

Title Effect of 1-MCP on shelf-life and volatile production of Mexican guava fruits (cv. 'Media China')

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Abstract

The Mexican guava fruit shelf-life is very short (two weeks at 8-10°C) which does not allow for export to distant markets and improvement of the marketing process. The chemical 1-methylcyclopropene (1-MCP) inhibits the formation of ethylene and extends the shelf-life in different fruits, but it can at the same time modify their sensory characteristics. The objective of this work was to determine the time and concentration optimum of 1-MCP to extend the guava fruit shelf-life and to study its effects on the production of volatiles. A first experiment used 1-MCP concentrations in the air of 0.6, 0.9, and 1.2 p.p.m. at different exposure times (1, 3, and 5 hours.) and at room temperature with the subsequent transfer of the fruits to 10°C under a humid air flow (20 L h⁻¹) during 30 days. Fruit samples were analyzed at different periods. After the identification of the best conditions, a second experiment was realized to compare volatile production in treated and untreated fruits. The respiration rate, ethylene production, color changes, penetration resistance, total sugars content, volatile production, and sensorial analysis were measured. A 0.6 p.p.m. application of 1-MCP during five hours allowed 25 days of shelf-life with high penetration resistance (31.6 N) and slow color change (a* value 3.7) with respect to the control (4.2 N and 6.3, respectively). The ethylene production was low (0.8 µl kg⁻¹ h⁻¹) whereas the control showed 1.8 µl kg⁻¹ h⁻¹. After 15 and 20 days of storage at 10°C and 6 days at 25°C, the total aroma was clearly higher in control samples (9.59 and 24.04 mg kg⁻¹) than untreated fruits (4.69 and 8.886 mg kg⁻¹), which was explained by minor peak areas in the first 170 peaks. The sensory analysis confirmed these results, but the 1-MCP could be used to extend the shelf-life only with low aroma and sweetness intensities in the fruits.