

Tolerance of high inorganic mercury of perna viridis: laboratory studies of its accumulation, depuration and distribution

Abstract

The tolerance of *Perna viridis* to a high inorganic mercury (Hg) exposure was determined based on its accumulation, depuration and distribution. The Hg accumulation of the mussel was conducted for a 4-day semi-static exposure at a 'very' high Hg concentration (100 µg/L). None of the mussels died after the experimental period, indicating that the elevated level of inorganic Hg exposure was not toxic to *P. viridis*. Following the 4-day exposure, the Hg concentrations were higher in the gill and byssus than in the mantle, foot, gonad and muscle (with bioconcentration factor values being between 13 and 625). The Hg distribution among the different soft tissues after 11 days of depuration was almost similar with that after Hg exposure. The high Hg levels found in the byssus and different soft tissues after the depuration indicated that Hg accumulated in the different ST was tightly bound to metallothionein and it was not easily mobilized. The Hg distribution in the byssus and in the different soft tissues could be due to their differing capacities for Hg accumulation and depuration. Since the soft tissues of *P. viridis* can accumulate inorganic Hg in high concentrations after exposing to a 'very' high level of inorganic Hg, it has a high bioaccumulative capability and a high tolerance to inorganic Hg. The mussel byssus was found to have the highest depuration rate coefficient, indicating that it could act as one of the excretion routes for Hg and it can be proposed as a sensitive biomonitoring material for Hg. The fecal materials released by the mussel had elevated levels of Hg, indicating that the mussels acted as a Hg retention mechanism in the coastal ecosystem.

Keyword: Mercury (Hg); *Perna viridis*; laboratory study