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Alternative Respiratory Pathway under Drought is Partially Mediated by Hydrogen Peroxide and Contributes to Antioxidant Protection in Wheat Leaves

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Abstract: Water stress significantly enhanced the capacity of alternative respiratory pathway and induced *AOXI* transcript in wheat (*Triticum aestivum* L.) leaves. The water-stressed seedlings pretreated with 1 mM salicylhydroxamic acid (SHAM) had higher level of production of reactive oxygen species (ROS) than the seedlings either subjected to drought or SHAM treatment alone did. This observation suggests that cyanide-resistant respiration could play a role in antioxidant protection under the condition of drought. Exogenous application of hydrogen peroxide effectively increased the capacity of alternative respiratory pathway and induced *AOXI* transcription. Pretreatment with ROS scavengers, such as 4,5-dihydroxy-1,3-benzene disulfonic acid (Tiron) and dimethylthiourea (DMTU), arrested the increase of ROS and partly inhibited the induction of both cyanide-resistant respiration and *AOXI* transcript under water stress. These results suggest that the enhancement of cyanide-resistant respiration under drought might be partially mediated by hydrogen peroxide.

Keywords: [Antioxidant defence system](#), [Cyanide-resistant respiration](#), [Reactive oxygen species](#), [Water stress](#), [Wheat](#)

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