ASSESSMENT OF LEAD IN LUANDA SOIL FROM ANGOLA, AFRICA

Devonte Thomas, Maria Gomes, Clement Yedjou and Paul Tchounwou

Environmental Toxicology Research Laboratory, College of Science, Engineering and Technology, Jackson State University, 1400 Lynch Street, P.O. Box 18540, Jackson, Mississippi, USA

Abstract: Lead is a naturally occurring bluish-gray metal present in small amounts in the earth’s crust. It can be found in all parts of our environment. Although lead occurs naturally in the environment, most of the high levels of lead found come from human activities such as burning fossil fuels, mining, and manufacturing. Lead has many different applications and it is currently used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Acute exposure to lead induces brain damage, kidney damage, and gastrointestinal diseases, while chronic exposure may cause adverse effects on the blood, central nervous system, blood pressure, kidneys, and vitamin D metabolism. Therefore, the aim of the present investigation was to monitor and assess the level of lead in eleven sites of Luanda soil from Angola. To achieve the goal, the Niton handheld XRF analyzer was used to measure the levels of lead in soil samples collected from Luanda. The levels of lead detected were compared to Environmental Protection Agency (EPA) standards and regulatory guidelines. We found that the concentrations of lead vary significantly from one site to another. Interestingly, the amount of the lead detected fell below the EPA standards and regulatory guidelines. Based on the EPA standards and regulatory guidelines, we conclude that Luanda soil sites tested during the course of the present study are safe for children activities or exercises.

Key words: Lead, EPA standard, XRF analyzer, Angola Soil

Acknowledgements: This research was financially supported by a grant from the National Institutes of Health (Grant No. 2G12RR013459-11), through the RCMI-Center for Environmental Health at Jackson State University.