以饋料批次是發酵行本土靈芝菌(CCRC36041)之菌體與多醣生產

林佳滿、謝建元

E-mail: 9300048@mail.dyu.edu.tw

摘 要

中文摘要 本研究主要探討不同條件下搖瓶批次發酵與饋料批次式發酵並使用其條件在5L發酵槽探討靈芝菌絲生長與多醣體產生之影響。搖瓶實驗在不同起始pH發現以pH4-6菌絲濃度沒有明顯之差異性，以pH5發酵培養7天後胞外多醣濃度最高（937.18±38.58 mg/L）；在基質方面以CSP為氮源培養所得之菌絲濃度與胞外多醣濃度較高；不同碳源則以蔗糖為碳源所得菌絲濃度最高（4.37 ±0.36 g/L），以葡萄糖之胞外多醣濃度較高（845.54±19.77mg/L），胞內多醣的差異不大（24.85 mg/g-29.95 mg/g），但以果糖最高。以HPLC-SEC分析靈芝多醣分子量分佈情形，發現靈芝胞外多醣分子量分佈在22,200-205,800Da之間，胞內多醣分子量分佈在35,300-169,200Da之間。添加鹽類、糖濃度提高與氮源濃度提高有助於菌絲體乾重與胞外多醣增加。 在搖瓶饋料批次發酵發現在第7天添加10mL 25％ CSP之胞外多醣濃度於第7天的869.69 mg/L下降至第9天755.13 mg/L，發酵第13天回到845.83 mg/L、而添加10mL 35％葡萄糖和10mL 35％葡萄糖+25％CSP則分別達到1317.84 mg/L和1339.96 mg/L。培養基中磷源濃度降低至原基質的1/5，在磷源限制下培養13天後菌體乾重與胞外多醣濃度與原培養基並無明顯差異。培養基中氮源濃度限制為原基質40％，單位菌體多醣產量由107.28 mg/g cell上升至177.86 mg/g cell。5L發酵槽批次式發酵培養時，攪拌速度從200rpm提高到350rpm，菌體濃度從11.61 g/L些微增至12.22 g/L，胞外多醣濃度則從2231.33 mg/L降至1765.88mg/L。在饋料批次中以發酵培養第三天饋入1％CSP 1L (pH4.68)，第七天饋入4％葡萄糖1L，單位菌體多醣產量由144.51 mg/g cell上升至200.78 mg/g cell，但在發酵培養第三天饋入1％CSP 2L (pH7)，單位菌體多醣產量則下降至129.28 mg/g cell。

關鍵詞 : 靈芝 ; 饋料批次 ; 胞外多醣 ; 胞內多醣

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