

Aktivitas Antioksidan Hidrolisat Jeroan Ayam Kampung Menggunakan Protease dari *Pseudomonas aeruginosa* yang Diisolasi dari Limbah Kulit Pikel

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INTISARI

Penelitian ini bertujuan untuk mengetahui aktivitas antioksidan dari hidrolisat jeroan ayam kampung bagian hati, usus, ampela, jantung, dan limpa yang dihidrolisis menggunakan enzim protease dari *Pseudomonas aeruginosa* yang diisolasi dari limbah kulit pikel. Alur penelitian meliputi isolasi bakteri dari limbah kulit pikel, *screening* bakteri proteolitik, identifikasi bakteri proteolitik, pengujian variasi waktu hidrolisis jeroan ayam kampung secara enzimatis menggunakan protease dari *Pseudomonas aeruginosa*, dan pengujian aktivitas antioksidan hidrolisat jeroan ayam kampung menggunakan metode DPPH (2,2-diphenyl-1-picrylhydrazyl). Data identifikasi bakteri, dan variasi waktu hidrolisis jeroan dianalisis secara deskriptif. Data konsentrasi asam amino pada *screening* bakteri divisualisasikan menggunakan *heatmap*, dan dianalisis secara deskriptif. Data persentase inhibisi dianalisis menggunakan *one way anova* dan uji lanjut *turkey* apabila hasil analisis yang diperoleh signifikan. Hasil penelitian menunjukkan bahwa isolasi bakteri dari limbah kulit pikel menghasilkan 16 isolat bakteri proteolitik terpilih. *Screening* bakteri menghasilkan 1 isolat bakteri proteolitik terpilih dengan kemampuan hidrolisis terbesar yaitu isolat nomor 14. Hasil identifikasi bakteri pada isolat nomor 14 yaitu bakteri *Pseudomonas aeruginosa*. Variasi waktu hidrolisis jeroan ayam kampung 0, 2, 4, dan 10 jam menghasilkan konsentrasi asam amino hidrolisat jeroan ayam kampung terus meningkat. Pengujian aktivitas antioksidan hidrolisat jeroan ayam kampung menggunakan metode DPPH (2,2-diphenyl-1-picrylhydrazyl) menunjukkan bahwa kelima hidrolisat jeroan ayam kampung memiliki aktivitas antioksidan dengan persentase inhibisi antar jeroan ayam kampung memiliki perbedaan secara signifikan antar jenis jeroan ($P < 0,05$). Hidrolisat protein jeroan ayam kampung dapat menghambat radikal bebas pada rentang 63,64 – 78,07%. Hidrolisat jeroan ayam kampung yang berpotensi sebagai antioksidan yaitu hidrolisat jeroan hati, usus, jantung, dan limpa dengan persentase inhibisi masing-masing sebesar 78,07%, 72,95%, 73,575%, dan 71,67%. Dan yang tidak berpotensi sebagai antioksidan terdapat pada hidrolisat jeroan ampela dengan persentase inhibisi sebesar 63,64%.

Kata kunci: Jeroan ayam kampung, hidrolisis enzimatis, bakteri proteolitik, aktivitas antioksidan

Antioxidant Activity of Native Chicken Offal Hydrolysate using Protease from *Pseudomonas aeruginosa* Isolated from Pickling Leather Waste

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ABSTRACT

This study aims to determine the antioxidant activity of hydrolysate of native chicken offal parts of liver, intestine, gizzard, heart, and spleen hydrolysed using protease enzyme from *Pseudomonas aeruginosa* isolated from pikelet skin waste. The research flow includes isolation of bacteria from pikelet skin waste, screening of proteolytic bacteria, identification of proteolytic bacteria, testing the time variation of enzymatic hydrolysis of native chicken offal using protease from *Pseudomonas aeruginosa*, and testing the antioxidant activity of native chicken offal hydrolysate using DPPH (2,2-diphenyl-1-picrylhydrazyl) method. Bacterial identification data, and time variation of offal hydrolysis were analysed descriptively. Amino acid concentration of bacterial screening data were visualised using heatmap, and analysed descriptively. Percent inhibition data were analysed using one way anova and turkey further test if the results obtained were significant. The results showed that bacterial isolation produced 16 isolates of selected proteolytic bacteria. Bacterial screening produced 1 selected proteolytic bacterial isolate with the greatest hydrolysis ability, namely isolate number 14. The results of bacterial identification of isolate number 14 are *Pseudomonas aeruginosa* bacteria. The variation of hydrolysis time of 0, 2, 4, and 10 hours resulted in an increasing concentration of amino acids in the hydrolysate of native chicken offal. Testing the antioxidant activity of the hydrolysates using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method showed that all five hydrolysates of native chicken offal had antioxidant activity with the percentage of inhibition between the offal having a significant difference between types of offal ($P < 0.05$). The hydrolysate of free-radical inhibiting protein of native chicken offal can inhibit free radicals in the range of 63.64 - 78.07%. Hydrolysates of domestic chicken offal that have potential as antioxidants are hydrolysates of liver, intestine, heart, and spleen with inhibition percentages of 78.07%, 72.95%, 73.575%, and 71.67%. The offal gizzard hydrolysate, however, shows no antioxidant potential with an inhibition percentage of 63.64%.

Keywords: Native chicken offal, enzymatic hydrolysis, proteolytic bacteria, antioxidant activity