

Abstract

XXXI Cycle of PhD program in Drug Discovery and Development, Pharmacy Department, University of Salerno

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PhD Thesis in: Valorization of typical agricultural productions and related biomasses as sources of bioactive compounds

Main target of this PhD project was to define the metabolome of the main by-products, and in certain cases of the edible parts, of selected agroalimentary productions, that are the flowers of *Opuntia ficus indica* Mill. (nopal cactus), the leaves of *Ficus carica* L. (common fig), the leaves, the husks, the shells and the kernels of *Prunus dulcis* Mill. (sweet almond) and *Pistacia vera* L. (pistachio). Attention was mainly focused on valorizing the waste material generated from manufacturing processes as potential sources of bioactives, pointing out their perspective employment in nutraceuticals and cosmetics.

Particularly, the selected plant parts were extracted by employing different solvents and extraction methods. The obtained extracts were submitted to LC-HRMS/MS experiments, in order to achieve a preliminary overview on their chemical composition. Polar extracts were fractionated by different chromatographic approaches, and the isolated compounds were characterized by 1D and 2D-NMR experiments, further supported by HRMS experiments. In addition, total phenolic content was determined by Folin-Ciocalteu assay, while radical scavenging activity was evaluated by DPPH and ABTS assays. Moreover, the main constituents of certain extracts were quantified by LC-MS/MS experiments by a Multiple Reaction Monitoring approach.

The obtained results highlighted sweet almonds and pistachios as rich sources of unsaturated fatty acids and antioxidant phenolics. On the other hand, the main by-products of the selected species exhibited a variegated metabolome, with several constituents belonging to different chemical classes, mainly phenolics, reported for their antioxidant and antiinflammatory properties, suggesting their potential employment for the manufacturing of nutraceutical and cosmetic formulations.