

Role of virgin coconut oil VCO as co-extractant for obtaining xanthonenes from mangosteen *Garcinia mangostana* pericarp with supercritical carbon dioxide extraction

ABSTRACT

Virgin coconut oil (VCO) was used as co-extractant with supercritical carbon dioxide (scCO₂) extraction for obtaining xanthonenes from mangosteen pericarp (MP) without organic co-solvents. In each experiment, 120 g of dried MP that had median particle sizes of 0.85 mm was used. Extraction of MP with 40% VCO co-extractant using scCO₂ (1.08 kg/h) for 420 min at 430 bar and 70 °C gave α -mangostin (32.2 mg/g), γ -mangostin (7.2 mg/g), xanthonenes (28.2 mg/g) in extract and an extraction yield of 31%. The role of VCO is that it promotes dissolution of xanthonenes and mass transfer into the scCO₂ phase as elucidated with the Pardo-Castaño model. The Lentz equation was generalized in terms of (P, T, %VCO, ρ CO₂) to correlate all extraction curve data to within 7.4% and to estimate extraction yield crossover regions. Xanthonenes can be separated from mangosteen pericarp with VCO and scCO₂ extraction without organic co-solvents.

Keyword: Bioactive compounds; Vegetable oil co-solvent; Separation; α -mangostin; Correlation; Crossover region