培養環境對蛹蟲草菌絲球形態及生物活性成份生產之相關性影響

陳佳玲、徐泰浩

E-mail: 9501061@mail.dyu.edu.tw

摘 要

本研究探討接種年齡、培養溫度、培養基起始pH值及組成、接種量，對蛹蟲草菌（Cordyceps militaris）菌體形態、菌絲體生質量及生物活性成分產出之影響。利用影像分析量化及特徵化C. militaris菌體形態，包含菌絲球平均直徑、粗糙度、圓形度及核心面積比。接種培養2周所形成C. militaris菌落之孢子，於20℃、培養基起始pH值為6.0、接種5×104 spores/mL及葡萄糖作為碳源培養下，菌絲體生質量及各生物活性成分產量最高。於起始pH 5.5~6.5培養，菌體形態以毛狀且大菌絲球為主。隨著接種量增加，菌絲球數目及粗糙度遞增，平均直徑及圓形度遞減。以葡萄糖作為碳源培養時，菌絲球數目及粗糙度最大。以麥芽萃取物及酵母萃取物作為氮源培養時，菌體形態以菌絲球為主；以蛋白?滿B硝酸銨及硫酸銨培養時，則以游離菌絲為主。當酵母萃取物作為氮源培養時，菌體內生物活性成分含量最高。培養於培養基碳氮比為2時，菌絲體生質量、醱酵液中蟲草素產量及菌絲體內多醣、腺?ㄓ恲啻饈嬪t量最高，分別為12.94 g/L, 172.60 mg/L, 58.3, 0.75, 1.48 mg/g；而高碳氮比培養基，降低菌絲球數目且不利於胞內多醣及蟲草素合成。隨著培養時間增長，菌絲球逐漸形成毛狀緊實菌絲球。於第9天，醱酵液中蟲草素產量最高（225.89 mg/L），於第7天，菌絲體內多醣、腺?ㄘM蟲草素含量最高。發現外部毛狀和內部緊實的菌絲球利於C. militari生物活性成分產出。

關鍵詞 : 蛹蟲草、多醣體、蟲草素、菌絲球、形態、影像分析

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