

Dolphins in Taiji Are Virtually Industrial Waste

What is the cause of mercury and PCBs contamination in dolphins?

Summary

On June 2, 2011, BlueVoice.org and Elsa Nature Conservancy jointly released the latest data on mercury and PCB contamination levels found in samples of dolphin meat taken from Taiji city where dolphin drive hunts are taking place.

The results (see last page) showed that mercury (Total-Hg [T-Hg]), methyl mercury (M-Hg) and PCBs exceeded provisional regulatory levels set by the Japanese government and even exceeded industrial waste and wastewater treatment standards (base stipulated by Water Pollution Control Law: T-Hg 0.005mg/l, PCB 0.003mg/l). In the sense that there is the potential hazard to human health, including toxicity and infectiousness, or damage to living environments, it would perhaps not be an overstatement to say that these dolphins are contaminated living creatures equivalent to industrial waste.

This document provides a summary examining the possible causes of contamination in dolphins focusing on oceanic pollution resulting from mercury and PCBs, the toxic substances targeted in the latest toxicity data on dolphin meat.

1. Pollution in different seas

The direct cause of the effect of toxic substances on marine life is oceanic pollution. Oceanic pollution offshore the Kii peninsula where Taiji city is located is thought to directly affect dolphins migrating through the sea area.

Environmental problems caused by toxic substances are becoming more apparent and oceanic pollution is becoming increasingly serious in line with the rapid economic growth of countries around the East China Sea, which lies to the southeast.

Sea areas around Japan are potentially affected by the Kuroshio Current, one of the world's largest ocean currents, which is bringing polluted seawater from the East China Sea. However, T-Hg and PCB concentration levels in all offshore sea areas around Japan are lower than environmental standards except for river mouth areas with drainage channels from industrial factories.

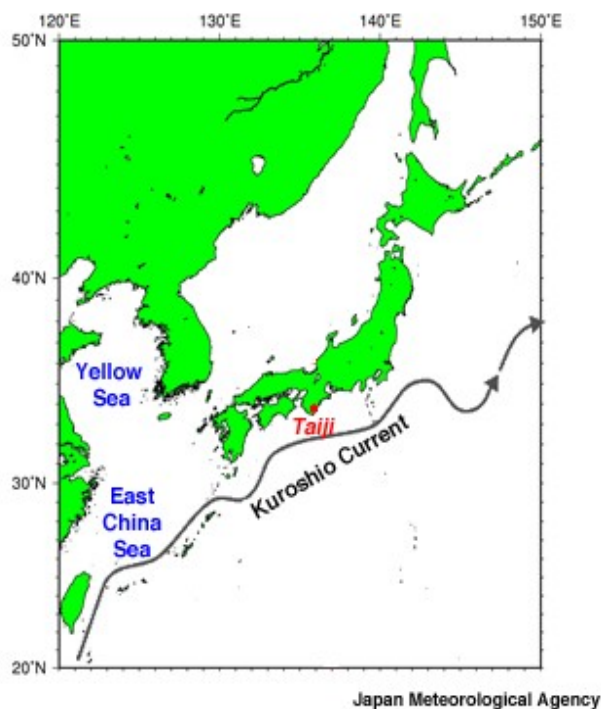
There are many things about cetacean ecology that are uncertain. Migration is the one of them. Although there are also rare cases in which some cetaceans stay in one sea area, many other species are known to migrate on a global scale. More specifically, even though cetaceans are affected by the seawater of the sea areas to which they migrate, they are unlikely to be affected by pollution of specific sea areas on a long-term basis.

In addition, T-Hg and PCB concentration levels in major seas in the world are far lower than regulatory standards set by each nation as well as the United Nations Environment Programme, World Health Organization, the U.S. Environmental Protection Agency and the European Union, among others. More specifically, taking a look at only the regulation values and measurements, there is no mercury and PCB contamination in any offshore or open sea areas. Yet, cetaceans and large fishes are contaminated with a high concentration level of mercury and PCBs.

Why then, are Taiji dolphins heavily contaminated with toxic substances?

2. Oceanic Pollution and biological concentration

Pollution of seawater affects marine life in their habitat. However, the T-Hg concentration level in the sea at 137 degrees east longitude and 20 to 30 degrees north latitude, the area through which dolphins hunted in Taiji migrate, is 9ng/l, or far lower than the T-Hg level regulatory standard for public water supply districts in Japan. Conversely,



according to the latest data on toxic substances in dolphin meat, the highest T-Hg concentration level of *irukaharabo* (dolphin belly) meat is 3.03ppm (about 3.026mg/kg). This means that T-Hg in seawater of the sea area is concentrated more than 330,000 times in a dolphin's body.

The average PCB concentration level from around the southwest islands to the offshore sea area of western Japan is 0.08ng/l (2003 data). According to the latest data, the PCB concentration level in *irukaharabo* meat is 0.21ppm (approximately 0.21mg/kg), which is about 1.62 million times higher. In *irukaharabo* blubber, the PCB concentration level is 9.8ppm (about 9.8mg/kg), or about 120 million times higher.

3. Pollution in other sea areas and other cetacean species

Among major sea areas in the world, the East China Sea has the highest T-Hg concentration level. However, the level is still far lower than the T-Hg level regulatory standard for public water districts in Japan. Conversely, the T-Hg concentration level in long-finned pilot whale meat in the Faeroe Islands in 2003 was 1.0 – 1.9ppm, 5.0 - 8.4ppm in the kidneys and 8.4 – 11.8ppm in the liver. These levels are somewhat low compared with Taiji dolphin meat, but several times higher than the provisional regulatory level set by the Japanese government.

