

# **DETERMINATION OF ORGANOCHLORINE PESTICIDES (OCPS), POLYCHLORINATED BIPHENYLS (PCBS) AND POLYBROMINATED DIPHENYL ETHERS (PBDES) IN HARBOUR PORPOISES (*PHOCOENA PHOCOENA*) FROM THE SOUTHERN NORTH SEA**

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Harbour porpoises (*Phocoena phocoena*) are good indicators of coastal pollution, because they live in coastal waters and do not present large-scale migration. Relationships between organochlorines and reproductive, endocrine and immunological disorders have been suspected in marine mammals from highly contaminated areas, such as the North or Baltic Sea. Liver samples from 21 harbour porpoises (*Phocoena phocoena*) which were stranded on the French and Belgian North Sea coast between 1997 and 2001, were analysed for 59 polychlorinated biphenyl (PCB) congeners, 10 organochlorine pesticides and 9 polybrominated diphenyl ethers (PBDEs). Liver samples were extracted by Soxhlet, cleaned-up on acidified silica gel and analysed by GC/MS.

PCBs were the most important contaminants in the harbour porpoises. The hexa-CB congeners dominated the profile (58%), followed by hepta-CBs (26%) and penta-CBs (11%). PCB concentrations found in the porpoises stranded on the Belgian North Sea coast are in agreement with concentrations previously reported in literature. The mean concentrations (SD) for 59 congeners were 36.4 (26.4)  $\mu\text{g/g}$  lipid (range 1.9 – 404  $\mu\text{g/g}$  lipid). Higher concentrations of organochlorine compounds were found in porpoises stranded on the Belgian/Dutch coast of the North Sea in comparison with the English coast, due to discharges from the Rhine, Meuse and Scheldt rivers or due to coastal currents from the French to Dutch coast. Because the harbour porpoises seem to have a decreased capacity of metabolising PCB congeners, the PCBs were higher contributors ( $\sim 20$  times) than PCDD/PCDFs to the total dioxin-like toxicity.

The most abundant organochlorine pesticides were DDT and its metabolites, followed by HCB and HCHs (96%  $\gamma$ -HCH). Mean concentrations of DDTs were 3.4 (2.3)  $\mu\text{g/g}$  lipid (range 0.3 - 44.3  $\mu\text{g/g}$  lipid), with a contribution of 69% from p,p'-DDE. Concentrations of p,p'-DDT and total DDT were lower than those previously reported from North or Baltic Sea porpoises.

PBDEs were found in relatively high concentrations with mean (SD) = 2.3 (1.8) and range 0.4 – 5.8  $\mu\text{g/g}$  lipid. In contrast to PCB values, there were no extremely high values for PBDEs and the range was relatively small (one order of magnitude). The principal contributor to the sum of BDEs was BDE 47, followed by BDE 99, 100, 154 and 153.

Median concentrations of PCBs, DDTs and PBDEs were higher in the adult group (n=8) than in the juveniles (n=13). For HCB and HCHs, no difference was observed between the age groups. Concentrations of PCBs, DDTs, PBDEs and HCB were significantly higher in males (n=15) than in females (n=6), probably due to a loss of POPs by females through gestation and lactation. Juvenile porpoises are therefore subjected to high transfer of contaminants from the mother.