

Title Ripening of 'Rendaiji' persimmon treated with 1-methylcyclopropene after ethanol vapor treatment to remove astringency

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Abstract

'Rendaiji' persimmon fruits, a local astringent cultivar prone to rapid softening after harvest, were harvested at commercial maturity and treated with $20 \mu\text{L}\cdot\text{L}^{-1}$ 1-methylcyclopropene (1-MCP) for 24 h after exposure to ethanol vapor for 5 days to remove astringency and to alleviate the symptoms of acetaldehyde-induced rapid softening. As a result, an application of 1-MCP to 'Rendaiji' delayed softening but had little or no effect on ethylene evolution. However, 1-amino-cyclopropene-1-carboxylic acid (ACC) synthase (ACS) activity was greatly suppressed while the inhibition of ACC oxidase (ACO) was transient, lasting until 11 days after 1-MCP treatment. The levels of ACC as a substrate were also markedly inhibited. The content of malonyl-1-aminocyclopropene-1-carboxylic acid (MACC), the malonylated conjugate of ACC, was high in fruits after harvest, but decreased steadily, due to a possible inhibition by 1-MCP treatment, whereas in control fruits MACC slightly increased. The inhibitory effect of 1-MCP on the activity of ACS was not correlated with those on ethylene biosynthesis, which could suggest a differential sensitivity to ethylene depending on tissue type. The changes in ACO activity coincided with ethylene production in 1-MCP-treated fruits.