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Evaluation of different spent coffee grounds extracts composition in bioactive compounds

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Background: Coffee is one of the most popular beverages in the world. The main by-product that is generated during the brewing process of coffee is the spent coffee ground (SCG) - a wet solid dark brown. The research conducted in the last decade in the field of food waste exploitation showed that this residue is rich in lignocellulose, cellulose and hemi-cellulosic polysaccharides but also in proteins, non-protein nitrogenous compounds (caffeine), lipids, phenolic compounds, minerals.

Aim & Methodology: The aim of the present study was to evaluate the content in bioactive compounds of SCG residues resulted after brewing the coffee by different techniques: moka pot, French press, espresso machine, filter coffee machine and Turkish coffee maker. For the obtained SCG samples the total polyphenolic content (Folin-Ciocalteu method), flavonoid content ($\text{NaNO}_2\text{-AlCl}_3\text{-NaOH}$ chromogenic system) and the antioxidant capacity (DPPH assay) were assessed spectrophotometrically. The volatile profile and the fatty acid methyl esters were determined by gas chromatography-mass spectrometry. The antimicrobial activity of the SCG samples was also evaluated against several microorganisms.

Results: The results showed that the SCG samples contained considerable amounts of bioactive (polyphenols, flavonoids, caffeine, and lipids) as well as good antioxidant and antimicrobial activities, but dependent on the applied brewing technique.

Conclusion: Thus, the engagement of the scientific community in the exploitation of food waste in general and of SCG by-products in particular for the recovery of biologically active molecules became more and more thorough due to the manifold possibilities of using the recovered bioactive in the development of new added-value products.

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