



Back

In vitro antibacterial activities, chemical composition and efficacy of green solvent extracts of Carica papaya seed in food model systems

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Abstract

This study investigated the antibacterial activities and chemical composition of green-solvent extracts of Carica papaya seed and their efficacy in food model systems. Carica papaya seed extract (CPSE) var. Sekaki/Hong Kong was extracted using nine green solvents to evaluate CPSEs' antibacterial properties and chemical compositions. All fourteen strains tested showed moderate to high inhibition under the disk diffusion test (DDT). Ethanolic C. papaya seed extract (ECPSE) was selected as the most effective extract in inhibiting Clostridium perfringens and Bacillus cereus at a minimum inhibitory concentration (MIC) of 2.81 mg/mL, and Salmonella enterica subsp. enterica serovar Enteritidis at MIC of 1.41 mg/mL. The polar CPSEs had the highest yield (96.25-201.33 mg/g) compared to the non-polar CPSEs (139.23-154.79 mg/g). The ECPSE had the highest total phenolic content (TPC) at 22.59 mg gallic acid equivalent (GAE)/g dried weight (DW) and total flavonoid content (TFC) at 3.04 mg quercetin equivalent (QE)/g DW. The gas chromatography-mass spectrometer (GC/MC) identified 51 compounds in the ECPSE, where oleic acid (21.96%), hexadecanoic acid (15.1%), β -sitosterol (7.42%) and trimethyl phosphate silanol (6.1%) were the dominant compounds bioactive compounds that were reported to render antibacterial activities. The ECPSE showed efficacy against the C. perfringens, B. cereus and S. Enteritidis growths

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