

Abstract

Bioassays and biological tools have been developed for the evaluation of the toxicity of water. A protocol of short-term tests allowed the examination of the influence of temperature, salinity, hardness and effect of complexation on the toxicity of Cd^{2+} , Cu^{2+} , Ni^{2+} and Zn^{2+} by means of a test daphnia (*Daphnia magna*). The development of an experimental installation functioning continuously, where the trophic level is represented by the daphnia, led to the development of a system of bio-indication. The survival of the daphnia is examined under conditions of disturbances produced by Cd^{2+} , Cu^{2+} , Ni^{2+} and Zn^{2+} . The application of the chronic test (21 d) allowed the follow-up of the inhibition of the survival and the reproduction of *D. magna* by Cd^{2+} , Cu^{2+} and Ni^{2+} . A methodology with the help of the phototactic effect of *D. magna* was proposed. This one aims at developing a phototactic biosensor subjected to the toxicity of cadmium. Bioassays, using the purifying activity of the activated sludge, were considered and enabled understanding of the phenomena of inhibition and adaptation of these muds in the presence of trivalent chromium. In addition, two watery freshwater plants, *Lemna minor* and *Salvinia natans*, were exposed to Cd^{2+} , Cu^{2+} and Zn^{2+} in order to test their sensitivity. We consequently carried out a histological study on leaves of *S. natans* contaminated by metal toxicity independently of the test.