

Title Quality and volatile attributes of attached and detached 'Pluk Mai Lie' papaya during fruit ripening

Author P. Fuggate, C. Wongs-Aree, S. Noichinda and S. Kanlayanarat

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Abstract

The 'Pluk Mai Lie' papaya (*Carica papaya* L.) is a promising cultivated fruit for use in fresh and processed products due to its firm flesh, but the aroma it releases is flat. Changes in quality and volatile profiles were analyzed during on- and off-tree fruit ripening. Detached fruit ripened faster than attached fruit, accumulating high internal ethylene levels. Aside from peel color, which was redder in on-tree ripened fruit, most quality attributes changed similarly in the two ripening situations. A slight increase in total soluble solids (TSS) was measured from the onset of the preclimacteric stage, whereas titratable acidity (TA) remained stable throughout the development. Whereas 2-ethyl-1-hexanol was found specifically in green fruit, ethyl octanoate emerged only in fully-ripe fruit. Furthermore, benzyl isothiocyanate was the most abundant volatile and was present in fruit at every stage except full ripening. The production of total esters, highly correlated with a loss of firmness and an increase in cavity ethylene accumulation, was about 10-fold higher in off-tree ripened fruit. The levels of methanol and ethanol sources in fruit increased steadily throughout ripening, with esters formed from ethyl alcohol predominating from the half-ripe through the senescence phases. The alcohol dehydrogenase activity in the mesocarp increased dramatically during the early ripening stages, whereas alcohol acetyltransferase was active throughout ripening. No difference in volatile profiles was found in the papaya fruit during on-tree and postharvest ripening.