

SFE as a Superior Technique for Extraction of Eugenol-Rich Fraction from Cinnamomum tamala Nees (Bay Leaf) - Process Analysis and Phytochemical Characterization

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Abstract : Highest yield of eugenol-rich fractions from Cinnamomum tamala (bay leaf) leaves were obtained by supercritical carbon dioxide (SC-CO₂), compared to hydro-distillation, organic solvents, liquid CO₂ and subcritical CO₂ extractions. Optimization of SC-CO₂ extraction parameters was carried out to obtain an extract with maximum eugenol content. This was achieved using a sample size of 10 g at 55°C, 512 bar after 60 min at a flow rate of 25.0 cm³/sof gaseous CO₂. This extract has the best combination of phytochemical properties such as phenolic content (1.77 mg gallic acid/g dry bay leaf), reducing power (0.80 mg BHT/g dry bay leaf), antioxidant activity (IC₅₀ of 0.20 mg/ml) and anti-inflammatory potency (IC₅₀ of 1.89 mg/ml). Identification of compounds in this extract was performed by GC-MS analysis and its antimicrobial potency was also evaluated. The MIC values against E. coli, P. aeruginosa and S. aureus were 0.5, 0.25 and 0.5 mg/ml, respectively.

Keywords : antimicrobial potency, Cinnamomum tamala, eugenol, supercritical carbon dioxide extraction

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