

OCCURRENCE AND PROFILES OF PCBs AND PBDEs IN HARBOUR SEALS AND HARBOUR PORPOISES FROM THE SOUTHERN NORTH SEA

Weijls Liesbeth^{1,2}, Alin C. Dirtu^{2,3}, Krishna Das⁴, Adriana Gheorghe^{2,5}, Peter Reijnders⁶, Hugo Neels², Ronny Blust¹ and Adrian Covaci^{1,2}

¹ University of Antwerp, Laboratory of Ecophysiology, Biochemistry and Toxicology, Groenenborgerlaan 171, 2020 Antwerp, Belgium
E-mail: liesbeth.weijls@ua.ac.be

² University of Antwerp, Toxicological Centre, Universiteitsplein 1, 2610 Wilrijk, Belgium

³ University of Iassy, Department of Inorganic and Analytical Chemistry, Carol I Bvd. 11, 700506 Iassy, Romania

⁴ University of Liège, MARE Center, Laboratory for Oceanology B6C, 4000 Liège, Belgium

⁵ University of Bucharest, Department of Analytical Chemistry, Soseaua Panduri 90-92, 050663 Bucharest, Romania

⁶ Institute for Marine Resources and Ecosystem Studies, Dept Ecology, PO Box 167, 1790 AD Den Burg, the Netherlands

Harbour porpoises (*Phocoena phocoena*) and harbour seals (*Phoca vitulina*), two representative top predator species of the North Sea ecosystem, are good indicators of coastal pollution. Concentrations of sum PCBs were 1-2 orders of magnitude higher than concentrations of sum PBDEs (with median values of 23.1 $\mu\text{g.g}^{-1}$ lw (lipid weight) and 12.4 $\mu\text{g.g}^{-1}$ lw for sum PCBs and 0.33 $\mu\text{g.g}^{-1}$ lw and 0.76 $\mu\text{g.g}^{-1}$ lw for sum PBDEs in harbour seals and harbour porpoises respectively) and were highly dependent of age group and gender. For both species, the highest PCB concentrations were observed in adult males as the result of accumulation for years and years, while the highest PBDE concentrations were measured in juveniles probably due to better developed metabolic capacities for these congeners with age in adults. Results for PCBs were higher than observations in harbour seals and porpoises from other areas, while results for PBDEs were comparable indicating that the North Sea is a highly contaminated area. Relative PCB and PBDE profiles were constructed to compare metabolic capacities between harbour seals and porpoises. A higher contribution of lower chlorinated and non-persistent congeners, such as CB 52, CB 95, CB 101, CB 118 and CB 149 indicated that harbour porpoises are unable to metabolize these compounds. Similar to PCBs, higher contributions of other PBDEs than BDE 47 were observed in harbour porpoises, suggesting that this species has difficulties to metabolize these congeners. In contrast, harbour seals showed a higher ability to metabolize PCBs and PBDEs.