Cancer Chemoprevention Study of *Luffa Aegyptiaca* Seed Extract on Human Breast Cancer Cell Lines (MCF-7)

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ABSTRACT

Objectives/Research Problem: Breast cancer is a major health problem in Malaysia and the world. It is the commonest malignancy in women and the second leading cause of cancer deaths. There are many conventional treatments available for breast cancer patients, such as chemotherapy, radiation therapy, immune therapy, hormone therapy and many more. However, drug resistance acquired by cancer cells has led to treatment failure. Alternative treatment with minimum or no side effect is highly demanded. Therefore, the aim of this study was to determine the chemopreventive effect of *Luffa aegyptiaca* seed extract (LSE) on breast cancer through anti-proliferative effect and its mechanisms on breast cancer cell (MCF-7). It can be evaluated by result of IC_{50} determination, cell proliferation assay and flow cytometer analysis on apoptosis induction and cell cycle arrest.

Materials and Method: MCF-7 cells were seeded at a density of 4.7×10^4 cells/well. Trypan blue exclusion method was used to determine the viable cells using haemocytometer. The IC50 assay was determined against MCF-7 cell at different concentrations of LSE administration. The morphological changes of MCF-7 cells also were observed. MCF-7 cell and 3T3-L1 cell were treated with LSE at IC50 to evaluate the cell proliferation assay and cytotoxicity assay, respectively. The induction of apoptosis and alteration on cell cycle regulation will be assessed by flow cytometer.

Results and Discussion: LSE showed the growth inhibitory effect with IC_{50} value at 0.0625 mg/ml after 72 hours exposure. Morphological changes displaying apoptosis also had been observed upon treatment with LSE at IC50. Moreover, LSE showed no toxicity effect on normal cells (3T3-L1). Thus proved the potential chemopreventive agent of the extracts on MCF-7. The results for flow cytometric analysis are yet to be determined as the works are still in progress.

Conclusion: Overall, the data collected provided new insight of using the Luffa aegyptiaca seed which can be used as chemopreventive agents on MCF-7.

KEYWORDS: Cancer Chemoprevention, Breast Cancer, *Luffa aegyptiaca*, Anti-Proliferative Effect, IC_{50} Determination, Apoptosis, Cell Cycle, MCF-7

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