

Hydro priming stimulates seedling growth and establishment of Malaysian Indica rice (MR219) under drought stress

ABSTRACT

Drought stress severely effects on seed germination and seedling establishment as critical stages in crops lifetime. Seed hydro priming is useful process for improving crops tolerance to drought stress. The present investigation was designed to evaluate the effect of hydro priming on adaptation strategies of Malaysian Indica rice (MR219) under drought conditions. Rice aseptic seeds were soaked at 20°C for 8h distilled water. Primed and non-primed seeds were subjected to polyethylene glycol (0, - 0.4, - 0.8 and -1.2) MPa treatments. Results showed that germination percentage, germination index, the fresh and dry weight, shoots and roots lengths decreased with increasing polyethylene glycol concentrations. We observed that polyethylene glycol tolerance of primed seeds is higher than non-primed seeds at all polyethylene glycol levels. Mean germination time and relative polyethylene glycol injury are increased in non-primed seeds as compare to primed seeds under drought stress. Proline content positively correlated increased with the increasing polyethylene glycol concentrations. The results indicated that hydro priming of Malaysian Indica rice (MR219) seeds is associated with the accumulation of proline and modulating the activity of ascorbate peroxidase and catalase under drought stress. This study suggests the hydro priming as an effective technique on rice seeds to withstand under drought condition which could be a step forward to commercialization.

Keyword: *Oryza sativa*; Germination; Proline; Enzyme activity