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***Punica granatum* L. bioresidues as a source of compounds with bioactive properties**

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Punica granatum L. (pomegranate), is a fruit that has been widely studied due to its composition in specific phenolic compounds, having also been described as displaying excellent bioactive properties (antioxidant, antimicrobial, and anti-inflammatory activity), with preventive action against some diseases [1,2]. Given that the inedible part of this fruit can represent up to about 50% of the total weight, this bio-waste has high potential as a source of bioactive compounds of interest [3].

Thus, this study compared different types of solvents in the extraction of phenolic compounds from the exocarp, mesocarp and pericarp of two pomegranate varieties: Mollar de Elche (yellow pomegranate) and Purple Queen (red pomegranate).

Chemical characterization was performed by HPLC-DAD-ESI/MS and revealed the presence of fourteen phenolic compounds in the Mollar de Elche, highlighting punicalagin and galloyl-HHDP-glucose as the major compounds. The extracts of pomegranate Purple Queen showed the same 14 phenolic compounds, despite being present in lower amounts, but this cultivar revealed also three anthocyanins, which may justify the characteristic reddish color of its bark.

Additionally, the antioxidant activity (inhibition of thiobarbituric acid reactive species formation in brain homogenates and inhibition of oxidative hemolysis, OxHLIA), antibacterial (against a panel of 5 Gram-positive bacteria and 3 Gram-negative bacteria, using the microdilution method), anti-inflammatory activity (rat macrophage cells), and cytotoxic potential (in human tumor cell lines by the sulforhodamine B method). Mollar de Elche stood out for its higher antioxidant and antibacterial activity, and cytotoxicity.

In general, the different extracts obtained from the by-products of both pomegranate varieties represent a source of phenolic compounds that allow it to exhibit excellent bioactive properties with potential application in the food industry as a natural ingredient, which will allow valuing these bio-residues.

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