

Área: ORG.

Concentration of bioactives from freeze-dried *Euterpe oleracea* using supercritical CO₂ and ultrasound-assisted extraction

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Palavras Chave: Antocianinas, atividade antioxidante, solventes verdes, extração por fluido supercrítico, extração com solvente assistida por ultrassom, sistemas sustentáveis.

Highlights

- Polar and non-polar compounds were extracted and analyzed for total phenolics and antioxidant activity.
- Anthocyanins, especially cyanidin-3-glucoside, were identified and quantified using HPLC-UV.
- Nanofibers with antioxidant activity was developed.

Resumo/Abstract

The species *Euterpe oleracea*, commonly known as açai, has garnered significant scientific interest due to the antioxidant and anti-inflammatory properties attributed to the anthocyanins present in its pulp. This study proposes the concentration of bioactive extracts from freeze-dried açai pulp using non-conventional extraction techniques, namely supercritical CO₂ extraction and ultrasound-assisted extraction. Initially, the açai pulp was freeze-dried under controlled pressure and temperature conditions to increase its solid content and preserve thermolabile compounds such as anthocyanins. The resulting dried material was then sieved to obtain a specific particle size range suitable for the subsequent extraction procedures. Supercritical CO₂ extraction was conducted in a fixed-volume vessel under defined temperature and CO₂ flow rate conditions. In parallel, ultrasound-assisted extraction was performed using ethanol as the solvent, followed by filtration and low-temperature drying to ensure the recovery of bioactive compounds. The resulting extracts were evaluated for their antioxidant activity and total phenolic content using standard analytical assays. In addition, high-performance liquid chromatography (HPLC), equipped with a C₁₈ column and UV-Vis detection, was employed to identify and quantify specific anthocyanins, particularly cyanidin-3-glucoside. Subsequently, polymeric solutions of poly(1-vinylpyrrolidone)-co-(vinyl acetate) (PVP/VA), containing the residual extraction cake from açai, were processed via electrospinning to obtain nanostructured systems. These systems are intended for biomedical applications, such as wound dressings. Overall, this methodology aims to develop materials with high antioxidant capacity and to create promising nanostructured platforms with potential applications in nutraceutical and herbal medicine formulations.

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