Evolution of the Volatile Organic Compounds, Phenols and Antioxidant Capacity during Fruit Ripening and Development of Rubus ulmifolius Schott Fruits

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Abstract
Nowadays, a growing interest in consumers' fruit with a high content of health-promoting compounds has been observed. In this sense, wild berries have received special attention based on their high accumulation of phenolic compounds, as well as their characteristic and pleasant aroma. In this work, we characterize the color development, antioxidant capacity, phenolic contents, and volatile profile of Rubus ulmifolius Schott fruit at different ripening stages during two seasons on the same orchard. Four stages were established based on the color parameter, which was consistent with changes in the weight and size of the fruit. In addition, total phenolic and flavonoid content showed a decrease during the fruit ripening, in contrast with the total anthocyanins content that increased at the final stages of ripening. In addition, the antioxidant capacity was evaluated through two approaches: FRAP and DPPH, which consistently displayed higher levels at the final stages in the two different seasons. Finally, the VOCs analysis showed an active synthesis of volatile compounds during the late stage of ripening, with alcohols being the most abundant compounds for each ripening stage. These results allow us to propose a classification of different ripening stages of the wild blackberry to have a better knowledge of this interesting fruit with higher healthy- and nutraceutical compounds.

Author keywords
fruit ripening; healthy compounds; phenols; volatile organic compounds; wild blackberry