

KARAKTERISASI DAN PERTUMBUHAN ISOLAT PK4 PENGHASIL ALKALINE PROTEASE DARI LIMBAH RUMEN RUMAH PEMOTONGAN HEWAN GIWANGAN

Muhammad Imam Bahtiyar
10/301523/PT/0872

INTISARI

Salah satu enzim protease yang juga banyak diaplikasikan dalam bidang industri adalah protease basa. Enzim protease dapat dihasilkan oleh tanaman, hewan dan mikroorganisme. Enzim dari mikroorganisme mempunyai kelebihan yaitu produksi enzimnya lebih cepat. Penelitian ini bertujuan untuk 1) mengetahui karakter isolat PK4 penghasil enzim alkaline protease dari limbah rumen, 2) mengetahui pertumbuhan isolat PK4 penghasil enzim alkaline protease dari limbah rumen, 3) mengetahui berat molekul enzim protease isolat PK4. Tahap penelitian ini meliputi karakterisasi bakteri, pengujian pertumbuhan bakteri isolat selama 48 jam, diameter koloni, uji aktifitas enzim dan SDS-PAGE. Data karakterisasi, pertumbuhan, aktivitas protease Isolat PK4, dan SDS-PAGE dianalisis secara deskriptif sedangkan data diameter koloni bakteri, diameter zona bening, dan indeks proteolitik pada medium agar padat dianalisis dengan menggunakan rancangan acak lengkap pola searah, apabila terdapat perbedaan dilanjutkan dengan uji *Duncan New Multiple Range Test* (DMRT). Dari hasil purifikasi diperoleh bahwa isolat PK4 merupakan penghasil alkaline protease. Karakteristik isolat PK4 mempunyai morfologi koloni berbentuk bulat, warna putih, tepian rata dan elevasi cembung, sedangkan morfologi sel berbentuk bulat dan Gram negatif. Pertumbuhan isolat PK4 dengan skim 2% tertinggi pada 36 jam, yaitu 5,36 Log CFU/ml. Diameter koloni bakteri ($1,8 \pm 0,26$ cm) dan zona bening ($2,91 \pm 0,46$ cm) skim 2% menunjukkan hasil yang berbeda nyata. Aktivitas enzim dari protease yang terpresipitasi menunjukkan hasil yang lebih tinggi (7,01 U/ml) dari protease kasar. Hasil SDS-PAGE isolat PK4 memiliki 3 pita dan diperkirakan mempunyai berat molekul enzim protease 27,7 kDa. Kesimpulan sementara penelitian adalah data hasil karakterisasi menunjukan bahwa isolat PK4 termasuk dalam genus *Pseudomonas sp.*

Kata Kunci: karakter, pertumbuhan, bakteri, Protease, RPH

CHARACTERIZATION AND GROWTH PROFILE OF ALKALINE PROTEASE PRODUCING PK4 FROM RUMEN WASTE OF GIWANGAN SLAUGHTERHOUSE

Muhammad Imam Bahtiyar
10/301523/PT/0872

ABSTRACT

Alkaline protease is one of the enzyme that is widely applied in industries. Protease enzyme can be produced by plants, animals and microorganisms. Enzyme produced by microorganisms has some advantage such as shorter in production time. This study aims to 1) determine the character of alkaline protease enzyme producing PK4 from rumen waste, 2) determine the growth of alkaline protease enzyme producing PK4 isolate from rumen waste, 3) determine a protease enzym molecular weight of PK4 isolate. The study involve the characterization of bacteria, observing of isolates growth for 48 hours, the diameter of the colony measurement, the enzyme activity test and SDS-PAGE. Data of characteristic, growth, PK4 Isolates protease activity, and SDS-PAGE were analyzed descriptively, while data of bacterial colony diameters, the diameter of clear zones, and proteolytic index on agar solid analyzed using a completely randomized design one way ANOVA, if there are differences followed by Duncan New Multiple Range Test (DMRT). Based on protein purification analysis, isolate PK4 categorited as alkaline protease producing bacteria. Refer to characteristic of colony morphology, isolates PK4 has a coccus, white, flat edge and biconcave elevation, while the coccus-cell morphology and included as Gram-negative bacteria. When growing in 2% skim medium, isolate PK4 has most optimal growth at 36 hours for 5.36 Log CFU/ml. Bacterial colony diameter ($1,8 \pm 0,26$ cm) and clear zone ($2,91 \pm 0,46$ cm) of 2% skim isolate showed significant differences. Protease activity of the precipitated enzyme showed a high yield (0,701 U/ml). The results of SDS-PAGE isolates PK4 has 3 bands and estimated to have a protease enzym molecular weight of 27,7 kDa. In conclusion, isolate PK4 was predicted as belongs to genus *Pseudomonas* sp.

Keywords: character, growth, bacteria, protease, slaughterhouses