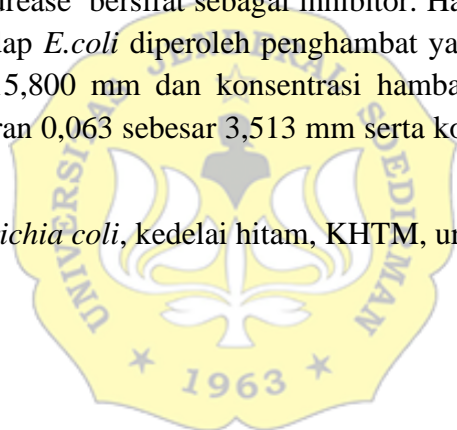


ABSTRAK

Enzim urease telah banyak dimanfaatkan dalam bidang industri. Eksplorasi enzim urease terus dilakukan, mengingat enzim urease masih impor sehingga harganya mahal. Penelitian ini bertujuan untuk mengetahui karakterisasi ekstrak kasar enzim urease dari kedelai hitam dan aplikasi antibakteri terhadap *E. coli*. Aktivitas urease ditentukan menggunakan metode Nessler dan diukur menggunakan spektrofotometer UV-Vis pada panjang gelombang 500 nm. Ekstrak kasar enzim urease diuji aktivitasnya terhadap *E.coli* menggunakan difusi cakram. Kontrol positif yang digunakan adalah tetrasiklin dan kontrol negatif menggunakan buffer pH 7. Hasil penelitian menunjukkan enzim urease memiliki aktivitas optimum sebesar 4,803 U/mL pada pH 7; suhu inkubasi 35 °C; dan konsentrasi 12000 ppm. Laju maksimum (V_{maks}) dan konstanta Michaelis-Menten (K_M) yang diperoleh sebesar 8,621 ppm/menit dan 10242,610 ppm. Penambahan ion logam Hg^{2+} dan Ni^{2+} 0,1 ppm pada urease bersifat sebagai inhibitor. Hasil uji aktivitas antibakteri enzim urease terhadap *E.coli* diperoleh penghambat yang kuat pada pengenceran ekstrak 1 sebesar 15,800 mm dan konsentrasi hambat tumbuh minimum yang diperoleh pengenceran 0,063 sebesar 3,513 mm serta kontrol positif sebesar 9,213 mm.

Kata kunci: *Escherichia coli*, kedelai hitam, KHTM, urease



ABSTRACT

Urease enzymes have been utilized in various industrial applications. However, the exploration of urease enzymes has continued due to their import dependence and high cost. This study aimed to characterize the crude extract of urease enzyme from black soybean and evaluate its antibacterial activity against E. coli. The activity of urease was determined using the Nessler method and measured using UV-Vis spectrophotometry at a wavelength of 500 nm. The crude extract of urease enzyme was tested for its activity towards E. coli using cakram diffusion. Tetracycline was used as the positive control and buffer pH 7 was used as the negative control. The results showed that the urease enzyme has an optimum activity of 4.803 U/mL at pH 7, an incubation temperature of 35 °C, and a concentration of 12000 ppm. The maximum velocity (V_{max}) and Michaelis-Menten (K_M) constant were 8.621 ppm/min and 10242.610 ppm. The addition of 0.1 ppm metal ions Hg^{2+} and Ni^{2+} showed strong inhibitor for urease activity. The antibacterial activity of the urease enzyme towards E. coli showed strong inhibition at extract 1 dilution of 15.800 mm, the minimum inhibitory concentration obtained by dilution 0.063 of 3.513 mm, and control positive of 9.231 mm.

Keywords: Escherichia coli, black soybean, KHTM, urease

