



Section: 02

OPTIMIZATION OF ULTRASOUND EXTRACTION OF BIOACTIVE COMPOUNDS FROM THE SPECIES *Hancornia speciosa*

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The Brazilian Cerrado, the most biodiverse savanna worldwide, harbors species of high medicinal and economic relevance, such as *Hancornia speciosa* (mangaba). This species is recognized for producing secondary metabolites with antioxidant, anti-inflammatory, and wound-healing activities. This study aimed to optimize the ultrasound-assisted extraction (UAE) of bioactive compounds from *H. speciosa* leaves and to chemically characterize the extracts, increasing scientific knowledge about the biodiversity of the Tocantinense cerrado. A Central Composite Design (CCD) was employed, testing extraction times (30, 90, and 120 minutes) and ethanol concentrations (30%, 50%, and 70%) as independent variables. Leaves collected in Palmas-TO, Brazil (10°18'00" S, 48°31'41" W), were identified at the UNITINS herbarium (voucher HUTO 7278), dried, powdered, and extracted in an ultrasonic bath (200 W, 40 kHz). Extracts were evaluated for yield, total phenolic content (Folin-Ciocalteu method, mg GAE/g), and flavonoid content (quercetin method, mg QE/g). The maximum extraction yield was 41.53%, obtained at 90 min/50% ethanol, while the highest phenolic content occurred under the same condition (242.39 mg GAE/g). For flavonoids, the best response was observed at 120 min/70% ethanol (50.76 mg QE/g). Statistical modeling showed limited predictive power for yield ($R^2 = 47.01\%$) and phenolic content ($R^2 = 69.06\%$), but demonstrated a strong and significant fit for flavonoids ($R^2 = 91.10\%$; $p < 0.05$). The global desirability analysis indicated 120 min/70% ethanol as the overall optimal condition ($D = 0.83$), favoring the recovery of bioactive compounds, especially flavonoids. Overall, these findings reinforce the biotechnological potential of *H. speciosa* and emphasize the importance of optimized extraction protocols to promote the valorization of native Cerrado species.

Keywords: Mangaba; ultrasound assisted; phenolic compounds; flavonoids; Central Composite Design