

## Parasitology researchers discuss new species and paradigm shift in swimmer's itch prevention.

By Joshua Roose, The Missaukee Sentinel, Friday, July 10, 2020.

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Swimmer's itch season is here, as some swimmers have already found out the itchy way. Canadian and American parasitology researchers have recently discovered a new species of schistosome (pronounced SHIS-tuh-sohm, this is the family of parasitic worms responsible for swimmer's itch) in Michigan waters, and they are working to rethink how we fight the itch.

Understanding how we get swimmer's itch in the first place requires a short lesson on parasite life cycles. Some parasites live in different hosts depending on their stage in life.

Adult parasites live in "definitive" hosts (often waterfowl in the case of swimmer's itch), and young parasites live in "intermediate" hosts (snails in the case of swimmer's itch).

Young schistosomes are called cercariae (pronounced ser-KAIR-ee-ee), and as they make their way from snails to waterfowl, sometimes they accidentally end up in the wrong creature — humans.

As cercariae burrow into your skin, your body works to fight them off and causes an itchy rash. The technical name for this condition is cercarial dermatitis, but most people just call it swimmer's itch. Dr. Thomas Raffel, an associate professor of ecology and parasitology at Oakland University, said that this rash comes from your immune system attacking the cercariae that have penetrated your skin.

"It's basically a hypersensitivity reaction response, like you would get with an insect bite or poison ivy," he said. "That's why some people respond a lot more strongly than others. It's the same level of unpredictability as allergies."

Preventing swimmer's itch has historically focused on disrupting the life cycle of schistosomes by killing intermediate hosts or relocating definitive hosts. For example, killing snails with chemicals like copper sulfate has been a common approach, as well as trapping and relocating common mergansers, a species of fish-eating duck. Unfortunately, these strategies have proved to be both expensive and ineffective.

"In the '50s and '60s, back then we were just dumping chemicals. That was our solution to everything," said Ron Reimink, owner of Freshwater Solutions. "We did a study where we took water samples before they put in copper. Yes, the copper killed the snails, but it did not decrease the worms in the water. It didn't do anything for swimmer's itch."

Copper sulfate use has also caused environmental concerns, as copper will build up in lake sediments. "A lot of different places are really opposed to copper sulfate and are looking for other solutions," Raffel said. "That's why merganser control became popular, but it's difficult and expensive."

Merganser control programs have not proved effective either, according to Reimink who gave the control program for Lake Leelanau as an example.

"Leelanau is giving up," he said. "People are still getting swimmer's itch and sometimes getting bad swimmer's itch, even though there haven't been mergansers on the lake for three years."

Trapping and relocating mergansers is even further complicated by the fact that most Michigan lakes do not have just one species of schistosome, and common mergansers are not the only definitive host.

Recent research further highlights how futile trapping and relocating seems going forward. Researchers, including Reimink, Raffel, and Dr. Patrick Hannington from the University of Alberta, have discovered a novel schistosome species whose definitive host is one of the most common birds around — Canada geese.

Instead of poisoning snails and trapping flocks of ducks and geese, Reimink said that he thinks the solution to swimmer's itch will require rethinking our approach to swimmer's itch altogether.

"To try to control that lake-wide, I think you're fighting a losing battle," Reimink said. "The paradigm shift that needs to happen for people to go swimming and not worry so much about swimmer's itch would be a shift from whole-lake control to the individual."

"The best analogy to use are mosquitoes," Reimink said. "How do we manage mosquitoes?" Of course, we don't try to kill all the mosquitoes. Instead we learn how to live with them — from screened-in porches, to citronella candles, to insect repellent, to long pants instead of shorts.

"You don't have to get swimmer's itch if you don't want to," Reimink said. "There are prevention strategies. It's like when you go out in the mosquito world, you don't have to get mosquito bites if you don't want to."

Reimink and Raffel said that some methods to prevent swimmer's itch have already proven to be quite effective, such as wearing rash guards while swimming. Because cercariae tend to float along the surface and go wherever the wind blows them, avoiding beaches where the wind is blowing directly into the shore can reduce your chances of getting swimmer's itch as well. Other preventative strategies include using baffles to prevent cercariae from floating along the surface into swimming areas.

Raffel said a European study found that applying liposome-based DEET to your skin has promise in preventing swimmer's itch as well. "It doesn't absorb into your skin as much as regular DEET would, and it doesn't rinse off as fast. So, it stays on the surface of your skin longer," Raffel said. "Regular DEET will rinse off of your skin within like five minutes of getting in the water."

Reimink is also experimenting with using anti-jellyfish lotion against the itch-causing cercariae. While this lotion is effective in preventing jellyfish stings in the ocean, its efficacy in preventing swimmer's itch is still unclear. "Not scientifically proven, these are things that we're working on," said Reimink. "We're just saying this is the stage that we're at. We're now attempting to assess some of the prevention strategies to see which ones are most effective."

The paradigm shift away from snail poisoning and bird trapping is still underway, and Reimink said that finding the best solutions will take some time. "We're encouraged," he said. "We're working hard to get prevention strategies that are very cost effective and easy."