

Extracts of catfish caught in polluted waters cause breast cancer cells to multiply

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Exposing estrogen-sensitive breast cancer cells to extracts of channel catfish caught in areas with heavy sewer and industrial waste causes the cells to multiply, according to a University of Pittsburgh study being presented at the annual meeting of the American Public Health Association in Washington, D.C.

The study, which tested extracts from channel catfish caught in the Allegheny and Monongahela rivers near Pittsburgh, suggests that the fish, caught in areas of dense sewer overflows, contain substances that mimic the actions of estrogen, the female hormone. Since fish are sentinels of water quality, as the canary in the coal mine is a sentinel of air pollution, and can concentrate fat soluble chemicals from their habitats within their bodies, these results suggest that pharmaceutical estrogens and xeno-estrogenic chemicals, those that mimic estrogens in the body, may be making their way into the region's waterways.

“We believe there are vast quantities of pharmaceutical and xeno-estrogenic waste in outflows from sewage treatment plants and from sewer overflows, and that these chemicals end up concentrated and magnified in channel catfish from contaminated areas,” said Conrad D. Volz, Dr.P.H., M.P.H., principal investigator, department of environmental and occupational health, University of Pittsburgh Graduate School of Public Health. Sewer overflows result from inadequate sewer infrastructure, which releases raw, untreated sewage directly into area rivers during wet weather, according to Dr. Volz. “In Pittsburgh alone, 16 billion gallons of raw, untreated sewage are

deposited into area rivers every year with major implications for public health.”

In the study, Dr. Volz and colleagues exposed extracts of catfish to estrogen-responsive and estrogen non-responsive human breast cancer cells. They found that catfish extracts caused the estrogen-responsive breast cancer cells to multiply by binding to and activating estrogen receptors – the proteins within cells that render the cells sensitive to estrogen – but had no effect on the estrogen negative cell line. Extracts of fish caught in areas heavily polluted by industrial and municipal wastes resulted in the greatest amount of cell growth. This growth occurred regardless of the sex of the fish.

According to Dr. Volz, the next step in this research is to identify the specific estrogenic chemicals and their sources in the local water and fish. “These findings have significant public health implications, since we drink water from the rivers where the fish were caught. Additionally, the consumption of river-caught fish, especially by semi-subsistence anglers, may increase their risks for endocrine-related health issues and developmental problems,” said Dr. Volz.

The abstract, number 159141, will be presented at a special session on “Contaminants in Freshwater Fish: Toxicity, Sources and Risk Communication,” on Wednesday, Nov. 7.

Source: University of Pittsburgh

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