

Title Influence of dipping in sodium metabisulfite on pericarp browning of litchi cv. Yu Her Pau (Feizixiao)

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Abstract

Rapid pericarp browning and decay of litchi fruit are the primary reasons for their short shelf-life. Instead of the commonly used sulfur dioxide fumigation method to reduce browning and decay, we dipped litchi fruit after harvest in a solution of $\text{Na}_2\text{S}_2\text{O}_5$ (30 g L^{-1} or 60 g L^{-1}), then 1.1 M HCl, and stored them at $20 \text{ }^\circ\text{C}$ and 95% RH. Throughout the storage period, we examined the pericarp browning index, decay rate, pH, anthocyanin and malondialdehyde contents, polyphenol oxidase (PPO) and peroxidase (POD) activities, and sulfite residues of the fruit. Soluble solids and titratable acidity of the arils were also examined. Results showed that dipping in 60 g L^{-1} of $\text{Na}_2\text{S}_2\text{O}_5$ effectively delayed the browning reaction and reduced decay, thereby extending the fruit storage life. Dipping in 60 g L^{-1} of $\text{Na}_2\text{S}_2\text{O}_5$ increased anthocyanin content in pericarp tissues while reducing PPO and POD activities. The total soluble solids and titratable acidity of the arils after dipping in $\text{Na}_2\text{S}_2\text{O}_5$ showed no variation from that of the control group. Additionally, no sulfur dioxide was detected in the aril after the dipping process. Although 97.7 mg kg^{-1} of sulfur residue was found in the pericarps dipped in 60 g L^{-1} of $\text{Na}_2\text{S}_2\text{O}_5$, after storage for 18 d, no residual sulfur was detected. Therefore, dipping in 60 g L^{-1} sodium metabisulfite is effective for slowing browning and decay of litchi fruit.