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| Thesis Title | The Preliminary Study on Conversion of Waste and Low Cost Raw Material to Citric Acid by *Candida lipolytica* |
| Name | Chiranan Hempulsert |
| Degree | Master of Science (Technology of Environmental Management) |
| Thesis Supervisory Committee | Rungjarat Hutacharoen, M.Sc.<br>Thanakorn Uan-on, Ph.D.<br>Kanit Sa-nguantrakul, M.Sc.<br>Damrong Khummongkol, Ph.D. |
| Date of Graduation | 7 June B.E.2533 (1990) |

## ABSTRACT

Citric acid is an organic acid which is used widely in many industries. The commercial production of citric acid is the fermentation of mallasses by fungus *Aspergillus niger*.However,the present work studies the production of citric acid, by yeast *Candida lipolytica* UPCC 2072, from various kinds of wastes and low cost raw materials such as pomace of pineapple juice, cassava and coconut water.

In this work, the effect of temperature, pH and substrate concentration on the citric acid productivity was studied. The substrates studied included pomace of pineapple juice, cassava and coconut water. For preliminary study,the concentration of each substrate was fixed as 500 gm per litre, and the temperature and pH were changed. The temperatures were set at 20°, 25°, 30° and 35°C. The results

indicated that the productivity increased with the increase of temperature for any substrates used. To study the effect of pH, the pH of the media was adjusted and controlled at 3.5, 4.5 and 5.5. The results were compared with uncontrolled pH medium. It was found that the citric acid productivity increased as the pH decreased from 5.5 to 4.5 and insignificantly varied as pH further dropped at 4.5.

For the preliminary study, the optimum condition was 35° C and pH 4.5; the best substrate was pineapple juice. At this condition production of citric acid is 0.6779 gm after 5 days of fermentation. In the further study, concentration of pineapple juice was varied from 20% to 100% by wt. The concentration that gave the best yield was 50%.

Moreover, the unit cost of citric acid obtained from 50% pineapple juice was the lowest, about 61.21 baht. The market price of citric acid produced by Aspergillus niger was around 80 baht; consequently, the citric acid produced by Candida lipolytica UPCC 2072 was lower.