

Rachmadani, D.A., 2014, Penapisan Mikroba Selulolitik Pendegradasi Sampah Organik Dan Karakterisasi Aktivitas Katalitiknya. Skripsi ini Dibawah Bimbingan Dr. Purkan, S.Si., M.Si dan Dr. Sri Sumarsih, M.Si. Departemen Kimia, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Penelitian ini bertujuan untuk mengisolasi bakteri selulolitik dari cairan fermentasi sampah organik, menentukan kondisi optimum produksi enzim selulase serta karakterisasi aktivitas ekstrak kasar enzim selulase, meliputi pH dan suhu optimum. Bakteri selulolitik diisolasi dengan menggunakan metode *pour plate* menggunakan media spesifik CMC (*Carboxymethyl Cellulose*) dan diinkubasi pada suhu 37°C selama 24 jam. Aktivitas bakteri pendegradasi selulosa dapat dilihat dengan adanya zona bening di sekitar tempat tumbuh koloni. Identifikasi isolat dilakukan secara makroskopis, mikroskopis dan biokimia. Aktivitas enzim selulase ditentukan dengan menggunakan metode Miller terhadap substrat CMC. Pada penelitian ini diperoleh 2 isolat bakteri penghasil selulase dengan indeks selulolitik terbesar adalah 1,903 (DA1). Kondisi optimum produksi enzim selulase oleh bakteri adalah pada waktu 24 jam dengan kadar molase optimum 0,4% sebesar menghasilkan aktivitas enzim sebesar 0.04802 U/mL. Enzim selulase yang dihasilkan isolat DA1 menunjukkan ekstrak enzim mempunyai aktivitas optimum pada pH 5 dan suhu 50°C.

Kata Kunci: sampah organik, molase, bakteri selulolitik, selulase

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ABSTRACT

The objectives of this research are to isolate cellulolytic bacteria from liquid fermentation of organic waste, to determine the optimum conditions of cellulose enzyme production and characterize of crude extract cellulase enzyme activity, including pH and optimum temperature. Cellulolytic bacteria was isolated with pour plate method using specific media CMC (*Carboxymethyl Cellulose*) and incubated at the temperature of 37⁰C for 24 hours. The activity of cellulolytic bacteria can be seen by the presence of transparent zone around the place where colony grows. The identification of isolates was done macroscopically, microscopically and biochemistry. Cellulolytic enzyme activity was determined with Miller method to CMC substrate. In this research, 2 isolates of cellulose producer bacteria with the biggest cellulolytic index of 1,903 (DA1) was obtained. Optimum condition of cellulose enzyme production by the bacteria was at hour-24 with the optimum molasses concentration of 0,4% and producing enzyme activity which is 0,04802 U/mL. The cellulose enzyme activity which was produced by DA1 isolate showed that the crude enzyme has optimum activity at pH 5 and temperature of 50⁰C.

Keywords: organic waste, molasses, cellulolytic bacteria, cellulose