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Anti-tumour activities of Trametes scopulosa (Berk.) Bres.
proteins against colon cancer

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Abstract

Proteins from polypore mushrooms have a great potential to exhibit cytotoxic activity against tumour cells. According to Xu et al. (2011), mushrooms produce a large number of biologically active proteins. In this study, anti-tumour activities of solvent and protein extracts of Trametes scopulosa (KUM70034) against colon cancer cell line (HCT 116) were evaluated. Pre-screening for cytotoxic activity against HCT 116 using MTT assay showed that all solvent extracts of KUM70034 (methanol, ethanol, dichloromethane and ethyl acetate) were deemed not actively cytotoxic against HCT 116 cells (with IC₅₀ > 20 µg/ml). However, all protein fractions obtained by ammonium sulphate precipitation at 30%, 60% and 90% (F30, F60 and F90) were actively cytotoxic against HCT 116 cancer cells line with F60 exhibiting the most potent cytotoxicity (IC₅₀ 1.0 µg/ml). Determination of protein content in all fractions revealed that protein yield was highest in F60 (940.77 µg/ml) as compared to F30 (181.54 µg/ml) and F90 (349.23 µg/ml). SDS-PAGE was performed to pool the protein extracts of partially purified F60. F60 was separated into a few single bands corresponding to a molecular weight ranged from 25 kDa to 65 kDa. Meanwhile, there was no band spotted for crude extracts and F30 while F90 revealed a single band ranging from 15 kDa to 10 kDa. Thus, F60 was evaluated for cytotoxicity against HCT 116 at the same protein concentration. Results showed that F60 of KUM70034 was indeed cytotoxic against HCT 116 cancer cell line with IC₅₀ 0.6 µg/ml protein. The in vitro scratch wound assay was used to measure inhibition of cellular migration activity. The HCT 116 cells treated with F60 (tested at IC₅₀ 0.6 µg/ml) did slow down the migration activity of the cells. This fraction will be separated and fractionated again using SDS-PAGE and fast protein liquid chromatography (FPLC) for identification. This study suggests that proteins from Trametes scopulosa have potential anti-tumour effect against colon cancer.

Keywords: anti-tumour mushroom, Trametes scopulosa, proteins, colon cancer cell line, cytotoxicity

Reference: