

ABSTRAK**PENGARUH PENAMBAHAN GLISEROL TERHADAP AKTIVITAS ENZIM PROTEASE DARI BAKTERI *Klebsiella sp.* LPG172****Oleh****PUTRI AYU SAFITRI**

Penelitian ini bertujuan untuk mengetahui pengaruh gliserol terhadap aktivitas enzim protease dari bakteri *Klebsiella sp.* LPG172. Produksi enzim protease dilakukan dengan menumbuhkan *Klebsiella sp.* LPG172 pada media dengan 1% susu skim yang dilarutkan dalam larutan buffer fosfat 0,05 M pada pH 7. Enzim dipanen setelah fermentasi selama 42 jam dan dimurnikan melalui fraksinasi ammonium sulfat serta dialisis. Aktivitas enzim dihitung dengan metode Kunitz dan kadar protein ditentukan dengan metode Lowry. Karakterisasi enzim mencakup pengujian pH, suhu, dan waktu inkubasi optimum. Aktivitas optimum protease tercapai pada pH 7, suhu 50°C, dan waktu inkubasi 40 menit. Enzim hasil dialisis diuji tanpa dan dengan penambahan gliserol pada konsentrasi 0,5 M, 1,0 M, dan 1,5 M. Pada pH 7, penambahan gliserol 0,5 M, 1,0 M, dan 1,5 M meningkatkan aktivitas enzim masing-masing sebesar 5,00%, 18,18%, dan 8,36%. Pada suhu 50°C, penambahan gliserol 0,5 M, 1,0 M, dan 1,5 M meningkatkan aktivitas enzim sebesar 2,46%, 14,26%, dan 8,11%. Pada waktu inkubasi 40 menit, peningkatan aktivitas enzim dengan penambahan gliserol 0,5 M, 1,0 M, dan 1,5 M adalah 5,40%, 8,88%, dan 18,79%. Hasil menunjukkan bahwa penambahan gliserol mampu meningkatkan aktivitas enzim protease dari *Klebsiella sp.* LPG172 tanpa mengubah kondisi kerja optimum enzim, yaitu pada pH 7, suhu 50°C, dan waktu inkubasi 40 menit. Konsentrasi gliserol 1,0 M memberikan peningkatan aktivitas yang konsisten dan signifikan.

Kata kunci: protease, *Klebsiella sp.*, gliserol.

ABSTRACT

THE EFFECT OF GLYCEROL ON THE PROTEASE ENZYME ACTIVITY OF *Klebsiella* sp. LPG172 BACTERIA

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This study aims to investigate the effect of glycerol on the activity of the protease enzyme from *Klebsiella* sp. LPG172. Protease enzyme production was conducted by cultivating *Klebsiella* sp. LPG172 in a medium containing 1% skim milk dissolved in 0.05 M phosphate buffer solution at pH 7. The enzyme was harvested after 42 hours of fermentation and purified through ammonium sulfate fractionation and dialysis. Enzyme activity was measured using the Kunitz method, and protein content was determined using the Lowry method. Enzyme characterization included determining the optimal conditions for enzyme activity, including pH, temperature, and incubation time. The optimal activity of the protease was achieved at pH 7, 50°C, and 40 minutes of incubation time. The dialyzed enzyme was tested without and with the addition of glycerol at concentrations of 0.5 M, 1.0 M, and 1.5 M. At pH 7, the addition of 0.5 M, 1.0 M, and 1.5 M glycerol increased enzyme activity by 5.00%, 18.18%, and 8.36%, respectively. At 50°C, the addition of 0.5 M, 1.0 M, and 1.5 M glycerol increased enzyme activity by 2.46%, 14.26%, and 8.11%, respectively. At 40 minutes of incubation, the addition of 0.5 M, 1.0 M, and 1.5 M glycerol increased enzyme activity by 5.40%, 8.88%, and 18.79%, respectively. The results show that the addition of glycerol can enhance the activity of the protease enzyme from *Klebsiella* sp. LPG172 without altering the enzyme's optimal working conditions, which are pH 7, 50°C, and 40 minutes of incubation time. The 1.0 M glycerol concentration consistently and significantly increased enzyme activity.

Keyword: protease, *Klebsiella* sp, glycerol.