

Total carotenoid and ascorbic acid contents in healthy and cracked fruits of the cape gooseberry (*Physalis peruviana* L.)

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Abstract

The cape gooseberry is the most promising exotic fruit exported from Colombia. Fruits of this species are susceptible to cracking, a disorder which is influenced by calcium applications and irrigation management, which can affect the nutraceutical properties of this fruit. The experiment was developed in a plastic greenhouse of the Faculty of Agronomy of the Universidad Nacional de Colombia in Bogota at 2,556 m a.s.l. The average greenhouse temperature was 18.5°C and the relative humidity was 62%. The total carotenoid and ascorbic acid contents in the fruits of the cape gooseberry Colombian ecotype were evaluated. The plants were irrigated with different frequencies (every 4, 9 and 14 days), water levels (0.7, 0.9, 1.1, and 1.3 of evaporation of class A tank), and calcium doses (0, 50 and 100 kg ha⁻¹). The experimental design was in randomized blocks (irrigation frequency) with 12 treatments (the combination of the water levels and the calcium doses). Plants were planted in 20 L plastic pots filled with peat moss and placed at a distance of 1.5 m between plants and 2.0 m between rows. When the plants were 11 months old, the fruits were harvested at state 3 of ripeness according to Norma Técnica Colombiana 4580. A factorial analysis of variance was used and the a Tukey's range test at 5% was applied to compare means. Calcium concentrations did not affect the contents of ascorbic acid or total carotenoid. The highest irrigation coefficient (1.3) increased the fruits' total carotenoid contents, while the lowest irrigation coefficient (0.7) had the lowest carotenoid values. The plants with the irrigation frequency of 14 days developed fruits with the highest ascorbic acid content, in both healthy and cracked fruits. Healthy fruits had higher total carotenoid and ascorbic acid contents as compared to the cracked fruits. Cracked fruits showed a stronger oxidation process, which increased the dehydroascorbate and decreased the ascorbic acid concentrations.