

COMPARISON OF HEAVY METAL CONCENTRATIONS IN TERRESTRIAL PLANTS IN VIEQUES, PUERTO RICO.

According to recent studies (Mattina et al., 2003), plants have been found to be reliable biological indicators for detecting toxins and heavy metals in their immediate and surrounding environments. Upon root contact, both terrestrial and aquatic plants can take up and bio-accumulate heavy metals.

The plants used in this study are from the south east of the main island of Puerto Rico on the island of Vieques. This area was once a training range that encompassed about half the area of the island and was used for artillery missile training from 1941 until 2003. This area has since been converted to a National Wildlife Refuge. We collected plant samples from four sites located on public beaches in Vieques National Wildlife Refuge. On these beaches we collected the leaves, roots and shoots of two species of coastal dune dwelling plants: *Scaevola taccada*, and *Scaevola plumieri*. Using an X-Ray Fluorescent spectrometer and an Inductively Coupled Plasma Optical Emission Spectrometer, we tested for the presence and quantity of heavy metal in dried tissue samples. We compared metal uptake in each of the plant species and also considered the effect of pH on the uptake of heavy metals. We have found non-naturally occurring heavy metals in leaf tissue at levels higher than considered permissible. These include the metals Al, As, Cd, Pb, and Ti. Based on this data we also have found that in areas with higher amounts of metals present, the acidity of the soil increased. Using these plants as primary indicators, we generated information regarding health, toxicity and contamination of the ecosystem, allowing us to provide remediation recommendations and assess the impacts these metal levels may have on other flora and fauna present.