

Assessment of Cobalt Concentrations in Wastewater and Vegetable Samples Grown along Kubanni Stream Channels in Zaria, Kaduna State, Nigeria

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Abstract : The level of cobalt was determined in wastewater and vegetable (carrot, lettuce, onion, spinach, cabbage, tomato and okro) samples collected on seasonal basis from December, 2012 to September 2014 along Kubanni stream channels in Zaria. The results showed cobalt concentrations in wastewater were in the range of 3.77 - 15.20 mg/L for the year 2013 and 4.74 - 15.20 mg/L in 2014 while the vegetable had concentrations in the range of 1.25 - 8.75 mg/Kg for the year 2013 and 2.76 - 12.45 mg/Kg in 2014. Statistical analysis revealed a significant difference in cobalt levels across the locations for wastewater and vegetables whereas seasons (harmattan, dry and rainy) showed no significant difference in wastewater and vegetables analyzed. Pearson correlation revealed substantial ($r = 0.726$) relationship between cobalt levels in wastewater for the year 2013 and 2014 likewise, substantial ($r = 0.750$) relationship was also obtained for vegetables cultivated in 2013 and 2014 respectively. Cobalt concentrations obtained in this study was higher than Maximum Contaminant Levels set by Standard Organization such as W.H.O. and F.A.O. for wastewater; however, vegetables indicated no contamination with cobalt metal.

Keywords : cobalt, concentration, wastewater, vegetable

Conference Title : ICFQSA 2015 : International Conference on Food Quality, Safety and Analysis

Conference Location : Dubai, United Arab Emirates

Conference Dates : September 13-15, 2015