利用schizochytrium屬海洋真菌生產二十二碳六烯酸

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摘 要

二十二碳六烯酸（Docosahexaenoic Acid，DHA）為n-3族系之多元不飽和脂肪酸。近幾年來，DHA在人體之功效上已受到世人之矚目，其與視網膜及腦部組織的發育有著密不可分的關係，並能降低血液中之膽固醇含量，且對於心血管疾病中血栓之形成及動脈硬化具有降低發生的效果。本研究主要以具高DHA產能之菌株Schizochytrium goldstein S-3 ATCC 26185於三升發酵槽（Mituwa KMJ-3B）中進行培養，並探討以批次培養及饋料批次培養操作量產DHA之最適條件。批次培養之發酵液組成為：15 g/L葡萄糖、5 g/L酵母萃取物及8 g/L蛋白?活C 批次培養方式利用一次只改變一個因子之方式，逐步探討影響DHA產量之物理因子如培養溫度、pH值、通氣量、攪拌翼形狀、攪拌速率及培養時間。結果發現溫度在20 ℃時可得較高DHA產量。不控制pH值之整體表現較控制發酵液pH值（5.5、6.5、7.5及8.5）佳。在攪拌翼種類（渦輪式、槳式、45°軸向渦輪式及螺旋式）方面，利用渦輪式培養可得較大生質量及DHA產量。在高攪拌速率下，會降低生質量及DHA產量，以200 rpm為最適攪拌速率，而1.5 vvm 為生產DHA之較佳通氣量。此外，培養時間以七天為最適培養時間。若將以上條件組合，可得生質量及DHA產量分別為6.8 g/L及310 mg/L，而初始培養條件之生質量及DHA產量則分別僅有6.1 g/L及150 mg/L。 在饋料批次培養方面，本研究探討二種不同梯度饋料方式，一為饋料濃度（2倍、4倍、6倍及8倍濃度），一為饋料間隔（6小時、12小時、18小時及24小時）對菌體之生長及DHA生產之影響。所有饋料首先以1升發酵液培養48小時後，再進行饋料72小時，總饋入量為1,200 mL。結果發現饋料濃度以6倍濃度有最佳生質量及DHA產量，分別為12.1 g/L及450 mg/L。饋料間隔以6小時有最佳生質量及DHA產量，分別為11.7 g/L 及438 mg/L。饋料批次培養之結果，其生質量及DHA產量分別為批次方式之1.8倍及1.5倍。

關鍵詞 : 二十二碳六烯酸 ; 真菌 ; 批式 ; 梯度饋料批式

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