

Inhibitory effects of hydrogen sulfide on oxidative damage and pericarp browning in harvested litchi

Mohammed Wasim Siddiqui, Vinayak Deshi, Fozia Homa, M. A. Aftab and Tariq Aftab

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Abstract

Postharvest pericarp browning (PB) drastically affects acceptability and marketability of litchi fruits. This study was aimed to assess the effect of vacuum infiltrated hydrogen sulfide (H₂S) (1 and 2 mM) on pericarp browning associated metabolism and overall quality of litchi fruit during cold storage. Results revealed that H₂S (2 mM) significantly minimized the accumulation of quinone and MDA content with reduced weight loss, pericarp browning, disease occurrence during storage. The H₂S-treated fruits maintained higher anthocyanin, total phenols, and antioxidant activity. Moreover, H₂S infiltration significantly inhibited accumulation of reactive oxygen species (superoxide and hydrogen peroxide) and membrane leakage, which coincided with higher phenylalanine ammonia lyase activity and suppressed activity of polyphenol oxidase and peroxidase resulting in lower PB in litchi during storage of 16-d. H₂S infiltration also prevented loss of TSS, acidity, and ascorbic acid as compared to control fruit indicating effectiveness of H₂S in delaying metabolic activity. Therefore, postharvest vacuum infiltration of H₂S (2 mM) could be suggested to downregulate oxidative damage and PB resulting in extended shelf life during cold storage.