

Title Effect of 1-methylcyclopropene on postharvest physiological changes of 'Zaohong' plum
Author Juan Kan, Jing Che, Hai Yan Xie and Chang Hai Jin
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Abstract

Plum is a highly perishable fruit and postharvest fruit softening limits its shelf life. The aim of this work was to study the specific effects of 1-methylcyclopropene (1-MCP) treatment on physiological changes in 'Zaohong' plums. Plums were treated with 500 nL L⁻¹ 1-MCP at 20°C for 18 h followed by 20°C storage. The results showed that 1-MCP treatment significantly reduced endogenous ethylene production and the activities of ethylene biosynthetic enzymes' (1-aminocyclopropane-1-carboxylic acid synthase, ACS and 1-aminocyclopropane-1-carboxylic acid oxidase, ACO) in plum fruit during storage when compared with untreated fruit. Although 1-MCP treatment inhibited ethylene production and 1-aminocyclopropane-1-carboxylic acid (ACC) accumulation, it did not inhibit the accumulation of *N*-malonyl-ACC (MACC). Higher firmness was also found in 1-MCP-treated plums than in controls. During storage, superoxide anion (O₂⁻) and hydrogen peroxide (H₂O₂) levels decreased in 1-MCP-treated fruit. 1-MCP treatment also regulated superoxide dismutase (SOD) and catalase (CAT) activities during storage. Xylanase activity was upregulated while activities of polygalacturonase (PG), pectin methyl esterase (PME) and cellulase enzymes in the fruit were downregulated by 1-MCP treatment. In conclusion, 1-MCP might be a potent compound for extending both storage period and shelf life of 'Zaohong' plums by suppressing ethylene biosynthesis, regulating cell wall degradation enzymes and reducing fruit softening.

<http://www.springerlink.com/content/n6j74248k825j4w8/fulltext.pdf>