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Abstract

Bioaccumulation of Heavy Metals in Exposed Mine Tailings of the Creosote Bush

The focus of this study is examining the potential bioaccumulation of anthropogenically exposed heavy metals and toxicants of mine tailings. The plant, *Larrea Tridentata* (DC.) Coville, more commonly known as creosote bush, is found along Eagle Wash in Nelson, NV and throughout the American southwest. The creosote bush has been demonstrated to uptake elements like, arsenic (As), barium (Ba), chromium (Cr), mercury (Hg) and selenium (Se). Mine tailings represent waste products, commonly rocks and uneconomical ore byproducts, that are deposited on the surface of the Earth exposing them to increased weathering and transport by meteoric water. Once mobilized, the elements then move by way of water in the subsurface and are subsequently taken up by the root systems of the creosote bush. These elements become distributed throughout the plant's biological components. Once the heavy metals make their way into the biomass of the creosote bush, they can be consumed by various desert wildlife species. This increases the potential for bioaccumulation in higher trophic levels species. Furthermore, there is a paucity of data for heavy metal mobilization in arid environments that may be further utilized by Mars exploration of past fluvial environments. By examining the uptake of heavy metals from the biological parts of the creosote bush from ground water movement, it may be possible to demonstrate where water once flowed on Mars by tracing mineral, or more specifically, heavy metal distribution in detritus. Further studies on the bioaccumulation of heavy metals in the arid Nevada environment plays an important role in understanding potential effects of toxicants on wildlife and analogous heavy metal transport on Mars.