

The Flavonoid and Cytotoxicity Potential of Six Single Medicinal Herbs and its Formula against MCF-7 Breast Cancer Cells

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The burden of cancer is rising globally, this is also reflected in breast and gynecological cancers among women. Treatment resistance remains a serious concern, which can lead to therapeutic failure in cancer. Medicinal herbs have demonstrated good anti-cancer activity. Thus, in this research, an ancient traditional recipe from Sri Lanka, with six herbs was scientifically evaluated which is currently given to treat cancers that women are affected. The single herbs and its formula were analysed by various *in vitro* experiments and all extracts and the formula with all six herbs, were prepared as same as the traditional method using water. The phytochemical analysis was studied by Folin Ciocalteu's method to determine the total phenolic content (TPC) and aluminum chloride colorimetric method to determine the total flavonoid content (TFC). The antioxidant properties were studied using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) and (2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)) (ABTS) assays. The present study investigated the cytotoxicity effect of the extracts by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay using human breast cancer cells (MCF7) and Vero cells. The phytochemical analysis revealed that the highest concentration tested:1mg/ml, of *P. alatum* (single herb) showed the highest TPC value of 0.087 ± 0.001 mg/ml Gallic Acid equivalent g, in comparison the formula showed a value of 0.035 ± 0.001 mg/ml Galic Acid equivalent g for TPC. The formula extract showed the highest TFC value out of all extracts: 0.023 ± 0.0002 mg/ml Quercetin equivalent g. The DPPH assay exhibited an inhibition of $40.13\pm 1.27\%$ for the formula, while the formula reported an inhibition activity of $31.43\pm 0.082\%$ for the ABTS assay. The cytotoxicity effect of the highest concentration:1mg/ml tested showed an inhibition of $73.22\pm 4.13\%$ and $67.76\pm 1.13\%$ by the formula extract against MCF7 and Vero cells respectively. The high TFC and cytotoxicity results may suggest that the formula might be able to decrease oxidative damage in cancers. More experiments will be conducted in the future.

Keywords: Traditional formula, MCF7 breast cancer cells, Total flavonoid content, Cytotoxicity.

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