

Efficacy of different priming methods in mitigating the transient waterlogging in *Zingiber officinale* Rosc.

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The anomalous rainfall and transient waterlogging were endlessly affecting the plants, chiefly in the agriculture domain. Priming is the effective method to impart stress tolerance to crop plants. This work is to evaluate the effect of priming in *Zingiber officinale* (variety Karthika) under waterlogging. Three priming methods were done on ginger namely hydropriming (24 hour), halopriming (50 mM NaCl), and chemical priming (50 mM KH₂PO₄). The control and primed plants were exposed for 48 hours of waterlogging and 48 hours of post-waterlogging. From the results, it was found that primed plants effectively counteracted the stressed condition when compared to non-primed ones. Primed plants showed high relative water content (RWC), after exposure of stress, hydroprimed ginger plants showed high RWC when compared to control plants (94.16% and 85% respectively). Primed plants also showed high chlorophyll content in the leaves and among the priming treatments, hydroprimed plants showed highest stress mitigating effect than others, and it retained 24.7% of chlorophyll content than control stressed plants. The proline content was found to be highest in the primed stressed plants. In the case of osmolarity, the control stressed plants showed highest value than the primed stressed plants. Primed plants showed increased soluble protein content. In the case of lipid peroxidation, it was lowest in the primed stressed plants; among the priming treatments it was lowest in the haloprimed plants. From the results, it was evident that the primed ginger plants effectively mitigated the effects of waterlogging stress.

Keywords: Ginger, Osmolarity, Priming, Stress tolerance, Waterlogging