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## Selection and Characterizations of Gamma Radiation-Induced Submergence Tolerant Line in Rice

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### Objectives

The objectives of the present work were to produce and assess new submergence tolerant line in rice utilizing *in vitro* mutagenesis of variety cultivated; determine the relationships between factors related to tolerant mechanism and submergence tolerance and investigate cross protection for salt.

### Materials and Methods

1. Materials: Dongjinbyeon and M<sub>3</sub> 5,000 lines derived from callus irradiated.
2. Selection method: Placed trays contained pot in larger plastic container, filled with distilled water at a depth of 50 mm, inoculated 30 seeds in each pot and kept for 10 days. To identify cross protection for salt, submergence tolerant line 15 seed was placed on solution with 1.25% NaCl for 14 days and then transferred

on salt-free solution for 7 days.

3. Enzyme activity and electric conductivity value: ADH and alpha-amylase was extracted and their activities were measured by monitoring substract. Electric conductivity value was examined by conductivity meter.

### Results and Discussion

Under submergence stress, the plant height, root length and root number of tolerant line were statistically significant at 1% and 0.1% level as compared with its original variety. The original variety, cultured on solution with 1.25% salt, did not survive after the second culture on salt-free solution but mutant was rasied. The fact that this original variety died could be due to irreversible injuries provoked by salt. The tolerant line showed about a 1.4, 1.55 and 1.7-fold increase in each ADH activity,  $\alpha$ -amylase activity and electric conductivity value as compared with original variety when grown on submergence.