

Title Effect of a biocontrol agent (*Bacillus subtilis*) and modified atmosphere packaging on postharvest decay control and quality retention of litchi during storage

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Abstract

The efficacy of biological control and two types of modified atmosphere packaging (MAP) alone and in combinations was evaluated under cold storage as well as simulated market-shelf conditions to control decay and pericarp browning on litchi cv. 'McLean's Red'. Fruits were dipped for 2 min at 15°C in *Bacillus subtilis* or prochloraz separately, packed in MAP [low density polyethylene (LDPE) or polypropylene (PP)], heat sealed and stored at 2°C and 90% r.h. for 18 days followed by 2 days at 14°C and 75% r.h. to simulate market-shelf conditions. A commercially adopted sulfur dioxide treatment was included as a comparative control. Fruits treated with *B. subtilis* + PP or prochloraz + PP and stand-alone PP treatment did not show decay or browning at 2°C. Decay and browning were controlled significantly after 2 days at 14°C in *B. subtilis* + PP or prochloraz + PP treatments. However, the prochloraz + PP affected the natural pinkish-red color of the pericarp and gave higher h° (hue angle) values. The stand-alone PP treatment (~14% O₂, ~5% CO₂) showed 11.3% decay due mainly to *Alternaria alternata* and *Cladosporium* spp. at 14°C. The effectiveness of the MAP was improved at 14°C when *B. subtilis* was combined with PP, controlling decay and pericarp browning and retaining the fruit color and quality. *B. subtilis* survived in PP at 2° and 14°C, but not in LDPE. Stand-alone LDPE (~3% O₂, ~10% CO₂) and combination treatments *B. subtilis* + LDPE or prochloraz + LDPE failed to control decay and pericarp browning. Higher yeast populations were observed in LDPE or *B. subtilis* + LDPE at both 2° and 14°C. *Candida*, *Cryptococcus* and *Zygosaccharomyces* spp. were the predominant yeasts in all LDPE treatments.

<http://www.springerlink.com/content/1847v4204p267567/fulltext.pdf>