

Edible Flowers as a re-emerging healthy food option: the case of *Gardenia jasminoides* Ellis, from absorption to antiproliferative and anti-inflammatory properties.

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Gardenia jasminoides Ellis is a flowering plant belonging to the *Gardenia* genus and the *Rubiaceae* family. Traditional medicine in many Asian countries makes extensive use of this plant's fruit, which is believed to treat hepatic diseases, reduce pain, and alleviate other disorders such as headaches, hypertension, and fever. Some of its parts may have a slightly sweet or bitter taste, including their petals that can be consumed in several different dishes. Moreover, the plant's yellow pigmentation makes it an excellent natural colorant in Japan and China, where it is used in various foods such as juices, candies, and noodles. The plant's major bioactive compounds include iridoid glycosides, carotenoids (e.g., crocetin and its derivatives), monoterpenoids, flavonoids, organic acid esters, sterols. The compounds responsible for the yellow pigmentation of these herbs are mainly crocetin and its derivatives. Several studies suggest the involvement of these compounds in health-promoting effects, mainly due to their antioxidant properties.

In this work the gastrointestinal absorption, antiproliferative and anti-inflammatory properties of the main carotenoids present in *Gardenia*, crocetin, crocin-1 and crocin-2, were assayed on MKN-28 and Caco-2 cell lines.

Overall, crocetin was the compound that presented the highest gastrointestinal transport efficiency. Since after absorption crocins are metabolized into crocetin, the antiproliferative capacity of crocetin was assayed in MKN-28 (stomach), Caco-2 (colon), and MCF-7 (breast) – local and remote effect. The results point to an antiproliferative effect of crocetin on the three cell lines tested, potentially by the downregulation of IL-1 β and TNF- α but not IL-6.

Altogether, these results suggest that these compounds can have an important role against cancer proliferation, highlighting the importance of *Gardenia jasminoides* Ellis as a nutraceutical food source.