

Enhanced Expression of Alternative Oxidase Genes Is Involved in the Tolerance of Rice (*Oryza sativa* L.) Seedlings to Drought Stress

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Drought stress significantly enhanced the capacity of the alternative respiratory pathway and induced AOX1a and AOX1b transcripts in rice seedling leaves. The drought-stressed seedlings pretreated with the inhibitor of the alternative respiratory pathway, 1 mM salicylhydroxamic acid, had a lower level of relative water content than the seedlings either subjected to drought or salicylhydroxamic acid treatment alone. This observation suggests that the alternative respiratory pathway could play a role in the tolerance of rice seedlings to drought stress. Pretreatment with exogenous hydrogen peroxide, salicylic acid, and abscisic acid alone mitigated the water loss of rice leaves exposed to drought stress. Exogenous application of hydrogen peroxide and salicylic acid increased the capacity of the alternative respiratory pathway and induced AOX1a and AOX1b transcripts, while exogenous abscisic acid failed to induce any expression of AOX1 genes. These observations suggest that rice AOX1a and AOX1b genes may be responsive especially to drought stress but not be induced by all of the stress signals related to drought.

Key words: Rice, Alternative Respiratory Pathway, Drought Stress, Stress Signals