

Title Use of a custom array to study differentially expressed genes during blood orange (*Citrus sinensis* L. Osbeck) ripening

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Citation Journal of Plant Physiology, Volume 167, Issue 4, 1 March 2010, Pages 301-310

Keywords Anthocyanins; Blood sweet orange; Fruit flesh; Microarray analysis; qRT-PCR

Abstract

A flesh-specific oligonucleotide custom array was designed to study gene expression during blood orange ripening. The array included 301 probes derived from a subtracted SSH library, a cDNA-AFLP collection, and a set of regulatory genes from the Harvest citrus database. The custom array was hybridized using samples of Moro, a pigmented cultivar, and Cadenera, a common cultivar, at three different ripening stages: the immature phase, the halfway point of maturation (corresponding to the start of Moro pigmentation) and the full ripening. Of the 301 probes, 27 in total, corresponding to 20 different transcripts, indicated differential expression in stage-to-stage and/or cultivar-to-cultivar comparisons. Transcripts encoding for anthocyaninbiosynthesis represented most of the total over-expressed probes. The remaining differentially expressed transcripts were functionally associated with primary metabolism as flavor biosynthesis, defense and signal transduction. The expressed products associated with probes indicating differential expression were confirmed by qRT-PCR. The microarray was designed considering a small collection of sequences useful for monitoring specific pathways and regulatory genes related to fruit ripening and anthocyaninpigmentation. The main novelty of this customization is the use of expressed sequences specifically derived from blood orange flesh to study different cultivars and ripening stages, and the provision of further information about processes related to anthocyaninpigmentation in citrus fruit flesh.