

Characterization of the optimal ripening stage for 'Pico Colorado' sweet cherry, based on colour and bioactive compounds

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Abstract

Sweet cherries are a very attractive fruit. Their colour and skin pigmentation are essential quality characteristics for consumers. Fruits are considered a natural source of antioxidants including anthocyanins and polyphenols. Numerous studies have been conducted to evaluate their properties in terms of quality and bioactivity. Studies of ripening are of special interest because they help to identify the optimum point of maturity for harvesting. The objective of this work was to characterise the evolution of colour and phenolic compounds in 'Pico Colorado' fruit during ripening. This cultivar is a late "Picota" cherry (44 days after 'Burlat') that, when harvested naturally, is stemless and is commercialized under the protected designation of origin (PDO) as 'Cereza del Jerte'. Edible ripe fruits of 'Pico Colorado' were collected from various trees on the same day and grouped into 3 ripening stages according to the colour of their skins. Upon their arrival at the laboratory, they were analysed with the results showing significant increases during ripening in the content of soluble solids, total phenols and total antioxidant activity; a non-significant decrease in firmness; and significant decreases in the colour parameters of both skin and flesh, and in carotenoid pigments. The following compounds were identified and quantified using HPLC-DAD/ESI-MS: four anthocyanins, with cyanidin-3-O-rutinoside being most abundant (38.87 ± 0.59 mg 100 g⁻¹ fw); 3 hydroxycinnamic acids, the principal of which was neochlorogenic acid (14.18 ± 0.15 mg chlorogenic acid 100 g⁻¹ fw); a flavonol, rutin (4.56 ± 0.10 mg 100 g⁻¹ fw); and a flavan-3-ol, epicatechin, which was the least abundant of all the phenolic compounds, and only could be quantified in the third ripening stage. Because of the increased levels of bioactive compounds associated with the ripening stage, stage 3 could be considered to represent the highest nutritional and functional quality.