

# **Arsenic uptake and performance of *Eleocharis macrostachya* in constructed wetlands**

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## **Abstract**

The development of new technologies to achieve the reduction of arsenic contamination in water and soil is a very important issue. Arsenic removal from water can be achieved through phytostabilization using arsenic-tolerant plants species in constructed wetlands. Proper plant selection is a key factor to ensuring the success of rhizofiltration as a water cleanup strategy. Therefore, the aim of this study was to analyze the performance of *Eleocharis Macrostachya* in the arsenic uptake from water. The performance of *Eleocharis macrostachya* in constructed wetlands for arsenic removal was determined at the prototype level. The concentrations of arsenic in the inlet water were maintained constant at three levels (0.1, and 0.5 mg/l). Water samples were taken at the inlet and outlet of the wetlands, during the testing period to determine the arsenic uptake by the plant-soil system. Arsenic removal from the treated water showed in average 90% efficiency during the test period with the highest feedwater concentration (0.5mg/l), and 86% efficiency for the test stage with the lowest As concentration (0.1mg/l). The bio concentration and translocation factors were 3.7 and 0.027 respectively, showing that arsenic was absorbed and retained by the root system. The number of individual plants almost doubled during the experiment, showing that the presence of the metalloid had no effect on growth. Results indicate that *E. Macrostachya*, performed as a rhizofiltrator since it was able to tolerate and accumulate in its roots significant amounts of arsenic from water.

**Keywords:** arsenic; constructed wetlands; *Eleocharis macrostachya*; water.