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Título artículo: Physicochemical characterization of *Crocus serotinus* stigmas indicates their potential as a source of the bioactive apocarotenoid crocetin.

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RESUMEN:

Alternative plant sources to the dried flower stigmas of *Crocus sativus* L. (saffron) are desirable for the recovery and industrial production of the potentially bioactive apocarotenoid crocetin (CRT). In the present study, the phytochemical profile of the orange-red stigmas from several wild and cultivated accessions of *Crocus serotinus* Salisb, a Spanish autumn flowering *Crocus* plant, is characterized by chromatographic and spectroscopic fingerprinting methods. Saffron but also dried stigmas from two of its closest allies (*C. cartwrightianus* Herb. and *C. thomasii* Ten) are used for comparison. Among the studied accessions the cultivated ones present higher coloring strength values, up to fivefold lower than the minimum value of the corresponding ISO 3632 trade specification for saffron. Their polar extracts contain crocetin sugar esters ($\sim 30\text{mgg}_1\text{dw}$) with a different pattern than that prevailing in saffron or its closest allies but also simple phenolic and flavonoid constituents. The Fourier Transform Mid-Infrared (FT-MIR) spectra of *C. serotinus* flower stigmas are also assessed and CRT-related diagnostic bands of potential use in the quality control of the plant material are identified. The results indicate that if successfully bred, the *C. serotinus* plant may serve as an alternative source of CRT for food, pharmaceutical, and other applications. *Practical Applications:* The results of the study show that the red flower stigmas of the fertile *C. serotinus* plant that is natively grown in the Iberian Peninsula but also cultivated for gardening purposes may be an alternative source of the bioactive compound crocetin. Thus, apart from its morphological and physiological traits that are of interest for plant breeders, the particular natural product may have an added-value that deserves further exploitation.

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