Moreover, according to research on mercury and PCB contamination of whale-derived foods by Japan's Ministry of Health, Labour and Welfare, almost the same level of mercury contamination as Taiji dolphin meat was found in Baird's beaked whales in the Okhotsk Sea, minke whales, sperm whales, Bryde's whales and striped dolphins in the North Atlantic Ocean. Also, high PCB concentration levels were confirmed in minke whales and bowhead whales in the Arctic sea, beluga whales in Hudson Bay, Canada, and some dolphin species in the Mediterranean Sea. Therefore, it is highly possible that many cetacean species in the Northern Hemisphere are contaminated with a high concentration level of mercury and PCBs.

There are two causes: 1) whales live on top of the food chain in the open sea and 2) biological concentration of toxic substances occurs in their bodies.

4. “Lower than the regulatory standard” does not mean “Not contaminated”

From animal rights and animal welfare standpoints, dolphins and whales should not be treated as food resources. In reality, however, people in some areas in the world consume whales as food, and furthermore, many kinds of fish with commercial value are contaminated with mercury and PCBs. Therefore, this represents a major concern, and contamination caused by biological concentration is definitely a serious problem for humans.

What does high concentration levels of mercury and PCB contamination in dolphins and whales mean?

We tend to think about the contamination of marine life and seawater separately. Also, environmental regulations and standards are based on the premise of the direct effect of seawater contamination on humans. However, people basically drink seawater by accident while swimming in the ocean and there is no comparison to drinking fresh water. If seawater contamination affects humans, it is through food resources from the ocean.

The minimum mercury concentration level set by the Japanese water quality standard is “Not detected (with a detection limit of 0.0005mg/l).” The level in all sea areas around Japan is 30 times lower than the detection limit. More specifically, the seas around Japan are not contaminated according to the results of water quality inspections. The majority of open sea areas in the world are showing similar results. Conversely, a few nanograms (one billionth of a gram) of mercury and PCBs contained in a liter of seawater will be concentrated several tens of millions of times and accumulated in the bodies of dolphins, whales and fishes. Also, current detection technology is able to measure units of picograms (one trillionth of a gram). Accordingly, environmental regulation standards for mercury and PCB levels should be set lower than now.

The facts speak for themselves. In terms of the ocean environment, we should think about marine life and seawater as one. Also, we should be aware that the ocean environment is extremely sensitive given the fact that a such a small change (e.g., one millionth the amount of substances in a liter of seawater) has a huge impact on the ocean's existing life forms.

Biological concentration of mercury and PCBs occurring in the bodies of many kinds of cetacean species and large fishes, including Taiji dolphins, is a warning sign from nature that tries to tell us that “Lower than the regulatory standard” does not mean “Not contaminated” and “Humans should not break the balance of our planet's extremely sensitive ocean environment.”

This report was researched and written by Tosh Tachibana.

A Report of Toxic Substances in Dolphin Meat

Provisional regulatory levels of mercury and PCBs set by the Japanese government:
 Mercury (T-Hg):0.4ppm, Methyl mercury (M-Hg):0.3ppm, PCBs:0.5ppm

Date	Sample	A : T-Hg (ppm)	B : M-Hg (ppm)	C : PCBs (ppm)	Extent of contamination	Testing facility	Source	Notes
May 17,2011	iruka (dolphin)	1.4	0.63	0.82	A: 3.5 times higher than the <u>maximum allowance level</u> B: 2.1:times higher than the m.a.l.	NSBC(*)	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at "Shimoji," in Tanabe City, Wakayama.
May 17,2011	irukaharabo (dolphin, belly)	2.88	1.5	0.21	A: 7.2 times higher than the m.a.l. B: 5 times higher than the m.a.l.	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at "Okuwa" in Shingu City.
May 17,2011	irukaharabo (dolphin, belly)	3.03	1.4	0.29	A: 7.575 times higher than the m.a.l. B: 4.66 times higher than the m.a.l.	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at "Okuwa" in Shingu City.
May 17,2011	irukaharabo (dolphin, belly)	2.84	1.4	0.23	A: 7.1 times higher than the m.a.l. B: 4.66 times higher than the m.a.l	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at "Okuwa" in Shingu City.
May 17,2011	gondou(tail)	7.32	2.6	0.15	A :18.3 times higher than the m.a.l. B: 8.66 times higher than the m.a.l	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at the supermarket of Taiji Fishery Cooperative Gondou = short finned pilot whale
May 17,2011	Mairuka(belly)	1.59	0.67	1.9	A: 3.975 times higher than the m.a.l B : 2.23 times higher than the m.a.l C: 3.8 times higher than the m.a.l	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at the supermarket of Taiji Fishery Cooperative Mairuka = striped dolphin
May 17,2011	blubber of irukaharabo (dolphin, belly)	—	—	9.6	C: 19.2 times higher than the m.a.l.	NSBC	BlueVoice.org & Elsa Nature Conservancy	Hunted off the coast of Taiji Purchased at "Okuwa" in Shingu City.

(*)NSBC=Nihon Shokuhin Bunseki Center (Japan Food Research Laboratories)

(Made by BlueVoice.org & Elsa Nature Conservancy)