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Screening of the profile of phenolic compounds from grape pomace before and after treatment with filamentous fungi

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In this study, two methods of solid-liquid extraction of phenolic compounds from grape pomace were tested, namely ultrasound-assisted extraction and conventional extraction in a water bath. It was found that the best extraction efficiency of total phenolic compounds ($67.13 \text{ mg}_{\text{GAE}}/\text{g}_{\text{db}}$) and total flavonoids ($35.90 \text{ mg}_{\text{CE}}/\text{g}_{\text{db}}$) was achieved with the conventional solid-liquid extraction method, where the extraction conditions were optimal: $T = 80 \text{ }^\circ\text{C}$, extraction solvent 50% aqueous ethanol, $n = 200 \text{ rpm}$, $t = 120 \text{ min}$, solid-liquid ratio: 40 mL/g, which was used for further experiments. Furthermore, a biological treatment of the grape pomace was carried out over a period of 1 to 5, 10 and 15 days with 11 different filamentous fungi (*Trametes versicolor* TV6, *Trametes versicolor* TV8, *Trametes versicolor* AG613, *Trametes gibbosa*, *Phanerochaete chrysosporium*, *Ceriporiopsis subvermispora*, *Pleurotus eryngii*, *Ganoderma lucidum*, *Ganoderma resinaceum*, *Humicola grisea*, and *Rhizopus oryzae*) for the recovery of phenolic compounds from the complex lignocellulose structure. The results showed that *P. eryngii* and *R. oryzae* had the highest impact on the recovery of most phenolic compounds among the microorganisms used, with an increase of 1.1 to 4.5-fold compared to the untreated initial sample. The positive effect of biological treatment was most pronounced for ellagic acid, whose concentration increased from an initial value of $34.65 \text{ }\mu\text{g}/\text{g}_{\text{db}}$ to $303.72 \text{ }\mu\text{g}/\text{g}_{\text{db}}$ after 15 days of treatment with *C. subvermispora*.

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