

UNIVERSITI TEKNOLOGI MARA

**GENOTOXICITY AND
CYTOTOXICITY PROFILES OF
WINGED BEAN, GREEN SOYBEAN
AND SEA CUCUMBER PROTEIN
HYDROLYSATES**

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

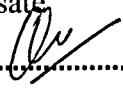
Faculty of Applied Sciences

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non- academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Winged bean (*Psophocarpus tetragonolobus*) seed protein hydrolysates, green soy bean (*Glycine max L*) seed protein hydrolysates and sea cucumber (*Stichopus horrens*) protein hydrolysate were known as a potential source for generating peptides with biological activities such as angiotensin-converting enzyme (ACE) inhibitory which act as an anti-hypertensive agent. Despite the functional properties of protein hydrolysate, there was lack of information on the safety of the hydrolysates. The safety of winged bean, green soy bean protein hydrolysates and sea cucumber (*Stichopus horrens*) protein hydrolysate has been confirmed in several *in vitro* studies including *in vitro* genotoxicity tests (Ames test and *in vitro* micronucleus test) and cytotoxicity test (neutral red uptake assay). Mutant strains of *Salmonella typhimurium* bacteria were used in Ames test to evaluate the mutagenicity effect of the protein hydrolysate samples while V79 Chinese hamster lung fibroblast cell was used to evaluate the clastogenicity effect of the hydrolysate samples. NIH/3T3 cell embryonic mouse fibroblast cell was used to determine the cytotoxic effect of the hydrolysate samples. The mutagenicity test, clastogenicity test and cytotoxicity test confirmed that winged bean, green soy bean and sea cucumber protein hydrolysates was not mutagenic, clastogenic and cytotoxic respectively. In conclusion, winged bean and green soy bean protein hydrolysate is safe in term of mutagenicity, clastogenicity and cytotoxicity. However, several tests including *in vivo* and pre-clinical study should be conducted in order to verify the safety of the protein hydrolysate samples so that the protein hydrolysate can be commercialized for human benefits.

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