

Title Changes in external and internal color during postharvest ripening of ‘Manila’ and ‘Ataulfo’ mango fruit and relationship with carotenoid content determined by liquid chromatography–APcI⁺-time-of-flight mass spectrometry

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Abstract

High-performance liquid chromatography–atmospheric pressure chemical ionization (APcI⁺)-time-of-flight mass spectrometry studies revealed that all-*trans*- β -carotene and the dibutyrate esters of all-*trans*-violaxanthin and 9-*cis*-violaxanthin were the main carotenoids in ‘Ataulfo’ and ‘Manila’ mango fruit mesocarp. The concentration of these carotenoids in the mesocarp was measured during fruit ripening and correlated with colorimetric changes of mesocarp and epidermis. The lowest and highest concentrations of all-*trans*- β -carotene, all-*trans*-violaxanthin and 9-*cis*-violaxanthin (as dibutyrate esters) during the ripening of ‘Manila’ mango were 0.25×10^{-3} to 35.57×10^{-3} , 0.40×10^{-5} to 31.97×10^{-3} and 0 to 16.81×10^{-3} g kg⁻¹ of fresh mesocarp, respectively. For ‘Ataulfo’ they were 2.55×10^{-3} to 39.72×10^{-3} , 0.16×10^{-3} to 15.00×10^{-3} and 0.21×10^{-3} to 7.48×10^{-3} g kg⁻¹ of fresh mesocarp, respectively. The concentration of these carotenoids increased in an exponential manner during fruit ripening in ‘Ataulfo’ and in an exponential or second-order polynomial manner in ‘Manila’. The highest correlation coefficients were obtained for the relationships between the mesocarp and epidermis a^* and h° color values and the concentration of the evaluated carotenoids in both mango cultivars ($R = 0.81$ – 0.94). Equations to predict the concentration of the most important carotenoids in ‘Manila’ and ‘Ataulfo’ mango fruit on the basis of their mesocarp and epidermis color values were obtained.