SWIMMER'S ITCH:
"AN OUNCE OF PREVENTION..."

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HISTORICAL PERSPECTIVE

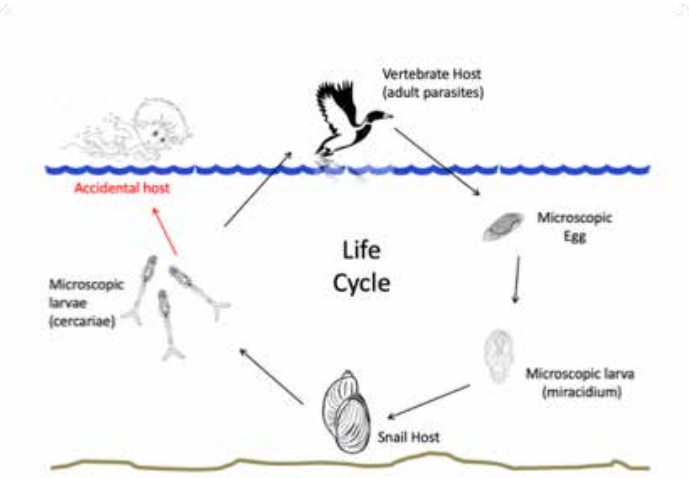
The discovery that avian schistosome cercariae ("worms") cause cercarial dermatitis (Cort, 1928), known regionally as swimmer's itch, set in motion a nearly century-long quest for control of this common and troublesome malady. Initial efforts of control focused on destroying the snail intermediate hosts, either lakewide or in select swim areas, using a molluscicide such as copper sulfate. Research mounted over the ensuing decades showing inadvertent and negative impacts these broad-spectrum chemicals had on non-target species. With the aid of new and developing technologies (Rudko et al., 2018), such as quantitative polymerase chain reaction (qPCR), recent research showed the ineffectiveness of killing the snail intermediate hosts for its intended purpose in a defined swim area (Froelich et al., 2019). Michigan followed other neighboring states in banning the use of these chemicals for swimmer's itch control soon after.

The idea of controlling the adult parasite lakewide by either killing the worms in the definitive waterfowl hosts with a drug (praziquantel) or by removing all summer resident waterfowl began in the late 1980s. Breaking the life cycle and reducing swimmer's itch by managing the definitive host proved challenging, however, due to both transmission from non-resident migratory birds and because there were multiple species of the itch-causing parasites found in many lakes, each with its own unique waterfowl host (Rudko et al., 2022). Adding to the difficulty of control by managing the definitive waterfowl hosts was the important discovery of a new and ubiquitous itch-causing schistosome cycling through Canada geese, a waterfowl species whose population has exploded in Michigan over the past 40 years (McPhail et al., 2021). This newly discovered species now appears to be the most prevalent species in Michigan (Soper et al., 2023), although its effectiveness at causing swimmer's itch for some people is still being researched (Anderson et al., 2022; McPhail et al., 2021).

CHANGING PARADIGMS

Recent scientific discoveries of parasite behavior and parasite community complexity, driven by advances in water sampling technologies and combined with the ineffectiveness of lakewide control on lakes with a healthy biodiversity, stimulated exploration of ways to shift the nearly century-long, lakewide control paradigm to one of localized or individual prevention. This paradigm shift moves us from attacking the parasite hosts (snails and waterfowl) to managing the actual parasite itself.

This shift may have ecological benefits. Organism diversity is a well-established indicator of ecosystem health, which is true even when considering parasites. The same larvae that cause swimmer's itch also function as important members of aquatic food webs and should be preserved (McKee, et al., 2020; Preston, et al., 2013; Koprivnikar, et al., 2023; Moore, et al., 2024). You can think of these larvae as the mosquitoes of the aquatic world…annoying for humans but essential to the natural environment. Their presence and abundance may ultimately help your fishing because they serve as food for zooplankton, which in turn nourish minnows, which then provide food for our prized predator fish.



A GENERALIZED LIFE CYCLE OF THE SWIMMER'S ITCH PARASITES

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New understanding of the temporal-spatial dynamics of the itch-causing worms, again driven by technological advances, created this paradigm shift opportunity. For example, cercariae emerge most abundantly in the morning and travel up to the water surface due to positive phototaxis and negative geotaxis (Horák et al., 2015). They move around in surface waters due to wind and currents (Froelich et al., 2019), often accumulating in shallow water with onshore winds (Sckrabulis et al., 2020). With no feeding mechanism, the worms only live for a day and either die or are eaten as the day progresses, greatly diminishing their numbers later in the day (Rudko et al., 2018).

