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Explicating morphophysiological and biochemical responses of wheat grown under acidic medium: Insight into to the antioxidant defense and glyoxalase systems

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Abstract

Low soil pH causes from H⁺ rhizotoxicity results in nutrients unavailability in the growing media, inhibits plant growth, development and reduces crop yields. The present study was carried out to reveal morphophysiological and biochemical responses of wheat (*Triticum aestivum* L.) to acidity stress. Four wheat varieties viz. BARI Wheat-21, BARI Wheat-25, BARI Wheat-26 and BARI Wheat-30 were used in the study. Eight-day-old seedlings were exposed to different pH levels (3.5, 4.5, 5.5 and 6.5) of growing media. Acidity stress at any level reduced biomass, water, and chlorophyll contents in all the varieties; whereas BARI Wheat-26 showed the least damage. H⁺ rhizotoxicity also caused oxidative stress through excess production of reactive oxygen species and methylglyoxal which increase lipid peroxidation in all the varieties but the lowest oxidative damage was observed in BARI Wheat-26 due to better performance of the antioxidant defense and glyoxalase systems. Considering the growth, physiological and biochemical attributes BARI Wheat-26 may be considered as acidity stress tolerant, among the variety examined.

Keywords: Acidity Stress, H⁺ Rhizotoxicity, Reactive Oxygen Species, Antioxidant defense, Methylglyoxal

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