ABSTRAK

PEMURNIAN ENZIM KITINASE SERTA UJI ANTIMIKROBA DARI FUNGI LAUT 18A12RF

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Enzim kitinase merupakan enzim yang spesifik untuk mendegradasi kitin menjadi turunannya seperti *chitooligosaccharide* (COS) dan *monooligosaccharide* (MOS). Pada penelitian telah dilakukan peremajaan dan identifikasi isolat fungi 18A12RF. Penampakan secara visual, fungi memiliki warna putih dengan bentuk seperti kapas. Sedangkan secara mikroskopi isolat 18A12RF terindikasi sebagai *Aspergillus sp*. Untuk meperoleh enzim kitinase, fungi 18A12RF dikultivasi secara SSF pada media limbah kulit udang selama 4 hari.

Optimasi produksi enzim kitinase dilakukan variasi pH 5. 7, dan 9. Selanjutnya, hasil kultivasi diekstraksi dengan akuades dan dianlisis kadar glukosamin menggunakan DNS dan kadar protein menggunakan Lowry. Hasil analisis menunjukan bahwa hasil kultivasi pada pH 9 memiliki kadar tertinggi glukosamin (147,38 ppm). Selanjutnya proses *scale up* dilakukan menggunakan 100 g kulit udang dalam 1000 mL Erlenmeryer. Hasil Kultivasi mengalami peningkatan aktivitas sebanyak 6 kali (0,5 U/mL).

Uji antimikroba enzim kitinase fungi 18A12RF menunjukan aktivitas antijamur terhadaap *Malassezia globosa*, sedangkan tidak memiliki aktivitas terhadap bakteri MDR *staphylococcus aureus* dan MDR *Pseudomonas aeruginosa*. Enzim kitinase yang didapatkan mampu mendegradasi substrat menjadi COS dan MOS dalam waktu inkubasi 2 jam, didapatkan nilai Rf yang mendekati standard yaitu 0,4; 0,3; dan 0,4. Hasil degradasi COS juga biasa didapatkan oleh enzim kitinase, sehingga memudahkan dalam produksi COS sebagai antibakteri. Oleh karena itu, informasi awal ini penting untuk kajian lebih lanjut terkait pemanfaatan enzim kitinase dari isolat fungi perairan Indonesia.

Kata kunci : antimikroba, enzim kitinase, isolat fungi laut 18A12RF, *solid state fermentation*,glukosamin.

ABSTRACT

PURIFICATION CHITINASE ENZYME AND ANTIMICROBIAL ASSAY FROM MARINE FUNGAL ISOLATE 18A12RF

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Chitinase enzyme is a specific enzyme for degrading chitin into its derivatives such as chitooligosaccharide (COS) and monooligosaccharide (MOS). In this research, maintenance and identification of fungal isolate 18A12RF were carried out. Visually, the fungus has a white color with a cotton-like shape. Meanwhile, microscopically, isolate 18A12RF was indicated as *Aspergillus* sp. To obtain the chitinase enzyme, the 18A12RF fungus was cultivated using SSF in shrimp shell waste media for 4 days.

Optimization of chitinase enzyme production was carried out by varying pH 5**,** 7**,** and 9. Then, the cultivation results were extracted with aquadest and analyzed for glucosamine content using DNS and protein content using Lowry. The analysis results showed that the results of cultivation at pH 9 had the highest levels of glucosamine (147.38 ppm). Furthermore, the scale up process was carried out using 100 g of shrimp shells in 1000 mL Erlenmeryer. Cultivation results increased activity by 6 times (0.5 U/mL).

Antimicrobial assay of the fungal chitinase enzyme 18A12RF showed antifungal activity against *Malassezia globosa*, while it had no activity against MDR *Staphylococcus aureus* and MDR *Pseudomonas aeruginosa* bacteria. The chitinase enzyme obtained was able to degrade the substrate into COS and MOS within an incubation time of 2 hours. The Rf value was obtained which was close to the standard, namely 0.4; 0.3; and 0.4. COS degradation results are also usually obtained by the chitinase enzyme, making it easier to produce COS as an antibacterial.Therefore, this initial information is important for further studies regarding the utilization of chitinase enzymes from Indonesian waters

Keyword : antimicrobial, chitinase enzyme, marine fungal 18A12RF, solid state fermentation,glucosamine.