UNIVERSITI TEKNOLOGI MARA

GENOTOXICITY AND CYTOTOXICITY STUDIES OF *Averrhoa bilimbi*, *Cosmos caudatus* AND *Pereskia bleo* EXTRACT

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ABSTRACT

Malaysia is rich with many medicinal plants and fruits which are well known for its traditional medicinal value. Some of these plants even contributed in healing and providing ailments towards certain diseases. Recent interest in the health-promoting properties of these Malaysian plants has been based on facts about their benefits in health. However, insufficient scientific information is available to support these facts. The overall objectives of this study were to evaluate and investigate the mutagenicity, cytotoxicity and genotoxicity of these three species of selected Malaysian plants (*Averrhoa bilimbi*, *Cosmos caudatus* and *Pereskia bleo*). These tests included the mutagenicity test performed based on OECD guidelines section #471 that was proposed by Maron and Ames (1983), *in vitro* micronucleus test subjected to OECD guidelines #487using Chinese hamster lung cell (V79) and neutral red uptake cytotoxicity assay using normal mouse fibroblast cell (NIH/3T3). In bacterial reverse mutation test, *A.bilimbi* fruit extracts, *C. caudatus* and *P. bleo* plant extracts were treated onto *Salmonella typhimurium* strains (TA98, TA100, TA1535, and TA1537). Based on the result, the number of revertant colonies of *A. bilimbi* did not exceeded the two-fold of negative control and no dose dependent relationship when tested on all four strains with and without metabolic activation on all concentrations. Meanwhile *C. caudatus* plant extracts showed weak mutagenic (0.794 mg/plate strain TA100 without metabolic activation, 7.143 mg/plate strain TA98 with and without metabolic activation) because the revertant bacteria exceeded two fold of the number of negative control. *P. bleo* leaf extracts also showed weak mutagenic on strain TA98 (with metabolic activation) at concentration of 0.089 mg/ml. In addition, *P. bleo* leaf extracts (with and without metabolic activation) reported no growth of the revertant colonies (TA98, TA100, TA1535 and TA1537) at concentrations of 7.143, 2.381 and 0.794 mg/plate, respectively. In Neutral Red cytotoxicity assay, *A. bilimbi* exhibits no cytotoxic activity against NIH/ 3T3 mouse fibroblast cell at all concentrations 0.5, 0.25, 0.125, 0.0625 and 0.03125 mg/ml, respectively. In contrast, *C.caudatus* (0.031026 mg/ml) and *P.bleo* (0.018192 mg/ml) leaves extract demonstrated cytotoxic activity when screened against NIH/3T3 cells. Based on micronuclei detection formation, *A. bilimbi* does not induced chromosomal damage on all concentration used with and without the presence of metabolic activation. Meanwhile *C. caudatus* and *P. bleo* leaves extract showed chromosomal damage when screened against V79 cells (without the presence of metabolic activation), at concentrations of 0.125, 0.25 and 0.5 mg/ml, respectively. In conclusion, the results in the present study have provided some information on the mutagenicity, chromosomal damage and cytotoxicity activities, hence further detailed investigations are crucial to examine the ingredient responsible for causing the genotoxicity and cytotoxicity of these plants.

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