DETERMINATION OF HEAVY METALS CONTENT IN PLANTED *PUCUK PAKU* AND *PUCUK UBI* COLLECTED AT VARIOUS DISTANCES FROM POLLUTION SOURCE

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ABSTRACT

DETERMINATION OF HEAVY METALS CONTENT IN PLANTED *PUCUK PAKU* AND *PUCUK UBI* COLLECTED AT VARIOUS DISTANCES FROM POLLUTION SOURCE

The concentrations of heavy metals such as Zn, Fe, Cd and Cu were studied using atomic absorption spectrometer (AAS) on planted vegetable samples which were *pucuk paku* and *pucuk ubi*. Wet digestion method was used to extract the heavy metals in vegetables. Twelve samples were obtained at various distances which were 1 km, 2 km and 3 km from pollution source. At each distance, two samples of *pucuk paku* (*pucuk paku* at point 1 and *pucuk paku* at point 2) and two samples of *pucuk ubi* (*pucuk ubi* at point 1 and *pucuk ubi* at point 2) were collected. These points 1 and 2 refer to the different directions within the same distance. Samples were then analysed and compared with permissible limit from WHO. It was found that, only two samples were below the permissible limit which were *pucuk paku* point 1 at 3 km distance (for Zn which was 11.75 mg/kg and for Fe which was 3.250 mg/kg). The rest of the samples for all elements exceeded the safe limit provided by World Health Organization (WHO). In this study, the concentrations of Zn, Fe and Cd were shown to decrease with increase in distance. But, Cu was vice versa whereby increase in distance causes the concentration of Cu in vegetables to increase.

CHAPTER 1

INTRODUCTION

1.1 Background and problem statement

The air pollution contributed by industrial factories bring many negative effects on human and environment. In Malaysia, the pollutants come from different type of factories such as stainless steel, petroleum industry and thermal power station. Heavy metals or toxic metals are the poisoning elements that are easily absorbed by plant and can cause harm to human in high doses (Durulbe *et al.*, 2007). People consume vegetables and fruits to maintain their health. But, what if those foods are poisonous? In order to promote food safety and information, it is crucial to monitor the concentration of heavy metals in vegetables.

In this project, the content of toxic metals such as Cu, Cd, Fe and Zn in vegetables planted at various distances from the pollution source were measured. In short, the manipulated variable in this project was the distance of planted vegetable from pollution source while the responding variable was the amount of toxic metal in vegetable. For this project, the pollutants come from one of the factories in Terengganu. The initial response or assumption in this