SCREENING FOR LIPASE ACTIVITY FROM MARINE BACTERIA ISOLATED FROM CORAL MUCUS

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Lihat sebelah

SCREENING FOR LIPASE ACTIVITY FROM MD030 BACTERIA ISLATED FROM CORAL MUCUS

By

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°C - celcius

g - gram

µg - microgram

ml - milliliter

M - molar

rpm - rotation per minute

NaOH - natrium hydroxide

sp - species

ABSTRACT

There are very few environmental studies to date, focusing on lipase activities in marine microbes such as bacteria. In this research, the ability to produce lipase by marine bacteria MD030, isolated from coral mucus was investigated. The identification of the MD030 bacteria was confirmed by several biochemical tests based on their morphological and phenotypic characteristics. The results suggested that the bacteria are *Moraxella* sp. Prior to induction of lipase by the bacteria, three different media have been tested to determine the best culture medium: Nutrient Broth in Distilled Water, Nutrient Broth in Sea Water and ZoBell's modified medium. In this study, Nutrient Broth in Sea Water medium was chosen as the medium for lipase induction. The protein content of the crude enzyme was 150μg/ml. The induction of lipase with olive oil as substrate was initiated with the preparation of pre-inoculum. Several reaction parameters influencing lipase activity such as incubation time, temperature and amount of substrate have been determined. There was no significant difference ($p>0.05$) between all incubation times tested. Free fatty acids released (ml) at 27°C was significantly higher ($p<0.05$) compared to 15 and 37°C. No significant difference ($p>0.05$) was observed for 2 and 3 %, but there was significant difference ($p<0.05$) observed between 1 and 3 %. Therefore, the optimum conditions chosen for lipase activity were 18 hours of incubation time, at 27°C with 2-3% of olive oil as substrate, in a lipase assay using 300μg crude enzyme. The results indicate that MD030 bacteria is capable in producing lipase.

PENYARINGAN AKTIVITI LIPASE DARIPADA BAKTERIA MD030 YANG DIPENCILKAN DARI MUKUS BATU KARANG

ABSTRAK

Setakat ini hanya terdapat beberapa kajian persekitaran mengenai aktiviti lipase daripada mikrob marin seperti bakteria. Dalam kajian ini, keupayaan bakteria marin MD030 untuk menghasilkan lipase yang dipencilkan dari batu karang telah dikaji. Dalam melakukan pengesahan identiti bakteria MD030, beberapa ujian biokimia telah dilakukan berdasarkan morfologi dan ciri- ciri fenotopik bakteria tersebut. Keputusan yang diperolehi mencadangkan bakteria tersebut adalah *Moraxella* sp. Sebelum mengaruh penghasilan lipase daripada bakteria, tiga media yang berbeza telah diuji untuk menentukan medium kultur yang paling baik; 'Nutrient Broth' dalam air suling, 'Nutrient Broth' dalam air laut dan medium ZoBell yang diubahsuai. Dalam kajian ini, medium 'Nutrient Broth' dalam air laut telah dipilih sebagai media untuk penghasilan lipase. Kandungan protein oleh enzim yang ditentukan ialah 150µg/ml. Lipase diaruh menggunakan minyak zaitun sebagai substrat dan dimulakan dengan penyediaan pra-inokulum. Beberapa parameter tindakbalas terhadap aktiviti lipase seperti masa pengeraman, suhu dan jumlah substrat telah dilakukan. Tiada perbezaan signifikan ($p>0.05$) antara kesemua masa pengeraman yang diuji. Asid lemak bebas yang dibebaskan (ml) pada 27°C adalah signifikan yang tinggi ($p<0.05$) dibandingkan dengan 15 dan 37°C. Tiada perbezaan signifikan ($p>0.05$) telah diperhatikan untuk 2 dan 3%, tetapi terdapat perbezaan signifikan ($p<0.05$) diperhatikan antara 1 dan 3%. Oleh itu, keadaan optimum yang dipilih untuk aktiviti lipase adalah pada18 jam masa pengeraman pada suhu 27°C menggunakan 2-3 % minyak zaitun sebagai substrat, di dalam asai lipase yang menggunakan 300µg enzim kasar. Keputusan menunjukkan bakteria MD030 berkebolehan menghasilkan lipase.