

董晓庆,饶景萍,朱守亮,杨青珍.气调包装与1-MCP结合抑制苹果蜡质成分降低[J].农业工程学报,2013,29(16):269-277

气调包装与1-MCP结合抑制苹果蜡质成分降低

Combination of modified atmosphere packaging and 1-methylcyclopropene treatment suppress decreasing of wax composition of apples during cold storage

投稿时间: 2013-04-22 最后修改时间: 2013-07-17

中文关键词: [贮藏](#), [包装](#), [果实](#), [苹果](#), [1-甲基环丙烯](#), [蜡质成分](#)

英文关键词: [storage packaging](#) [fruits](#) [apple](#) [1-MCP](#) [wax composition](#)

基金项目:国家现代苹果产业技术体系建设专项 (nycytx-08-05-02); 国家科技支撑计划 (2013BAD19B04)

作者	单位
董晓庆	西北农林科技大学园艺学院, 杨凌 712100
饶景萍	西北农林科技大学园艺学院, 杨凌 712100
朱守亮	西北农林科技大学园艺学院, 杨凌 712100
杨青珍	西北农林科技大学园艺学院, 杨凌 712100

摘要点击次数: 117

全文下载次数: 59

中文摘要:

为了探讨红富士苹果在贮藏过程中主要蜡质成分特别是与油腻相关的蜡质成分变化, 以及贮藏过程中果实主要品质指标的变化规律, 研究了聚氯乙烯袋 (PVC) 自发气调包装 (MAP) 与1-甲基环丙烯 (1-MCP) 结合处理 (MAP+1-MCP) 对(0±1)℃冷藏过程中红富士苹果蜡质成分和果实贮藏品质的影响。结果表明: 在贮藏过程中, 对照 (不做任何处理) 的蜡质总量一直降低, MAP和MAP+1-MCP处理的在贮藏一个月后升高, 随后贮藏的过程中降低。所有处理和对照中, 二十九烷和二十七烷含量降低, 十六烷酸和9,12-十八碳二烯酸含量升高, 二十九-10-醇和二十九-10-酮含量先降低再升高。MAP和MAP+1-MCP能够抑制蜡质总量和其他成分相应的变化。MAP和MAP+1-MCP均能延缓果实硬度的下降、可溶性固形物和可滴定酸的降解速度, 降低固酸比率和失重率, 抑制呼吸速率和乙烯释放速率, 且可以抑制苹果贮藏后期油腻的发生。无论对蜡质成分的影响, 还是对果实贮藏品质的影响来看, MAP+1-MCP的效果优于MAP。PVC气调包装结合1 μL/L 1-MCP是较为理想的长时间保鲜红富士苹果的处理方式。研究成果可为生产上科学有效的长期贮藏红富士苹果、解决贮藏后期果实油腻问题提供参考。

英文摘要:

Abstract: Modified atmosphere packaging (MAP) is a very useful method in postharvest storage for fruits and vegetables by altering the gaseous environment of the stored commodities. 1-methylcyclopropene (1-MCP) is a potent inhibitor of ethylene action, and has been extensively researched in a variety of horticultural crops, especially climacteric fruits. Greasiness is a problem for apples following their prolonged storage. At present, the storage quality and physiology property of fruits and vegetables treated with MAP or a combination of MAP and 1-MCP have been studied, however, there are few reports about the effects of MAP or a combination of MAP and 1-MCP on the wax composition of an apple during storage. The objective of this study was to study the changes of primary wax composition during storage and the relationship of wax composition and greasiness and the quality of apple fruit during storage after treatment with MAP and MAP+1-MCP. The effects of MAP of 0.03 mm polyvinyl chloride bags and a combination of MAP and 1 μL/L 1-MCP were investigated on total wax and primary wax components. Included were nonacosane and heptacosane which were saturated hydrocarbons representing the predominant component (95%) of nonpolar wax components, hexadecanoic acid, the most abundant saturated fatty acid, and 9,12-octadecadienoic acid, the most abundant polyunsaturated fatty acid of polar wax components, and nonacosan-10-ol (secondary alcohol) and nonacosan-10-one (ketone), the latter two of which have a relationship with fruit greasiness. Wax composition of "Red Fuji" apples (*Malus domestica* Borkh. 'Red Fuji') was investigated by gas chromatography-mass spectrometry. Analyses of fruit quality during storage at (0±1)℃ for seven months included firmness, soluble solid content (SSC), titratable acid (TA), SSC/TA ratio, respiration rate, ethylene release, and weight loss. Wax was extracted using chloroform/methanol (3:1,v/v), and eluted stepwise with n-hexane (heptadecane as an internal standard) for nonacosane and heptacosane and methanol (deuterated heptadecanoic acid as internal standard) for hexadecanoic acid, 9,12-octadecadienoic acid, nonacosan-10-ol, and nonacosan-10-one. The results indicated that total wax of the control fruit declined during storage and fruit treated with MAP and MAP+1-MCP increased during the first month and then declined over first to seven months. In all treatments, nonacosane and heptacosane declined, while hexadecanoic acid and 9,12-octadecadienoic acid increased. Nonacosan-10-ol and nonacosan-10-one declined, followed by an increase over seven months storage at (0±1)℃. Nonacosan-10-ol and nonacosan-10-one of the control fruit and MAP-treated fruit declined during the first three months and then increased, but fruit treated with MAP+1-MCP declined during the five months and then increased. Changes in total wax and primary wax components were delayed or suppressed in fruit subject to MAP and MAP+1-MCP treatments, especially for MAP+1-MCP-treated fruit. Compared with the control, MAP and MAP+1-MCP delayed the decline in flesh firmness, TA and SSC and reduced ethylene and respiration rates and weight loss. MAP and MAP+1-MCP treatments suppressed development of apple greasiness, presumably due to altered wax composition, but did not alter fruit flavor. MAP+1-MCP was more effective than MAP for suppressing changes in wax composition and maintaining storage quality. The results of this study indicate that a combination MAP/1-MCP treatment was the most effective for maintaining the quality of "Red Fuji" apple fruit during long-term storage.

[查看全文](#) [下载PDF阅读器](#)

关闭

您是第**6536702**位访问者

主办单位：中国农业工程学会 单位地址：北京朝阳区麦子店街41号

服务热线：010—65929451 传真：010—65929451 邮编：100125 Email: tcsae@tcsae.org
本系统由北京勤云科技发展有限公司设计