

Title Qualitative and quantitative changes in carotenoids and phenolic compounds in tomato fruit during ripening

Author Armando Carrillo-Lopez and Elhadi M. Yahia

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Abstract

Tomato is an important agricultural crop world-wide. Its pigments and phenolic compounds are very important in many ways, and have been associated with health benefits such as lowering the risk of some chronic diseases. Identification of carotenoids and phenolic compounds using liquid chromatography coupled to mass spectrometry, and quantification by HPLC-DAD was carried out in the exocarp and mesocarp of the fruit during 6 different ripeness stages (mature-green, breaker, turning, pink, light red and red). Several phenolic compounds have been identified including chlorogenic acid and phenolic glycosides, such as caffeoyl-hexoside, coumaroyl-hexoside, feruloyl-hexoside, siringic-hexoside and rutin. Four carotenoids have been followed during ripening; β -carotene and lycopene were identified, whereas γ -carotene and lycopene-epoxide were tentatively identified, and the four of them were monitored during fruit ripening. Fruit exocarp had higher quantities of chlorophyll, carotenoids and phenolic compounds compared to the mesocarp. Chlorophylls drastically decreased, lycopene drastically increased, while β -carotene, γ -carotene and lycopene-epoxide slightly increased during fruit ripening. There were differences in the changes in phenolic compounds. Chlorogenic acid decreased and rutin increased, both in the exocarp and in the mesocarp, during fruit ripening.