

13th International Conference on

Structural and Molecular Biology: Techniques & Market Analysis

October 22-23, 2018 | Ottawa, Canada

Apoptosis studies on HT-29 cells with chemical components of *Phaleria macrocarpa* (Scheff.) Boerl fruits

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Medicinal plants can be found worldwide. However, they are most abundant in tropical regions. The *Phaleria macrocarpa* (Scheff) Boerl plant is a medicinal plant that originates from Yogyakarta, Indonesia. The fruits of *P. macrocarpa* have bright red skin, with fruit flesh, shells, and seeds located inside the fruit. At first, 1-(2,6-Dihydroxy-4-methoxyphenyl)-2-(4-hydroxyphenyl) ethanone (DMHE) and 2, 4, 6-Trihydroxy-4-methoxybenzophenone were isolated from the ethyl acetate fraction of *Phaleria macrocarpa* (Scheff.) Boerl fruits and these structure confirmed by GC-MS and NMR analysis. These compounds were tested on the HT-29 human colon adenocarcinoma cell line using MTT cell proliferation assay. Both compounds were found to inhibit cell proliferation in HT-29 human colon carcinoma cell line but no cytotoxic effect on MRC-5 normal human fibroblast lung cell lines. Morphological features of apoptotic cells upon treatment, e.g., cell shrinkage and membrane blebbing, were examined by an inverted and phase microscope. Other features, such as chromatin condensation and nuclear fragmentation were studied using acridine orange and propidium iodide staining under the fluorescence microscope. Future evidence of apoptosis/necrosis was provided by the result from annexin V-FITC/PI (fluorescein-isothiocyanate/propidium iodide) staining revealed the percentage of early apoptotic, late apoptotic, necrotic and live cells in a dose and time dependent manner using flow cytometry. Therefore, we have shown that both compound induced apoptosis in HT-29 cells during G0/G1 arrest and the inhibition of cell growth could be a result of the induction of apoptosis, which may be resolved by cell cycle arrest, which may consequently result in programmed cell death.

Biography

Ma Ma Lay is studying Molecular Biology and Biochemistry area and so she already published six articles in BioMed Research International, International Journal of Molecular Sciences, Complementary and Alternative medicine BMC. She is interested in doing many molecular and biological techniques: chemical investigations from plants, GC_MS analysis, column chromatography technique, cytotoxicity and morphological examination on cells and molecular biological studies and microscopic examination, flow cytometry, cell cycle and western blot analysis on apoptosis studies. At the moment, she is working on Post Doctorate Fellowship Researcher in Faculty of Biotechnology and Biomolecular Sciences at University Putra Malaysia from 2017 to now. Therefore, she wants to improve knowledge of biomolecular techniques and create new drugs designs for her future research.

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