

Abstract

Coccinia grandis is a medicinal plant traditionally used for its antioxidant, antidiabetic, and anti-inflammatory properties. However, its poor bioavailability limits its therapeutic potential. This study aimed to formulate and characterize a nanoemulsion incorporating *C. grandis* extract to improve its antioxidant activity. Ethanol-based extraction was followed by nanoemulsion preparation using varying ratios of Tween 80 and ethanol, and characterized for droplet size, PDI, zeta potential, pH, viscosity, and stability. Antioxidant activity was evaluated using the DPPH assay. The results showed that all nanoemulsions had particle sizes below 20 nm and acceptable PDI values (<0.5), with formulation F4 exhibiting optimal stability and the highest antioxidant activity. Compared to the crude extract, all nanoemulsions significantly enhanced antioxidant performance. These findings highlight the potential of nanoemulsion technology to improve the functional application of *C. grandis* in pharmaceutical and nutraceutical formulations.

Keywords: *Coccinia grandis*, nanoemulsion, antioxidant activity, DPPH assay,