



## Preliminary data about the phytoremediation capability of some plant species in Pb-Zn and Hg-As mining wastes, Cantabrian range, north of Spain

Corrado Marcenò (1), Susana Fernandez (2), David Jimenez Gamez (2), Álvaro Bueno (1), and Miguel Angel Alvarez (2)

(1) JBA – Atlantic Botanical Garden, Av.da del Jardín Botánico – 33394. Gijon. Asturias. Spain, (2) INDURÓT, Natural Resources Institute of Oviedo University. Campus of Mieres s/n. 33600. Mieres. Asturias. Spain. (smdez@indurot.uniovi.es)

In order to identify potential phytoremediation among native plant species that have colonized naturally mining waste two locations with Pb-Zn and Hg-As rubbish were screening in the Cantabrian range. One of them, Aliva, was located in Picos de Europa National Park and is a lead mine at 1300 m altitude in disused since 1989. Other one, Caunedo is a Pb-Zn mine located at 1300m of altitude in Somiedo Natural Park. In each sampled location of the mining wastes, plant and soil under it were collected. A total of 28 species and 28 soil were sampled (10 in Aliva and 18 in Caunedo). The plants were freed in liquid nitrogen (-80°C) and pulverized in agate mortar. Heavy metals and As were analyzed using a portable X- ray fluorescence analyzer.

High concentrations of Pb (2250ppm) and Zn (13659 ppm) in soil samples of Aliva mining waste were measured. Also the plants show high concentrations of these elements until 314 ppm of Pb and 3810 ppm of Zn. Similar situation were found in Caunedo mining waste, until 322 ppm of As and 5558ppm of Hg was measured in the soil samples. In the other hand, until 65 ppm of Hg was found in Caunedo plants but arsenic not was detected in them. In this way, the Hg was detected in samples of *Silene nutans* L. (65 ppm) and *Brachypodium pinnatum* subsp. *rupestre* (Host) Schubler & Martens (33 ppm). In *Silene ciliata* Pourret and *Minuartia verna* (L.) Hiern analysis showed high percentages of Zn 7220 ppm and 10992 ppm respectively. *Helianthemum urriense* (M. Laínz) Nava & Fern. Casado is the species with the highest concentrations of Pb (870 ppm), while *Trifolium thalli* Vill. is the only species in which there is some accumulation of Cd (90 ppm). The analysis of the ICP mass is pending and the preliminary results of this study should be used with caution. Analysis of X-ray fluorescence shows accuracy about the soil but it has yet been calibrated to analyze plants. The study "Correlation between ICP mass and X-ray fluorescence in soil and plant analysis" is pending and currently in favor of this technique there is an excellent correspondence in concentrations of metals detected in soil and plants.

Key words: Phytoremediation; Heavy metals; Hg-As; Pb-Zn; X-ray fluorescence.