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MORFOLOGICHE E FUNZIONALI




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CHIMALI 2023 MARSALA



XIII CONGRESSO NAZIONALE DI CHIMICA DEGLI ALIMENTI

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29 – 31 maggio 2023

Hotel Resort Villa Favorita,
Marsala (TP)

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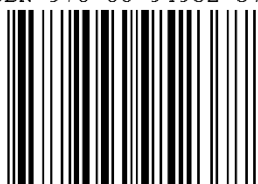
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Grape products and by-products: comparative analysis of phenolic profile and *in vitro* biological activities

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Grapes (*Vitis vinifera* L.) are one of the most widely produced crops in the world, with approximately 75 million tons produced every year; about 41% are produced in Europe, 29% in Asia and 21% in the Americas. About 45% of grapes produced is used as such or as fresh derivatives, while the remaining 55% is fermented for wine production [1]. In the last years, in parallel with the wine industry, the interest in grape non-fermented derivatives or by-products, as a source of health-promoting compounds, has notably increased. This could be due, among other factors, to: 1- national/international campaigns intended to reduce the alcohol abuse/misuse, especially among adolescents and young people [2]; 2-the promotion of winery by-products valorization, with the aim of reducing the negative impact of winemaking practices on the environment [3]. As a consequence, grape products that received more attention are fresh table grapes, raisins, grape leaves and pomace, the latter deriving from wine industry. Grape products are consumed as such (table grapes), as ingredients of food products (raisins, winemaking by-products) or as extracts for food supplement formulation (mainly grape leaves and winemaking by-products). In addition to nutritional aspects, grapes derivatives are among the richest sources of polyphenols; among them, flavonoids are the most abundant, especially flavanols, flavonols, phenolic acids and anthocyanins (red varieties). A broad spectrum of beneficial properties for human health have been associated with these compounds, including the reduction of oxidative stress and inflammation, both factors contributing to the progression of different chronic diseases [4]. On this basis, the aim of the present work was the characterization of the phenolic pattern and the evaluation of some biological properties of different grape derivatives, including: thirteen table grapes varieties; four samples of raisins; one extract of *Vitis vinifera* leaves; nine grape pomaces deriving from different varieties of red wine grapes. Different spectrophotometric (Folin-Ciocalteu's assay, pH differential method, vanillin assay) and chromatographic techniques (HPTLC, HPLC-DAD and LC-MS) were applied for a quantitative measurement of the main classes of polyphenols. *In vitro* biological assays included: DPPH (1,1-diphenyl-2-picrylhydrazyl) test for antioxidant activity evaluation and NF- κ B assay for the evaluation of anti-inflammatory activity in an *in vitro* gastritis model.

The results obtained show that, generally speaking, flavonols, procyanidins, phenolic acids and anthocyanins (in red varieties) were the most representative compounds mainly in fresh grapes, raisins and grape pomace. Anthocyanins were the characterizing compounds in grape leaves. These classes of phenol compounds were also well correlated with antioxidant and anti-inflammatory activity, showing to be interesting and promising ingredients for functional foods or food supplement formulation.

References

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