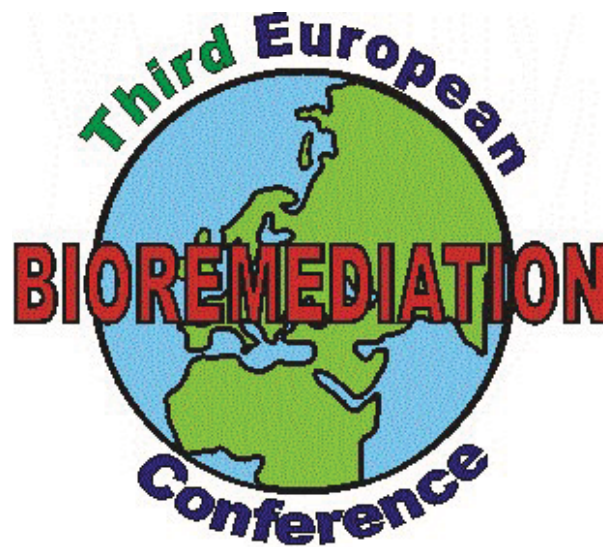


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# BIOREMEDIATION CASE STUDY: USE OF CONSTRUCTED WETLANDS FOR TANNERY WASTEWATER TREATMENT

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## SUMMARY

The art of tanning has been practiced in Portugal since the earliest historical times. Tannery wastewater can cause environmental problems due to its high salinity, high organic loading (COD, BOD<sub>5</sub>), high content of ammonia and organic nitrogen, and the presence of specific pollutants (e.g., sulphide, chromium). Constructed wetlands, also called Root-zone technology, offer potential new opportunities for a range of environmental problems associated with the leather manufacturing including secondary and tertiary effluent treatment. Based on this technology, a study was carried out aiming at the evaluation of different plant species and substrates for the treatment of a tannery effluent.

Under the scope of this project, a characterisation of target effluent of a tannery company that has the Post-Tanning and Finishing Operations was undertaken. Eight pilot units, with horizontal subsurface flow, were established with plant species (*Canna Indica*, *Phragmites australis*, *Typha latifolia*, *Iris pseudacorus* and *Stenotaphrum secundatum*) and a range of substrates (sand, Filtralite – expanded clay), in order to analyse the efficiency under different operational conditions, including different hydraulic loading, aiming at process optimisation for organic removal. The pilot-scale units are operating since March 2003. For organic loading rates ranging from 400 to 3800 KgCODha<sup>-1</sup>d<sup>-1</sup>, the pilot units accomplished removal efficiencies up to 70%. Although vegetation plays an important role in the functioning of constructed wetlands, microorganisms are the most important processors of wastewater contaminants, and as such bacterial communities in the same pilot units are being analysed.

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