

Zeni Arini, 2006, Pengaruh Konsentrasi Inokulum dan Lama Fermentasi terhadap Produksi Enzim Amilase oleh *Aspergillus oryzae*. Skripsi di bawah bimbingan Drs. Agus Supriyanto, M.Kes., dan Dr. Ir. Tini Surtiningsih, DEA., Jurusan Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Airlangga, Surabaya

ABSTRAK

Tujuan dari penelitian ini adalah untuk mengetahui pengaruh konsentrasi inokulum, lama fermentasi, dan kombinasi keduanya terhadap produksi enzim amilase oleh *Aspergillus oryzae*. Penelitian ini bersifat eksperimental laboratoris menggunakan percobaan faktorial 3x3 dengan 3 ulangan. Konsentrasi inokulum yang digunakan adalah 3 % (v/v), 5 % (v/v) dan 7 % (v/v), sedangkan waktu fermentasi yang digunakan adalah selama 3, 5 dan 7 hari. Produksi enzim amilase dilihat dari aktivitas enzim dan biomassa kapang. Kadar aktivitas enzim dianalisis dengan metode DNS. Sedangkan biomassa kapang diperoleh dengan metode timbang berat kering. Data yang diperoleh dianalisis dengan ANAVA dua arah dan dilanjutkan uji Tukey dengan taraf signifikansi 5%. Hasil penelitian menunjukkan bahwa konsentrasi inokulum tidak berpengaruh terhadap produksi enzim amilase. Aktivitas enzim amilase dan biomassa tertinggi dicapai pada konsentrasi inokulum 5% yaitu sebesar $3,478 \pm 0,247$ (unit/L) dan $7,845 \pm 0,485$ (g/L). Sebaliknya lama fermentasi mempunyai pengaruh terhadap aktivitas enzim amilase dan biomassa kapang dengan aktivitas enzim amilase dan biomassa kapang tertinggi dicapai pada lama fermentasi 5 hari yaitu sebesar $5,333 \pm 0,247$ (unit/L) dan $8,88 \pm 0,485$ (g/L). Kombinasi konsentrasi inokulum dan lama fermentasi tidak berpengaruh terhadap aktivitas enzim dan biomassa kapang dengan aktivitas enzim amilase tertinggi dicapai pada kombinasi konsentrasi inokulum 3% dengan lama fermentasi 5 hari yaitu sebesar $6,100 \pm 0,429$ (unit/L). Sedangkan jumlah biomassa tertinggi didapatkan pada kombinasi konsentrasi inokulum 5% dan 5 hari masa fermentasi yaitu sebesar $9,272 \pm 0,841$ (g/L).

Kata kunci : *Aspergillus oryzae*, enzim amilase, fermentasi, dan konsentrasi inokulum

Zeni Arini, 2006, The effect of Inoculum Concentration and length of fermentation to the production of amylase enzyme by *Aspergillus oryzae*. Script was under supervision of Drs. Agus Supriyanto, M.Kes., dan Dr. Ir. Tini Surtiningsih, DEA., Departement of Biology. Faculty Mathematics and Natural Science. Airlangga University, Surabaya

ABSTRACT

The purpose of this research was to know the effect of inoculum concentration, length of fermentation, and the combination both of them to amylase enzyme production by *Aspergillus oryzae*. This Research was laboratory experimental and using experimental design of the factorial 3x3 with 3 replication. Inoculum concentration of *A. oryzae* used were 3 % (v/v), 5 % (v/v) and 7 % (v/v), while length of fermentations were for 3, 5 and 7 days. The production of amylase enzyme was obtained from the activity of enzyme and mold biomass. The activity of enzyme was determined by DNS method. The mold biomass was determined by dry weight method. The obtained data were analyzed by two-way variance analyze (ANOVA) and followed by Tukey test at level significance 5%. The results of this study showed that the kinds of inoculum concentration had no significantly effect to the activity of enzyme and mold biomass. The highest activity of amylase enzyme and mold biomass was obtained at 5% inoculum concentration with $3,478 \pm 0,247$ (unit/L) and $7,845 \pm 0,485$ (g/L). But the length of fermentation had significantly effect to the activity of enzyme and mold biomass. The highest activity of amylase enzyme and mold biomass was obtained at 5 days length of fermentation with $5,333 \pm 0,247$ (unit/L) and $8,88 \pm 0,485$ (g/L). Combination of inoculum concentration and length of fermentation had no significantly effect to the activity of enzyme and mold biomass. The highest activity of amylase enzyme was obtained at 3% of inoculum concentration and 5 days length of fermentation with $6,100 \pm 0,429$ (unit/L). The highest activity of mold biomass was obtained at 5% of inoculum concentration and 5 days length of fermentation with $9,272 \pm 0,841$ (g/L).

Key words : amylase enzyme, *Aspergillus oryzae*, fermentation, and inoculum concentration.