

# Harbor porpoise calves exposed to neurotoxic PCBs in mothers' milk

December 2 2019

---



A harbor porpoise. Credit: CSIP-MEM\_Rod Penrose

Harbour porpoise calves around the UK are carrying a more neurotoxic

cocktail of PCBs than their mothers, as females unknowingly detoxify themselves by transferring the chemicals while feeding their young, new research reveals today.

Published in the *Science of the Total Environment* today and led by Cetacean Strandings Investigation Programme (CSIP) scientists from international conservation charity ZSL (Zoological Society of London) and Brunel University London, the study shows that the 209 variants of PCBs have varied levels of persistence in marine mammals, with some types of the chemicals proving less toxic and more efficiently metabolised than others throughout an animal's lifetime.

Critically however, the most persistent toxins remain in a mother's body until they are transferred to infants during lactation—exposing their young to dangerous doses of the [chemical](#) pollutants, that are particularly toxic during brain development.

PCBs were once used in the likes of electrical equipment, surface coatings and paints back in the mid-1980s, before being banned across Europe due to their [toxic effects](#) on both people and wildlife. However, the group of persistent toxic chemicals continues to enter the [marine environment](#) through terrestrial run off, dredging and atmospheric transport, resulting in a complex mixture of the chemicals entering the food chain.



A harbor porpoise ready for postmortem at ZSL. Credit: CSIP-ZSL

The highest levels are often found in odontocetes (toothed whales) that are high up in the food chain, where they can cause suppression of the immune and reproductive systems and have contributed to population declines of several species in some regions.

Rosie Williams, lead author and Ph.D. Researcher at ZSL's Institute of Zoology and Brunel University London said: "It's a tragic irony that juvenile porpoises are being exposed to a toxic cocktail of chemicals during feeding—when all they're supposed to be getting are the vital

nutrients they need for the crucial developmental stage of their life.

"Previously, scientists tended to monitor PCB concentrations by grouping them together and treating them as one chemical, but as we know, they're a group of chemicals with different toxicity levels so it was a bit like trying to measure how much caffeine someone's had—without knowing whether they drank three cans of red bull or three cups of tea. Our study has highlighted the need to change our approach to monitoring PCBs, to look at the composition of individual chemicals, so that we can get a better understanding of the risk posed by these chemicals to our marine wildlife.

"Studying PCB exposure in more abundant species like porpoises, helps us to predict their effects in more vulnerable species already low in numbers; such as our native population of orcas in the UK that are facing extinction because of PCBs, with only eight remaining. As top predators, killer whales are exposed to some of the highest levels of PCBs, because there is an accumulative effect of PCBs as you go up the [food chain](#).



A harbor porpoise at Seaford. Credit: Rob Deaville\_CSIP-ZSL

"It's obvious that marine mammals are still experiencing the lingering impacts of PCBs, so identifying the sources and pathways they're entering our oceans is a vital next step to preventing further pollution."

Professor Susan Jobling, co-author at Brunel University London's, Institute of Environment, Health and Societies said: "This research helps further our understanding of these legacy industrial chemical pollutants and the effects that different levels of exposure, in complex mixtures, may have. Learning more about PCB exposure in juvenile animals is

vital, so that we can try to mitigate the impact of these dangerous chemicals on populations and help protect the future status of marine mammals in UK waters."

The team of scientists used the world's largest cetacean toxicology dataset generated by the Centre for Environment Fisheries and Aquaculture Science from samples collected by the CSIP from UK stranded cetaceans, with a total of 696 harbour porpoises stranded in the UK between 1992 and 2015 identified for the study.

**More information:** Rosie S. Williams et al, Juvenile harbor porpoises in the UK are exposed to a more neurotoxic mixture of polychlorinated biphenyls than adults, *Science of The Total Environment* (2019). [DOI: 10.1016/j.scitotenv.2019.134835](https://doi.org/10.1016/j.scitotenv.2019.134835)

Provided by Zoological Society of London

Citation: Harbor porpoise calves exposed to neurotoxic PCBs in mothers' milk (2019, December 2) retrieved 27 April 2024 from <https://phys.org/news/2019-12-harbor-porpoise-calves-exposed-neurotoxic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.