

Effect of hydrolysis time on antioxidant and antimicrobial properties of Jack Bean (*Canavalia ensiformis*) protein hydrolysate

ABSTRACT

Jack Bean or Kacang Koro (*Canavalia ensiformis*) is one of the under-exploited tropical dry beans. This study was aimed to determine the effect of hydrolysis time on physicochemical properties, antioxidative and antimicrobial activity of Jack Bean protein hydrolysate (JBPH). The physicochemical properties of JBPH were evaluated based on protein content, WHC, OHC, degree of hydrolysis, foam stability and foaming capacity. The antioxidative activity of JBPH was measured using DPPH, hydroxyl radical scavenging, superoxide radical scavenging and FRAP. Well diffusion method was used to study antimicrobial activity of JBPH. The highest protein content ($33.16 \pm 0.03\%$) obtained in JBPH that hydrolysed for 150 min. The degree of hydrolysis was showed for JBPH highest at 120 min ($51.79 \pm 0.28\%$). The size of the microstructure of JBPH analysed using SEM were decrease with hydrolysis time. FTIR analysis confirmed that JBPH comprised of three major components (Region I, II and III). Water holding capacity of JBPH was the highest for the sample hydrolysed for 60 min ($63.87 \pm 0.72\%$) while oil holding capacity depicts the highest by it at 180 min ($57.17 \pm 1.19\%$). Foaming capacity and foam stability decreased with hydrolysis time. JBPH produced at 120 min hydrolysis time showed the highest inhibition toward DPPH (42.44%) and hydroxyl radicals (20.01%). FRAP and superoxide radical scavenging, JBPH at 90 min showed the highest inhibition ($91.15 \pm 0.05 \mu\text{M}$ and 64.33%). JBPH also showed antimicrobial properties by inhibits the growth of *P. aeruginosa*. The best hydrolysis time to produce JBPH with the highest physicochemical properties was found at 120 min.