



Usefulness of phytoremediation in sites with high levels of potentially toxic elements: results for a case study

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An artificial pond was constructed with two topsoils collected from Portman Bay (SE Spain). This area is heavily polluted as a result of historical mining and processing activities, during which time great amounts of wastes were produced, characterised by a high PTE content, acidic pH and minerals resulting from supergene alteration. In order to simulate the mixing with carbonate materials, which naturally occurs in the study area, a stabilisation approach was applied by mixing with 30 % of limestone filler. Three replicate experiments involving aquatic macrophytes *Phragmites australis*, *Juncus effusus* and *Iris pseudacorus* were carried out, each type of sediment being prepared in pots for the three selected species. The total PTEs content (As, Cd, Cu, Fe, Pb and Zn) was determined and the bioconcentration factor (BCF) and transfer factor (TF) calculated.

Under the reducing conditions existing in the wetland, the PTEs could be absorbed by the roots, particularly iron. Within the root, the conditions become more oxidising and insoluble compounds, such as iron oxyhydroxides, are formed, avoiding that PTEs be transferred to leaves. This behaviour was observed for the three selected species. The rest of the PTEs were also retained in the plant root.

The results indicate that it is feasible to use the selected species for phytoremediation of soil contaminated with PTEs. Both *Juncus effusus* and *Phragmites australis*, as well as *Iris pseudacorus* could be considered as bioindicators, and natural or artificial wetlands containing these species could be useful for remediation purposes.