Journal of Agricultural Science and Research (JASR)
Vol. 3, Issue 1, Jun 2016, 49-56
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GENETIC VARIABILITY STUDIES FOR ZINC EFFICIENCY IN AEROBIC RICE

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ABSTRACT

To study variation in zinc efficiency (ZE) among rice genotypes under aerobic condition, a pot experiment was conducted with sixty rice genotypes at two Zn levels +Zn and -ZN. A Zn deficient clay soil was used in our screening. Zn deficiency resulted in a marked decrease in shoot and root dry matter production of most genotypes after 28 days of growth. Genotypes were ranked according to their tolerance to Zn deficiency based on ZE, expressed as the ratio of shoot dry weight at Zn deficiency over that at adequate Zn supply. Substantial genotypic variation in ZE (63.15 to 92.67%) was found among rice genotypes. Genotypes CB-07-701-128, CB-00-11-4 and CB-06-803-2 were most tolerant to Zn deficiency whereas genotypes CB-07-701-283 and CO51 were the most intolerant genotypes.

ZE correlated significantly ($P < 0.05$) with shoot Zn concentration ($R^2 = 0.71$), Zn translocation from root to shoot ($R^2 = 0.42$) and root surface area ($R^2 = 0.38$). These results indicate that shoot Zn concentration, root surface area and Zn translocation may be an important determinant of ZE under aerobic condition in rice. Estimation of genetic parameters revealed that high GCV and PCV were observed for the traits viz., shoot zinc content, root zinc content, shoot dry weight and root dry weight under +Zn and –Zn conditions. All these traits also exhibited high heritability and high genetic advance as percentage of mean indicating the presence of additive gene action. Directional selection for these traits would be more effective for desired genetic improvement.

KEYWORDS: Genetic Variability, Zinc Efficiency and Aerobic Rice

Received: Mar 28, 2016; **Accepted:** May 20, 2016; **Published:** May 28, 2016; **Paper Id.:** JASRJUN20166

Original Article