

**Title** Effect of ripeness and postharvest storage on the evolution of colour and anthocyanins in cherries (*Prunus avium* L.)

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### Abstract

The relationship between colour parameters and anthocyanins of four sweet cherry cultivars, Burlat, Saco, Summit and Van was studied. The colour ( $L^*$ ,  $a^*$ ,  $b^*$ , chroma and hue angle parameters) and anthocyanins were analysed during two different years at two different ripening stages (partially ripe, and ripe, respectively). The cherries were analysed at harvest and after storage at  $1.5 \pm 0.5$  °C and  $15 \pm 5$  °C for 30 and 6 days, respectively. The colour was measured by tristimulus colourimetry (CIELAB system) directly on the fruits, while anthocyanins were quantified by HPLC-DAD analysis on methanolic extracts of freeze-dried samples of the fresh cherries and on the differently stored cherries.  $L^*$ , chroma, and hue angle values were always lower for the ripe than for the partially ripe cherries. All of the cultivars were found to contain cyanidin-3-rutinoside and cyanidin-3-glucoside as the major anthocyanins. The total anthocyanin content in fruits of the different cultivars varied in the order Burlat > Saco > Van > Summit. The concentration of anthocyanins increased at both temperatures of storage in both ripe and partially ripe cherries, but the extent of increase varied among cultivars. Cherries stored at  $15 \pm 5$  °C showed higher reduction of  $L^*$ , chroma and hue angle than fruits stored at  $1.5 \pm 0.5$  °C.  $L^*$ ,  $a^*$ ,  $b^*$ , chroma and hue angle correlated negatively ( $P < 0.001$ ) with the total anthocyanins levels, but not with the total phenols. These results show that chromatic functions of chroma and hue correlate closely with the evolution of colour and anthocyanins levels during storage of sweet cherries and indicate that colour measurements can be used to monitor pigment evolution and anthocyanin contents of cherries (and *vice versa*).