

Title Exogenous ethylene and 1-methylcyclopropene effects on ACC oxidase activity of yellow passion fruit and guava

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Abstract

This study aimed to determine the exogenous ethylene and 1-methylcyclopropene (1-MCP) effects on ACC oxidase activity of yellow passion fruit and guava. Passion fruit at predominantly green (25% skin yellow color) and yellowgreen (50% skin yellow color and 50% green color) ripening stages and guava at dark-green, light-green and yellowishgreen ripening stages were treated with ethylene (1000 $\mu\text{L L}^{-1}$ for 24 hours) and 1-MCP (passion fruit: 600 nL L^{-1} for 12 hours; guava: 900 nL L^{-1} for 3 hours). Non-treated fruits were used as control. Fruits were stored at 23 ± 1 °C and $85\pm 5\%$ RH for 9 days and analyzed every 3 days (for passion fruit pulp without seed was used). ACC oxidase activity was determined according to Moya-Leon and John (1994) and the results expressed as $\mu\text{l C}_2\text{H}_4 \text{ kg}^{-1} \text{ h}^{-1}$. 1-MCP treatment suppressed ACC oxidase activity of passion fruit at both ripening stages. However, ethylene treatment promoted the highest ACC oxidase activity for predominantly green fruits, which reached maximum activity 3 days after treatment. By day 3, the enzyme activity was 6 times higher relative to control and 1-MCP treated fruits. Increased enzymatic activity was observed for control yellow-green fruits and fruit treated with ethylene, but no statistical difference was observed between these two treatments. After the initial rise in enzymatic activity, it decreased until the 6th day of storage, and then remained constant until the end of storage. Exogenous ethylene increased ACC oxidase activity of dark-green guava up to 10 times relative to control and 1-MCP treated fruits. 1-MCP treatment maintained enzyme activity at low levels for 6 days after treatment. There were no differences between treatments for guava at light-green and yellowish-green ripening stages.