

Thitima Jerajasin 2014: Cytotoxicity of Aqueous Extracts from *Clausena heptaphylla* Wright&Arn. Leaves and *Vernonia cinerea* Less. on Human Lymphocytes and TK6 Cells. Master of Science (Biology), Major Field: Biology, Department of Zoology. Thesis Advisor: Assistant Professor Kantimane Pradermwong, Ph.D. 118 pages.

The aqueous extracts of *Clausena heptaphylla* leaves (CH), *Vernonia cinerea* plant (VC) and mixture 1:1 (v/v) were commonly used as medicinal plants for relieving cigarette craving and the latter for anti-obesity. The antioxidant activities and cytotoxic effects on human lymphocytes and human lymphoblastoid TK6 cells were determined in this study. All the aqueous extracts exhibited antioxidant activity significantly ( $p < 0.05$ ) when the concentrations were increased. CH showed the strongest activity with DPPH radical scavenging assay ( $IC_{50}$  values = 431.72  $\mu\text{g/ml}$ ) while VC showed the strongest activity with superoxide radical ( $O_2^{\cdot -}$ ) scavenging assay ( $IC_{50}$  values = 70.10  $\mu\text{g/ml}$ ). Mixture 1:1 (v/v) showed lower antioxidant activity than CH and VC. The cytotoxicity induced by all extracts on human lymphocytes and TK6 cells was evaluated using MTT assay. Data obtained from MTT assay revealed that all the extracts were non toxic to human lymphocytes at 24 and 48 hrs with the  $IC_{50}$  value  $\geq 1,036.75$   $\mu\text{g/ml}$ . CH and mixture 1:1 (v/v) were non toxic to TK6 cells while VC was moderately toxic at 12, 24 and 48 hrs with the  $IC_{50}$  value  $\geq 272.59$   $\mu\text{g/ml}$ . Apoptosis was evaluated on human lymphocytes using double-staining method. The results from 48 hr after treatment at the concentration of 1,000  $\mu\text{g/ml}$  indicated that VC showed higher percentage proportion of apoptosis than those of CH and mixture 1:1 (v/v), respectively. In addition, VC induced significantly ( $p < 0.05$ ) higher apoptosis of TK6 cells than mixture 1:1 (v/v) after 24 hr treatment. The genotoxicity induced by VC and mixture 1:1 (v/v) on TK6 cells was evaluated using cytokinesis-block micronucleus (CBMN) assay. Micronucleus induced by VC was significantly ( $p < 0.05$ ) higher than that of mixture 1:1 (v/v) at 24 hr after treatment. In addition, VC and mixture 1:1 (v/v) inhibited the proliferation of TK6 cells. The results suggested that the single extract or mixture of both plants would exert different antioxidant activity and are not toxic to lymphocytes and TK6 cells while VC was moderately toxic and induced DNA damage on TK6 cells.

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Thesis Advisor's signature