

This work has two parts as a first part, we are interested in eliminating the heavy metals by two plants that belong to the family of Poaceae (*Arundo donax* and *Phragmites australis*). It is the treatment via planted filters. Secondly, the comparison has been made of the tolerance and accumulation by these two plants. A purification system is set up which consists of two vats: one located in height and the second in low to receive the water that flows from the first vat, in which were planted macrophytes. The results obtained, show a significant elimination of the heavy metals on the plants filter of *Phragmites australis* compared to *Arundo donax* after a stay of 30 days. The yields of eliminations are respectively 84.45% and 75.00% for *Phragmites australis* and *Arundo donax*. The results of this study also showed a significant reduction in COD, BODs, Conductivity, Phosphate and Nitrate. The greatest accumulation of heavy metals is produced in the roots followed by leaves for both plants. The calculated values of biological transfer coefficient (BTC) and bioconcentration factor (BCF) showed that *Phragmites australis* and *Arundo donax* are effectively acting as species of phytoremediation for some heavy metals