UNIVERSITI TEKNOLOGI MARA

CONCENTRATION OF HEAVY METALS IN ORGANIC AND INORGANIC GREEN TEAS (*Camellia sinensis*) FROM PHYSICAL AND ONLINE STORES AND ITS POTENTIAL HEALTH RISK

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Project submitted in fulfillment of the requirements

for the degree of

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DECLARATION BY STUDENT

Project entitled "Concentration of Heavy Metals in Organic and Inorganic Green Teas (Camellia sinensis) from Physical and Online Stores and its Potential Health Risk" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Mr. Razi Ikhwan Bin Md. Rashid. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, The Most Gracious, The Most Merciful

Assalamualaikum and Alhamdulillah, all praise to Allah S.W.T The Supreme Lord of the Universe. Peace and blessing to Nabi Muhammad S.A.W., all prophets and their families. I praise Allah S.W.T. for the strength and His blessings in completing my study.

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ABSTRACT

Consumption of tea is booming because of its multiple health-promoting effects. During the growth period of the tea plant and during tea processing, tea itself can be contaminated by heavy metals, which might increase the metal body burden in humans. This study was conducted to determine the concentration of Lead, Cadmium, Copper and Zinc in the organic and inorganic green tea purchased from physical and online stores, to determine the compliance of heavy metals concentration in tea with permissible limit regulated by local and international food regulations and to identify the associations between potential health risks and consumption of tea contaminated by heavy metals. Ten commercialized brands of green teas have been purchased from online and physical stores in Puncak Alam. There are five brands of organic tea and five brands of inorganic tea which purchased equally from both stores. Three samples were taken from different tea bag for each brand of the green tea and made up thirty samples altogether in this study. All samples treated using dry ashing method and then measured by using Atomic Absorption Spectroscopy (AAS). Then, the data is analyzed by using SPSS. The total mean concentration of Pb, Cd, Cu, and Zn in all categories of green teas are 11.7110 mg/kg, 0.0000 mg/kg, 1.9717 mg/kg and 18.1950 mg/kg respectively. The mean difference for all heavy metals are statistically no significant difference with p-value > 0.5. As for the Health Risk Assessment, all values are below 0.1, which indicates that there is no significant risk to human health expected to occur when consuming the green tea product.

Keywords: *Green tea, Heavy metals, Organic and inorganic, Physical and online stores, Health risk assessment*