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ARTICLE

Heavy metals concentration in undisturbed peat soil at Pekan District, Pahang, West Malaysia

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ABSTRACT

Soil is a mixture of various materials such as air, water, and organic matter. Soft soil (peat) has very deprived physical properties such as low shear strength, high moisture content, high compressibility, and permeability. In an engineering perspective it is considered as a weak soil, while in the agricultural context it is considered as a rich soil because of high amount of carbon. Heavy metals such as arsenic, chromium, cadmium, and lead are considered highly toxic, and it may produce mutagenic, carcinogenic, and genotoxic effects. This study examined the heavy metals concentration of peat soil. There were nine peat samples collected from three different sites which are Kampung Bahru (KB), Kampung Lancang I (KL I), and Kampung Lancang II (KL II), Pekan district, Pahang State, Malaysia. This research indicated that the average organic content were 97.8 % for KB, 95.88 % for KL I, and 98.48 % for KL II approximately for peat soil. It concluded that the concentration of As, Cu, Ni, Pb, and Zn exceeded the standard guidelines, and Mg concentration was observed below the recommended guidelines. It is essential to extract these metals and further assess their toxicological impact on the environment and human health.

1. Introduction

Soil is the combination of various complex, heterogeneous, accumulated different heavy metals due to its tendency to connect and attach several metals (Palansooriya et al., 2020). These elements persist in the soil in different shapes, surrounded by various forces (Umeh et al., 2020). There are multiple types of heavy metals found everywhere in the environment, such as soil, water, sediments, and plants (Appiah et al., 2019; Bhuyar, 2017).

However, soils having various chemical properties due to different formation conditions (Umeh et al., 2020). The toxic heavy

metals concentration in agricultural soil is high because using other pesticides as fertilizers reduces food value and crop production, impacting the food chain, human health, and environmental quality (Wuana et al., 2014; Bhuyar et al., 2021).

As a nutrient, mostly the metals are essential in a low quantity, it acts as a cofactor and is involved in enzymatic and metabolic activities. Nevertheless, in all living organisms, including humans, animals, plants, and microorganisms, the large quantities of these metals can become strongly inhibiting. Few

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