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Investigation of the antioxidant activity of *Careya arborea* (kahata) – lemongrass oil loaded microcapsules

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Historical evidence proves that humans have been interconnected with nature since ancient times. Ethnopharmacological drug discovery is used to find novel treatment by utilizing traditional herbal remedies. This research was mainly focused on investigating the antioxidant activity of stem bark extract of *Careya arborea* and the *C. arborea* extract - lemongrass oil loaded microcapsules. Previous investigations revealed the influence of antioxidant property of plant extracts and essential oils in finding treatments for wounds. The ability of antioxidants to scavenge free radicals and prevent tissue damage is important in wound healing. *C. arborea* extracts have proven antioxidant, antibacterial and anti-inflammatory properties. In this work, *C. arborea* powder and lemongrass oil loaded gelatin/sodium alginate microcapsules were prepared by using complex coacervation, one of the most common methods of microencapsulation. Microencapsulation is an important technique which, protects the active core ingredients and at the same time, facilitates the control release of the core material. For the investigation of antioxidant activity, 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay and Folin-Ciocalteu assay were used. Percentage radical scavenging activity (% RSA) was calculated by using DPPH assay, and ascorbic acid was used as the reference. Folin-Ciocalteu assay was used to determine the antioxidant capacity (AOC) by using pyrogallol as the standard. *C. arborea* powder displayed 91.1% RSA, while 32.5% RSA was shown by the ascorbic acid reference. Synthesized microcapsules also showed 72.7% RSA, which implies that the antioxidant activity remains even after microencapsulation. According to the Folin-Ciocalteu assay, *C. arborea* powder showed 889.4 µg PGE/mL AOC, while the synthesized microcapsules showed 341.9 µg PGE/mL AOC. On the other hand, lemongrass oil showed 7.5% RSA and 111.3 µg PGE/mL AOC. As a result of the study, it can be concluded that microcapsules enriched with *C. arborea* powder have the potential to be developed into wound healing treatments.

Keywords: *Careya arborea*, lemongrass oil, microencapsulation, complex coacervation, antioxidants

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