

Title Effect of 1-MCP and short-term high CO₂ postharvest treatments on plum (*Prunus domestica* spp. *domestica*) quality during shelf-life at room temperature

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

Keyword 1-MCP; Plum; CO₂

Abstract

Prunus is a very heterogeneous plant family with a partially different ripening behaviour observed between European (*P. domestica*) and Japanese (*P. salicina*) plums. Cultivars of *P. salicina* normally show a climacterical ripening behaviour with a characteristic increase in respiration and ethylene formation. Japanese plums are generally firmer and react to high CO₂ treatments in CA-conditions and/or to 1-MCP application with improved storability. On the other hand, *P. domestica* cultivars are mostly non-climacteric ripening types with smaller and softer fruit and more limited storability. Between both ripening types there are some cultivars that exhibit a transitional position with no clearly defined ripening behaviour concerning respiration changes or ethylene formation. This work tests the effects of 1-MCP and short-term high CO₂ treatments applied at room temperature on plum quality during shelf life of two European plum (*P. d. spp. domestica*) cultivars 'Hanita' and 'Elena' harvested at different ripening stages. 'Hanita' behaved as a climacteric fruit, since the 1-MCP treatment inhibited respiration rates and ethylene formation during the early ripening pre-climacteric stages, and slowed down fruit softening during shelf life at room temperature. On the contrary, 'Elena' behaved as a 'suppressed' climacteric fruit, in which there were no obvious ethylene or respiration peaks measured during shelf-life at room temperature. Short-term exposure to high CO₂ did not have any effect in extending the shelf-life of 'Elena' plums, but accelerated the deterioration of 'Hanita'.