

# Microwave-Assisted Extraction of Polyphenolic Antioxidants from Raw Mango (*Mangifera indica* L.) Peel: Glycerol-Sodium acetate Based Green Deep Eutectic Solvents †

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**Abstract:** Mango fruit has been reported as a source of bioactive compounds, although information about their peel is very limited. Generally, peels are not used commercially, which creates a major waste disposal problem, thereby contributing to pollution. Mangiferin is the main polyphenol in the mango peel in terms of antioxidative capacity. Microwave-assisted extraction is a potential clean-energy technology converting raw materials like mango peel into bioactive polyphenolic compounds and using residues as bioenergy (biofuels, heat, and electricity). Deep Eutectic Solvents (DESs) are fast emerging green extractants. The present investigation intends to develop an emerging novel technique like microwave-assisted deep eutectic solvent extraction (MADESE) for recovering polyphenolic antioxidants from mango peels. Glycerol:sodium acetate provided the highest TPC from mango peel amongst all DESs. Most favorable conditions for MADESE were planned by BBD layout, which consisted of 20% water in Gly:SA (3:1, mol/mol) as the extraction solvent, microwave power (440.18 W), time (12.10 min), and liquid to solid ratio (59.99 mLg<sup>-1</sup>). Recovery of TPC, FRAP and DPPH scavenging activity are 155.01 mg GAE g<sup>-1</sup>dw, 1043.44 μmol AAE g<sup>-1</sup>dw, and 67.99%, respectively, which were consistent with the experimental data. Major flavonoid- mangiferin was quantified in the extracts. Thus, MADESE based extraction methods can be applied for extracting bioactive compounds from biomass at the industrial level, which has major applications in food and medicine fields.

**Keywords:** antioxidant activity; microwave-assisted deep eutectic solvents extraction; polyphenolic compounds; raw mango peel; response surface methodology.

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## **Conflicts of Interest**

The authors declare no conflict of interest.