Sediment integrative assessment at the Alqueva reservoir: a chemical and ecotoxicological approach

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In order to study the pollution of aquatic ecosystems, it is necessary to analyze not only the levels of chemical pollutants in water, but also those accumulated in the sediment matrix, as well as to assess its ecotoxicological status. This study consisted in sediment characterization from five different sampling locations along the Alqueva reservoir, during 2011.

The evaluation of sediments was done by physical and chemical analysis: grain size, pH, organic matter, nitrogen, phosphorus and trace elements. For the sediment ecotoxicological evaluation, several acute and chronic bioassays were carried out: luminescence inhibition of Vibrio fischeri, 24-h mortality test with *Thamnocephalus platyurus,* 48-h immobilization/ mortality assay of *Daphnia magna*; 6-day mortality/ growth inhibition of the crustacean *Heterocypris incongruens*. Total metal concentrations in sediments indicated that As, Cd and Pb surpassed the levels for the protection of aquatic life in some Alqueva sampling stations, namely Alamos, Alcarrache and Lucefecit. The results from toxicity assessment showed that same locations at the Alqueva reservoir induced acute and chronic toxicity to the test species used. Further, the crustacean *Heterocypris incongruens* was the species most sensitive to the contamination found in the sediment, followed by the bacteria *Vibrio fisheri*. This integrative approach, together with the water column quality assessment, allowed a comprehensive evaluation of the environmental quality of this strongly modified water body and will allow implementing remediation strategies to obtain the good ecological potential that was proposed by the Water Framework Directive.

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