"Coco Loco": The Impact of Soil Contaminants in Coconut Water in the Florida Keys (Virginia Key and Key Biscayne,FL)

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The purpose of my project was to determine if it is possible to detect heavy metals in coconut water, when the coconut plant grows on contaminated soil. Since coconut plants take a long time to develop and bear fruits (6-8 years), over time, pollutants could accumulate in the plant tissues and fruit. The presumption is that the palm tree absorbs contaminants from surrounding soil and may show when tested. Coconuts were collected in Key Biscayne/Virginia Key area, Florida. Some of those locations have already been identified as polluted; nevertheless they are open to recreational, commercial and urban activities. The samples were analyzed using “Osumex” heavy metals testing kits. The test results were tabulated for comparison, all samples had a minimum pH of 6.2 for accuracy. As control samples, I used imported coconut water (from Thailand) tested and approved for human consumption by the FDA. The collected data showed traces of Manganese (Mn)/Nickel (Ni), Mercury (Hg), Cadmium (Cd)/Cobalt (Co) Lead (Pb) and Zinc (Zn) in the coconuts from the Virginia Key area around MAST Academy, Virginia Key Park and the Virginia Key Central District Waste Water Treatment Plant. Crandon Marina sampling area showed less traces of heavy metals and Key Biscayne sampling area showed copper. I found heavy metals present in the coconut water of Virginia Key /Key Biscayne areas. The applications of my research could be the development of a low cost method of long-term monitoring of soil pollution and bioremediation, the possible use of plants to restore contaminated areas.

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