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Encapsulated phytochemically rich SC-CO₂ extract of a polyherbal mix of tulsi, bay and cardamom as a novel food antioxidant: Shelf-life and frying stability of soybean oil

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SC-CO₂ extract of a polyherbal mix of 1:1:2 tulsi leaves, bay leaves and cardamom seeds having appreciable antioxidant potency was encapsulated using spray drying technology. Maltodextrin and gum arabic (60:40) were used as wall materials at an inlet temperature of 140°C to obtain an encapsulated powder. The microencapsulation efficiencies of the bioactive compounds were found to be 71% and 56% for eugenol and 1, 8-cineole, respectively and their surface binding was within the range of 2-5%. From the scanning electron microscopy photographs of the encapsulated powder, it was observed that the particles have smooth rounded morphology with size ranging from 3 to 25 mm. The powder had appreciable antioxidant activity, phenolic content, reducing power and anti-inflammatory potency. The encapsulated SC-CO₂ extract of the polyherbal mix was evaluated for its possible usage as a natural antioxidant in soybean oil. Non-encapsulated and encapsulated SC-CO₂ polyherbal extracts were administered individually into soybean oil samples to act as natural antioxidants. Two sets of oil samples were administered with the widely used commercial antioxidants- BHT and TBHQ. The shelf life and frying stability of soybean oil were ascertained using potato wedges as the model fried food. 30-day storage and frying stability studies of soybean oil samples, administered individually with the encapsulated and non-encapsulated extracts and commercial antioxidants TBHQ and BHT, established that the encapsulated polyherbal SC-CO₂ extract had the best antioxidant efficacy. This encapsulate allows controlled release of the antioxidant and is therefore advocated as a promising 'green' antioxidant for soybean oil.

Biography

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