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From: owner-promed-ahead-edr@promed.isid.harvard.edu [mailto:owner-promed-ahead-edr@promed.isid.harvard.edu] On Behalf Of ProMED-mail

Sent: Wednesday, August 04, 2010 2:54 PM

To: promed-ahead-edr@promedmail.org

Subject: PRO/AH/EDR> Cyanobacteria, canine, human - USA: (OH)

CYANOBACTERIA, CANINE, HUMAN - USA: (OHIO)

A ProMED-mail post

<<http://www.promedmail.org>>

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International Society for Infectious Diseases
<<http://www.isid.org><>

Date: Fri 30 Jul 2010

Source: The Washington Examiner, Associated Press (AP) report [edited]

<<http://www.washingtonexaminer.com/breaking/illnesses-of-at-least-9-people-dog-deaths-may-be-linked-to-toxic-algae-in-ohio-lake-99655099.html>>

Ohio health officials are investigating whether 9 people who reported suffering from stomachaches, rashes, and numbness were sickened by toxic water from the state's largest inland lake.

One man, whose dog died after a swim in the lake, was hospitalized last week [week of 19 Jul 2010] after he gave the dog a bath. Within days, the 43-year-old man began having trouble walking and lost feeling in his arms and feet.

"We weren't swimming in the lake because it's disgusting," said the victim's wife, whose husband, is still having trouble with memory loss and fatigue. "Our dog was just covered in that sludge, and my husband washed him."

Thick patches of green and turquoise slime with toxins that health officials say can cause rashes, vomiting, or even liver and nerve damage have been floating on Grand Lake St. Marys in western Ohio since the beginning of summer [2010].

The state says the recreational lake is no longer safe for swimmers or boaters or for fishing. Residents say they've seen hundreds of dead fish washed up on the shores. The city of Celina, with about 10 000 residents, gets its drinking from the lake, but the state says the water is treated to remove the toxins and is monitored regularly.

Friday [30 Jul 2010], Gov. Ted Strickland announced a series of steps

to combat the algae outbreak, starting with a test project in September [2010] to see if a chemical can slow the algae's growth.

The state also wants farmers to reduce the amount of manure that makes its way into the water and feeds the algae. Proposals include preventing farmers from putting manure on fields during the winter and requiring large farms to have plans for getting rid of their manure.

The lake, midway between Toledo and Dayton, is one of the state's most polluted waters because of fertilizer and manure that runs off from the nearby farms and flows into creeks and streams that empty into the lake.

"This crisis has been generations in the making, and it will take all of us working together to try to restore this lake to health and prosperity," Strickland said.

This year [2010], state environmental regulators have found a different species of algae that can produce up to 7 different toxins. Water tests have shown low levels of 2 toxins -- cylindrospermopsin and saxitoxin -- that can affect the liver and nervous systems.

While this type of blue-green algae called cyanobacteria has been found elsewhere in lakes and rivers, less is known about the toxins they produce.

There are no federal guidelines on how much exposure is dangerous and no tests can determine whether people are sickened by it. Instead, doctors are forced to rule out other causes before they can blame the algae, said Jen House, spokeswoman for the Ohio Department of Health. Many symptoms such as nausea and diarrhea are common to other diseases, she said.

Nine people have come forward since early July [2010] to say they might have been sickened by the water, House said. State and local health workers have been interviewing those who reported illnesses, asking them about how much contact they've had with the water and meeting with their doctors, she said.

The victim, who lives about a block from the lake in Celina, said his problems started after his black Labrador jumped in the water about 2 weeks ago. After pulling the slime off the dog, the victim had trouble walking and with his vision. He even started swerving while driving, his wife said.

The victim spent 4 days in a hospital where doctors first thought he had a stroke. They ruled that out along with other diseases.

Dr. Wilfred Ellis, an infectious disease specialist, said he's pretty

certain the toxins are to blame for the victim's illness. He also said the neurological problems could be permanent.

"This is why they put the warnings up at the lake," he said.

The victim's dog died Sunday [25 Jul 2010]. Veterinarian Craig Miesse said at least 3 dogs may have died from either swimming or drinking the lake water. One was found floating in the lake after it had been spotted drinking from it.

The water warnings also have wiped out the area's tourism business, which brings in over USD 100 million to marinas, campgrounds, and restaurants each year. Organizers of a boat race that draws about 30 000 people each year said Friday [31 Jul 2010] they will cancel the event scheduled for late August.

