

ORGANOCHLORINE CONCENTRATIONS IN RESIDENT BOTTLENOSED DOLPHINS (*TURSIOPS TRUNCATUS*) IN THE SHANNON ESTUARY, IRELAND

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ABSTRACT

Polychlorinated biphenyls (PCBs) and Organochlorine pesticides (OCPs) are persistent anthropogenic pollutants that are ubiquitous in the marine environment. They have a high affinity for lipids and elevated concentrations of PCBs have been associated with potential reproductive failure in marine mammals. Resident dolphins as lipid rich marine top predators can therefore act as a good indicator species of water quality within the estuary.

The Shannon estuary contains the only known resident group of bottlenose dolphins in Ireland and has been designated a candidate Special Area of Conservation under the EU Habitats Directive. As part of a long-term programme to try and identify the main threats to the health and status of dolphins in the estuary, tissue samples from resident dolphins were obtained by using biopsy darts. The combination of biopsy sampling and photo-identification of individuals has the advantages in providing "real time" tissue samples and enables long-term effects of biopsy sampling and temporal changes in pollutant burden in the dolphins to be monitored. A molecular genetic approach using skin tissue was employed to determine the sex of each dolphin sampled and the concentrations of 11 PCB congeners and 7 organochlorine pesticides were determined in blubber tissue. The primary objective of the study was to compare results to available literature and to assess the potential impact of persistent pollutants on the habitat quality of the estuary for bottlenose dolphins.

Mean concentrations for each organochlorine in all 8 dolphins (6 male: 2 female) sampled were greater in males; p'p' DDE, *trans*-nonachlor and PCB153 and PCB138 being the most abundant OCPs and PCBs respectively. Results suggest that levels are higher in bottlenose dolphins from the Shannon estuary compared to those of previous studies on harbour porpoises and common dolphins from outside around the Irish coast, but are similar to those determined from white-sided dolphins from Killala in Co Mayo. Levels were similar to those reported for bottlenose dolphins from Scottish waters but were much lower than those studied in the Mediterranean Sea and for PCBs recorded in mammals from Cardigan Bay in Wales.

The pollutant distribution pattern suggests uniformity in metabolic response to the contaminant burden suggesting that dolphins were not exposed to local point sources of contamination but to a diffuse source in the marine environment. The study further suggests that persistent pollutants are not a significant threat to bottlenose dolphins in the estuary but that current monitoring of water quality and contaminant levels should continue in order to ensure a favourable status for the species.