URINARY ARSENIC SPECIATION OF MARINE MAMMALS

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Marine organisms are known to accumulate and convert inorganic arsenic, present in sea water, to organic arsenic compounds. Marine mammals like seals (Phoca vitulina) and porpoises (Phocoena phocoena) feeding on marine organisms are accumulating arsenic due to their top position in the food web. Seals are feeding on fish, crustaceans and cephalopods [1], harbor porpoises feed mainly on fish and less frequently on mollusks and squids [2]. The major arsenic compounds in these food items (marine fish, crustaceans and mollusks) are well characterized. Mammals are known to excrete most of their ingested arsenic via urine, although not much is known about the arsenic excretion of marine mammals. The determination of the total arsenic concentration and the arsenic compounds in the urine of marine mammals can clarify the arsenic metabolism of these animals and may be used to get some more information about their feeding habits.

In the present work, the arsenic concentration and its species in urine of seals and porpoises collected from carcases found on the North Sea and Baltic Sea coasts were determined using anion-exchange, cation-exchange, and reversed phase high performance liquid chromatography coupled to inductively coupled plasma mass spectrometry. Arsenic species were identified by matching the retention times and or spiking experiments with commercial available standard arsenic compounds. ICPMS was used as element-selective detector to enable the detection of arsenic compounds at low concentration ranges. In the presentation identified arsenic compounds will be discussed and comparisons between the excretion patterns of marine mammals and humans will be highlighted.