Geophysical Research Abstracts
Vol. 13, EGU2011-6853, 2011
EGU General Assembly 2011
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Heavy metal accumulation in plants collected in the vicinity of a sulphuric acid plant (SE, Spain).

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Human activities have introduced numerous potential hazardous trace elements in the environment. Although heavy metals are released in varying quantities into the soil from parent materials, increasing environmental contamination has been caused by human activities, such as mining, smelting, fossil fuel combustion, fertilizers industry and waste disposal. Contamination of heavy metals in the soil is a major concern because of their toxicity and threat to human life and environment. These heavy metals may adversely affect soil ecology, agricultural production, or product quality and water quality.

Sediment samples were collected in the vicinity of a sulphuric acid plant. Pyrite ashes are obtained as a result of the sulphuric acid production process during the roasting of pyrite ores. These wastes, which are generally landfilled or dumped into the sea, could cause serious land and environmental pollution problems due to the release of acids and toxic substances. Pyrite ashes are accepted as a hazardous waste because it contains considerable amounts of heavy metals

The potential of three species (Dittrichia viscosa, Glaucium flavum and Zygophyllum fabago) was examined to determine their tolerance and ability to accumulate metals for phytoremediation purposes, in polluted soils. The total contents of heavy metals were determined in sediment and plant samples.

To determine Pb, Zn and Cd content, an acid digestion was carried out in soil samples and in the lyophilized vegetable samples. In order to evaluate the phytoextraction potential of the selected plants, the transfer factor (TF) and the bioconcentration factor (BCF) were calculated.

Obtained results for sediment samples showed that average Pb content was 7600 mg kg-1. Zn average concentration was 19479 mg kg-1 and Cd average content 52 mg kg-1.

Trace element content in roots and leaves of Zygophyllum fabago suggested that trace element concentration in leaves is lower than root concentration, being BCF and TF values lower than 1. Dittrichia viscosa could be considered as hyperaccumulator for Cd and Glaucium flavum for iron (TF>1).