

Fitria, I. L., 2018, Produksi β -D-xilosidase *Dictyoglomus thermophilum* H-6-12 Rekombinan dalam *Escherichia coli*. Skripsi Ini Dibawah Bimbingan Prof. Dr. Ni Nyoman Tri Puspaningsih, M.Si. dan Ali Rohman, M.Si., Ph. D. Departemen Kimia, Fakultas Sains dan Teknologi Universitas Airlangga, Surabaya.

ABSTRAK

β -D-xilosidase merupakan enzim yang terpenting dari kelompok enzim xilanolitik yang menghidrolisis ikatan glikosidik β -1,4 pada rantai utama xilan. Produksi enzim β -D-xilosidase dari bakteri termofil *Dictyoglomus thermophilum* H-6-12 dalam sistem ekspresi *E. coli* BL21 dilakukan untuk memperoleh enzim Dt-Xyl yang hipertermofilik. Dt-Xyl berhasil diekspresikan dalam *E. coli* BL21 dengan induksi IPTG 1 M. Analisis SDS-PAGE menunjukkan adanya pita protein pada berat molekul 59 kDa. Kondisi produksi Dt-Xyl dioptimasi dengan penambahan beberapa zat aditif. Dt-Xyl dimurnikan dengan metode kromatografi afinitas menggunakan kolom Ni-NTA. Dt-Xyl murni menunjukkan aktivitas β -D-xilosidase terhadap substrat spesifik pNP-X. Dt-Xyl memiliki karakteristik optimum pada pH 5 dan suhu 80 °C.

Kata kunci : xilan, β -D-xilosidase, *Dictyoglomus thermophilum* H-6-12, Dt-Xyl

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ABSTRACT

β -D-xylosidase is the most important enzyme of the xylanolytic enzymes group that hydrolyzes the β -1,4 glycosidic bond on the xylan chain. Production of the β -D-xylosidase enzyme from the *Dictyoglomus thermophilum* H-6-12 in the expression system of *E. coli* BL21 was performed to obtain a hyperthermophilic enzyme. Dt-Xyl was successfully expressed in *E. coli* BL21 with IPTG 1 M as inducer. SDS-PAGE analysis showed the presence of protein bands at 59 kDa molecular weight. The production conditions of Dt-Xyl were optimized with the addition of some additives. Dt-Xyl was purified by affinity chromatography method using Ni-NTA column. Pure Dt-Xyl showed activity of β -D-xylosidase in the presence of *p*NP-X as specific substrate. Dt-Xyl had an optimum characteristic at pH 5 and temperature of 80 °C.

Keywords : *xilan, β -D-xylosidase, Dictyoglomus thermophilum H-6-12, Dt-Xyl*