IDENTIFIKASI PEPTIDA ANTIBAKTERI DARI HIDROLISAT TRIPSIN PROTEIN BIJI JARAK KEPYAR *(Ricinus communis L.)* TERFRAKSINASI KOLOM EKSTRAKSI FASA PADAT SISTEM FASA TERBALIK

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INTISARI

Penelitian mengenai identifikasi peptida antibakteri dari hidrolisat tripsin protein biji jarak kepyar (*Ricinus communis L.*) terfraksinasi kolom ekstraksi fasa padat sistem fasa terbalik telah dilakukan. Penelitian ini bertujuan untuk mengidentifikasi fraksi peptida aktif antibakteri dari hidrolisat protein biji jarak kepyar. Isolasi protein dilakukan menggunakan kombinasi metode ekstraksi ultrasonik (*Ultrasound Assisted Extraction*) dengan bantuan presipitasi aseton. Isolat protein kemudian dihidrolisis dengan enzim tripsin. Hidrolisat protein difraksinasi dengan kolom SPE fasa terbalik menggunakan sorben *HyperSep Retain Polar Enhanced Polymer* (PEP) dan eluen metanol dengan variasi konsentrasi 25, 50, 75 dan 100%. Masing-masing fraksi diuji aktivitas antibakterinya terhadap bakteri *E. coli* dan *S. aureus* menggunakan metode difusi cakram. Fraksi peptida paling aktif antibakteri diidentifikasi urutan asam amino penyusunnya dengan metode HRMS melalui pencarian *database Ricinus communis* menggunakan *software* Proteome Discoverer.

Hasil isolasi protein biji jarak diperoleh isolat protein dengan jumlah protein relatif terhadap massa sampel sebesar 69,92%. Hidrolisis dengan enzim tripsin menghasilkan hidrolisat protein dengan tingkat hidrolisis mencapai 70,27%. Hasil fraksinasi dengan metode SPE fasa terbalik diperoleh dua fraksi paling aktif antibakteri dengan diameter zona hambat kategori sedang, yakni pada fraksi metanol 25% dan metanol 100%. Identifikasi peptida aktif antibakteri dari kedua fraksi menghasilkan 6 peptida dengan urutan asam amino GEGDSMSGRMATEGAER, GSKSIAR, AIQLFSK, AAGASG, LRTLTLEYLPR dan VLNPAPGASDLASIR.

Kata kunci: biji jarak kepyar; *HyperSep Retain Polar Enhanced Polymer* (PEP); peptida antibakteri; SPE fasa terbalik; tripsin

IDENTIFICATION OF ANTIBACTERIAL PEPTIDES FROM TRYPTIC HYDROLYZATE OF JATROPHA SEED (Ricinus communis L.) PROTEIN FRACTIONATED BY REVERSED-PHASE SYSTEM OF SOLID-PHASE EXTRACTION COLUMN

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ABSTRACT

Research on the identification of antibacterial peptides from tryptic hydrolyzate of Jatropha seed (*Ricinus communis L.*) protein fractionated by reversed-phase system of solid-phase extraction column has been conducted. This experiment aimed to identify active antibacterial peptide fractions from Jatropha seed protein hydrolyzate. Protein isolation was carried out using the combination methods of ultrasonic extraction (ultrasound-assisted extraction) and acetone precipitation method. The protein isolate is then hydrolyzed with trypsin enzyme. Protein hydrolyzate was fractionated with a reversed-phase SPE column using HyperSep Retain Polar Enhanced Polymer (PEP) sorbent and methanol eluent with various concentrations of 25, 50, 75, and 100%. Each fraction was tested for its antibacterial activity against *E. coli* and *S. aureus* bacteria using the disc diffusion method. The most active antibacterial peptide fraction was identified by its constituent amino acid sequence with the HRMS method by searching the *Ricinus communis* database using the Proteome Discoverer software.

Jatropha seed protein isolation results obtained protein isolate with a relative amount of protein to the sample mass of 69.92%. Hydrolysis with trypsin enzyme produces protein hydrolyzate with a hydrolysis rate of 70.27%. The results of fractionation using the reversed-phase SPE method obtained the two most active antibacterial fractions with medium category inhibition zone diameters, namely the 25% methanol and 100% methanol fractions. Identification of active antibacterial peptides from the two fractions resulted in 6 peptides with the amino acid sequence GEGDSMSGRMATEGAER, GSKSIAR, AIQLFSK, AAGASG, LRTLTLEYLPR, and VLNPAPGASDLASIR.

Keywords: antibacterial peptides; HyperSep Retain Polar Enhanced Polymer (PEP); Jatropha seeds; reversed-phase SPE; trypsin