee and Dandumara* (90%), *Dewaradderi* (88.89), *Kokuvellai* (85.71%), *MI 329, Ingirisi wee, Kirikara and Herathbanda* (85%), *Seeraga Samba Batticaloa* (83.33%) *Naudu wee, Gangala and Kottakaram* (80%), recorded more than 80% survival percentages at complete submergence stress for 10 days. The hypocotyl length gained during submergence stress was calculated by subtracting initial plant height before submergence stress from plant height after submergence. Among the plants that survived, most of the cultivars (69.23%) elongated rapidly during the period of stress compared to the control plants. *Gangala* recorded the longest gained hypocotyl length (1.42 cm) during 10 day submergence stress under a 10 cm-deep water column. There was a positive correlation ($r = 0.321$) between survival rate and hypocotyl elongation during submergence.

Keywords: Traditional rice cultivars, submergence stress, hypocotyl elongation, seedling stage