ABSTRAK

EVALUASI PRODUK HIDROLISIS KULIT UDANG MENGGUNAKAN AKTINOMISETES 18D36A2 DAN UJI ANTIBAKTERI

Oleh

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Enzim kitinase merupakan enzim yang secara spesifik berperan dalam proses degradasi kitin menjadi senyawa turunannya, seperti chitooligosakarida (COS). Penelitian ini mencakup peremajaan serta identifikasi isolat Aktinomisetes 18D36A2, yang berdasarkan analisis mikroskopis diduga termasuk dalam genus *Microscoccus unila*. Untuk memperoleh enzim kitinase, isolat 18D36A2 dikultivasi melalui metode fermentasi padat (*Solid State Fermentation*/SSF) menggunakan media berbahan dasar limbah kulit udang selama tujuh hari. Hasil fermentasi diekstraksi menggunakan akuades, kemudian dilanjutkan dengan proses dialisis. Selanjutnya, dilakukan analisis kadar glukosamin dengan metode DNS dan pengukuran kadar protein menggunakan metode Lowry. Hasil analisis menunjukkan bahwa fermentasi 100 gram limbah kulit udang dalam labu Erlenmeyer berkapasitas 1000 mL menghasilkan glukosamin sebesar 459,6 ppm. Setelah dialisis, aktivitas enzim meningkat dua kali lipat hingga mencapai 0,2 U/mL. Uji aktivitas antibakteri menunjukkan bahwa enzim kitinase dari isolat Aktinomisetes 18D36A2 mampu menghambat pertumbuhan *Staphylococcus aureus* dan *Pseudomonas aeruginosa*. Selain itu, enzim kitinase yang diperoleh dapat menghidrolisis substrat kulit udang menjadi COS dalam waktu inkubasi dua jam. Mengingat kemampuannya dalam menghasilkan COS yang berpotensi sebagai agen antibakteri, temuan ini memberikan landasan penting bagi penelitian lanjutan terkait pemanfaatan enzim kitinase dari isolat tersebut.

Kata kunci : antibakteri, enzim kitinase, isolat aktinomisetes laut 18D36A2, *solid state fermentation,* glukosamin.

ABSTRACT

EVALUATION OF SHRIMP SHELL HYDROLYSIS PRODUCTS USING ACTINOMYCETES 18D36A2 AND ANTIBACTERIAL TEST

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Chitinase enzyme is an enzyme that specifically plays a role in the degradation process of chitin into its derivative compounds, such as chitooligosaccharides (COS). This study includes the rejuvenation and identification of the Actinomycetes isolate 18D36A2, which based on microscopic analysis is suspected to belong to the genus Microscoccus unila. To obtain the chitinase enzyme, the isolate 18D36A2 was cultivated through the Solid State Fermentation (SSF) method using shrimp shell waste as the base medium for seven days. The fermentation results were extracted using distilled water, then continued with the dialysis process. Furthermore, glucosamine levels were analyzed using the DNS method and protein levels were measured using the Lowry method. The results of the analysis showed that fermentation of 100 grams of shrimp shell waste in a 1000 mL Erlenmeyer flask produced glucosamine of 459.6 ppm. After dialysis, enzyme activity doubled to 0.2 U/mL. Antibacterial activity test showed that chitinase enzyme from Actinomycetes isolate 18D36A2 was able to inhibit the growth of Staphylococcus aureus and Pseudomonas aeruginosa. In addition, the chitinase enzyme obtained could hydrolyze shrimp shell substrate into COS within two hours of incubation. Given its ability to produce COS which has the potential as an antibacterial agent, this finding provides an important basis for further research related to the utilization of chitinase enzyme from the isolate.

Keywords: antibacterial, chitinase enzyme, marine actinomycetes isolate 18D36A2, solid state fermentation, glucosamine.