

INTISARI

ISTIQOMAH, 2018, ISOLASI DAN KARAKTERISASI ISOLAT BAKTERI AIR LIMBAH TAMBANG BATUBARA PENGHASIL ENZIM PROTEASE DARI BAKUNGAN TENGGARONG KALIMANTAN TIMUR, SKRIPSI, FAKULTAS FARMASI UNIVERSITAS SETIA BUDI, SURAKARTA.

Mikroorganisme dari air beranekaragam dan memiliki peran penting sebagai dekomposer, penyedia unsur hara bagi makhluk hidup di perairan dan juga sebagai penghasil enzim. Peranan enzim sangat penting bagi industri makanan, obat, pertanian, dan peternakan. Salah satu enzim yang tersebar luas dan peranannya cukup baik dalam industri adalah protease. Protease merupakan enzim yang dapat menguraikan atau memecah protein. Enzim ini akan mengkatalisis reaksi hidrolisis, yaitu reaksi yang melibatkan unsur air pada ikatan spesifik substrat. Penelitian ini bertujuan untuk mengisolasi dan identifikasi bakteri yang didapat pada air limbah batubara Tenggarong Kalimantan Timur yang mampu menghasilkan enzim protease.

Penelitian ini merupakan penelitian deskriptif kualitatif. Data yang diperoleh disajikan secara deskriptif meliputi identifikasi makroskopis, mikroskopis, uji aktivitas protease secara kualitatif. Uji potensi proteolitik secara kualitatif dengan mengukur diameter zona bening dalam media *Skim Milk Agar*.

Hasil isolasi diambil lima isolat bakteri yang mampu menghasilkan zona bening pada substrat *Skim Milk Agar*. Berdasarkan uji makroskopis semua bakteri memiliki warna, bentuk, tepian dan elevasi yang hampir sama. Pada pewarnaan Gram, pewarnaan kapsul dan pewarnaan spora semua bakteri tergolong Gram negatif, berkapsul dan berspora. Hasil uji aktivitas proteolitik secara rata-rata pada 3 kali sampling dari 5 isolat yang mampu menghasilkan zona bening disekitar koloni yaitu ALT1 (14,53 mm), ALT2 (6,63 mm), ALT3 (7,36), ALT4 (8,3 mm), ALT5 (8,6 mm). Isolat ALT1 memiliki nilai indeks proteolitik yang tertinggi.

Kata kunci : isolasi, identifikasi, bakteri, limbah, batubara, protease

ABSTRACT

ISTIQOMAH, 2018, ISOLATION AND CHARACTERIZATION OF ISOLATES OF BACTERIA PRODUCING COAL MINE WASTEWATER ENZYME PROTEASE OF BAKUNGAN TENGGARONG EAST KALIMANTAN, SKRIPSI, FACULTY OF PHARMACY, UNIVERSITAS SETIA BUDI, SURAKARTA.

Microorganisms from the water is diverse and has an important role as the provider of this species, nutrient elements for living beings in the water and also as a producer of enzymes. The role of the enzyme is essential for food industry, medicine, agriculture, and livestock. One of the enzymes that are widely dispersed and its role quite well in the industry is a protease. Protease is an enzyme which can decipher or break down protein. This enzyme would catalyze the hydrolysis reactions, reactions involving elements of water on bonding of specific substrates. This research aims to isolate and identify bacteria obtained at sewage water the East Kalimantan coal Tenggarong capable of producing the enzyme protease.

This research is a descriptive qualitative research. The data obtained are presented in descriptive macroscopic, microscopic identification include, qualitative protease activity assay. Test potential proteolytic qualitatively by measuring the diameter of the clear zone in the media *Skim Milk Agar*.

Results isolation taken five bacterial isolates capable of producing clear zone on a substrate of Skim Milk Agar. Based on macroscopic tests all bacteria have the color, shape, margin, and nearly the same elevation. On coloring grams staining capsule and staining spores all bacteria classified as Gram-negative, encapsulated and there are spores. Proteolytic activity of test results on average at 3 times the sampling of 5 isolates that are able to produce a clear zone surrounding the colony namely (14.53 mm) ALT1, ALT2 (6.63 mm), ALT3 (7.36), ALT4 (8.3 mm), ALT5 (8.6 mm). ALT1 isolates have the highest proteolytic index value.

Key words: isolation, identification, bacteria, waste, coal, protease