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Abstract
Polysaccharides extracted by initially using ethanol, followed by hot water, then cold alkaline, and finally hot alkaline from both the fruit bodies and the liquid-cultured mycelium of G. frondosa have been studied. The extracted components consist of mainly the carbohydrates and proteins. The content of polysaccharides components extracted by hot water, cold alkaline, and hot alkaline from the mycelia of G. frondosa were found 94.72%, 98.23%, and 7.93%, respectively and from the fruit bodies of G. frondosa were found 62.11%, 68.5%, and 49.8%, respectively. The molecular weight of the polysaccharides was found in the range of 3-1410 kDa, and the bioactivity against mammalian cancer cell growth showed molecular weight dependent. The cell growth inhibitions for the extracts against various mammalian cancer cells at the concentration of 10 mg/mL were that: i). Extracts from the liquid-cultured mycelium of G. frondosa showed MCF-7 has best effect against Hela cells; MCF-5 and MCF-7 have best effect against AGS cells; MCF-1 has best effect against Hep G2 cells; MCF-7 has best effect against breast cancer cell of MCF-7 and ii). Extracts from the fruit bodies of G. frondosa showed FCF-1 has best effects against Hela, Hep G2, AGS cells and breast cancer of MCF-7. Overall, the best bioactivity against mammalian cancer cells is the extract of FCF-1 from the fruit bodies of G. frondosa.

For anti-oxidation properties, methanolic extracts from fruit bodies and mycelia showed excellent scavenging ability toward DPPH (1,1-diphenyl-2-picryl hydrazyl)(96% at 15mg/mL) and good potential in reducing ability at the concentration of 2.5 mg/mL and chelating effect on ferrous ion (about 82% and 77% for extracts from mycelia and fruit bodies, respectively) at the concentraction of 2.5 mg/mL. Ethanolic extracts (MCF-1) from mycelia has the best reducing ability potential at the concentration of 5mg/mL, while ethanolic extracts （FCF-1） form fruit bodies has the best reducing effect at 10mg/mL. These results show the extracts from mycelia have better reducing effect than that from the fruit bodies; while it is the extracts from the fruit bodies have better scavenging effect toward DPPH than that from mycelia. The FTIR spectrum showed that the extracted polysaccharides have the sugar functional group.
Advisory Committee Hsu Ming-Ching - advisor

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