

# Postharvest application of glycine betaine ameliorates chilling injury in cold-stored banana fruit by enhancing antioxidant system

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## Abstract

Chilling injury (CI) represents a physiological disorder caused by improper low temperature management, which affects the postharvest quality and marketing potential of banana fruit. In this study, postharvest application of glycine betaine (GB) can significantly reduce the CI incidence of banana fruit during cold storage, as observed by lower CI index, electrolyte leakage, malondialdehyde (MDA) contents, and higher values of lightness, chlorophyll, soluble sugar contents. Moreover, GB not only increased the antioxidant substances such as total phenolics, glutathione and ascorbic acids (AsA), but also elevated the enzyme activities and gene expression of the antioxidant enzymes including ascorbate peroxidase (APX), catalase (CAT), superoxide dismutase (SOD) and peroxidase (POD). In addition, GB could obviously enhance the total antioxidant capacity of banana fruit under refrigerated storage. Collectively, these findings suggest that GB-attenuated CI incidence in banana fruit during cold storage might be, at least partially, ascribed to the enhancement of antioxidant system involving antioxidant substances, as well as enzyme activities and gene expression of antioxidant enzymes.