Botflies and the perils of scientific research

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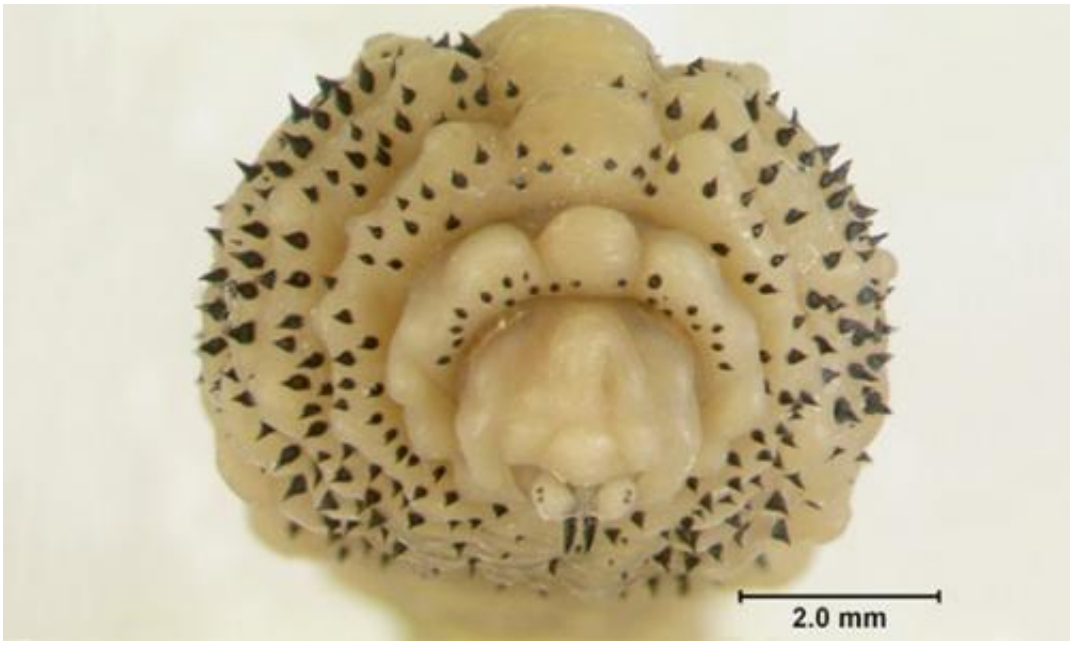

Credit: Lyle J. Buss

At first, Chris Dick thought the persistent ache in his ankle was caused by a thorn embedded in his skin. Made sense, seeing as he had done some work on a Pennsylvania farm around that time. An X-ray revealed nothing unusual, and the doctor recommended that Dick squeeze the foreign object out, once it worked itself toward the surface.

What Dick hadn't considered was his recent scientific expedition to Central America. An associate professor in the Department of Ecology and Evolutionary Biology, Dick collects data in the tropical forest on

Barro Colorado Island, a Smithsonian research station in Panama. It just so happens that parasitic insects called botflies (*Dermatobia hominis*) love the place.

Botflies also love the place just under your skin. And they'll stay there, eating your flesh and growing inside you—in some cases, for several months. The stabbing pain that Dick felt in the protuberance on his ankle was actually a botfly larva chewing through his flesh with its two sharp fangs, wriggling through his tissue.

Rows of spines on the bulbous front end of the larva were gaining purchase, anchoring the creature's body under his skin. Had Dick looked closely, he may have been able to see the posterior end of the larva poking out of a small wound in his ankle, breathing air through its butt.

Botfly, Don't Bother Me

The botfly larva probably found Dick by riding a mosquito. When an adult botfly is ready to lay eggs, she pounces on a mosquito in midflight. She grips the mosquito and glues a bunch of eggs to its belly. Then she flees the scene to find another mosquito, and the egg-heavy mosquito resumes its search for blood meals in places like Dick's ankle. His body heat triggered a botfly egg to hatch, the hatched larva fell onto his skin, and the larva burrowed inside of him, head first.

Left unmolested, a botfly larva would develop until it eventually emerged from the air hole that it drilled in the skin of its host. The larva would drop to the ground, pupate in the soil, and finally metamorphose into an adult fly.

Most people prefer to remove their parasitic insect invaders, however, and a couple of different methods of extraction exist. One tactic capitalizes on what we know of the creature's biology by exploiting its

unique mode of breathing. A larva must occasionally venture its anal breathing apparatus through the surface of the skin to access the surrounding air.

A number of substances can be used to block the breathing hole—applying a thick layer of pork fat, ointment, beeswax, chewing gum, mineral oil, petroleum jelly, nail polish, glue, or duct tape can force the larva to evacuate the skin under threat of suffocation. Pork fat, or even a slab of meat, seems to work especially well, as the larva readily enters another substance that resembles animal flesh. Within about 24 hours, the larva migrates out of the skin and into the pork fat in search of air on the surface; the pork fat and the parasite can then be discarded.

Another method of pest control calls for the simple application of lateral pressure—popping the little beast out like a zit. Yet another option, albeit invasive and expensive, involves injecting anesthesia into the botfly larva and removing it surgically. Fragmentation of the insect can complicate these methods of forcible extraction; any piece of its body left behind can fester and cause an infection.

Dick used the popping method. One day in the shower, he noticed that the sore spot on his ankle was really red. He squeezed, and out came a writhing botfly. He scooped up the larva and kept it as a tropical ecologist's trophy; a scientist's souvenir.

Botflies, face-eating protozoa, giant pit vipers, and other hazards can't keep Chris Dick away from scientific research in the field. Why? Fieldwork allows him to investigate the remarkably improbable dispersal of tree seeds between continents by way of an inhospitable ocean. Tromping through botfly habitat, he can study the sexual reproduction of trees that are pollinated across huge distances in the forest. He has even discovered new tree species in the Amazonian jungle.

Discovery—it's worth an occasional parasitic larva crawling around under your skin. Right?

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