

Title Salicylic acid-induced enhancement of cold tolerance through activation of antioxidative capacity in watermelon

Author Yang Jing-Hua, Gao Yuan, Li Yan-Man, Qi Xiao-Hua and Ming-Fang Zhang

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Abstract

The purpose of this study is to determine suitable temperature for selecting germplasm with cold tolerance and to investigate the effects of exogenous SA on cold tolerance in watermelon. We found that low temperature (10 °C) was the most suitable temperature to identify cold tolerance germplasm in watermelon. Moreover, we classified the capacities of four different watermelon germplasms, of which No. 9 was the germplasm with strongest cold tolerance and No. 2 was the one with chilling sensitiveness. The suitable exogenous SA (1.0 mmol/L) enhanced cold tolerance in watermelon through activations of antioxidative capacity, such as, G-POD, ASA-POD, CAT, SOD and GR. The activities of antioxidative enzymes were more significantly increased in cold tolerance germplasm No. 9 than that in chilling sensitive germplasm No. 2 in watermelon after being treated with suitable exogenous SA (1.0 mmol/L), although they were also been enhanced in No. 2. However, higher concentration of exogenous SA decreased the activity of antioxidative enzymes, consequently, weakened the capacity of cold tolerance in watermelon.