Extraction of antioxidant compounds from enzymatic hydrolysis of brewer's spent grain after solid-state fermentation

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Phenolic compounds have antioxidant properties that can benefit human health and food preservation. During solid-state fermentation (SSF) of lignocellulosic substrates, filamentous fungi produce carbohydrate degrading enzymes which can amplify the quantity of phenolics released linked to vegetable matrix when applying enzymatic hydrolysis (EH). In this work, brewer's spent grain (BSG) was fermented with *Aspergillus ibericus* and later the lignocellulolytic enzymes were extracted and used on an EH of fermented BSG. EH was optimized by a Box-Behnken design approach, studying the effect of three factors in the extraction of antioxidant compounds, namely the quantity of SSF-crude extract added, load of fermented solid and addition of β-glucosidase. The maximum increase of phenols and antioxidant activity in comparison to unhydrolyzed BSG were 42.9 mg/g and 83.5 μmol trolox/g, respectively. β-glucosidase addition and low solid-load had a positive effect on the phenols released and antioxidant activity. The quantities of crude SSF-extract studied did not had a significant effect on phenols and antioxidant released.

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