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Submergence Acclimation to Low-Temperature Stress in Rice Roots

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Abstract: A low temperature (10°C, 48 h) inhibited primary root growth of rice seedlings (*Oryza sativa* L.). However, the inhibition was significantly mitigated by submergence for 24 h before the exposure to low temperatures, which induced alcohol dehydrogenase and increased the ethanol concentration in roots. Exogenous application of ethanol also had a similar mitigating effect. These results suggest that submergence pretreatment increases the tolerance to low temperature in rice roots due to ethanol accumulation in the roots.

Keywords: Acclimation, Alcohol dehydrogenase, Ethanol, Ethanolic fermentation, Low temperature tolerance, Rice

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