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ISOLATION AND EXPRESSION ANALYSIS OF A MYB-LIKE GENE CONTROLLING THE ANTHOCYANIN PATHWAY IN *CITRUS SINENSIS* L. OSBECK

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Fruit-specific anthocyanin accumulation is a distinctive trait that makes Sicilian oranges a unique product. Red pigments attract consumers, not only for their beauty but also for their power as antioxidants.

We isolated a Myb-like transcription factor gene, called *CsPMC1*, using degenerate primers. The gene is composed by three exons and two introns and it seems to be responsible for the "blood orange" phenotype. Using a PCR-based DNA marker from the *CsPMC1* gene on different blood and common oranges and different hybrids, with high, medium and low content of anthocyanins, only blood oranges and hybrids showed the fragment diagnostic of 'blood orange'. This DNA band was absent in all common oranges and blond hybrids that we tested. Expression analysis conducted on the same pigmented and blond samples showed a strong correlation between the red pigmentation and the expression level of *PMC1*. Moreover, tobacco transformed with CaMV35S:*PMC1* showed the ectopic production of anthocyanins in vegetative tissues of regenerated plants.

We propose that the *PMC1* gene could be used as marker for the "production of anthocyanins in fruit" during the marker assisted selection, and it could be used in at very early developmental stages, during breeding programs, even though the marker scores only the ability to produce anthocyanins in fruit flesh, not the levels that will accumulate. We hypothesize that a 'gain of function' mutation underlies all the blood orange varieties that involve elevated levels of anthocyanins. We suggest that the mutation involved changes to the promoter sequence of the *PMC1* genes, since this is where the diagnostic DNA marker is located.