Title Treatment with 1-MCP and the role of ethylene in aroma development of mountain papaya fruit

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Abstract

Mountain or highland papaya (*Vasconcellea pubescens*) is a climacteric fruit which develops a strong and characteristic aroma during ripening. The dynamics of aroma volatile production during ripening of whole papaya fruit were analysed by headspace-SPME. The main compounds produced by the fruit were esters (aliphatic and branched) and alcohols: the most abundant esters were ethyl acetate, ethyl butanoate, methyl butanoate and butyl acetate, comprising 88% of the volatiles in fully ripe fruit; butanol was the most abundant alcohol. Among the volatiles produced, ethyl butanoate, ethyl acetate, ethyl hexanoate and ethyl 2-methylbutanoate were found to be the most potent odour compounds. During ripening of mountain papaya fruit there was an increase in the total content of both esters and alcohols. In order to clarify the role of ethylene in aroma formation, mature fruit were treated with 0.3 μL L^{-1} of 1-MCP (16 h at 20 °C) or with 2 g L^{-1} Ethrel, and then allowed to ripen at 20 °C. The treatment of the fruit with 1-MCP inhibited the rise in ethylene production in the fruit, while Ethrel advanced the development of the climacteric phase. Most esters identified in mountain papaya were dependent on ethylene, showing an increase in production during ripening and in response to Ethrel treatment, and a strong reduction in response to 1-MCP treatment. The data presented provide evidence that most esters produced by mountain papaya are derived from fatty acids and amino acid metabolic pathways, both of them being affected by ethylene.