UNIVERSITI TEKNOLOGI MARA

CYTOTOXIC EFFECTS AND THE ACTION MECHANISM OF SINGLE AND COMBINATION TREATMENTS OF *Nigella sativa* AND *Zingiber zerumbet* ON HUMAN MYELOID LEUKEMIA (HL60) CELL LINES

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Thesis submitted in the fulfilment
of the requirements for the degree of
Master of Science

Faculty of Applied Sciences

February 2016

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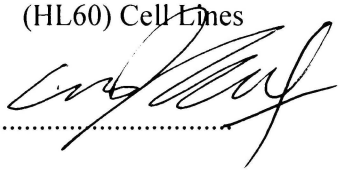
Signature of Student	:	
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ABSTRACT

Cancer is a population of cells that characterized by over growth of antagonist cells. This research focused on the human myeoid leukemia (HL60) cell lines that derived from peripheral blood of woman with acute myelocytic leukemia. The main objectives of this study were to determine the interactive effects of *Nigella sativa* and *Zingiber zerumbet* extracts on HL60 cells using the 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT) assay and to measure their mode of cell death using annexin-v flow cytometry assay. The cytotoxicity of hexane extract of *Zingiber zerumbet* rhizome towards HL60 cells was greater than the petroleum ether extract of *Nigella sativa* seed with IC_{50} values of 63.72±5.363µg/ml and 654µg/ml. However, petroleum ether extract of *Nigella sativa* seed alone showed protective effect on normal V79 viable cells with higher IC_{50} (940µg/ml) value but hexane extract of *Zingiber zerumbet* rhizome was toxic on V79 cells by lesser IC_{50} value (38µg/ml). The combination treatment of petroleum ether extract of *Nigella sativa* seed and hexane extract of *Zingiber zerumbet* rhizome on both HL60 and V79 cells resulted the antagonist effects with CI value more than 1. Moreover, the mode of cell death showed that the petroleum ether extract of *Nigella sativa* seed alone conveyed the apoptosis and the hexane extract of *Zingiber zerumbet* rhizome regulated both apoptosis and necrosis cell death. As the HL60 cells exposed to the combination treatment of both plant extracts, the apoptosis cell increased and necrosis cells were decreased in the increased of combination dose. In conclusion, the combination between *Nigella sativa* and *Zingiber zerumbet* extracts conveyed the antagonist interactive effects on HL60 cells and indicated that *Nigella sativa* and *Zingiber zerumbet* could not be combined in order to achieve a safe drug. Moreover, combination of both plant extracts increased the apoptosis and reduced the necrosis of HL60 cells.

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