INTISARI

CAHYANINGRUM, N.P., 2019, ISOLASI, UJI AKTIVITAS, DAN KARAKTERISASI ENZIM PROTEASE DARI BAKTERI *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Salmonella typhi* ATCC 13311, *Serratia marcescens* ATCC 8100, DAN *Staphylococcus aureus* ATCC 25923, SKRIPSI, FAKULTAS FARMASI, UNIVERSITAS SETIA BUDI, SURAKARTA.

Enzim protease merupakan biokatalisator untuk reaksi pemecahan protein menjadi oligopeptida atau asam amino. Protease berperan penting dalam banyak industri. Enzim protease dapat diperoleh dari bakteri baik secara alami atau melalui rekayasa genetik. Penelitian ini bertujuan untuk mengetahui aktivitas dan karakterisasi enzim protease dari bakteri *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Salmonella typhi* ATCC 13311, *Serratia marcescens* ATCC 8100, dan *Staphylococcus aureus* ATCC 25923.

Penelitian dilakukan dalam beberapa tahap yaitu identifikasi bakteri yang meliputi pengamatan morfologi, pewarnaan Gram, dan pengujian biokimia. Fermentasi bakteri dan uji aktivitas ekstrak kasar enzim protease menggunakan metode difusi dalam media *Skim Milk Agar*. Penentuan aktivitas enzim diuji berdasarkan pengaruh suhu dan pH.

Hasil penelitian menunjukkan kelima bakteri yang digunakan pada penelitian ini mampu menghasilkan enzim protease. Aktivitas protease terbesar berasal dari *P. aeruginosa* ATCC 27853 dengan diameter zona bening sebesar 15,62 mm. Karakteristik protease dari *P. aeruginosa* ATCC 27853 memiliki suhu dan pH optimum sebesar 30^{o}C dan pH 8.

Kata Kunci: Karakteristik, bakteri proteolitik, enzim protease,

ABSTRACT

CAHYANINGRUM, N.P., 2019, ISOLATION, ACTIVITY TEST, AND CHARACTERISTICS OF ENZYME PROTEASE FROM BACTERIA OF *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Salmonella typhi* ATCC 13311, *Serratia marcescens* ATCC 8100, AND *Staphylococcus aureus* ATCC 25923, THESIS, FACULTY OF PHARMACY, UNIVERSITAS SETIA BUDI, SURAKARTA.

Protease enzyme is a biocatalyst for the reaction of protein breakdown into oligopeptides or amino acids. Protease plays an important role in many industries. Protease enzymes can be obtained from bacteria either naturally or through genetic engineering. This study aimed to determine the activity and characterization of protease enzymes from *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Salmonella typhi* ATCC 13311, *Serratia marcescens* ATCC 8100, and *Staphylococcus aureus* ATCC 25923.

The research was conducted in several stages, namely identification of bacteria which included observations of morphology, Gram staining, and biochemical testing. Bacterial fermentation and test activities for the crude extract of protease enzymes used the diffusion method in the *Skim Milk Agar* media. Determination of enzyme activity was tested based on the influence of temperature and pH.

The results showed that the five bacteria used in this study were able to produce protease enzymes. The largest protease activity originated from *P. aeruginosa* ATCC 27853 with a clear zone diameter of 15.62 mm. Protease characteristics of *P. aeruginosa* ATCC 27853 have an optimum temperature and pH of 30^{o}C and pH of 8.

Keywords: Characteristics, proteolytic bacteria, protease enzyme