



Research article

EFFECT OF EXTRACTION SOLVENT ON PHENOLIC AND FLAVONOID CONTENTS AND ANTIOXIDANT ACTIVITY OF *CAESALPINIA SAPPAN* L.

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ABSTRACT

Caesalpinia sappan L. heartwood contains phenolic and flavonoid compounds with reported antioxidant properties. Solvent selection and extraction conditions can substantially affect the recovery of these compounds. This study evaluated the effects of 70% (v/v) ethanol–water and 70% (v/v) methanol–water on total phenolic content (TPC), total flavonoid content (TFC), and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical-scavenging activity of *Caesalpinia sappan* L. heartwood extracts. Response surface methodology (RSM) was used to investigate extraction temperature (30–70 °C) and time (15–45 minutes) and to identify conditions that simultaneously maximize the measured responses. The highest experimentally observed TPC and TFC values were 7.8 and 8.1 mg/g, respectively, while the highest reported DPPH inhibition was 93% for the ethanol extract at 65 °C for 40 minutes. RSM-based optimization predicted a desirability solution for ethanol at 65 °C and 38 minutes, with predicted responses of 4.60 mg/g TPC, 6.80 mg/g TFC, and 85% inhibition; the corresponding methanol solution was 52 °C and 35 minutes, with predicted responses of 1.52 mg/g TPC, 2.35 mg/g TFC, and 74% inhibition.