Determination of toxic trace elements in the blue crab Carcinus maena exposed to inorganic mercury, methylmercury and selenium using ICP-MS

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Environmental pollution with toxic trace metals and its impact on marine biota is of prime importance where food chains are concerned, especially in the case where biota is used for food or feed. In particular, mercury is well known for its bioaccumulation in biota and biomagnification through the aquatic food chain. Here, the neurotoxic methylmercury is the major mercury species in aquatic biota and of major interest when determining risk to human health. Recently, it was suggested that selenium counteracts toxic methylmercury in fish, and recent studies have shown that a high Se-Hg ratio prevent neurotoxicity [1]. Furthermore, the amount of many other elements in the different organs of the crabs can also provide valuable information regarding the metabolism of mercury, methylmercury and selenium in their bodies. In this work, we use the common blue crab *Carcinus maena* for feeding experiments with mercury species and selenium to evaluate the distribution and bioaccumulation of these elements within the different crab tissues with regards to the species-specific exposure. In this context, an evaluation of the total content of metals and metalloids in crabs *Carcinus maena* exposed to inorganic mercury, methylmercury and selenium by using inductively coupled plasma mass spectrometry (ICP-MS) will be performed. For this experiment, forty C. maena crabs were divided into five groups, according to metal exposition. The exposition procedure will take place in static tanks with air supply during one week. After the period of exposition, the total concentration of metals and metalloids will be measured by ICP-MS in the following parts of the crabs, after pooling each part according to the exposition group: gill, gizzard, heart, muscle and exoskeleton. Accordingly, a comparison will be made in order to investigate the impact on other trace elements including essential elements after this period of exposition to mercury species and/or selenium. Furthermore, we will establish relationships between the most critical toxic elements in today's seafood versus beneficial values of selenium.

References

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