

Abstract

The first noticeable event during the ripening of mountain papaya (*Vasconcellea pubescens*) is the rapid degreening of the skin, followed by climacteric ethylene and flesh softening. When ethylene perception is blocked by 1-methylcyclopropene (1-MCP, $0.3 \mu\text{l l}^{-1}$ for 16 h at 20°C), the increase in ethylene evolution is avoided, and softening and color development are partially delayed. This indicates that ethylene perception is an absolute requirement for ethylene production during ripening and that softening and color development are only partially dependent on ethylene. Our data also suggest that the changes in pH, titratable acidity, and soluble solids are not dependent on ethylene. Mountain papaya fruit displayed the typical climacteric rise in ethylene production, reaching maximum values of $1.8\text{--}3.2 \mu\text{mol kg}^{-1} \text{h}^{-1}$, and so confirmed the climacteric nature of the fruit. The activity of ACC oxidase paralleled changes in ethylene production. Nevertheless, when 1-MCP treated fruit recover ethylene sensitivity, a big increase in ACC oxidase activity is observed followed by a further increase, but at a reduced level, of ethylene; the reduced ACC content suggests that in these fruit the availability of ACC is limiting ethylene biosynthesis. Finally, our results indicate that treatment of mountain papaya with 1-MCP delays the onset of the climacteric phase, and therefore can be used commercially to extend effectively the short shelf life of this fruit.