



ASSESSMENT OF HEAVY METALS IN AGRICULTURAL SOILS IN SELECTED LOCAL GOVERNMENT AREAS OF KWARA STATE

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ABSTRACT

Assessment of agricultural soils for heavy metal contents is of great concern due to potential health implications and safety issues involved in the uptake of the metals by crops on agricultural soils. This study is aimed at assessing the concentration of heavy metals in agricultural soils of some selected farms in Kwara state. Soil samples were collected from four location (Idofian, Oro, Omu-Aran and Ogbondoroko) and analysed for pH, textural classification and some heavy metals metal contents (Cd, Cr, Pb, Zn, Co, Cu, and Mn) using standard pH meter, hydrometer method and atomic absorption spectrometer (AAS) method respectively. The results of the analysis showed that the pH of the soil ranges from slightly acidic to slightly alkaline (5.40 to 7.50). The textural classification of the soils showed that aside of Oro which can be classified as sandy loam other locations have loamy soil. The mean concentrations of the heavy metals ranged from (0 to 7.67 mg/kg) for Cd, Cr, Pb, Zn, Co, Cu, and Mn. The obtained values for respective metal are below the established limit of FAO and WHO. This implies that the heavy metals considered are not of grave concern at present. The correlation analysis showed a strong correlation between the heavy metals and soil pH.

Keywords: Agricultural Soils, Heavy Metals, Kwara State, Pearson's correlation analysis

INTRODUCTION

Soil is an important component of the ecosystem that supports the growth of plants. This vital resource is a subject to short term fluctuations, such as variation in moisture content and pH, and it as well undergoes gradual alterations in response to changes in management and environmental factors (Abubakar et al, 2002). Aside the agricultural function; it is also an important reservoir receiving a significant amount of pollutants from different sources. It does not only serve as sink for the chemical pollutants but also acts as a natural buffer by controlling the transport of chemical elements and substances in the environment (Kabata-Pendias et al., 2011). The chemical reaction between chemical pollutant and soils are usually irreversible leading to undesirable changes in our environment and leaving the soil contaminated (Odoi et al., 2011). Once the soil is contaminated it poses health risk to soils, most biomaterials cultivated on it and to man who ultimately consumed them (Stavrianou, 2007). Soil gets expose to these metals through a number of way which include natural sources, fossil fuel combustion, phosphate fertilizers, wastewater and municipal solid waste incineration (Michael, 2010).

Recently, different groups have produced reports addressing the state of the soils and recommendations have been made for soil protection policy (Qishlaqi and Moore, 2007). Van-Camp et al. (2004) for instance identified the need to measure soil heavy metal concentrations and contamination processes. The excessive use of agrochemicals in agriculture in order to boost production is also noted for the introduction of heavy metals as well as other pollutants into the soil (Facchinelli et al., 2001). The analysis of heavy metal concentrations in agricultural soils is therefore, critical for policy making orientated toward reducing heavy metal inputs to soil and guaranteeing the maintenance or even the improvement of soil quality (Mico et al., 2006). Thus, this study is aimed at assessing the heavy metal content of agricultural soil in Kwara state.

MATERIALS AND METHODS

Description of the Study Area

This study was carried out in some Local Government Areas of Kwara state. Soil samples were collected from four (4) sites. The sites are Idofian in Ifelodun Local Government (Lat 8°23'24"N; Long 4°39'53"E), Ogbondoroko in Asa Local Government (Lat 8°23'45"N; Long 4°35'13"E), Oro (Lat 8°13'52"N; Long 4°54'3"E) and Omu Aran (Lat

