SCREENING FOR LIPASE ACTIVITY FROM MD 012
BACTERIA ISOLATED FROM CORAL MUCUS

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FAKULTI SAINS DAN TEKNOLOGI
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# SCREENING FOR LIPASE ACTIVITY FROM MD019 BACTERIA ISOLATED FROM CORAL MUCUS

By

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## TABLE OF CONTENTS

# LIST OF TABLES

## LIST OF FIGURES

## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| ANOVA | - | Analysis of Variance |
| BSA | - | bovine serum albumin |
| CV-I | - | crystal violet-iodine |
| $CaCl_2$ | - | calcium chloride |
| EMB | - | eosin methylene blue |
| FFA | - | free fatty acid |
| g | - | gram |
| $H_2S$ | - | hydrogen sulfide |
| M | - | molar |
| MR | - | methyl Red |
| ml | - | mililiter |
| NaOH | - | sodium hydroxide |
| nm | - | nanometer |
| $O_2$ | - | oxygen |
| TSI | - | triple sugar iron |
| VP | - | Voges-Proskaeur |
| % | - | percentage |

## LIST OF APPENDICES

## ABSTRACT

Lipases which are among the most important industrial enzymes have the ability to catalyze the breakdown of triacylglycerol to free fatty acids and glycerol. However, there are a few reports on the productions of lipase from marine bacteria. In this study, the screening for lipase activity from MD019 bacteria isolated from the mucus of *Aeropora cervicornis* coral at Bidong Island has been carried out. Several biochemical tests have been done manually to confirm the identification of the bacteria, based on their morphological and phenotypic characteristics. The results suggested that the bacteria is *Erwinia* sp. The presence of lipase enzyme in MD019 bacteria have been detected by halo zone on tributyrin agar. Several reaction parameters were studied to obtain the optimum reaction conditions for lipase activity in MD019 bacteria: incubation time, temperature and amount of substrate. In the effect of incubation time, no significant difference ($P>0.05$) was observed between 6, 12 and 18 hours, but there was significant difference ($P<0.05$) observed between 6 and 24 hours. In the effect of temperature of incubation, there was no significant difference ($P>0.05$) observed in all temperatures tested. In the effect of amount of olive oil, there was no significant difference ($P>0.05$) observed for the amount of olive oil between 2 and 3%, but there was significant difference ($P<0.05$) observed between 1 and 3%. The results obtained showed that the optimum free fatty acids were released in the range of 6 to 18 hours of incubation using 2 to 3% of olive oil as substrate. Optimum temperature for lipase activity could not yet be determined. The results indicate that *Erwinia* sp. is capable of producing lipase. It was very timely to screen for lipase from marine bacteria as an alternative to terrestrial microbes.

# PENYARINGAN AKTIVITI LIPASE DARI BAKTERIA MD019 YANG DIPENCILKAN DARI MUKUS KARANG

## ABSTRAK

Lipase merupakan salah satu enzim yang penting dalam proses industri dan berkeupayaan untuk memangkinkan tindak balas penguraian triasilgliserol kepada asid lemak bebas dan gliserol. Bagaimana pun, cuma terdapat sedikit laporan tentang penghasilan lipase oleh bakteria marin. Dalam kajian ini, penyaringan aktiviti lipase oleh bakteria MD019 yang dipencilkan dari mukus karang *Aeropora cervicornis* di Pulau Bidong telah dijalankan. Beberapa ujian biokimia telah dijalankan bagi memastikan pengecaman bakteria MD019 ini, berdasarkan ciri-ciri morfologi dan fenotipnya. Keputusan mencadangkan bahawa bakteria tersebut adalah *Erwinia* sp. Kehadiran enzim lipase telah dikenalpasti dengan kesan zon halo di atas agar tributirin. Beberapa parameter tindak balas telah diuji untuk mendapatkan tindak balas pada keadaan yang paling optimum bagi aktiviti lipase oleh bakteria MD019: masa pengeraman, suhu dan amaun substrat. Dalam kesan masa pengeraman, tiada perbezaan penting ($P>0.05$) yang telah diperhatikan antara 6, 12 dan 18 jam, tetapi terdapat perbezaan penting ($P<0.05$) telah diperhatikan antara 6 dan 24 jam. Dalam kesan suhu pengeraman, tiada perbezaan penting ($P>0.05$) telah diperhatikan dalam semua suhu yang diuji. Dalam kesan amaun minyak zaitun sebagai substrat, tiada perbezaan penting ($P>0.05$) telah diperhatikan bagi amaun minyak zaitun antara 2 dan 3%, tetapi terdapat perbezaan penting ($P<0.05$) telah diperhatikan antara 1 dan 3%. Keputusan yang diperoleh menunjukkan asid lemak bebas optimum telah dibebaskan pada 6 hingga 18 jam pengeraman menggunakan 2 hingga 3% minyak zaitun sebagai substrat. Suhu optimum untuk aktiviti lipase tidak dapat ditentukan. Ini adalah masa yang paling sesuai untuk menguji kehadiran lipase dalam bakteria marin, sebagai alternatif kepada bakteria daratan.