

New Fluorescence Method Detects Mercury in Fish

Researchers from the University of Burgos (Spain) have developed a fluorescent polymer that lights up in contact with mercury that may be present in fish.

The presence of the toxic metal mercury in the environment comes from natural sources, however, in the last decades industrial waste has caused an increase in concentrations of the metal in some areas of the sea. In the food chain, mercury can be diluted either in organic form as methylmercury (MeHg⁺) or as an inorganic salt, the cation Hg²⁺.

Now, researchers from the University of Burgos have created a fluorescent polymer, JG25, which can detect the presence of these two forms of mercury in fish samples. The development is published in the journal 'Chemical Communications'.

"The polymer remains in contact with samples extracted directly from the fish for around 20 minutes. Then, while is being irradiated with ultraviolet light, it emits a bluish light, which varies in intensity proportionally to the quantity of methylmercury and inorganic mercury present in the fish," explains Tomás Torroba, lead author of the paper.

A portable polymer probe, which can be used in situ, was used to apply the technique to 2-gram samples from a range of fish species. The qualitative relationship between the mercury levels in fish and the increased fluorescence was verified using chemical analysis (called ICP-Mass).

The research showed that the larger is the fish the higher are the levels of mercury: between 1.0 and 2.0 parts per million for swordfish, tuna and dogfish, around 0.5 ppm in conger eels and 0.2 ppm in panga. No mercury was found in farmed salmon. These are large fish and at the top of the food chain, but the metal is not present in captivity due to the lack of an industrial or natural source.

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