

Lacto-fermented Kenaf (*Hibiscus cannabinus* L.) seed protein as a source of bioactive peptides and their applications as natural preservatives

ABSTRACT

Kenaf seeds are a promising source of natural preservatives for food applications due to their potential as a substrate to generate peptides with high antibacterial activity. We sought to generate bioactive peptides with antibacterial activity from Kenaf seed proteins via lacto-fermentation. The ground seeds were defatted and protein extracted using acid precipitation. Kenaf seed protein was fermented with *Lactobacillus casei* for 72 h at 37 °C, and the antibacterial activity, MIC, and MBC were determined using a 96-well microtiter plate assay. The fermented protein was subjected to fractionation and peptide identification using reversed-phase high pressure liquid chromatography and liquid chromatography-mass spectrometry, respectively. The fermented protein showed high antibacterial activity against *Salmonella typhimurium*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, and *Streptococcus pyogenes*. The MIC value was 4 mg/mL against all tested pathogens and the MBC value was 8 mg/mL against *S. typhimurium*, *P. aeruginosa*, and *E. coli* and 4 mg/mL against *B. subtilis*, *S. aureus*, and *S. pyogenes*. Fraction 17 demonstrated the strongest antibacterial activity (98%–100%), and five peptide sequences were identified in this fraction. The findings of this study demonstrated high potential for kenaf seed protein fermented using *Lactobacillus casei* as a source of natural preservatives for a broad range of food applications.

Keyword: Kenaf seeds; Bioactive peptides; Antimicrobial; Food application; Preservation