Global Scientific JOURNALS

GSJ: Volume 8, Issue 4, April 2020, Online: ISSN 2320-9186
www.globalscientificjournal.com

Study of the concentration of Lead (Pb) deposits on common and edible fruits sold in major motor parks in Port-Harcourt, Rivers-State. Ngeria.

Enyidah, L and Okah, R.

Department of Science and Laboratory Technology

School of Science and Technology

Captain Elechi Amadi Polytechnic, Rumuola, Port-Harcourt, Rivers-State. Nigeria.

Corresponding Author: ogweru12345@gmail.com

ABSTRACT

The concentration of lead in water extract of washed common and edible fruits such as apples, cucumbers, mangoes, avocado pears, oranges, garden eggs etc sold in different motor parks located along major roads in port harcourt such as rumuokoro, mile 1, mile 3, oil-mill and town motor parks were evaluated using Atomic Absoprtion Spectrophotometer (AAS). The results showed that lead concentration from the major motor parks which are rumuokoro, mile 1, oil-mill, mile 3 and town were below detectable limits (BDL) which is less than 0.001ppm respectively, the results further indicates that lead deposits on exposed fruits in rumuokoro, mile 1, mile 3,oil-mill and town motor parks in Port Harcourt is insignificant and may not pose any health hazard or any form of lead poisoning, however, proper hygiene should be maintained before the fruits are consumed.

Keywords: Lead, edible fruits, motor parks, Absorption Atomic spectrophotometer, etc.

INTRODUCTION

Fruit is the sweet and freshly product of a tree and other plants that contains seed, edible fruits, in particular, are of great importance in our diet because of the presence of vitamins and mineral salts. They contain water, calcium, iron, sulphur and potash (Shilu,

2000). Fruits constitute an important part of human diet since they contain carbohydrates, proteins, vitamins, minerals and fibers required for human health (Aboudonia, 2015). They also act as neutralizing agents for acidic substance formed during digestion (Rizf, 2001). Fruit are very important class of food and usually for maintenance of health and as preventive treatment of various diseases (Grant, 1989). Lead (Pb) is naturally-occurring ubiquitous element that can be harmful to humans when ingested or inhaled, particularly to children under the age of six (Goldstein, 1992). At high levels of human exposure, there is damage to almost all organs and organ systems, most importantly the central nervous system. Kidneys and blood, culminating in death of excessive levels. At low levels, homorne synthesis and other biochemical processes are affected, psychological and neurobehavioral functions are impaired and there is a range of other effects (WHO; 1995).

Much research over the last 30 years has demonstrated adverse health effects of moderately elevated blood levels, i.e below 25µg/dl. The permissible exposure level in the ambient (Air, water, soil, etc) environment, as well as in the working environment, has therefore been progressively lowered (Ibim, 2017). Although the problem of overt lead poisoning have largely receded in developed countries, chronic exposure to low levels of lead is still a significant public health issue, particularly among some minorities and disadvantaged groups. Furthermore, both occupational and environmental exposures have remained a serious problem in many developing and industrializing countries. Following the advent of motor vehicle at the beginning of the 20th century, there was a substantial increase in environmental lead contamination because of the use of lead in petrol (gasoline). Leaded gasoline contains tetraelthyl lead and to some extent tetramelthyl lead which are used as anti-knock additive to gasoline. Therefore, leaded gasoline is identified as a source of lead pollution with adverse health effects in humans (Dan, 2005). Lead exposure in gasoline station occurs from lead fumes generated during filling cars, from cars emissions and from contaminated hands, food, water and clothing.

MATERIALS AND METHOD

Water Sample, Fruits (cucumbers, garden eggs, oranges, apples etc)

Methods

Exposed edible fruits sold along the various market roads, each were obtained. The fruits were washed with distilled water separately according to their location. The five separate extracts (water after washing) from the five locations were taken to the laboratory and tested for heavy metal (Lead) using Atomic Absorption Spectrophotometer.

Results

Motor Parks	Sample	Conc. Of Lead/Unit
Mile 3 Motor Park	Water extracts from exposed fruits	<0.001 ppm BDL
Oil Mill Motor Park	Water extracts from exposed fruits	<0.001 ppm BDL
Rumuokoro Motor Park	Water extracts from exposed fruits	<0.001 ppm BDL
Mile 1 Motor Park	Water extracts from exposed fruits	<0.001 ppm BDL
Town Motor Park	Water extracts from exposed fruits	<0.001 ppm BDL

Discussion

the concentration of lead in water extract from exposed fruits as shown on the table above from Mile 3, Oil Mill, Rumuokoro , Mile 1 and Town motor parks showed that the level of lead is insignificant and is at below detectable limits (BDL).All results showed that concentration of lead in various samples were below the limit level of 0.001 ppm. According to World Health Organisation (WHO) standard, the limit of lead concentration in the atmosphere or the annual average lead level in air should not exceed 0.5µg/m^3. The proposal is based on the assumption that the upper limit of non-anthropogenic lead in the blood is 30µg.

Conclusion

The result showed that the concentration of lead is insignificant in all the different locations. This maybe probably as a result of the decline in the use of leaded gasoline in Port Harcourt environment due to the clamping down on local refineries in the Niger Delta region. The consumption of exposed edible fruits sold along major motor parks may not cause lead poisoning. However, other toxic heavy metals, dust and diseases that are airborne maybe

deposited on such foods. Hence, it is very hygienically wise to wash such fruits before consumption.

Recommendation

Proper research work should be carried out on exposed edible fruits to check for the presence of other toxic heavy metals and also recommend that the ministry of health should carry out campaign to alert the public on the consequences of consuming exposed edible fruits sold along major high ways without proper hygiene.

REFERENCES

Aboudonia M.A (2015) Risk Assessment of Lead in Egyptian Vegetable and fruits different environment, International Journal of Nutrition and Food Engineering. Vol. 9, No. 3, Publication 10003150.

Dan Y.G (2005). An investigation of the treatment of particulate matter from gasoline engine exhaust using non-thermal plasma: Journal of hazardous material, pp. 127, 149.

Goldstein G.W, (1992). Neurological concepts of lead poisoning in Children Pediatric Annals, 21(6): 384-388.

Grant, L.D (1989) Effects of low-levels exposure on paediatric neurobehavioral development. Current findings and future directions. In smith, MA Grant, Sois Al, eds. Lead exposure and child development: An International Assessment, Lancaster, England, MTP press: pp 49-118

Ibim, J (2017). Determination of heavy metals iron, zinc and lead in three selected boreholes in Port Harcourt Polytechnic. C.E.A Poly Printing, Rmuola

Rizf.S.F (2001). Decreased lead concentration in Cairo atmosphere due to use unleaded gasoline. C|EJOM, vol.7, No 1., pp53-59

Shilu, T.(2000). Environmental lead exposure: A public health problem of global dimensions. Bulletin of the World Health Organization. Vol.78(90pp 1068-1077)

Unites States Environmental Protection Agency, (1986). Air quality criteria for lead. Research triangle Park, NC, Environmental criteria and Assessment office (EPA/600/8-83/028af)

World Health Organization (1995). Inorganic lead: Environmental Health criteria, Geneva, No 165.