ISOLASI DAN KARAKTERISASI ENZIM β-GALAKTOSIDASE DARI ISOLAT BAKTERI TERMOFILIK SUMBER AIR PANAS GEDONG SONGO

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RINGKASAN

Enzim β-galaktosidase merupakan enzim yang dapat mengubah laktosa menjadi glukosa dan galaktosa. Berdasarkan uji kualitatif yang telah dilakukan oleh Suprapti menyatakan bahwa isolat bakteri termofilik sumber air panas Gedong Songo berpotensi menghasilkan enzim β-galaktosidase. Penelitian ini bertujuan untuk memperoleh enzim β-galaktosidase dari isolat bakteri termofilik sumber air panas Gedong Songo, memperoleh karakter enzim dan menentukan aktivitas spesifik enzim β-galaktosidase pada kondisi optimumnya.

Isolasi bakteri menggunakan media ½ Luria Berthani (½ LB). Jenis bakteri diidentifikasi dengan metode pewarnaan Gram. Enzim β-galaktosidase diproduksi pada media ½ LB selama 6 jam dengan menggunakan laktosa sebagai penginduksi. Enzim β-galaktosidase diisolasi dengan metode ekstraksi, fraksinasi amonium sulfat bertingkat dan dialisis. Uji aktivitas enzim β-galaktosidase dilakukan dengan menggunakan ONPG sebagai substratnya dan kadar protein diukur dengan menggunakan metode *Lowry*. Karakterisasi enzim meliputi pH, suhu dan waktu inkubasi optimum dari enzim β-galaktosidase yang diperoleh.

Isolat bakteri termofilik sumber air panas Gedong Songo memiliki sifat gram negatif dan berbentuk batang. Hasil karakterisasi menunjukkan bahwa kondisi optimum enzim β-galaktosidase isolat bakteri termofilik sumber air panas Gedong Songo dengan substrat ONPG adalah pada suhu 63 ^{o}C, pH 6,2 dan waktu inkubasi 30 menit. Aktivitas spesifik tertinggi pada kondisi optimum tersebut didapatkan pada F4 (60-80 %) yaitu 44,145 Unit/mg protein.

SUMMARY

β-galactosidase is an enzyme converting lactose to glucose and galactose. Suprapti through several qualitative tests concluded that thermophile bacteria isolated from Gedong Songo hot water spring has a potential of β-galactosidase. The research aim is to isolate β-galactosidase enzyme of thermophile bacteria isolated from Gedong Songo hot water spring, to characterize optimum pH, incubation time, and temperature of the enzyme and to know the specific activity of β-galactosidase in above condition.

Bacteria was isolated in ½ Luria Berthani (½ LB) medium. The kind of bacteria was identified using Gram's coloring method. Production of β-galactosidase was done in ½ LB medium for 6 hours using lactose as inducer. The β-galactosidase was isolated using extraction, fractionation and dialysis methods. Activity of enzyme fraction was tested using ONPG while protein concentration was measured using Lowry's method. Characterization done were optimum pH, temperature, and incubation time.

Bacteria isolated from Gedong Songo hot water spring had negative gram's character and bar shape. The optimum condition of β-galactosidase bacteria characterization isolated from Gedong Songo hot water spring by ONPG substrate were at 63 ^{o}C temperature, 6.2 pH and 30 minutes incubation time. Highest specific activity in above condition was obtained 44.145 Units/mg protein in F4 (60-80 %).

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