ABSTRAK

Urease adalah enzim yang berperan penting sebagai katalis dalam reaksi hidrolisis urea menjadi amonia dan CO_2. Enzim urease telah diisolasi dari polong-polongan, salah satu jenis polong-polongan yang berpotensi sebagai sumber urease adalah kacang buncis. Penelitian ini bertujuan untuk mengetahui karakteristik enzim urease dari kacang buncis. Enzim urease diisolasi dari biji kacang buncis dan diperoleh ekstrak kasar enzim urease. Ekstrak kasar enzim dimurnikan menggunakan garam amonium sulfat dengan prinsip presipitasi. Ekstrak kasar dan fraksi yang memiliki aktivitas tertinggi kemudian dilakukan karakterisasi meliputi pH, suhu, konsentrasi substrat, dan penambahan logam. Uji aktivitas enzim urease ini menggunakan metode Nessler dengan pengukuran absorbansi menggunakan spektrofotometer pada panjang gelombang 500 nm. Enzim urease dari biji kacang buncis memiliki aktivitas optimum pada pH 7, suhu inkubasi 35 ^oC, dan konsentrasi substrat 12.000 ppm dengan nilai aktivitas ekstrak kasar sebesar 14,620 U/mL dan F30 sebesar 17,720 U/mL. Ion logam Ni^{2+} dan Hg^{2+} merupakan inhibitor bagi enzim urease.

Kata kunci: biji kacang buncis, karakterisasi, pemurnian parsial, urease

ABSTRACT

Urease is an enzyme that plays a crucial role as a catalyst in the hydrolysis reaction of urea into ammonia and CO_2. Urease enzyme has been isolated from legumes, and one of the legume types with the potential as a urease source is the green bean. This research aims to determine the characteristics of urease enzyme from green beans. The urease enzyme was isolated from green bean seeds, and crude enzyme extract was obtained. The crude enzyme extract was purified using ammonium sulfate salt through the principle of precipitation. The crude extract and fractions with the highest activity were characterized, including pH, temperature, substrate concentration, and metal addition. The assay for urease enzyme activity used the Nessler method with absorbance measurement using a spectrophotometer at a wavelength of 500 nm. Urease enzyme from green bean seeds showed optimum activity at pH 7, an incubation temperature of 35 °C, and a substrate concentration of 12,000 ppm with crude extract activity of 14.620 U/mL and F30 (fraction) activity of 17.720 U/mL. The metal ions of Ni^{2+} and Hg^{2+} were inhibitor for the urease enzyme.

Keywords: characterization, kidney bean seeds, partial purification, urease