

HEAVY METALS (Cr, Cu, Pb, and Zn) CONCENTRATIONS OF
ROAD-DEPOSITED SEDIMENTS WITHIN SIX PUBLIC PLAZAS IN ILOILO CITY

by

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ABSTRACT

HEAVY METALS (Cr, Cu, Pb, and Zn) CONCENTRATIONS OF ROAD-DEPOSITED SEDIMENTS WITHIN SIX PUBLIC PLAZAS IN ILOILO CITY

Contamination from overland transportation is an unavoidable result of urbanization. Cr, Cu, Pb, and Zn are common heavy metals introduced to the environment by transportation. Road-deposited sediment (RDS) samples were collected from six public plazas (Villa Plaza, Molo Plaza, Mandurriao Plaza, Plaza Libertad, Lapaz Plaza and Jaro Plaza) in Iloilo City from March 2010 to May 2010. 0.5M HCl was used as extractant and heavy metals (Cr, Cu, Pb, and Zn) concentrations were determined using Flame Atomic Absorption Spectrophotometer (FAAS). The mean concentrations of Cr, Cu, Pb, and Zn in road-deposited sediments from six plazas were 8.79 ± 1.93 , 40.90 ± 24.21 , 60.74 ± 22.32 , and 164.25 ± 25.0 mg/kg, respectively. Metal enrichment of Cr, Cu, Pb and Zn were approximately x1, x8, x7 and x18 more than the background values respectively. There was no significant temporal variation in metals concentrations of RDS between sampling collections. Generally, RDS from Plaza Libertad has the highest metal concentrations. Cu and Pb metals were highly correlated ($R^2 = 0.891$) indicating possible similar sources. A good correlation ($R^2 = 0.918$) was observed between Pb concentration and the number of vehicles that pass along the plaza per hour. Heavy metal concentrations in sediments from plazas have low hazard quotients but bioaccumulation of metals in the body could cause health effects. Efficiency of digestion procedures varied depending on characteristics, texture and composition of road-deposited sediments. 0.5M HCl digestion was used because it is simple, cost-effective, time-efficient and it leaches out meaningful amounts of bioavailable metals. Using HCl as extractant simulates human digestion since human stomach contains HCl that could leach out metals if road-deposited sediments were ingested.