

Effect of different rates of zinc on root morphological traits among different upland rice landraces in Malaysia

ABSTRACT

Billions of people globally are estimated to suffer from Zn deficiency due to their low dietary intake, especially those with rice. Global efforts are under way to improve the Zn concentrations in rice to increase Zn in diets. Zinc uptake in relation to morphological root parameters among 7 upland rice varieties were studied by conducting a solution culture experiment using modified Yoshida solution in Agriculture Faculty of University Putra Malaysia. Five Zinc levels were developed by the addition of 0, 5, 10, 20, 30 mg L⁻¹ ZnSO₄. Seedlings were harvested in week 4. Zn uptake in roots and shoots of upland rice showed significant differences among all varieties. Root Zn uptake significantly increased at all rates. Other root parameters (length, average diameter, surface area, volume, and number of root tips) did not show any significant differences in 0 to 20 mg Zn L⁻¹, but they decreased significantly in 30 mg Zn L⁻¹ in 4th week of observation. In addition shoot Zn uptake like other root parameters followed this trend and decreased significantly in 30 mg Zn L⁻¹ in 4th week of observation.

Keyword: Zinc; Rice; Root morphology; Zn uptake; Upland rice