

Geochemical signatures of metals in intertidal invertebrates of Salinas de San Pedro, CA, USA

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We determined the concentrations of metals in bivalves and snails in the intertidal mud flat sediments of the Salinas de San Pedro, CA. The objective of this study is to create baseline concentrations of several metals in the tissues, foot, shell, and digestive parts of bivalves and snails in intertidal species. We chose bivalves since they are widely used as bio-indicators of heavy metals pollution because they are known time integrated indication of environmental pollution. The general distribution of metals as mean values (mg/g) for 77 samples were Ca (113.67) > S (2.20) > Fe (1.32) > Zn (0.82) > Mn (0.80), Sr (0.49) > Al (0.19) > Cu (0.14) > V (0.024) > Pb (0.02) > P (0.01) > Ni (0.009) > Cr (0.006) > As (0.002) > Ti (0.001) > Se (0.001) > Cd (0.001) > Ag (0.002). In general, values for the metals tested indicate that the concentrations of metals in some invertebrate samples found in Salinas de San Pedro were generally higher than those usually reported from same industrialized and urbanized marshes including Al, Cr, Cu, Fe, Mn, Ni, P, Pb, and Zn. All samples (n=77) showed a range of highest (max) values (mg/g) to lowest (min) values (mg/g) for Ag (0.01- ND), Al (2.33- ND), (0.08-ND), Ca (360 – 2.62), Cd (0.01-ND), Cr (0.15-ND), Cu (2.01-ND), Fe (15.50-0.01), Mn (6.30-ND), Ni (0.12-ND), P (1.023-ND), Pb (0.17-ND), S (5.81-0.01), Se (0.025-ND), Sr (1.90-0.01), Ti (0.03-ND), V (0.12-ND), and Zn (7.74-0.006). Moreover, species in sandy sediments showed lower trace metal values than those found on finer (silt and clay) sediments. Factors may affect on bioavailability of metals in the salt marsh species include pH, redox potential, salinity, particle size, and organic matter content. For organisms that ingest algae either from deposited sediments or from suspended particulate matter as a food source, these anthropogenic metals may cause severe adverse effects potentially leading to bioaccumulation by the organism and transfer via the food-chain to higher trophic levels.