PRODUKSI, PURIFIKASI PARSIAL DAN AKTIVITAS KITINASE DARI *Micromonospora* sp. AR17

Intisari

Kitin telah digunakan diberbagai bidang dalam bentuk monomernya yaitu N-asetilglukosamin (NAG) yang diproduksi dengan hidrolisis oleh kitinase. NAG telah banyak digunakan sebagai senyawa bioaktif seperti anti tumor, anti mikroba, dan antioksidan. Penelitian ini bertujuan untuk mengetahui waktu inkubasi optimal dalam produksi kitinase oleh *Micromonospora* sp. AR17, tingkat kemurnian kitinase *Micromonospora* sp. AR17 hasil purifikasi parsial melalui presipitasi amonium sulfat dan dialisis, serta NAG yang dihasilkan dengan menggunakan enzim hasil purifikasi parsial. Penelitian waktu inkubasi optimal dilakukan dengan fermentasi pada suhu 40 ^{o}C, pH 7, dan kecepatan agitasi 100 rpm selama 7 hari dengan pengamatan setiap 24 jam sekali. Supernatan dengan perlakuan lama waktu optimal dilanjutkan pada tahap purifikasi parsial yang meliputi presipitasi protein menggunakan amonium sulfat pada berbagai tingkat kejenuhan yaitu 20%, 40%, 60%, 80%, dan 100%. Fraksi presipitat terbaik dilanjutkan pada proses dialisis. Selanjutnya dilakukan uji aktivitas hidrolisis kitin menjadi NAG menggunakan kitinase hasil purifikasi parsial. Hasil penelitian menunjukkan hari ke-4 merupakan waktu optimal produksi kitinase dengan aktivitas kitinase sebesar 0,0040 U/mL dan jumlah NAG 7,62 ppm. Purifikasi parsial kitinase yang optimal didapat dari tingkat kejenuhan amonium sulfat 40% dengan nilai aktivitas spesifik kitinase sebesar 0,3683 U/mg dan tingkat kemurnian 1,63 kali. Enzim kitinase hasil dialisis mengalami peningkatan nilai aktivitas spesifik menjadi 0,6169 U/mg dan tingkat kemurnian 2,74 kali. Produksi NAG dengan kitinase dari *Micromonospora* sp. AR17 hasil purifikasi parsial dihasilkan dengan jumlah NAG 12,116 ppm dengan waktu inkubasi 30 menit.

Kata kunci: kitinase, *Micromonospora* sp. AR17, N-asetilglukosamin, purifikasi parsial

PRODUCTION, PARTIAL PURIFICATION AND CHITINASE ACTIVITY OF *Micromonospora* sp. AR17

Abstract

Chitin has been used in various fields in the form of a monomer, namely N-acetylglucosamine (NAG) which is produced hydrolyzed by chitinase. NAG has been widely used as a bioactive compound such as anti-tumor, anti-microbial, and antioxidant. This study aims to determine the optimal incubation time in chitinase production by *Micromonospora* sp. AR17, to determine the purity level of *Micromonospora* sp. AR17 chitinase results from partial purification through ammonium sulfate precipitation and dialysis, and to determine the NAG produced by using partial purified enzymes. Optimal incubation time was obtained by fermentation at 40 ºC, a pH of 7, and an agitation speed of 100 rpm for 7 days with observations every 24 hours. The supernatant with optimal treatment was continued at the partial purification stage which included protein precipitation with ammonium sulfate at various saturation levels 20%, 40%, 60%, 80%, and 100%. The best precipitate fraction was continued in the dialysis process. Furthermore, the hydrolysis activity test of chitin to NAG was carried out using partially purified chitinase. The results indicated that the fourth day was the optimal production time for chitinase with chitinase activity of 0.0040 U/mL and a total NAG of 7.62 ppm. The optimal partial purification of chitinase was obtained from 40% saturation fraction with a specific activity value of chitinase of 0.3683 U/mg and a purity level of 1.63 times. The chitinase enzyme resulting from dialysis has increased the specific activity value to 0.6169 U/mg and the purity level of 2.74 times. Production of NAG with chitinase from *Micromonospora* sp. AR17 partial purification results were generated with the amount of NAG 12,116 ppm with an incubation time of 30 minutes.

Keywords: chitinase, *Micromonospora* sp. AR17, N-acetylglucosamine, partial purification