Scientists clash over Vieques residents' health - Radiocápsula Ciencia Puerto Rico [1]

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Calificación:

SUMMARY OF FINDINGS Casa Pueblo has presented a series of studies pertaining to the flora and fauna of Vieques, that clearly demonstrates sequestration of high levels of toxic elements in plant and animal tissue samples. Consecuently, the ecological food web of the Vieques Island has been adversely impacted. Environmental consequences of military activities on the island are no longer restricted to the LIA, but has regional consequences. We have conducted in Vieques, specifically in the inner range, a study on: Biomagnification of heavy metals in crab tissue (1999), and Heavy metal composition on dominant terrestrial and aquatic vegetation at the AFWTF live impact area (2000). Additional studies were conducted in the civilian zone: Toxic metals in typical vegetation and edible crops of the Civil Zone of Vieques (2001), Elemental analysis of herbivorous hair samples (2001), and Heavy metal profile in fruit samples from Mount Carmelo, Vieques (2002). In summary, at the AFWTF we found: Significant differences in the quantities of Cu, Zn, Ni, Co, and Cd in crabs collected from the firing zone range when compared to those studied in control populations. There is up to 80 times more cadmium than in normal crabs from the shores of the US as determined by the National Marine Fisheries Service. Cadmium level in the body of the crabs from the bombing zone (8.5 µg/g) surpasses the Level of Concern (6 µg/g) according to the US Food and Drug Administration. Cadmium concentrations are greater than the maximum dosage considered safe by the World Health Organization [1989]. The level of cadmium in the crab tissue was almost 10 times higher than the concentration reported for sediments at the site. These findings evidenced biomagnification of heavy metals. Biomagnification is the process by which organisms accumulate environmental substances. We learn that at least five species of birds in Vieques feed on these crabs. The concentrations of heavy metals such as lead, cobalt and manganese accumulated in the vegetation of Vieques are significantly greater than those detected in the control populations at Guánica (Dry Forest) and Mayagüez. In the case of Panicum maximum studied at the Alzamora Farm (Mayagüez Campus), the concentration of lead was below detection levels. However, the content of lead in this same

pasture grass obtained from Vieques was as high as 13 µg/g, which is above safety guidelines [CEU, 1999; USFDA, 1998]. For the past 10 years the US Navy has maintained an agreement with local farmers to allow commercial cattle practices in Camp García (Adjacent to the AFWTF). Lead levels in the Syringodium filiforme from Carrucho Beach demonstrate the dispersion of pollutants throughout the marine food chain. This marine plant, commonly known as Manatee Grass is consumed by endangered marine mammals. Lead levels up to 33 µg/g were detected in the fruit of Ipomoea violacea. Both local and migratory birds feed on this fruit. Fire, decomposition of dead vegetable tissue, aerial dispersion and consumption by herbivores are all on-going transport pathways out of the US Navy firing range. At the Civilian Zone we found: Accumulation of toxic metals such as lead and cadmium in plant tissue samples. Levels of these metals are above critical values in vegetation for human or animal consumption as suggested by the Council of the European Union or the FDA. Excessive levels of lead (Pb) and cadmium (Cd) in plant species of agricultural production such as squash, chili pepper, pigeon peas, pineapple and yucca; only the plants of guamá and mango trees demonstrated acceptable levels for these toxics. The most affected species were those with shallow root systems, such as chili peppers, pigeon peas, pasture grass and squash, while the trees of guamá and mango were less contaminated. This is consistent with the thesis that heavy metals are deposited in the civilian area through air dispersion by windblown dust from the bombing zone. In pigeon peas and squash foliar samples, the levels of lead and cadmium are up to 10 times higher in Vieques as suppose to population samples from elsewhere Puerto Rico. Other metals that were discovered in excessive amounts were nickel (Ni), cobalt (Co), magnesium (Mn) and copper (Cu). The ATSDR has acknowledge that maximum concentrations of copper, lead and zinc detected in Vieques were outside the ranges found throughout the United States. Furthermore, the soil of Vieques has higher concentrations of antimony, arsenic, cadmium, manganese, molybdenum, silver, and strotium than sediment samples collected throughout the mainland of Puerto Rico. For example, the average soil concentration of cadmium is ten times (10X) higher than those reported for mainland Puerto Rico or the United States. The ATSDR [2001] recognized that this measured differences are statistically significant. The Food and Drug Administration has conducted studies of lead and cadmium in plants from the United States [USFDA, 2000]. Out of 286 analyses of squash conducted by the FDA, it found an average lead concentration of 0.007 µg/g, or 6,000 times lower than concentrations found in squash leaves from Vieques. Exposure to lead can severely damage the brain and kidneys and can cause miscarriages in pregnant women [US Department of Health and Human Services, 1992]. Levels of heavy metals in plant tissue increase with time. Heavy metal concentration in edible pigeon peas was slightly higher than those concentrations detected in the leaves. Only lead was below the level detected in other parts of the plant. Based on ATSDR methodology, our studies found that only five (5) pigeon peas will provide enough cadmium to surpass the oral health guideline for children. Harmful health effects could result from these exposure doses. Cadmium in human beings causes hypertension, liver damage and is carcinogenic. Cadmium is a non-essential element with a half-life in the human body between 10 to 30 years. Levels of lead were 24 to 50 times higher in goat hair samples pastured in Vieques than those from mainland Puerto Rico. Furthermore, cadmium was 5 to 7 times higher, aluminum 5 times higher, while cobalt was 6 times higher than goats from elsewhere. Goats graze almost exclusively on "guinea" grass (Panicum maximum), which is not the most bioaccumulator in Vieques. These levels demonstrate chronic exposure. Chronic toxicity is also called "cumulative poisoning" or "distal toxicity". Adverse biological effects could resulted by the long and continuous exposure. Since sample analyses were conducted in a certified laboratory in Illinois, these findings confirm in an independent form our observations of higher metal

concentrations in plants from Vieques.

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