

Unravelling the mystery of the kitty litter parasite in marine mammals

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Researchers at California Polytechnic State University have discovered what may be a clue to the mystery of why marine mammals around the world are succumbing to a parasite that is typically only associated with cats. The key may just be the lowly anchovy, according to research presented today at the 108th General Meeting of the American Society for Microbiology in Boston.

Toxoplasma gondii is a protozoan parasite which causes toxoplasmosis, considered to be the third leading cause of death attributed to foodborne illness in the United States. While the Centers for Disease Control and Prevention estimates that over 20% of the U.S. population carries the parasite, the only known reservoir of the infectious form of the parasite (the oocyst) are cats.

Over the past decade, toxoplasma infection has appeared in a variety of sea mammals including beluga whales, dolphins, sea lions and seals. It has also become a major cause of death in sea otters living off the coast of California. It is estimated that approximately 17% of sea otter deaths can be attributed to toxoplasma. While many believe fresh water runoff contaminated with cat feces is to blame, there is no definitive science on the source of infection.

“The question that drives our research is how are marine mammals from the Arctic Circle to Australia infected by a parasite that is spread primarily through the consumption of infectious cat feces and infected meat? Based on the global prevalence of *T. gondii* infections, we

hypothesize that migratory filter feeders, specifically northern anchovies, are serving to spread *T. gondii* throughout the ocean,” says Gloeta Massie, a graduate student who conducted the research with Associate Professor Michael Black.

As there is no previously published research on the ability of anchovies to filter oocysts, that was the first step towards proving their hypothesis. Massie and Black exposed northern anchovies to the parasite, and then, using molecular techniques, tested for the presence of the parasite within the fish. They detected *T. gondii* DNA in 66% of the exposed fish.

Now that they have shown that anchovies can filter oocysts from the water, the next step is to determine the infectivity of exposed anchovies to mammals.

“Do our research findings mean that you should stop eating anchovy pizza? No. *T. gondii* oocysts are destroyed by high heat. Unfortunately, marine mammals do not have the option of cooking their food before they eat it. As anchovies are considered prey for practically every major predatory marine fish, mammal and bird, if the exposed anchovies harbor infectious oocysts, this could present a possible transmission path of *T. gondii* in the marine environment,” says Massie.

Source: American Society for Microbiology

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