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Chemical characterization and bioactivity evaluation of black mulberry and grape seeds

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ABSTRACT: Circular economy is increasingly seen as a crucial way to reduce food by-products and residues and obtain valuable raw materials. There is a growing demand for industrial products with clean labels and bio benefits, where natural bioactive compounds play an important role. Among these natural biomolecules, polyphenols stand out for their health benefits against diseases such as cancer or diabetes. Thus, the use of agro-industrial bioresidues as a rich source of polyphenols for the development of new natural preservatives, colorants and nutraceuticals is in the spotlight [1,2].

The aim of this work was the recovery of polyphenols from grape and mulberry seeds, usually considered as biowaste. Polyphenols were characterized by HPLC-DAD-ESI/MSⁿ, and the obtained polyphenol-rich extracts were analysed for their bioactive properties, namely antimicrobial and antioxidant capacities. Grape seeds were richer in catechin oligomers (36.0 ± 0.3 mg/g), and mulberry seeds in ellagic acid derivatives (3.14 ± 0.02 mg/g). In addition, both extracts exhibited high antimicrobial activity against multi-resistant *Staphylococcus aureus*. On the other hand, mulberry seeds showed the strongest antioxidant activity by the lipid peroxidation inhibition (IC₅₀ = 23 ± 2 µg/mL) and oxidative haemolysis inhibition (IC₅₀ at a 60 min Δt = 46.0 ± 0.8 µg/mL) methods [2]. Both by-products could be exploited for the recovery of added-value bioactive polyphenols and further application in the industry [2].

Keywords: Bioactivity, polyphenols, by-products, grape/mulberry seeds.

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