

# Mosquito-feeding study may help stem dangerous viruses

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Mosquito. Image: UCLA.

Mosquitoes bite male birds nearly twice as often as they bite females, a finding that may help scientists understand how to stem some viruses from spreading to humans, new University of Florida research shows.

In findings published online today in *Royal Society Open Science*, UF entomology assistant professor Nathan Burkett-Cadena found [mosquitoes](#) bite male birds 64 percent of the time, compared to 36 percent for [females](#).

This marks the first step for scientists to try to determine why mosquitoes bite men more often than women in some parts of the world and vice versa in other areas, said Burkett-Cadena, who is based at the Florida Medical Entomology Laboratory in Vero Beach.

"Understanding why mosquitoes bite males more often than females may lead to novel strategies for interrupting disease transmission," said Burkett-Cadena, an Institute of Food and Agricultural Sciences faculty member.

Woodbridge Foster, a retired entomology professor at The Ohio State University, who was not part of the study, said research like this points scientists in the right direction toward mosquito-borne virus prevention.

"In the case of humans, sex- and age-connected risk can be reduced in a number of ways, including immunization, repellents, altering work and non-work habits and modifying the environment of the most vulnerable," Foster said.

Scientists such as Burkett-Cadena battle vector-borne diseases, which account for an estimated 17 percent of infectious diseases globally, according to the World Health Organization. Malaria, the most deadly vector-borne disease, caused an estimated 627,000 deaths in 2012.

"Until now, it's only been suspected that mosquitoes bite males—whether they're humans, birds or other animals—more often than females," he said. "Male birds are infected more often than females with the diseases that mosquitoes carry, so it makes sense that mosquitoes bite males more often. However, until this study, no one had shown it."

For his study, Burkett-Cadena and his colleagues went to a swamp near Tampa to collect hundreds of females of three mosquito species known to transmit viruses from birds to humans. Many of the mosquitoes still had blood in their digestive system that came from the animals they bit.

The blood-engorged mosquitoes were crushed to collect the animal blood from their guts. Then the blood was screened to determine what

type of animal they had bitten and another test run to determine the animal's gender. Through the tests, Burkett-Cadena identified the sex of birds from which mosquitoes fed.

Now that scientists know mosquitoes suck blood from [male birds](#) more than females, they can turn their research attention globally. For example, the human malaria parasite can be found five times more often in men than women in China, according to a 2009 study. Burkett-Cadena said using his method, researchers could investigate whether mosquitoes bite men more often than women and if that is the reason Chinese men are more often infected with malaria.

"What if some behavior men are engaging in is exposing them more to mosquitoes?" he said. "It's not that mosquitoes prefer to feed on men, but it's probably something men are doing. Are they working or relaxing outside while women are inside, taking care of the household? If men and women are engaging in different activities that cause them to be bitten by mosquitoes more or less often, then perhaps people can alter their behaviors to reduce their chances of contracting a deadly disease."

Provided by University of Florida

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