

Effect of 1-methylcyclopropene treatment on quality, volatile production and ethanol metabolism in kiwifruit during storage at room temperature

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Abstract

Kiwifruit are highly perishable during ripening, leading to the loss of quality and flavors, as well as the development of off-flavor. The aim of this work was to investigate the effect of 1-methylcyclopropene (1-MCP) treatment with different concentrations on fruit quality, volatile production and off-flavor development in kiwifruit cv. 'Bruno' during storage. In this study, both $0.5 \mu\text{L L}^{-1}$ and $1 \mu\text{L L}^{-1}$ 1-MCP treatments were effective in delaying fruit ripening, decreasing fruit decay, slowing fruit softening and maintaining fruit taste during storage. The effect of $1 \mu\text{L L}^{-1}$ 1-MCP treatment on improving postharvest quality of kiwifruit was more obvious than $0.5 \mu\text{L L}^{-1}$ 1-MCP treatment. Moreover, 1-MCP treatments, especially $1 \mu\text{L L}^{-1}$ 1-MCP treatment, could effectively eliminate off-flavors by suppressing ethanol metabolism in kiwifruit during storage. However, $1 \mu\text{L L}^{-1}$ 1-MCP treatment suppressed fruity aroma development in kiwifruit by inhibiting the synthesis of esters during fruit ripening. In contrast, $0.5 \mu\text{L L}^{-1}$ 1-MCP treatment not only maintained fresh and green aromas of kiwifruit, but also had no negative effect on the development of fruity aroma in kiwifruit during the whole storage. In conclusion, $0.5 \mu\text{L L}^{-1}$ of 1-MCP might be an optimal concentration for improving postharvest quality and maintaining aroma development in kiwifruit cv. 'Bruno' during storage.