

C726924 MAJOR BIOTECHNOLOGY

KEY WORD:

Dunaliella salina / BETA-CAROTENE / CULTURE SYSTEMS
NISACHOL SAENLAMOOOL : CULTURE OF Dunaliella salina
IN ROCK SALT WATER FOR BETA-CAROTENE. THESIS ADVISOR :
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Culture of Dunaliella salina in rock salt water for beta-carotene production was carried out in 3 experiments, 1) optimal cultured conditions for beta-carotene production, 2) comparison of culture systems, and 3) analysis of the cost of investment and the expected benefit. The first experiment was to find the optimal cultured conditions. D. salina was cultured in 10 liter-flask at KNO_3 concentrations of 0.5 and 1.0 g/l in modified J/1 medium. The result indicated that the medium of 0.5 g/l KNO_3 gave the higher content of carotenoid. D. salina was cultured in a $5.4 \times 1.3 \text{ m}^2$ pond at different depth (10, 20, 25 and 30 cm), it was found that the condition for an optimal growth rate with high content of carotenoid was at 20 cm.

In the second experiment, an extensive system without aeration carried out in a $6 \times 6 \text{ m}^2$ pond produced a maximum carotenoid content of 3.81 pg/cell, while that with aeration in a $25 \times 6 \text{ m}^2$ pond produced a maximum carotenoid content of 18.5 pg/cell. For intensive culture in a $38 \times 15 \text{ m}^2$ raceway pond with a paddle wheel for the water circulation produced the maximum carotenoid content of 82.8 pg/cell.

A cost-benefit analysis for an intensive culture of D. salina in a $12.5 \times 5 \text{ m}^2$ pond indicated that it is profitable within 5 years operation.

ภาควิชา.....

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