New knowledge brings new opportunities and this paradigm shift brings with it several advantages. Lake associations don't have to spend large sums of money annually for labor intensive and costly control activities, money that can then be spent on other pressing lake issues, such as battling invasive species. Prevention results are immediate compared to months or even years for some control methods. Environmental impact, both known and yet unknown, is minimized by using prevention strategies rather than killing all the snails or removing resident waterfowl. Importantly, when using prevention techniques, riparians have more control over the outcome and do not have to wonder if they will be attacked on any given day. As more research is conducted and entrepreneurs take new prevention strategy tools to market, swimmer's itch will become less of a concern, and more time and effort will go towards protecting our inland waters from diminishing biodiversity, pollution, and invasive species.

MODIFIED POOL SKIMMER THAT CAN BE DRAGGED THROUGHOUT A SWIM AREA TO REMOVE SWIMMER'S ITCH-CAUSING LARVAE

PREVENTION STRATEGIES TO TRY

There is new hope for riparians battling swimmer's itch. Here are some prevention strategies that may help you, your children, or your grandchildren swim without fear of vacation-ending cases of swimmer's itch, all with little effort or cost to you.

➔ Wear a tight-fitting rash guard

Commonly used for ocean swims to prevent jellyfish stings, these stylish garments also shield against itch-causing larvae. As a bonus, less sunscreen is necessary! There are many rash guard options available.

➔ Swim later in the day

New itch-causing larvae emerge from snails every morning during the summer months and will die off or be eaten as the day progresses (Rudko et al., 2018).

➔ Avoid lounging in surface waters

Larvae exit the snails and immediately migrate to the surface where they accumulate while waiting for a passing duck or goose.

➔ Avoid onshore winds

Larvae drift with the wind and can accumulate near shore. However, a strong onshore wind can actually push the larvae up on land where they quickly die… unless, of course, there is a seawall.

➔ Towel off after swimming

Some larvae are sticky and can cling to the skin when you exit the water.

➔ Swim in deeper water if it is safe and you are able

Larvae are released from shallow water snails, so fewer are found out in deeper water.

➔ Try different creams or lotions

Various products claim to repel larvae from entering the skin and one might work for you (Wulff et al., 2007).

➔ Skim surface water in the swim area with a fine mesh net (20um) before swimming or employ a swim baffle

Experiments employing various skimming apparatuses and containment booms (think oil slick baffle) showed promise for managing the itch-causing worms.

INTERESTING FACTS

➔Each infected snail can release several thousand or more itch-causing larvae every morning during the summer months, and usually <3% of the host snails are infected.

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A SEVERE CASE OF SWIMMER'S ITCH

A BAFFLE SET UP AROUND THE SWIMMING AREA TO KEEP LARVAE FROM ENTERING THE SPACE VIA WIND PATTERNS. THIS METHOD WOULD BE MOST EFFECTIVE IF THE SWIM AREA DOES NOT HAVE LARVAE-CARRYING SNAILS IN IT.

➔The larvae from snails migrate to the surface, don't feed, and therefore only live for a day.

➔All waterfowl and even some terrestrial birds carry the adult parasites, so attracting ducks and geese to your swim area is discouraged.

➔There are now over 100 different itch-causing parasite species around the world, and five or more are commonly found in Michigan. The more you have in your lake the healthier your biodiversity!

➔It's estimated that less than half of swimmers react to the itch-causing parasites that penetrate the skin, but it's not yet known the fate of those worms in people who don't get a reaction.

➔Most parasite eggs enter the lake in the feces of birds defecating in the water.

➔The only infective stage that causes swimmer's itch is the larvae (cercariae) coming from snails.

➔A new species of itch-causing parasite was discovered in Michigan in 2018 and has since been found to be the most widespread in the state (Soper et al., 2023).

➔Some of the newest ecological research describes the importance of the annual biomass (measured in tons) of itch-causing larvae to our lake ecosystems (McKee, et al., 2020; Preston, et al., 2013; Koprivnikar, et al., 2023; Moore, et al., 2024). This is yet another reason to encourage prevention versus control (via killing snails or removing waterfowl) as we all try to preserve our lake environments. There is an urgent need to educate riparians on the value of not turning our lakes into swimming pools.

LEARN MORE

There are many good resources to learn more about these itch-causing parasites, along with recent research on how to prevent swimmer's itch. Here are a few:

➔Center for Disease Control and Prevention (CDC): cdc.gov/parasites/swimmersitch

➔University of Alberta: swimmersitch.info
Scan the code below to report your case of swimmer's itch, learn where others are contacting it, and join the ongoing research on best prevention strategies.

➔Lake Leelanau Lake Association: lakeleelanau.org (they created a useful educational trifold)

➔Freshwater Solutions, LLC: freshwatersol.com (author contact and recent publications)

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