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Sensitivity of three unionid glochidia to elevated levels of copper, zinc and lead

In this study glochidia as most sensitive life-stage of bivalves were used to evaluate the toxicity of copper, zinc and lead. Sensitivity of three species, Anodonta anatina, Pseudanodonta complanata and Unio tumiduswere compared to copper and zinc, based on 24 and 48 h LC50s. The copper 24 h LC50 showed the lowest value (26.8 µg·L-1) for Unio tumidus glochidia. After 48 h exposure, close LC50 values, 18.9 and 19.0 µg·L 1, were recorded for A. anatina and U. tumidus glochidia, respectively. U. tumidus glochidia exhibited the highest sensitivity to zinc (48 h LC50 = 134.2 µg·L-1) followed by P. complanata (48 h LC50 = 201.6 µg·L-1) and A. anatina (48 h LC50 = 233.5 µg·L-1). Toxicity of lead to P. complanata glochidia was estimated, 24 and 48 h LC50s of lead to 374.6 and 260.8 µg·L-1, respectively. No observed effect concentrations (NOECs) for the tested metals exhibited species differences. All NOECs exceeded environmental quality standards (EQS), therefore these species are at risk only in such European freshwaters which have extreme concentration of these metals. Synergistic effect was reported for the combinations of Cu + Zn and Cu + Pb, additive effect was reported for Zn + Pb.

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