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POSTERS

Food composition and Authenticity

Antimicrobial activity and phenolic profile of chestnut (*Castanea sativa* Mill.) by-products

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Different agro-industrial by-products have been described as potential sources of phenolic compounds, which have been reported to exhibit several properties, such as, antimicrobial, antioxidant, anti-inflammatory, antimutagenic and cardioprotective [1]. During chestnut (*Castanea sativa* Mill.) processing, a large amount of wastes are generated that could be used as interesting and cheap sources of these compounds [2]. Therefore, this study aimed to extract phenolic compounds from chestnut by-products of Longal variety and evaluate their antimicrobial activity against antibiotic resistant bacteria.

The phenolic compounds were extracted from different parts of the chestnut, namely the shell, inner shell and bur, as well as from the leaves of chestnut tree. The extraction was performed with 100% ethanol, which was eliminated by rotoevaporation at low temperature (40°C) and the obtained residue was re-dissolved in DMSO to a final concentration of 100, 75, 50, 25 and 10 mg/mL for the antimicrobial activity assay. The antimicrobial susceptibility assay was performed using the Kirby-Bauer disc diffusion method against 6 Gram-positive bacteria: *Enterococcus faecalis*, *Enterococcus faecium*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Bacillus cereus*, *Listeria monocytogenes*; and 4 Gram-negative bacteria: *Escherichia coli*, *Salmonella enteritidis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*. For the phenolic compounds analysis, the extracts were dissolved in ethanol and the analysis was performed by HPLC-DAD-ESI/MS.

The individual major phenolic compounds identified and quantified in the chestnut by-products were gallic acid, ellagic acid, trigalloyl-HHDP-glucose and quercetin, syringetin and myricetin glycoside derivatives. All the extracts showed antibacterial activity, with the inner shell's extract being effective against all Gram-positive and two Gram-negative bacteria. This extract presented syringetin-3-O-galactoside and myricetin glycoside derivatives as the main phenolic compounds. None of the extracts had antibacterial activity against *E. coli* and *S. enteritidis*, while *S. aureus* and *S. epidermidis* showed susceptibility to all tested extracts.

The obtained results show that chestnut by-products are a good source of phenolic compounds with antimicrobial activity, being a potential tool to potentiate antibiotic effects in combating multidrug-resistant bacteria.

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