

利用微生物發酵自蝦蟹殼中萃取幾丁質

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摘要

幾丁質(chitin)主要存於甲殼動物(蝦、蟹等)、節肢動物、昆蟲的外骨骼及真菌細胞壁中,傳統多用強酸強鹼萃取當中的幾丁質,易造成大量環境汙染及幾丁質性質的改變,因此期望利用微生物發酵過程產生的酸及蛋白酶萃取幾丁質來作為替代方案。本篇目的為探討最佳幾丁質製備的發酵條件及其商業應用的可行性。比較蝦蟹殼中使用 *Lactobacillus rhamnoid* 及 *Bacillus amyloliquefaciens* 進行兩步驟發酵或單獨使用 *Lactobacillus plantarum* 進行乳酸發酵,在發酵條件上對於幾丁質產率的影響,包含碳源種類及濃度、接菌量、發酵時間等,並另外探討以乳酸或醋酸搭配 *Streptomyces griseus* 產生的蛋白酶對幾丁質產率的影響。結果顯示以兩步驟發酵法在4%-5%葡萄糖濃度、4%-6%接菌量、初始pH值6.5-7.0下分別進行48小時的脫礦物質(DM)及84小時的脫蛋白質(DP)可得最佳DM%、DP%及幾丁質產率,分別為99.6%、95.3%、6.93%;單獨乳酸發酵的最佳條件為在15%蔗糖濃度、10%接菌量下發酵60小時,其DM%、DP%及幾丁質產率分別為99.6%、95.3%、6.93%;另外以乳酸或醋酸結合蛋白酶其最適反應條件為酵素基質比55 U/g、粒徑25-50 μm 在pH = 7.0下培養3小時,可得DM%、DP%為98.64%/97.57%、91.10%。綜合以上結果可得最佳蝦蟹殼發酵條件,並且以微生物發酵製成的幾丁質較能保留其天然結構,產生較少環境汙染、回收的蛋白粉亦具營養價值,因此在商業大量製備上具有可發展的機會。

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