

# 以Cunninghamella echinulata發酵生產 $\gamma$ -次亞麻油酸 = Production of $\gamma$ -linoleic acid by Cunninghamella echinulata

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## 摘要

$\gamma$ -次亞麻油酸( $\gamma$ -linolenic acid, GLA)屬於  $\omega$ -6多元不飽和脂肪酸，為母乳中所含的多元不飽和脂肪酸，其具有緩和過敏性皮膚炎、降低膽固醇、改善生理痛、類風濕性關節炎等症狀，並具有緩和痛風等功能。本研究以絲狀真菌Cunninghamella echinulata為實驗菌株進行發酵培養生產  $\gamma$ -次亞麻油酸。實驗以20 L的發酵槽進行發酵培養，探討發酵過程中，菌種生質量、脂質合成和  $\gamma$ -次亞麻油酸的產量變化情形。培養基使用葡萄糖(34.0 g/L)為碳源、硫酸銨(1.0 g/L)為氮源、培養pH值利用2 N NaOH溶液的添加控制在6.5、發酵溫度25 °C、起始通氣量為0.375 v.v.m及起始攪拌速度為100 rpm。由實驗結果顯示，當培養至63 h時，氮源完全消耗，碳源則仍有30.61 g/L，生質量和脂質合成持續增加，並於培養96 h後生質量和脂質合成累積量開始大量增加，直至葡萄糖被消耗完後，生質量和脂質合成累積量才下降。在無碳源的情況下，脂質量逐漸降低，此乃微生物利用自身合成的脂質。當培養至160 h時，菌體的生質量最高達到5.47 g/L、脂質合成累積量最高達2.84 g/L，且菌株之生長和脂質合成累積量已趨近於平衡。此時，  $\gamma$ -次亞麻油酸產量達到1298.23 mg/L，脂質合成累積量和  $\gamma$ -次亞麻油酸產量分別佔生質量的51.92及23.73 % (w/w)。關鍵字：Cunninghamella echinulata、  $\gamma$ -次亞麻油酸

關鍵詞：Cunninghamella echinulata；  $\gamma$ -次亞麻油酸

## 目錄

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