

Effect of Enzyme Concentration on Phenolic Antioxidants Extraction from Raspberry Wastes

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Raspberry wastes are a promising source of phenolic antioxidants that may be used in cosmetic, pharmaceutical and food industries. The effect of different enzyme concentrations on phenolic antioxidant extraction from these residues was evaluated as an eco-friendly alternative compared to the extraction with organic solvents.

Soluble solids, phenolic content and antioxidant activity of the extracts were measured and compared with those obtained without enzyme addition. Antioxidant activity was evaluated by DPPH, ABTS and FRAP. Aqueous extraction was performed in batch at 50°C, 150 rpm, 18 hours and a liquid/solid ratio of 20. Grindamyl (Danisco) was used as biocatalyst. Enzyme/Substrate ratio (%w/v) varied between 0.75 y 10.

All enzyme concentrations increased the soluble solids with respect to the non-enzymatic control, from 15% to 172%. Total phenolic content varied only at high enzyme concentrations, with increases of 11% and 25%, for 5 and 10% E/S, respectively. All enzyme concentrations increased the antioxidant activity evaluated by ABTS method with respect to the non-enzymatic control, in a range of 13 to 203%, when the enzyme/substrate ratio was varied between 0.75 y 10. The antioxidant activity evaluated by FRAP showed increases of 20% and 38% for concentrations of 5 and 10% E/S, respectively. The same behavior was observed in the case of DPPH method, with increases of 18 and 36% obtained for concentrations of 5 and 10% E/S, respectively.

In general, the use of a higher enzyme concentration greatly improved the recovery of phenolic antioxidants.

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