

Mercury levels in Hawaiian yellowfin tuna increasing

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Mercury concentrations in Hawaiian yellowfin tuna are increasing at a rate of 3.8 percent or more per year, according to a new University of Michigan-led study that suggests rising atmospheric levels of the toxin are to blame.

Mercury is a potent toxin that can accumulate to high concentrations in fish, posing a health risk to people who eat large, predatory marine fish such as swordfish and [tuna](#). In the open ocean, the principal source of mercury is atmospheric deposition from human activities, especially emissions from coal-fired power plants and artisanal gold mining.

For decades, scientists have expected to see mercury levels in open-ocean fish increase in response to rising atmospheric concentrations, but evidence for that hypothesis has been hard to find. In fact, some studies have suggested that there has been no change in [mercury concentration](#) in ocean fish.

By compiling and re-analyzing three previously published reports on [yellowfin tuna](#) caught near Hawaii, U-M's Paul Drevnick and two colleagues found that the concentration of mercury in that species increased at least 3.8 percent per year from 1998 to 2008.

A paper about the study is scheduled for online publication in the journal *Environmental Toxicology and Chemistry* on Feb. 2. The other authors are Carl Lamborg of the Woods Hole Oceanographic Institution, now at the University of California at Santa Cruz, and Martin Horgan.

"The take-home message is that mercury in tuna appears to be increasing in lockstep with data and model predictions for mercury concentrations in water in the North Pacific," said Drevnick, an assistant research scientist at the U-M School of Natural Resources and Environment and at the U-M Biological Station. "This study confirms that [mercury levels](#) in [open ocean](#) fish are responsive to mercury emissions."

Drevnick and his colleagues reanalyzed data from three studies that sampled the same yellowfin tuna population near Hawaii in 1971, 1998 and 2008. In each of the three studies, muscle tissues were tested for total mercury, nearly all of which was the toxic organic form, methylmercury.

In their re-analysis, Drevnick and his colleagues included yellowfins between 48 and 167 pounds and used a computer model that controls for the effect of fish body size. Data from 229 fish were analyzed: 111 from 1971, 104 from 1998 and 14 from 2008.

The researchers found that mercury concentrations in the yellowfins did not change between the 1971 and 1998 datasets. However, concentrations were higher in 2008 than in either 1971 or 1998. Between 1998 and 2008, the mercury concentration in yellowfins increased at a rate greater than or equal to 3.8 percent a year, according to the new study.

"Mercury levels are increasing globally in ocean water, and our study is the first to show a consequent increase in mercury in an open-water fish," Drevick said. "More stringent policies are needed to reduce releases of mercury into the atmosphere. If current deposition rates are maintained, North Pacific waters will double in mercury by 2050."

Yellowfin tuna, often marketed as ahi, is widely used in raw [fish](#) dishes—especially sashimi—or for grilling. The Natural Resources

Defense Council's guide to mercury in sushi lists yellowfin tuna as a "high [mercury](#)" species.

More information: Drevnick, P. E., Lamborg, C. H. and Horgan, M. J. (2015), Increase in mercury in Pacific yellowfin tuna. *Environmental Toxicology and Chemistry*. doi: 10.1002/etc.2883

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