

‘泰山早霞’苹果采后1-甲基环丙烯处理对其软化及相关基因表达的影响

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The Regulation of 1-methylcyclopropene on Softening and Expression of Relevant Genes in ‘Taishan Zaoxia’ Apple

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摘要 以‘泰山早霞’苹果成熟的果实为试材, 于采收当天进行1-甲基环丙烯(1-MCP)处理, 研究其对果实软化及相关基因表达的影响。结果表明, ①1-MCP处理的果实在短期贮藏期间硬度均明显高于对照。②1-MCP处理后, 乙烯释放速率、PG、PME、β-Gal、α-L-Af及LOX等细胞壁酶基因的表达均被明显抑制, 在整个试验期内均有明显下降, 尤其是在处理后1 d, 就分别比各自的对照下降了72.0%、72.1%、87.5%、81.8%、90.2%和16.7%, 而1-MCP对AM和XET基因的表达没有明显作用。上述结果表明, 苹果‘泰山早霞’品种属乙烯极敏感型, 1-MCP对于延缓其果实软化具有明显作用, 其果实软化可能是PG、PME、β-Gal、α-L-Af及LOX等多种基因协同作用的结果。

关键词: 苹果 早熟 贮藏 软化 1-MCP 细胞壁酶 基因 表达

Abstract: In order to study the molecular softening mechanism of ‘Taishan Zaoxia’ apple, the effect of 1-MCP on softening and expressions of genes related to softening in ‘Taishan Zaoxia’ were investigated. The results showed that: ①The firmness of ‘Taishan Zaoxia’ fruit treated with 1-MCP were higher than the control fruit during the storage after harvest. ② Ethylene production rate and the expression of PG, PME, β-Gal, α-L-Af and LOX genes of ‘Taishan Zaoxia’ fruit were inhibited significantly throughout the whole experimental period after treated with 1-MCP, especially in the first day after treatment. They decreased 72.0%, 72.1%, 87.5%, 81.8%, 90.2% and 16.7% than control respectively. But 1-MCP had no effect on expression of AM and XET genes. These results indicated that ‘Taishan Zaoxia’ apple variety was very sensitive to ethylene and 1-MCP could delay softening of ‘Taishan Zaoxia’ fruit obviously; The fruit softening may be caused by synergistic effect of PG, PME, β-Gal, α-L-Af and LOX genes.

Keywords: apple, early-maturing, storage, softening, 1-MCP, cell wall enzyme, gene, express

引用本文:

刘美艳, 魏景利, 刘金等. ‘泰山早霞’苹果采后1-甲基环丙烯处理对其软化及相关基因表达的影响[J] 园艺学报, 2012, V39(5): 845-852

LIU Mei-Yan, WEI Jing-Li, LIU Jin et al. The Regulation of 1-methylcyclopropene on Softening and Expression of Relevant Genes in ‘Taishan Zaoxia’ Apple[J] ACTA HORTICULTURAE SINICA, 2012, V39(5): 845-852

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