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ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF *CITRUS LEMON* PEELS ENCAPSULATED IN PVA

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ABSTRACT

In this study, waste lemon peels were converted into a dietary supplement. Lemon peels were used because of the abundance of phytochemicals present in it and also they are easily available throughout the year. To improve the therapeutic efficacy, we used Polyvinyl Alcohol (PVA) as a nanocarrier of lemon peel methanolic extract. The lemon peel extract was encapsulated in PVA by the solvent evaporation method, to improve the solubility and stability of the compounds in the extract. Characterization of the prepared lime peel nanoformulation (LP-NF) was done by Scanning Electron Microscope, Zeta potential and Fourier Transform Infrared techniques. The antioxidant assays like DPPH(2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay and hydrogen peroxide assay showed a high scavenging activity when compared with commercial supplement with the IC50 value of 24 ± 0.05 and 26.07 ± 0.11 respectively. The Gram-negative bacteria, *E. coli* showed a zone of inhibition of 18 mm indicating the antibacterial property of LP-NF. The percentage release of the nanoformulation from sodium alginate beads was calculated and it showed the release of nanoparticle up to 83% after 7 hours in PBS at pH 7.4.