

Área: ANA

Comparison of extraction methods for β -ecdysone from *Pfaffia glomerata* for quantification by HPLC.

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Highlights

Ultrasound-assisted aqueous extraction enables rapid, efficient, and sustainable quantification of β -ecdysone from *Pfaffia glomerata* rhizomes in laboratory conditions.

Abstract

This study evaluated the efficiency of different polar protic solvents in the extraction of β -ecdysone from *Pfaffia glomerata* rhizomes. Two methods were compared: ultrasound-assisted extraction and mechanical shaking in a shaker. Separation was performed using a C18 column (AGILENT 5 TC (2), 5 μ m \times 250 \times 4.6 mm), with a mobile phase composed of ultrapure water (solvent A) and HPLC-grade methanol (solvent B). The gradient profile used was 0–5 min: 90:10 to 30:70 (v/v); 5–12 min: 30:70 (v/v), with a flow rate of 1 mL/min, temperature of 30 °C, and UV-DAD detection at 245 nm (SERRA et al., 2012). The analytical curve was obtained using standard solutions of 20-hydroxyecdysone with certified purity of 97% (Sigma-Aldrich, St. Louis, MO, USA) in 70% (v/v) HPLC-grade methanol, with concentrations ranging from 0 to 100 mg/L. The linear equation obtained was $y = 0.5738x - 0.1323$, with a determination coefficient $R^2 = 0.9999$. Extractions by mechanical shaking at 40 °C and 125 rpm, using 70% methanol (v/v), absolute ethanol, 50%, 70%, 80%, 90% ethanol (v/v), and ultrapure water, in different ratios (1:10, 1:25, 1:50, and 1:100 m/v) and durations of 4, 8, and 24 hours, yielded β -ecdysone contents ranging from 0.28% to 0.47%, depending on the solvent and conditions applied. These values were lower than the yield obtained by ultrasound-assisted aqueous extraction (1:100 m/v), which reached 0.56% in just 5 minutes, demonstrating greater efficiency and speed under laboratory conditions. Exhaustive aqueous extraction and subsequent re-extractions did not result in a significant increase in compound content, indicating matrix exhaustion with a yield of 0.04%. The data confirm that, for laboratory quantification of β -ecdysone, ultrasound-assisted aqueous extraction is more effective, faster, and environmentally sustainable.

Acknowledgments



Referências

SERRA, Lara Z.; FELIPE, Daniele F.; CORTEZ, Diógenes A. G. Quantification of β -ecdysone in different parts of *Pfaffia glomerata* by HPLC. *Revista Brasileira de Farmacognosia*, v. 22, p. 1319–1354, 2012.