

Scientists find industrial pollutants in Eastern Lake Erie carp

January 21 2011

Researchers from Upstate New York institutions, including the University at Buffalo, have documented elevated levels of two industrial pollutants in carp in eastern Lake Erie, adding to the body of scientific work demonstrating the lasting environmental effects of human activity and waste disposal on the Great Lakes.

The two contaminants the scientists studied were polychlorinated biphenyls (PCBs), manmade [organic compounds](#) once used in products including motor oils, adhesives, paints, plastics, pigments and dyes, and polybrominated diphenyl ethers (PBDEs), a class of flame-retardants found in common household items including furniture, personal computers, consumer electronics and drapes.

Both PCBs and PBDEs may disrupt the functions of the endocrine system, which secretes hormones that regulate bodily processes such as growth and development, reproduction and response to stress.

The team examined a sample of 18 carp from eastern Lake Erie and detected both pollutants in all the fish. The greatest concentration of PBDE the investigators found was just over 100 nanograms per gram of fish lipid -- a relatively low amount.

Concentrations of PCBs were higher, reaching 15,000 nanograms per gram in the lipid of one specimen. In contrast, 18 "control" carp from two cleaner New York lakes had no detectable level of PCBs.

The peer-reviewed journal *Chemosphere* published the findings in September, and researchers are now expanding their work to include a second study on eastern Lake Erie examining PBDE levels in plankton; sportfish including steelhead, walleye, [rainbow trout](#) and smallmouth bass; and forage fish including emerald shiner, gobies, yellow perch and smelt.

The goal is to provide knowledge on how PBDEs move through the food web and bioaccumulate in fish, including both commercial and invasive species. The measurements researchers collect will provide baseline data for establishing consumption advisories and better managing the ecological health of the lake. Though carp are not common food sources, the new study includes species that fishermen and consumers eat.

"Many people have documented these pollutants in fish in the [Great Lakes](#), but most studies that have been done are more on the western part of Lake Erie and in the other lakes," said Diana Aga, a UB professor of chemistry and an author of the *Chemosphere* paper. "What we're doing here is to document specifically what's happening in eastern Lake Erie, which is interesting because it can be easily impacted by industries and human activities in the Buffalo area."

"We wanted to document what we have now and compare it to other areas and to the future. If there's any cleaning up in the area, then whatever remediation is done, we'll be able to see if it has affected the levels of these chemicals in fish over time," Aga said.

Alicia Pérez-Fuentetaja, a biologist at Buffalo State College's Great Lakes Center, led the research on carp, overseeing an interdisciplinary group of biologists and chemists from UB and the State University of New York at Cortland. Pérez-Fuentetaja is also heading the project on plankton and sportfish, leading a team whose members include Aga, UB graduate student Susan Mackintosh and Mehran Alaei of Environment

Canada in Ontario. Funding for both studies comes from the Great Lakes Protection Fund.

In their *Chemosphere* paper, Pérez-Fuentetaja, Aga and co-authors wrote that PCBs and PBDEs "are of concern because they have the propensity to disrupt the endocrine system, cause neurobehavioral deficits and possibly cause cancer."

The discovery of high levels of PCBs in carp underscores the staying power the chemicals have in the environment. A ban on the production of PCBs has been in place in the U.S. since 1979, but scientists working in the Great Lakes and elsewhere in the country have continued to find accumulations of the substance in fish.

And while Pérez-Fuentetaja, Aga and collaborators called the low levels of PBDE contamination in carp they examined "encouraging news," they added that the flame retardants still regularly enter Lake Erie. Therefore, the researchers wrote, "it is reasonable to expect a future increase of this group of chemicals in sediment and biota, and continued monitoring is recommended."

Provided by University at Buffalo

Citation: Scientists find industrial pollutants in Eastern Lake Erie carp (2011, January 21) retrieved 23 June 2024 from <https://phys.org/news/2011-01-scientists-industrial-pollutants-eastern-lake.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.