

Gibberellic acid enhances postharvest toon sprout tolerance to chilling stress by increasing the antioxidant capacity during the short-term cold storage

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Scientia Horticulturae 237: 184-191. (2018)

Abstract

Gibberellic acid (GA₃) has been known as an important phytohormone signal in plants. Here, we investigated the physiology responses underlying GA₃-induced postharvest toon sprout tolerance to chilling stress for 5 d. Results showed that exogenous application of GA₃ remarkably decreased the browning and decay index of toon sprout. GA₃ treatment prevented anthocyanin breakdown and inhibited the decreases of the total flavonoid, Vitamin C and titratable acidity in toon sprout during postharvest cold storage. In comparison to distilled water treatment, exogenous GA₃ application maintained significantly higher levels of reducing sugar, soluble sugar and proline in toon sprout. Meanwhile, GA₃ significantly reduced the accumulation of malondialdehyde (MDA) and hydrogen peroxide (H₂O₂) in toon sprout. Furthermore, GA₃ enhanced the activities of antioxidant enzymes catalase (CAT) and superoxide dismutase (SOD) and reduced those of peroxidase (POD) and polyphenol oxidase (PPO). Taken together, our results suggested that exogenous application of GA₃ effectively enhanced postharvest toon sprout tolerance to chilling stress by regulating antioxidant enzymes and weakening lipid peroxidation.