

Title 1-MCP treatment preserves aroma quality of 'Packham's Triumph' pears during long-term storage

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Abstract

The effects of 1-MCP and CA storage in aroma production and consumer acceptance, were investigated during the long-term storage of 'Packham's Triumph' pears. Pears were harvested 144 (Harvest 1) and 157 days (Harvest 2) after full bloom. The fruit were stored under cold storage (0 °C, 90–95% R.H.), controlled atmospheres (CA, 2.0–2.5 kPa O₂ and 1.0–1.5 kPa CO₂) or treated at harvest with 1-MCP (0.2 µL L⁻¹) followed by cold storage. Ripening indices and aroma volatile production (using SPME technology) were determined after 2, 4 and 6 months of storage plus 5 days of shelf life, in addition to sensory evaluations. Butyl and hexyl acetate, followed by pentyl acetate and butyl butanoate, were the most abundant esters produced by the pears, and butanol and hexanol the most abundant alcohols. Their abundance increased during the development of ripening. Hexyl acetate with fruity notes was found to be the main contributor to the aroma of the pears, followed by butyl acetate and pentyl acetate, while alcohols showed a poor contribution. After 2 months of storage, pears stored under regular cold storage developed the highest content of volatile compounds and also the highest odour value, being preferred by sensory panelists. CA storage and 1-MCP treatment reduced the production of aromatic volatiles by the fruit. Nevertheless, after a longer storage period, pears treated with 1-MCP or stored under CA conditions, recovered capacity for volatile production with odour activity, and the panelists preferred 1-MCP treated over CA stored fruit. Pears treated with 1-MCP from the late harvest date were capable of producing higher amounts of volatile compounds during storage than those harvested at the commercial peak. The treatment of pears with 1-MCP followed by cold storage maintained textural characteristics preferred by the consumers and the capacity of volatile production, and therefore this technology could be used for maintaining fruit quality during long-term storage.