

Bye bye bugs? Scientists fear non-pest insects are declining

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In this May 26, 2010 file photo, a Coccinellidae, more commonly known as a ladybug or ladybird beetle, rests on the petals of a rose in Portland, Ore. A study estimates a 14 percent decline in ladybugs in the United States and Canada from 1987 to 2006. (AP Photo/Don Ryan)

A staple of summer—swarms of bugs—seems to be a thing of the past. And that's got scientists worried.

Pesky mosquitoes, disease-carrying ticks, crop-munching aphids and cockroaches are doing just fine. But the more beneficial flying [insects](#) of summer—native bees, moths, butterflies, ladybugs, lovebugs, mayflies and fireflies—appear to be less abundant.

Scientists think something is amiss, but they can't be certain: In the past, they didn't systematically count the population of flying insects, so they can't make a proper comparison to today. Nevertheless, they're pretty sure across the globe there are fewer insects that are crucial to as much as 80 percent of what we eat.

Yes, some insects are pests. But they also pollinate plants, are a key link in the food chain and help decompose life.

"You have total ecosystem collapse if you lose your insects. How much worse can it get than that?" said University of Delaware entomologist Doug Tallamy. If they disappeared, "the world would start to rot."

He noted Harvard biologist E.O. Wilson once called bugs: "The little things that run the world."

The 89-year-old Wilson recalled that he once frolicked in a "Washington alive with insects, especially butterflies." Now, "the flying insects are virtually gone."

It hit home last year when he drove from suburban Boston to Vermont and decided to count how many bugs hit his windshield. The result: A single moth.

WINDSHIELD TEST

The un-scientific experiment is called the windshield test. Wilson recommends everyday people do it themselves to see. Baby Boomers

will probably notice the difference, Tallamy said.

Several scientists have conducted their own tests with windshields, car grilles and headlights, and most notice few squashed bugs. Researchers are quick to point out that such exercises aren't good scientific experiments, since they don't include control groups or make comparisons with past results. (Today's cars also are more aerodynamic, so bugs are more likely to slip past them and live to buzz about it.)

Still, there are signs of decline. Research has shown dwindling individual species in specific places, including lightning bugs, moths and bumblebees. One study estimated a 14 percent decline in ladybugs in the United States and Canada from 1987 to 2006. University of Florida urban entomologist Philip Koehler said he's seen a recent decrease in lovebugs—insects that fly connected and coated Florida's windshields in the 1970s and 1980s. This year, he said, "was kind of disappointing, I thought."

University of Nevada, Reno, researcher Lee Dyer and his colleagues have been looking at insects at the La Selva Biological Station in Costa Rica since 1991. There's a big insect trap sheet under black light that decades ago would be covered with bugs. Now, "there's no insects on that sheet," he said.

But there's not much research looking at all flying insects in big areas.

THE EVIDENCE

Last year, a study that found an 82 percent mid-summer decline in the number and weight of bugs captured in traps in 63 nature preserves in Germany compared with 27 years earlier. It was one of the few, if only, broad studies. Scientists say similar comparisons can't be done elsewhere because similar bug counts weren't done decades ago.

"We don't know how much we're losing if we don't know how much we have," said University of Hawaii entomologist Helen Spafford.

The lack of older data makes it "unclear to what degree we're experiencing an arthropocalypse," said University of Illinois entomologist May Berenbaum. Individual studies aren't convincing in themselves, "but the sheer accumulated weight of evidence seems to be shifting" to show a problem, she said.

After the German study, countries started asking if they have similar problems, said ecologist Toke Thomas Hoye of Aarhus University in Denmark. He studied flies in a few spots in remote Greenland and noticed an 80 percent drop in numbers since 1996.

"It's clearly not a German thing," said University of Connecticut entomologist David Wagner, who has chronicled declines in moth populations in the northeastern United States. "We just need to find out how widespread the phenomenon is."

THE SUSPECTS



In this June 27, 2017 file photo, mayflies swarm around the bright lights of a ballpark during a baseball game in Cincinnati. Experts say light pollution is a big problem for some species of insects. Certain bugs are attracted to brightness, where they become easy prey and expend energy they should be using to get food, said University of Delaware entomologist Doug Tallamy. (AP Photo/John Minchillo)

Most scientists say lots of factors, not just one, caused the apparent decline in flying insects.

Suspects include habitat loss, insecticide use, the killing of native weeds, single-crop agriculture, invasive species, light pollution, highway traffic and climate change.

"It's death by a thousand cuts, and that's really bad news," Wagner said.

To Tallamy, two causes stand out: Humans' war on weeds and vast

farmland planted with the same few crops.

Weeds and native plants are what bugs eat and where they live, Tallamy said. Milkweeds, crucial to the beautiful monarch butterfly, are dwindling fast. Manicured lawns in the United States are so prevalent that, added together, they are as big as New England, he said.

Those landscapes are "essentially dead zones," he said.

Light pollution is another big problem for species such as moths and fireflies, bug experts said. Insects are attracted to brightness, where they become easy prey and expend energy they should be using to get food, Tallamy said.

Jesse Barber of Boise State is in the middle of a study of fireflies and other insects at Grand Teton National Park. He said he notices a distinct connection between light pollution and dwindling populations.

"We're hitting insects during the day, we're hitting them at night," Tallamy said. "We're hitting them just about everywhere."

Lawns, [light pollution](#) and bug-massacring highway traffic are associated where people congregate. But Danish scientist Hoyer found a noticeable drop in muscid flies in Greenland 300 miles (500 kilometers) from civilization. His studies linked declines to warmer temperatures.

Other scientists say human-caused climate change may play a role, albeit small.

RESTORING HABITAT

Governments are trying to improve the situation. Maryland is in a three-year experiment to see if planting bee-friendly native wildflowers helps.

University of Maryland entomology researcher Lisa Kuder says the usual close-crop "turf is basically like a desert" that doesn't attract flying insects. She found an improvement—70 different species and records for bees—in the areas where flowers are allowed to grow wild and natural alongside roads.

The trouble is that it is so close to roadways that Tallamy fears that the plants become "ecological traps where you're drawing insects in and they're all squashed by cars."

Still, Tallamy remains hopeful. In 2000, he moved into this rural area between Philadelphia and Baltimore and made his 10-acre patch all native plants, creating a playground for [bugs](#). Now he has 861 species of moths and 54 species of breeding birds that feed on insects.

Wagner, of the University of Connecticut, spends his summers teaching middle schoolers in a camp to look for insects, like he did decades ago. They have a hard time finding the cocoons he used to see regularly.

"The kids I'm teaching right now are going to think that scarce insects are the rule," Wagner said. "They're not realizing that there could be an ecological disaster on the horizon."

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