EKSPRESI GEN KITINASE PUTATIF II (*Chi*Put-II) DARI BAKTERI *Serratia plymuthica* STRAIN UBCR_12

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ABSTRAK

Gen kitinase putatif II (*ChiPut-II*) diisolasi dari bakteri rizosfer UBCR_12 dengan nomor aksesi KX863673 pada data gen bank. Gen *Chi*Put-II ini mampu memproduksi kitinase yang memiliki kemampuan sebagai biofungisida. Enzim kitinase memiliki mekanisme antibiosis mendegradasi dinding sel jamur patogen yang terbentuk dari kitin. Dinding sel jamur yang didegradasi oleh kitinase kemudian mengalami kerusakan dan menghambat pertumbuhan jamur patogen. Analisis ekspresi gen ini dianalisis protein ekstraseluler dan intraselulernya dalam *host* ekspresinya. Setelah dikloning kemudian gen ditransformasi kedalam *E. coli* BL21 sebagai *host* ekspresi gen. Induksi menggunakan IPTG 1 mM didapatkan hasil isolasi protein gen *Chi*Put-II pada ekstraseluler 55,24 ng/µl, intraseluler lisis pertama 174,83 ng/µl dan pada intraseluler lisis kedua 498,51 ng/µl. Protein ekstraseluler dan intraseluler gen *Chi*Put-II diuji kemampuan biofungisida dengan *C. gloeosporioides* dan memiliki kemampuan daya hambat paling tinggi yaitu 15,59% protein intraseluler lisis kedua. Kemampuan kitinolitik dari enzim *Chi*Put-II intraseluler lisis kedua ini efektif bekerja pada koloidal kitin 3% dengan kemampuan 1,235 U/µg. Berdasarkan hasil pengujian kitinolitik dan daya hambat terhadap jamur patogen terlihat protein intraseluler lisis kedua memiliki potensi yang lebih jika dibandingkan dari ekstraseluler dan intraseluler lisis pertama. Dengan kemampuan gen *Chi*Put-II dalam memproduksi enzim kitinase dapat dikembangkan sebagai biofungisida.

Kata kunci: *Chi*Put-II, intraseluler, kitinolitik, UBCR_12, biofungisida

EXPRESSION OF PUTATIVE CHITINASE II (*Chi*Put-II) from *Serratia plymuthica* Strain UBCR_12

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ABSTRACT

Putative chitinase II gene (*Chi*Put-II) was isolated from rhizosphere bacteria UBCR_12 with accession number KX863673 in gene bank data. The *Chi*Put-II gene is capable of producing chitinase which has the ability as a biofungicide. Chitinase enzyme has an antibiosis mechanism that degrades the cell wall of pathogenic fungi formed from chitin. The fungal cell wall degraded by chitinase then breaks down and in turn inhibits the growth of pathogenic fungi. Analysis of the expression of this gene was performed both in the extracellular and intracellular. After being cloned then the gene is transformed into *E. coli* BL21 as the host of gene expression. Induction using 1 mM IPTG obtained the protein isolation of *Chi*Put-II gene on the extracellular 55.24 ng/µl, the first intracellular lysis was 174.83 ng/µl and the second intracellular lysis 498.51 ng/µl. The extracellular and intracellular proteins of the *Chi*Put-II gene were tested for the ability of biofungicides with *C. gloeosporioides* and had the highest inhibitory ability of 15.59% of the second intracellular protein lysis. The chitinolytic ability of the second intracellular lysis *Chi*Put-II enzyme effectively works on 3% colloidal chitin with the ability of 1,235 U/µg. Based on the results of chitinolytic analysis and inhibition of pathogenic fungi, it appears that the second intracellular protein lysis has more potential compared to the extracellular and first intracellular lysis. The ability of the *Chi*Put-II gene to produce the chitinase enzyme it can be developed as a biofungicide.

Keywords: *Chi*Put-II, intracelluler, chitinolytic, UBCR_12, biofungicide