Retrospective monitoring of synthetic musk compounds in aquatic biota from German rivers and coastal areas

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Abstract: The polycyclic musk compounds HHCB (Galaxolide) and AHTN (Tonalide) are commonly used as synthetic fragrances in personal care products and household cleaners. These and other synthetic musk fragrances were quantified in different aquatic samples from the German Environmental Specimen Bank (ESB). While HHCB and AHTN were found in almost all samples, most of the other musk fragrances were detected only in a few samples and mostly at lower concentration levels. Blue mussels from the North Sea showed varying levels of 0.5-1.7 ng g^{-1} ww for HHCB and 0.4-2.5 ng g^{-1} ww for AHTN (ww - wet weight) in the period from 1986 to 2000, while blue mussels from the Baltic Sea were only slightly contaminated with synthetic musk fragrances. Lipid weight- related concentrations of synthetic musk compounds in blue mussels were higher than in eelpout muscles, bladder wrack and herring gull eggs.

In comparison to the marine specimens, muscles of bream from German rivers had higher concentrations of HHCB and AHTN. The ranges of HHCB and AHTN concentrations in bream from the Elbe River were 545-6400 ng g^{-1} lw and 48-2130 ng g^{-1} lw, respectively (lw - lipid weight; five sampling sites, period 1993-2003). In the Rhine River, HHCB and AHTN levels of bream muscles were highest at the Iffezheim site (up to 9750 ng g^{-1} lw HHCB, 1998). Even higher synthetic musk levels were detected in bream from the rivers Saale and Saar. In recent years, levels of both compounds determined in bream from most sampling sites have decreased from maximum values in the 1990s. As the concentrations of AHTN have decreased faster, the ratio of HHCB to AHTN increased from 2- 4 in the 1990s to 10- 20 in recent years.