

### **3.23.1 Effects of metal mixture and temperature stress on metal accumulation and ionoregulation in *Cyprinus carpio*. G.**

**Castaldo**, University of Antwerp / Biology; M. Pillet, La Rochelle Université / Littoral ENvironnement et Sociétés; B. Slootmaekers, Systemic Physiological and Ecotoxicological Research (SPHERE), University of Antwerp / Department of Biology; L. Bervoets, R. Blust, University of Antwerp / Biology; G. De Boeck, Systemic Physiological and Ecotoxicological Research (SPHERE), University of Antwerp / Department of Biology (SPHERE Research Group). Metal toxicity is often studied on an individual basis, but considering that we cannot predict the toxicity of a metal mixture on the basis of single compounds only, it is important to study mixture toxicity in order to understand the impact of pollution in the aquatic environment. Several studies already pointed out the adverse effects caused by waterborne metals as single and binary mixtures together with other stressors such as temperature. However, it is more difficult to find information on ternary mixtures using environmentally relevant concentrations at different temperatures. Therefore, with the present study we will try to answer the following question: “Is the temperature a determining factor for metal toxicity and bioaccumulation in a long term exposure scenario?”. In order to answer this questions we ran two parallel experiments for 27 days at 20°C and at 10°C, using a nominal metals mixture of Cu: 0.08 µM; Cd: 0.03 µM and Zn: 3.16 µM. The parameters investigated were metal bioaccumulation, disturbances in ionoregulation and induction of defensive mechanisms such as metallothionein gene induction. Our results in general show a rapid increase in Cu and Cd, with differences between the two temperatures that can only be observed from one week of exposure onwards. No ion loss was observed due to metal exposure for either temperature, however lower electrolyte levels were observed in fish exposed to 10°C. Regarding the defensive mechanisms an induction of metallothionein gene expression was recorded during the whole experiment.