

Green Extraction of Valuable Compounds from Rubber Seed Trees: A Path to Sustainability

ABSTRACT

Valorizing natural resources through sustainable and eco-friendly processes is a cornerstone in pursuing a greener and more sustainable future. This study focuses on the green extraction of valuable compounds from rubber seed trees (*Hevea brasiliensis*). This underutilized resource has the potential to yield bioactive compounds of economic and ecological significance. We explore the application of environmentally friendly extraction techniques, including supercritical fluid extraction (SFE), microwave-assisted extraction (MAE) and ultrasound-assisted extraction (UAE), to harness the bioactive potential of rubber seeds. Our research encompasses a comprehensive analysis of the extracted compounds, including their characterization and quantification using state-of-the-art analytical techniques. Environmental and economic sustainability aspects are evaluated, shedding light on the green extraction processes' ecological footprint and economic feasibility. The paper also delves into these extracted compounds' diverse applications and utilization prospects, ranging from pharmaceuticals and nutraceuticals to cosmetic and industrial products. We discuss the commercial potential, market opportunities, and emerging trends these sustainable endeavours may shape. In conclusion, this study paves the way for a more sustainable path in harnessing valuable compounds from rubber seed trees, exemplifying the potential for green extraction techniques to play a pivotal role in the journey toward environmental stewardship and economic prosperity