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SPERM WHALES FULL OF POLLUTANTS

Even whales near the supposedly pristine Galapagos Islands carry disturbing levels of man-made pollutants in their bodies.



By Jennifer Viegas
Mon Dec 6, 2010 08:49 AM ET
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THE GIST

- Pacific Ocean sperm whales carry evidence of exposure to several man-made pollutants.
- Evidence for the highest pollutant exposure was detected in sperm whales from the Galapagos Islands area.
- Sperm whales may be important sentinels of ocean health, including specific ocean regions.

Sperm whales throughout the Pacific Ocean carry evidence within their bodies of exposure to multiple man-made pollutants, according to a new *Environmental Health Perspectives* study.

In a surprising finding, researchers found that whales living near the Galapagos Islands appear to have higher levels of pollutants than those in other areas of the Pacific. The Galapagos Islands are a UNESCO-protected site and had been considered pristine.

The pollutants include the pesticide DDT, polycyclic aromatic hydrocarbons (PAH's, which can also have natural sources, such as volcanoes), hexachlorobenzene, and 30 types of polychlorinated biphenyls (PCB's).

"Ingestion is the main route of exposure for whales, via contaminants present in their diet," study co-author Celine Godard-Coding said, adding that absorption through skin, such as after an oil spill, is another significant route of exposure.

She and her colleagues biopsied skin and blubber from 234 male and female sperm whales in five locations across the Pacific: the Gulf of California, Mexico; the Galapagos Islands, Ecuador; Pacific waters between the Galapagos Islands and Kiribati (Pacific Crossing); Kiribati; and Papua New Guinea.

The scientists analyzed the tissue samples for expression of CYP1A1, an enzyme that metabolizes certain aromatic hydrocarbons. According to the researchers, the more a whale has been exposed to the pollutants mentioned in the study, the more it will express this enzyme.

CYP1A1 presence was highest in whales from the Galapagos Islands, second highest in those from the Gulf of California, and lowest in whales from waters farthest from the continents (Kiribati and Pacific Crossing.)

"We were surprised by the highest levels of the CYP1A1 biomarker seen in the

A sperm whale underwater. Research shows these mammals carry high levels of man-made pollutants in their bodies. [Click to enlarge this image.](#)

Chris Johnson, Ocean Alliance

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Galapagos," Godard-Codding told Discovery News. "Whether this actually reflects higher levels of pollutants in the Galapagos waters, or in the food chain in these waters, remains unknown."

She explained that the studied pollutants "are mainly man-made" and "end up in the oceans upon release into the environment."

"The oceans are considered the final sink for most persistent environmental contaminants," she said. "It's a global pollution issue with pollutants potentially distributed worldwide by atmospheric or oceanic currents."

Godard-Codding and her team were not able to do a detailed study on the health of the biopsied whales, since the whales were in the wild. Prior research on laboratory animals, including captive aquatic carnivorous mammals, has shown that the pollutants "can cause deleterious effects," she said.

For years, scientists have suspected that sperm whales are likely to accumulate fat-soluble pollutants because the whales are massive -- weighing up to 50 tons -- and can live up to 70 years. This makes them potentially more susceptible to chronic toxic exposure.

Given the present findings, it's now thought that sperm whales may be important sentinels of ocean health, revealing what organic pollutants persist in the marine environment. They may also provide information on specific regions of the Pacific, especially because females and juveniles tend to stay within a 621-mile range.

Sierra Rayne of the University of Victoria and colleagues conducted earlier research on free-ranging orcas, also known as killer whales, and found evidence that they too retain pollutants. In this case, chemical markers for flame retardant compounds were detected in killer whale blubber biopsy samples.

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Natali Nin

Necesitamos tomar conciencia urgente sobre el cuidado del planeta y el modo en que utilizamos los recursos afectan a otras especies. Necesitamos tomar conciencia ya! no dejemos que sea demasiado tarde...

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Chris Sasaki

Re: your headline and sub-head "Sperm Whales Full of Pollutants" and "whales...carry disturbing levels of man-made pollutants in their bodies": Research team-leader Dr Celine Godard-Codding of Texas Tech University is quoted in [ABC Science article](#) that: "We cannot know for sure that the whales from the Galapagos actually have higher levels of pollutants in their tissue. It's not that that's not the case, we just don't have the data to prove it." Does a careful read of the original work and ABC Science article justify the headline?

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