

## Ultrasonic Extraction of Phenolics from Leaves of Shallots and Peels of Potatoes for Biofortification of Cheese

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**Abstract :** This study was carried out with the aim of enriching fresh cheese with the food by-products, which are the leaves of shallots and the peels of potatoes. Firstly, the conditions for extracting the total polyphenols using ultrasound are optimized. Then, the contents of total polyphenols PPT, flavonoids and antioxidant activity were evaluated for the extracts obtained by adopting the optimal parameter. On the other hand, we have carried out some physicochemical, microbiological and sensory analyzes of the cheese produced. The maximum total polyphenols value of 70.44 mg GAE gallic acid equivalent / g of dry matter DM of shallot leaves was reached with 40% (v/v) ethanol, an extraction time of 90 min and a temperature of 10 °C. While, the maximum TPP total polyphenols content of potato peels of 45.03 ± 4.16 mg gallic acid equivalent / g of dry matter DM was obtained using an ethanol /water mixture (40%, v/v), a time of 30 min and a temperature of 60 °C and the flavonoid contents were 13.99 and 7.52 QE quercetin equivalent/g dry matter DM, respectively. From the antioxidant tests, we deduced that the potato peels present a higher antioxidant power with the concentration of extracts causing a 50% inhibition IC50s of 125.42 ± 2.78 µg/mL for 2,2-diphényl 1-picrylhydrazyle DPPH, of 87.21 ± 7.72 µg/mL for phosphomolybdate and 200.77 ± 13.38 µg/mL for iron chelation, compared with the results obtained for shallot leaves which were 204.29 ± 0.09, 45.85 ± 3,46 and 1004.10 ± 145.73 µg/mL, respectively. The results of the physicochemical analyzes have shown that the formulated cheese was compliant with standards. Microbiological analyzes show that the hygienic quality of the cheese produced was satisfactory. According to the sensory analysis, the experts liked the cheese enriched with the powder and pieces of the leaves of the shallots.

**Keywords :** shallots leaves, potato peels, ultrasound extraction, phenolics, cheese

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