

Cicadas are nature's weirdos. They pee stronger than us and an STD can turn them into zombies

April 1 2024, by Seth Borenstein



A periodical cicada nymph wiggles its forelimbs on the campus of Georgia Institute of Technology in Atlanta on Thursday, March 28, 2024. Trillions of cicadas are about to emerge in numbers not seen in decades and possibly centuries. Credit: AP Photo/Carolyn Kaster

The periodical cicadas that are about to infest two parts of the United

States aren't just plentiful, they're downright weird.

These insects are the strongest uriners in the [animal kingdom](#) with flows that put humans and elephants to shame. They have pumps in their heads that pull moisture from the roots of trees, allowing them to feed for more than a decade underground. They are rescuers of caterpillars.

And they are being ravaged by a [sexually transmitted disease](#) that turns them into zombies.

PUMPS IN THE HEAD

Inside trees are sugary, nutrient-heavy saps that flow through tissue called phloem. Most insects love the sap. But not cicadas—they go for tissue called xylem, which carries mostly water and a bit of nutrients.

And it's not easy to get into the xylem, which doesn't just flow out when a bug taps into it because it's under negative pressure. The cicada can get the fluid because its outsized head has a pump, said University of Alabama Huntsville entomologist Carrie Deans.

They use their proboscis like a tiny straw—about the width of a hair—with the pump sucking out the liquid, said Georgia Tech biophysics professor Saad Bhamla. They spend nearly their entire lives drinking, year after year.

"It's a hard way to make a living," Deans said.



A periodical cicada nymph wiggles in the grass in Macon, Ga., on Thursday, March 28, 2024, after being found while digging holes for rosebushes. Trillions of cicadas are about to emerge in numbers not seen in decades and possibly centuries. Credit: AP Photo/Carolyn Kaster

GOING WITH THE FLOW

All that watery fluid has to come out the other end. And boy does it.

Bhamla in March published a study of the urination flow rates of animals across the world. Cicadas were clearly king, peeing two to three times stronger and faster than elephants and humans. He couldn't look at the [periodical cicadas](#) that mostly feed and pee underground, but he used video to record and measure the flow rate of their Amazon cousins,

which topped out around 10 feet per second (3 meters per second).

They have a muscle that pushes the waste through a tiny hole like a jet, Bhamla said. He said he learned this when in the Amazon he happened on a tree the locals called a "weeping tree" because liquid was flowing down, like the plant was crying. It was cicada pee.

"You walk around in a forest where they're actively chorusing on a hot sunny day. It feels like it's raining," said University of Connecticut entomologist John Cooley. That's their honeydew or [waste product](#) coming out the back end ... It's called cicada rain."



Georgia Institute of Technology biophysicist Saad Bhamla holds a periodical cicada nymph on the campus of Georgia Institute of Technology in Atlanta on Thursday, March 28, 2024. "We've got trillions of these amazing living

organisms come out of the Earth, climb up on trees and it's just a unique experience, a sight to behold," Bhamla said. Credit: AP Photo/Carolyn Kaster

GOOD FOR CATERPILLARS

In the years and areas where cicadas come out, caterpillars enjoy a cicada reprieve.

University of Maryland entomologist Dan Gruner studied caterpillars after the 2021 cicada emergence in the mid-Atlantic. He found that the bugs that turn into moths survived the spring in bigger numbers because the birds that usually eat them were too busy getting cicadas.

Periodical cicadas are "lazy, fat and slow," Gruner said. "They're extraordinarily easy to capture for us and for their predators."

ZOMBIE CICADAS

There's a deadly sexually transmitted disease, a fungus, that turns cicadas into zombies and causes their private parts to fall off, Cooley said.

It's a real problem that "is even stranger than [science fiction](#)," Cooley said. "This is a sexually transmitted zombie disease."

Cooley has seen areas in the Midwest where up to 10% of the individuals were infected.



A cicada hole is visible in the soil after a heavy rain on the campus of Wesleyan College in Macon, Ga., Wednesday, March 27, 2024. Cicadas preemptively dig tunnels to the surface before they are ready to emerge. Credit: AP Photo/Carolyn Kaster



A periodical cicada nymph wiggles in the dirt in Macon, Ga., on Thursday, March 28, 2024, after being found while digging holes for rosebushes. Trillions of cicadas are about to emerge in numbers not seen in decades and possibly centuries. Credit: AP Photo/Carolyn Kaster

The fungus is also the type that has hallucinatory effects on birds that would eat them, Cooley said.

This white fungus takes over the male, their gonads are torn from their body and chalky spores are spread around to nearby other cicadas, he said. The insects are sterilized, not killed. This way the fungus uses the cicadas to spread to others.

"They're completely at the mercy of the [fungus](#)," Cooley said. "They're

walking dead."

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