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Abstract
Chang-Zhi, namely Antrodia camphorata, is an endemic species in Taiwan, which was used for food and medicine. This study we used mycelia obtained by solid stage and liquid fermentation for further experiments. Mycelia were extracted by ethanol and following partitions were extracted by n-Hexane, ethyl acetate (EA), and ethanol (EtOH) formation.

Ethanol extractions from Antrodia camphorata mycelia produced by solid and liquid stage fermentation were further used in the tests of antibiosis, antioxidant, and antitumor activities. The following microorganisms, such as Escherichia coli, Salmonella choleraesuis subsp. Choleraesuis, Staphylococcus aureus subsp.aureus, Pseudomonas aeruginosa, Proteus vulgaris, Pseudomonas glumae, Listeria monocttogenes, Aspergillus niger, Penicillium citrinum, and Fusarium moniliforme, were investigated for antibiotic examination by using double layers plate method. Except for Pe. citrinum, both extractions of mycelia (0.1g/mL) fermented by solid and liquid stage fermentation evidently contained antibiosis activity to inhibit the growth or sporulation of upper microorganisms.

Scavenging effect of DPPH・ (1,1-Diphenyl-2-picryl-hydrazyl) by ethanol extracts of solid stage fermentation was identically better more than that of liquid stage fermentation. Reaction after 30 minutes the scavenging effect on DPPH・ comparison with ethanol extraction of solid and liquid stage fermentation (0.4mg/mL) showed that the activity of extraction is EA layer > EtOH layer > n-Hexan layer. Meanwhile, the total antioxidant status of hot water extracts by solid stage fermentation was better than that of by liquid stage fermentation.

Both ethanol extractions (1mg/mL) indicated the ability of antitumor activity to cervical cancer cell (HeLa), breast cancer cell (MCF-7), and gastric cancer cell (AGS) was acceptable. On n-Hexane, ethyl acetate (EA), and ethanol (EtOH) formation, the inhibition antitumor cells comparison with solid and liquid stage fermentation proved that n-Hexane and EA layer was better than EtOH layer.

Mycelia hot water extracts (5mg/mL) by solid and liquid stage fermentation inhibited the HeLa and AGS tumor cell viabilities. On the ethanol precipitate (5mg/mL) obtained from solid stage fermentation in antitumor HeLa, MCF-7 AGS, and Hep G2 cells was better than that from liquid stage fermentation.

The polysaccharides of hot water extractions from A. camphorata mycelia eluted through

dialysis membrane (M.W. 3000) or precipitated in ethanol indicated that liquid stage fermentation was always higher than those by solid stage fermentation. The molecular weight of polysaccharides of solid and liquid stage fermentations eluted through gel filtration chromatograph (GPC) was over 106 Da, which was higher than that of by alcohol precipitate method.

Evidently, the functional activities of ethanol extractions and hot water extracts of A. camphorata mycelia in antibiotic, antioxidant, and antitumor were proved from both of solid and liquid stage fermentations.

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