



Research article

CHARACTERISATION OF CHITOSAN-STARCH FILM CONTAINING BANANA PEEL EXTRACT FOR POTENTIAL ACTIVE FOOD PACKAGING APPLICATIONS

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ABSTRACT

This study investigates the development of biodegradable composite films composed of chitosan-starch (CS) and banana peel extract (BPE) for food packaging applications. Films with varying BPE concentrations (0-2%) were analysed for physicochemical, mechanical and antimicrobial properties. Fourier Transform Spectroscopy (FTIR) confirmed enhanced intermolecular interactions due to polyphenolic compounds in the extract. Tensile strength increased from 28 MPa to 39 MPa, while elongation at break increased from 45% to 87%. Additionally, antibacterial activity against *E. coli* improved with increasing BPE concentration, with inhibition zones increasing from 1.00 cm to 1.70 cm showed increased *E. coli* inhibition with higher BPE levels. This study demonstrates the valorisation of banana peel waste as a multifunctional bioactive additive in chitosan-starch films, simultaneously enhancing mechanical, barrier and antimicrobial properties.