PS2-22

POTENTIAL APPLICATIONS OF MULTIFUNCTIONAL EXTRACT OBTAINED FROM CORN INDUSTRY IN FOOD PACKAGING

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Nowadays, in the food industry exists an increased demand, by the consumers, of natural additives that can replace those chemical additives obtained from non renewable resources. In this work extracts with surfactant and antioxidant properties were obtained from corn steep liquor (CSL) with potential applications in food packaging.

The extraction process was carried out using ethyl acetate and the operational conditions consisted of: CSL/ethyl acetate 1:3 (v/v), at 25°C during 45 min with agitation system at 150 rpm.

The antioxidant activity of the extract was determined by the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging method; whereas the surface active properties was evaluated by the Wilhelmy plate method in a force tensiometer with a platinum plate (Easy Dyne K20, KRUSS GmbH), at room temperature.

Fatty acid composition of extract was analyzed by gas chromatography coupled to a mass spectrometer (Bruker Scion 451-GC).

Chromatographic separations of polyphenols were carried out on a reverse phase Kromasil C18 column (250 × 3.2 mm internal diameter, 5 μm particle size) (Phenomenex, Barcelona, Spain). The solvents constituting the mobile phase were Milli-Q water 0.1% acetic acid (solvent A) and 100% AcN (solvent B). The gradient program was as follows: 0-5 min, 93% A and 7% B; 5-10 min, linear gradient until reaching 90% A and 10% B at 10 min; 10-20 min, linear gradient until 80% A and 20% B; 20-35 min linear gradient from 70% A to 30% B, 35-40 linear gradient from 93% A to 7% B; and finally, the column was washed and reconditioned. The mobile phase flow rate was 0.5 mL min−1 during the entire analytical run, the column temperature was set at 38 ºC, and the sample injection volume was 20 μL. A scan in the range of 190 to 700 nm was continuously performed by DAD.

The extract obtained form CSL after extraction with ethyl acetate showed an appreciable antioxidant capacity (EC50 of 9.65±0.48 g/L) and a surfactant capacity that was able to reduce the surface tension of water in more than 32 units. The extraction yield achieved was about 1% (about 10.22±2.28 g of extract were obtained by kg of CSL).

Regarding the chemical characterization, this extract was composed mainly by C16-C18 fatty acids consisting of linoelaidic acid, oleic or/and elaidic acid, stearic acid and palmitic acid; as well as antioxidants comprising protocatechuic acid, vanillic acid, p-coumaric, sinapic acid, quercetin and ferulic acid, proving that corn steep liquor (CSL) is an interesting natural source for obtaining extracts with antioxidant and biosurfactant properties.

Keywords: Corn steep liquor, Antioxidant, Surfactant, Multifunctional extract, Food packagin

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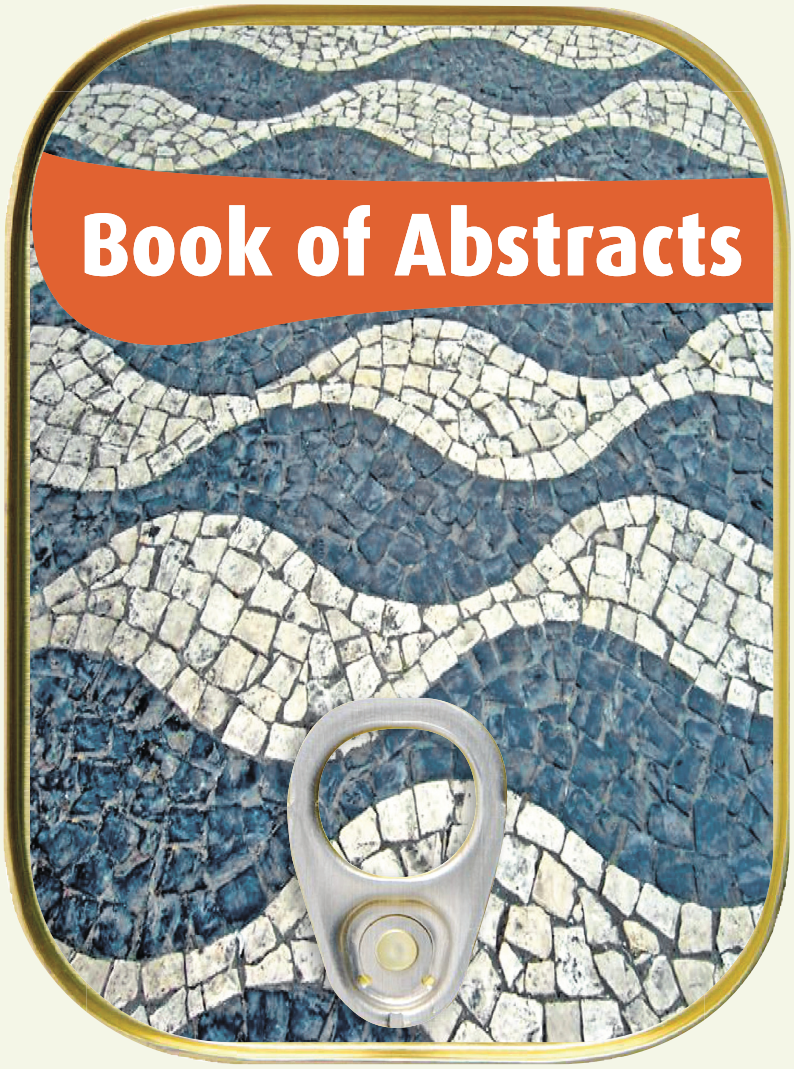

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