

The potential of hyperaccumulator plants growing on Bavanat Ni-lateritic soils, NE Fars province, Iran

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Ni-bearing soils occur discontinuously between the Sedimentary Zagros Orogenic (SZO) and Metamorphic Sanandaj-Sirjan (MSS) belts in Fars province, Iran. These are the only known Ni-bearing regolith in southwest Iran that were derived from serpentinized harzburgite in ultramafic rock complexes. Plants were collected, identified, and analyzed for serpentine-associated metals including Ni, Cr, Cu, Mn, and Fe. The maximum Ni concentration of the studied soils is 1787 $\mu\text{g g}^{-1}$. Many soil characteristics in the study area were investigated, such as Mg/Ca ratio, exchangeable metal fraction, extraction efficiency (EF), pH, organic content (OM), texture, cation exchange capacity (CEC), and metal transfer to plants. Vegetation types of the area mainly include open shrublands and semi-desert steppes. The highest concentrations of Cr and Cu measured in *Convolvulus leiocalycinus* and *Astracantha echidna* leaves were up to 370 $\mu\text{g g}^{-1}$. Investigating the indices for different elements demonstrated that these species had a bioconcentration factor (BCF) value greater than 1, for example, the BCF for Cu in the *Astracantha echidna* plant is about 10. Then, biogeochemical studies on the predominant plant species indicated that *Convolvulus leiocalycinus* and *Astracantha echidna* can be introduced as Cu and Cr-strong accumulators. Some plant species allow to accumulation of heavy metals to levels that are normally toxic, a phenomenon known as hyperaccumulation. Although heavy metal pollution is a worldwide problem, phytoremediation is an effective and low-cost interesting method. The results of this study provide experimental evidence that *Convolvulus leiocalycinus* and *Astracantha echidna* play an integral role in Cr and Cu detoxification and phytoremediation to remediate soil contaminated by heavy metals around the metal factories and mines.