



SETAC 21ST ANNUAL MEETING

Environmental Sciences in the 21st Century:
Paradigms, Opportunities and Challenges

12 - 16 November 2000
Nashville, Tennessee

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(PHA093) Occurrence and accumulation of TBT and TPhT in the marine wildlife from the Danish coastal waters.

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ABSTRACT- Organotin compounds as tributyltin (TBT) and triphenyltin (TPhT) have been used as antifouling agents in marine paints for more than three decades. The Danish waters are among the most heavily trafficked sea waterways compared to its small water volume. The occurrence of these compounds was studied in order to assess the bioaccumulation and possible adverse effects on different trophic levels. The plant and animal samples collected were sea-grass, bladder wrack, blue mussels, common whelk, shore crabs, flounder, cod, mute swan, eider duck, black-backed gull and harbour porpoises. The analysis was carried out on mainly liver tissue, as this is frequently the organ with the highest amounts of organotin compounds. Analysis was carried out by means of in-situ derivatisation, extraction to organic phase and determination on capillary gas chromatography equipped with a pulsed flame photometric detector. The limit of determination was between 0.3 and 1 ng g⁻¹ (as Sn). All samples collected contained organotin compounds. The highest concentrations of butyltins were found in the harbour porpoise (153 - 2283 ng g⁻¹), eider duck (82 - 202 ng Sn#g⁻¹) and flounder (60 - 259 ng Sn#g⁻¹) all as Sn and wet weight. The lowest concentrations were found in plants and plant feeders. This indicates a bioaccumulation through the food web. Occurrence of TPhT and degradation products in almost all samples indicate widespread continuous use as antifouling agent or terrestrial fungicide in the Danish region. Bioaccumulation factors will be presented and discussed. The concentrations of butyltin in harbour porpoises are the highest recorded stressing the importance of ecotoxicological studies on these species.

Key words: TBT, foodweb, bioconcentration, bioaccumulation

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