

Effect of 1-MCP on the regulation processes involved in ascorbate metabolism in kiwifruit

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Abstract

This research was conducted to investigate the mechanism of 1-methylcyclopropene (1-MCP) treatment on ascorbic acid (AsA) content in kiwifruit after harvest. Our findings indicated that 1-MCP treatment postponed the course of fruit senescence and maintained higher contents of AsA and total ascorbic acid (T-AsA) during storage in postharvest kiwifruit. Gene expression analysis revealed that the transcription level of genes involved in AsA metabolic pathway were regulated by 1-MCP treatment. The up-regulation of genes for AsA biosynthesis (*AdGME*, *AdGalDH*, *AdGalLDH* and *AdGalUR*) and regeneration (*AdDHAR* and *AdGR*) and down-regulation of degradation genes (*AdAO*) collectively contributed to the increase in AsA level in treated kiwifruit during storage. Moreover, the expression level of four candidate bHLH transcription factors, preliminarily screened from the transcriptome database of kiwifruit, was up-regulated by 1-MCP treatment by qPCR analysis. Taken together, our results suggested that due to its positive regulation on numerous ascorbate modifying genes and probably the candidate bHLH transcription factors, 1-MCP had a beneficial effect on AsA content.