

Antibiotic used in soaps and cosmetics tainting Minnesota's lakes

- Article by: JOSEPHINE MARCOTTY
- Star Tribune
- January 21, 2013 - 9:44 PM

An antibiotic widely used in soaps and cosmetics that mostly goes down the drain is slowly converting to toxins at the bottom of many of Minnesota's lakes and rivers.

A new analysis of sediment in eight lakes and rivers used by municipal wastewater treatment plants found that amounts of the antibiotic triclosan and the toxins it forms have been steadily increasing since it was first used in Dial soap in the 1960s.

The research by scientists at the University of Minnesota and the Science Museum of Minnesota is the first to show how pervasive the contaminant has become in tiny lakes and giant rivers, and that the same is likely true across the country.

"This really shows the magnitude of change," said Bill Arnold, a university civil engineering professor, and the study's leading author. In recent years, concerns about triclosan's potential effects on human health, the rise of antibiotic-resistant germs, and its toxic effect on the environment have prompted new federal regulatory scrutiny that is now underway.

The Food and Drug Administration (FDA) said that there is not enough evidence to recommend limiting its use, but that it is studying its health effects. In addition, the Environmental Protection Agency is investigating whether exposure to chlorine in the wastewater treatment process transforms triclosan into compounds called dioxins that can accumulate in the natural food chain, causing cancer, deformities and other problems in fish, frogs and other animals.

Companies that use it in consumer products -- everything from soft soap to deodorant -- say that it has a long track record of safe, effective use. Millions of people rely on it as part of their daily hygiene, and there is no evidence of harm in the environment, the American Cleaning Institute says.

Still, some companies, including Johnson & Johnson, are phasing it out, and the Minnesota Department of Health recommends consumers avoid it -- most products that contain triclosan say so on the ingredient list.

And, the Canadian government last year announced its intent to ban it from consumer products because, while safe for human use, it's potentially harmful in the environment.

Environmental and consumer safety groups are pressuring the federal government to outlaw it in the United States as well, if only because the FDA has found that it provides little benefit. Other than in toothpaste as a deterrent for gingivitis, it's no better than plain soap and water in combatting germs, the agency found.

"The point is, this is one of those things we don't need," said Dan Engstrom, director of the Science Museum's St. Croix Watershed Research Station and a co-author of the study.

"We have a substance that, by and large, was a marketing ploy."

Dioxins have been a worrisome family of environmental contaminants for many years. They generate a variety of health risks, from cancer to hormone disruption, and persist in the environment for years. They once came largely from industrial processes such as paper pulp facilities and incinerator plants that burn garbage, but increasingly stringent regulations have greatly reduced their emissions.

Arnold's study, announced Tuesday by the university and posted online last week by the journal *Environmental Science and Technology*, found that while other types of dioxins have declined, the four created by triclosan are rising and are now a primary source.

"We know that, since 1965, triclosan is the major source of dioxins in all these lakes," he said.

Water treatment removes most of the triclosan, but when the little that remains is exposed to chlorine and sunlight, it can become a toxin.

Arnold analyzed layers of sediment, building a toxic timeline for each lake and river going back decades. An eighth lake, in northern Minnesota, has no connection to wastewater treatment or industry, and was used as a comparison. No triclosan or its toxins were found there.

The other seven water bodies all had some of the toxins, even 9 miles from shore in Lake Superior, he said. The small lakes, such as Lake Winona in Alexandria, had concentrations of triclosan toxins that rose steadily over time and now make up 60 percent of all the dioxins in the sediment. In larger bodies, such as Lake Pepin and the Duluth Harbor, concentrations were lower, but also increased over time. In Lake Pepin, for example, there were no triclosan toxins in 1960, but now they account for 25 percent of the lake's contaminants.

Engstrom said the findings indicate that the same is likely true for most of the rivers and lakes that receive chlorine-treated wastewater -- the majority of facilities in Minnesota and the country.

"Seventy-five percent of wastewater treatment facilities use chlorination," he said. "It's really quite effective, but it does have some unintended consequences."

What's less clear at this point, the researchers said, is the effect on aquatic life. Some studies have shown that triclosan can interfere with the ability of algae to use light. It's also been shown to disrupt the thyroid hormone in frogs and rats, and studies also have shown that it alters sex hormones in animals. The industry, however, disputes those findings.