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Author Chia-may Shieh
Author's Email Address No Public.
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Abstract
Schizophyllum commune, which belongs to Basidiomycotina and can be used as both food and drug, is a kind of wood-decayed mushroom. The β-1-3/β-1-6 glucan is the major exopolysaccharides of S. commune, namely schizophyllan. Recently, the scientific studies have demonstrated that schizophyllan has antitumor activity. Moreover, schizophyllan can effectively enhance the ability of macrophage.
The culture of Schizophyllum commune CCJ CHU-07 isolated from Taiwan was used in this study. After the investigation of its growing conditions, the laboratory cultivation and 5L stirred type fermentator were carried out and the biological activities treated with extracts of fruit bodies and mycelium, and broth of liquid culture were analyzed.
The result of this study indicated that the optimum growth conditions of CCJ CHU-07 on agar medium are at 30℃ in pH4, and the carbon and nitrogen sources are fructose, and malt extract. Through the experiment of 5L stirred type fermentator, the result suggests that radio of the highest polysaccharides production was C:N=10:1 on various combination. In the 5L slimed type fermentor when added 0.1~0.3 % L-glutamic acid in upper optimum condition, the exopolysaccharides content largely promotes to 2.5 g/L. The molecular weight of polysaccharides detected by the gel filtration chromatograph, the fermented solution split on larger than 141KDa, while the hot water extracted of mycelia split on larger than 141KDa, 17KDa～3.5KDa and 430Da.However, hot water extracted of fruit bodies split on 9KDa, 2KDa and 970Da.
According to the results of antibiotic activity, the hot water extract (121℃，20min) from fruit bodies could inhibit the sporulation of Fusarium moniliforme. Furthermore, the inhibition of antitumor cells of fruit bodies and mycelium shows that the hot water extract (3mg/mL) is higher than 30% against fibrosarcoma cell (HT-1080), prostate cancer cell (Du145), breast cancer cell (MDA-MB-231), hepatoma cell (HepG2), cervical cancer cell (HeLa), breast cancer cell (MCF-7). Therefore, the extracts of fruit bodies and mycelium by hot water are potential in antibiotic and antitumor cells activities.
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