



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

Juliana Panato Didonet¹, Feliciano Da Silva Neto¹, Nathália A. A. Nunes¹, Aline Biggi Maciel Del Conte², Elisandra Scapin^{1,2*}

scapin@uft.edu.br

1-Curso de Engenharia Ambiental, Universidade Federal do Tocantins, Palmas, Tocantins, CEP 77001-090, Brazil. 2 -Programa de Pós-graduação em Biodiversidade e Biotecnologia - BIONORTE, Universidade Federal do Tocantins, Palmas, Tocantins, CEP 77001-090, Brazil.

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

