

Title Ethylene suppression treatments modify gene expression and activity of aroma volatile-related enzymes in ‘Delbard Estivale’ apples: Consequences on the aroma profile of fruit

Author Jamil Harb, Josef Streif, Omar Saleh, Isabel Lara and Basel Khraiwesh

Citation Abstracts Book, 6th International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

Keyword Ethylene; enzyme; apple

Abstract

Delbard estivale is an early apple variety and the influence of ethylene suppression treatments on the postharvest quality and longevity of this cultivar is missing. Consequently, the aim of this study was to assess the effect of AVG- and 1-MCP treatment on the postharvest behaviour of estivale delbard apple kept at room temperature, with special emphasis on the biosynthesis of odor volatiles, as a major quality attribute. Fruits were harvested at the proper time, and subjected to AVG (ReTain®) treatment about 3 weeks before harvest date, and another patch of fruits was treated with 1-MCP. Following treatments, untreated and treated fruits were monitored for various quality parameters, respiration rates and ethylene levels. Moreover, the aroma profile well as the activities of related enzymes was assessed quantitatively at various sampling times. In addition to that the gene expression of ADH and AAT enzymes were assessed also quantitatively at one selected sampling time. The obtained result clearly show that ethylene suppression treatments maintained the firmness, acidity, and the colour of fruits. However, both treatments have negative impact on the biosynthesis of odour-volatiles, in particular the esters. On the other hand, the activities of lipoxygenase (LOX), alcohol dehydrogenase (ADH), and pyruvate decarboxylase (PDC) were declined by these treatments, whereas the activities of alcohol o-acyltransferase (AAT) was higher with MCP treated fruit. Gene expression assessment confirmed these trends.