UNIVERSITI TEKNOLOGI MARA

ANTIMITOTIC ACTIVITY OF *Averrhoa bilimbi* L. (BELIMBING BULUH) FRUITS EXTRACT IN *Allium cepa* ROOT CELLS

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DECLARATION BY STUDENT

"I hereby declare that this thesis is based on my original work and has not has been submitted previously or currently for any other degree at UiTM or any other institutions."

Student's signature:

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ABSTRACT

Throughout the years, the number of medically certified cancer keeps on increasing making cancer as the third leading cause of premature death in Malaysia. An antimitotic agent is a type of drug that inhibits cell growth by preventing mitosis and is used to cure cancer. In previous studies, *Averrhoa bilimbi* fruits have been proved to have many antioxidants compounds making it useful in many ways to treat disease. There are numerous studies on the phytochemical screening of *A. bilimbi* fruits. However, there is still no report concerning the antimitotic activity of *A. bilimbi* fruits. Hence, in present study, potential antimitotic activity of aqueous and methanol extract of *A. bilimbi* fruits in three different concentrations (20 mg/ml, 30 mg/ml, 40mg/ml) was measured in actively dividing *Allium cepa* root tip cells, and compared with the negative control (distilled water). The *A. cepa* roots were immersed in the aqueous and methanol extract of *A. bilimbi* fruits for 72 hours. One thousand cells per replicate were observed microscopically to calculate the percentage of mitotic index (MI). A one-way ANOVA showed that there was a significant decrease in the mitotic index (MI) of aqueous and methanol extract on the mitotic activity ($p<0.001$) of *A. cepa* roots. Between all groups, 40 mg/ml of methanol extract yields the lowest percentage of mitotic index (7.78%). The antimitotic activity of *A. bilimbi* may be due to its potential antioxidant properties particularly by the main role of phytochemicals. In conclusion, both aqueous and methanol extract shows antimitotic activity against actively dividing cells. This finding suggests that *A. bilimbi* fruits may be a new candidate for cancer treatment. Thus, further study needs to be conducted to determine the anticancer potential.

Keywords: *Averrhoa bilimbi*, Antimitotic, *Allium cepa* assay, Mitotic Index