

Fukushima radiation found in California kelp

Marla Cone, San Francisco Chronicle, 4-8-12

Kelp off California was contaminated with short-lived radioisotopes a month after Japan's Fukushima Dai-ichi nuclear plant accident, a sign that the spilled radiation reached the state's coastline, according to a new scientific study.

Scientists from CSU Long Beach tested giant kelp collected off Orange County, Santa Cruz and other locations after the March 2011 accident and detected radioactive iodine, which was released from the damaged nuclear reactor.

The largest concentration was about 250 times higher than levels found in kelp before the accident.

"Basically, we saw it in all the California kelp blades we sampled," said Steven Manley, a CSU Long Beach biology professor who specializes in kelp.

The radioactivity had no known effects on the giant kelp, or on fish and other marine life, and it was undetectable a month later.

Iodine 131 "has an eight-day half-life, so it's pretty much all gone," Manley said. "But this shows what happens half a world away does effect what happens here. I don't think these levels are harmful, but it's better if we don't have it at all."

Spread in large, dense, brown forests across the ocean off California, giant kelp is the largest of all algae and grows faster than virtually any other life on Earth. It accumulates iodine, making it a useful way to check how far radioactive material spreads.

"Kelp forests are some of the most productive ecosystems on Earth," he said. "One thing about (kelp) is it has a large surface canopy," which means it is continually exposed to the air and whatever contaminants are in it.

In addition, giant kelp concentrates radioactive iodine - for every 1 molecule in the water, there would be 10,000 in its tissues.

Kelp was collected at three sites off Orange County, as well as Palos Verdes Peninsula in Los Angeles County, Santa Barbara, Pacific Grove and Santa Cruz. The highest concentration of iodine 131 was found in the kelp off Corona del Mar, a town near Newport Beach that receives runoff from a large portion of Orange County. Its kelp was collected on April 15 of last year and tested five days later.

The level of radioactive iodine found there - 2.5 becquerel per gram of dry weight - was "well above" levels sampled in kelps prior to the Fukushima release, according to the paper, published online in the journal *Environmental Science & Technology*.

Santa Cruz had the next highest level, with 2 becquerel per gram. The concentrations in Santa Barbara and Pacific Grove were significantly lower, under 1 becquerel.

When kelp from the same California sites was resampled a month later, in May 2011, it contained no detectable amounts of radioactive iodine.

Some radioactive material probably accumulated in fish that eat the kelp, including opaleye, halfmoon and seniorita.

"If they were feeding on it, they definitely got dosed. We just don't know if it was harmful. It's probably not good for them. But no one knows," Manley said. "In the marine environment, it was significant, but probably not harmful at the levels we detected it, except it may have affected certain fish's thyroid systems."

There is no published research on what iodine 131 might do to fish at the levels found in the kelp.

"That is a good question and one we don't really know the answer to as yet," said Christopher Lowe, a biology professor and director of CSU Long Beach's Sharklab, which studies sharks and game fish. Lowe was co-author of the kelp study.

Although radioactive iodine would move up the food web, it would decay at the same time that it is being concentrated, so it would be gone from the fish within days.

"It's definitely not harmful to humans," Manley said.

Iodine 131, found in nuclear fission products, is not naturally occurring and is not naturally found in oceans. The ocean and everything in it, however, contain many other naturally radioactive materials.

U.S. Environmental Protection Agency officials in San Francisco and Washington, D.C., declined to comment on the report or whether they will consider monitoring kelp. The EPA measured air and milk on the West Coast after Fukushima and concluded that "radiation levels remained well below any level of public health concern."