

# Phenolic content, color development, and pigment-related gene expression: A comparative analysis in different cultivars of strawberry during the ripening process

Parra-Palma C.

Morales-Quintana L.

Ramos P.

Globally, the strawberry is one of the most widely consumed fruits, but under certain environmental conditions, it exhibits inadequate red color development, causing economic losses due to lower product quality. In order to evaluate if changes in color are cultivar-specific and environmentally dependent, a comparative study of anthocyanin accumulation, total phenolic, total flavonoid content analysis and additionally a transcriptional profile of pigment-related genes in 'Camarosa', 'Cristal', 'Monterey', and 'Portola' (four strawberry cultivars) was performed. These showed an increase in their red coloration during fruit development. The anthocyanin accumulation in the four cultivars was related to the particular progress of the transcriptional activity of genes involved in the biosynthesis of flavonoid pigments. The greatest increase was observed in 'Monterey' and 'Camarosa'; thus, we have found a correlation between fruit color redness and total anthocyanins only in these cultivars. However, a positive correlation between the mRNA abundance of FaF30H and FaFLS and the total flavonoids content was found in all cultivars at early stages of ripening. Finally, we found correlations between color and other important physiological properties such as SSC/TA, weight, and aroma expressed as total esters. These results could be useful in making decisions in future breeding programs to improve the content of healthy compound content in strawberry fruit. © 2020 by the authors.

Cultivar quality traits correlation

Environmental incidence

Flavonoid biosynthesis

Strawberry anthocyanins

transcriptional profile