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Author Jiun-Guei Tseng
Author's Email Address No Public.
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Abstract
The cauliflower mushroom, Sparassis crispa, is an edible mushroom. It has been widely used in the orient society not only for their taste, texture and nutrition composition, but also for their claimed therapeutic value in thousand years. The optimal culture conditions for S. crispa, such as pH or temperature had been studied in this study.
The results showed that the optimal temperature was under 30℃ with optimal pH around 6, and the best nutrient composition was 0.5% wheat germ extraction plus 2% fructose for the growth of S. crispa. The liquid culture of S. crispa reached the maximum growth rate at day 8. After MTT assay, the liquid culture of S. crispa at day 10 showed the best inhibitory effect on the growth of tumor cells such as HeLa and MCF-7 cells by the supernant, 77 and 46%, respectively. The tumor cells such as HeLa and MCF-7 cells were also significantly inhibited by the water extract of mycelium from S. crispa, 74 and 43% respectively.
After the fermented liquid of S. crispa added on HT-1080 cell, fermented liquid had inhibitory effects on matrix metalloproteinases-2 and -9 by gelatin zymography analysis and on the expression of matrix metalloproteinase (MMP-2 and MMP-9) mRNA by RT-PCR analysis as well. Moreover, fermented liquid had the ability to inhibit tumor cell metastasis. Furthermore, flow cytometric analysis was also used to evaluate the anti-tumor mechanism. The results suggest the water extract of mycelium from S. crispa is able to induce the apoptosis in Hep G2 cell significantly.
Two-dimension electrophoresis analysis was used to distinguish the different bioactivities of S. crispa between different nutrients or different fermentation time points. The results showed that there were significantly variant proteins between high and low anti-metastasis activities or between high and low anti-tumor activities. In addition, the antioxidant activity was also conducted by DPPH assay. The results demonstrated that the liquid culture of S. crispa had better antioxidant activity than water extract of mycelium. The polysaccharide content of fermented liquid from S. crispa was studied as well. The polysaccharide contents were evaluated by using Phenol-sulfuric acid method and ELSD, and the concentration and relative molecule weight of polysaccharide were also detected during the study.

Other bioactivities, such as immuno-modulatory activity and antibiotic activity, were also evaluated in this study. The fermented liquid had the ability to enhance immune ability but did not have the antibiotic activity. These results suggest S. crispa indeed conducts some mechanics of biology activity. Hopefully, these findings are useful to further studies on bioactivity of S. crispa.
Advisory Committee Jian-Chyi Chen - advisor

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