[Byline: John Seewer]

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[This article says: "The state says the recreational lake is no longer safe for swimmers or boaters or for fishing. Residents say they've seen hundreds of dead fish washed up on the shores. The city of Celina, with about 10 000 residents, gets its drinking from the lake, but the state says the water is treated to remove the toxins and is monitored regularly."

But the article does not indicate if the lake was designated unsafe for swimmers and boaters before or after the incident reported here. Furthermore, if it was before the incident, why were there no warning signs posted? Had there been announcements on the local news? In the local newspaper? One wonders if this situation could have been prevented. The physician treating the victim implies that the warnings were put up after this particular victim was identified as suffering from toxins from the water.

Saxitoxin is a naturally occurring poison and is reportedly one of the most toxic, non-protein substances known. It is known that the LD50 (median lethal dose) in mice is 8 micrograms/kilogram. Based on a human weighing approx. 70 kg (154 lb), a lethal dose would be a single dose of 0.2 mg.

Saxitoxin is readily soluble in water and can be dispersed in aerosols. Saxitoxin is a sodium ion channel blocker.

The toxin can be produced by several algal species or

dinoflagellates. Those species include *Pyrodinium bahamense*, *Alexandrium tamarense*, and *Gymnodinium catenatum*. As such it is more often known as paralytic shellfish poisoning. When consumed in puffer fish incorrectly prepared it is known as fugu poisoning.

If mollusks consume these toxic algae, they are capable of concentrating them. Therefore human ingestion of the mollusks could certainly prove fatal.

However, other toxins produced by dinoflagellates have proven to cause illness and irritation from water spray in the eyes and inhalation of the toxin from the water spray. Given that, it is likely the contact with the toxin, as well as inhalation of the toxin during the washing of the dog may have caused the problems in this individual.

Cylindrospermopsin is a tricyclic alkaloid. This particular alkaloid has resulted in severe, acute hepatotoxicity at low doses in both humans and animals. It is a naturally produced toxin of certain cyanobacterial strains. The production of cylindrospermopsin is strain specific and not species specific. Treating lakes with algaecides may kill the cyanobacteria, but it also will result in an increased concentration of cylindrospermopsin in the water due to cell lysis.

This toxin has been found in drinking water, notably in Australia and the US, and has been a concern of the World Health Organization in other countries.

So if this municipal region is processing drinking water from this lake, and knowing there have been outbreaks in the US and Australia, in drinking water, then what test is this city using to ensure that all of cylindrospermopsin is being removed from the drinking water? Or any hepatic problems diagnosed in the town have not been connected to the drinking water? - Mod.TG]

[Images of cyanobacteria are available at
<<http://universe-review.ca/l11-30-cyanobacteria.jpg>>,
<http://upload.wikimedia.org/wikipedia/commons/thumb/c/cb/Efflorescence_verte_3_Cyanobacteria.JPG/800px-Efflorescence_verte_3_Cyanobacteria.JPG>
and
<<http://sharonapbio-taxonomy.wikispaces.com/file/view/cyanobacteria.jpg/50772279/cyanobacteria.jpg>>.

Grand Lake St. Marys, in northwestern Ohio, can be located on the HealthMap/ProMED-mail interactive map at
<<http://healthmap.org/r/01PT>>. - Sr.Tech.Ed.MJ]

[see also;
2009

Toxic algae, avian die-off - USA 20091215.4250

Blue-green algae, canine death - USA: (MN) 20090920.3307
2007

Blue-green algae, livestock deaths - USA (MT): alert 20070914.3056
Blue-green algae, livestock - USA (OK) 20070911.3011
2003

Toxic algae - USA, Canada 20030804.1910
2002

Saxitoxin poisoning, puffer fish - USA (02) 20020516.4228
Saxitoxin poisoning, puffer fish - USA: alert 20020418.3982]
2001

Algal toxin, potable water - USA (Florida) 20010530.1054
Algal toxin, potable water - USA (Florida) (02) 20010602.1088
1999

Blue-green algae, toxin?, dogs - USA (Vermont) 19990910.1604
Toxic algae, alligator & bird deaths - USA (Florida) 19990726.1256
1996

Renal dialysis fatalities - Brazil (7): Cyanobacter toxin 19960413.0706]
.....sb/tg/mj/mpp

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