

Title Specific response of apple skin and pulp tissues to cold stress and 1-MCP treatment
Author Rosa Vilaplana, Yolanda Soria, M. Carme Valentines and Christian Larrigaudière
Citation Postharvest Biology and Technology, Volume 43, Issue 2, February 2007, Pages 215-220
Keywords 1-Methylcyclopropane; Ethylene; ACC metabolism; Cold stress; Apple skin tissue; Apple pulp tissue

Abstract

It is now widely accepted that 1-MCP reduces ethylene production and prevents scald disorder in apple skin tissue. However, despite this beneficial effect, very little is known about the effects of 1-MCP on this tissue. This study aimed to determine how this treatment affects ACC metabolism in both skin and pulp tissues in relation to cold storage. Changes in ACC metabolism were monitored in control and 1-MCP treated fruit stored in air and removed after 0, 15, 30, 90 and 150 days of storage. 1-MCP treatment caused an inhibition of ethylene production but also of ACC synthase (ACS) activity and ACC levels both in pulp and skin. Compared to the control, 1-MCP treatment also induced a significant reduction in ACC oxidase (ACO) activity, but the inhibition remained incomplete in both tissues. High levels of MACC were found in 1-MCP treated fruit, showing the presence of a malonyl transferase insensitive to 1-MCP treatment. Collectively, these results showed that apple skin and pulp exhibited similar climacteric behaviour. The results also showed that the different parameters involved in ACC metabolism were differentially inhibited by the 1-MCP treatment during cold storage. ACS was completely inhibited in both tissues, ACO only partially and the treatment was ineffective to prevent MACC accumulation.