

[AAAS.ORG](#) | [FEEDBACK](#) | [HELP](#) | [LIBRARIANS](#)

Daily News

Enter Search Term

ADVANCED

[ALERTS](#) | [ACCESS RIGHTS](#) | [MY ACCOUNT](#) | [SIGN IN](#)

[News Home](#) | [ScienceNOW](#) | [ScienceInsider](#) | [Premium Content from Science](#) | [About Science News](#)

[Home](#) > [News](#) > [ScienceNOW](#) > [October 2009](#) > To Mosquitoes, We Smell Like Bird

Science **NOW** UP TO THE MINUTE NEWS FROM SCIENCE

To Mosquitoes, We Smell Like Bird

by Martin Enserink on 27 October 2009, 12:00 AM | [Permanent Link](#) | [0 Comments](#)

[Email](#) | [Print](#) |

0

[More](#)

[PREVIOUS ARTICLE](#)

[NEXT ARTICLE](#)

After its favorite birds have migrated away, the mosquito that transmits the West Nile virus starts snacking on people. Now researchers think they know why. Humans and birds produce a common smell that the mosquitoes find irresistible.

To find their hosts, mosquitoes sense heat, CO₂, moisture, and certain volatile chemicals; which cues they use depends on the species. Entomologists Walter Leal and Zainulabuddin Syed of the University of California, Davis, wanted to know what lures *Culex pipiens quinquefasciatus*, better known as the southern house mosquito. The species is an important--although not the only--carrier of the West Nile fever, the viral disease introduced in New York City from the Middle East in 1999 that has [become widespread](#) in North America. West Nile virus has wreaked havoc mostly on bird populations, but humans and a variety of other animals can become infected as well when bitten by a mosquito that previously dined on an infected bird. Symptoms can range from fever and headaches to coma and paralysis; last year 44 patients died from the virus.

Leal and Syed wondered whether the insects followed the same scent to find people and birds. So they analyzed the chemical composition of the odor mixture wafting from the forearms of 16 people of various ethnic backgrounds; they did the same for samples from pigeons and chickens, two species that *Culex* mosquitoes like. Of the four ingredients that dominated the human odors, the team found one, called nonanal, that for unknown reasons was also present at high levels in the bird samples.

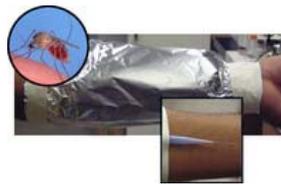
Next, the researchers tested whether neurons in the insects' olfactory receptors, or sensilla, responded to nonanal. They found that the compound triggered a strong reaction in more than half of the insects' 1300 sensilla, suggesting that the molecule drives the insect's behavior. Finally, the duo tested whether mosquitoes are actually drawn to nonanal. Disease surveillance programs often use traps baited with CO₂ (in the form of dry ice) to catch mosquitoes, which are then tested for the presence of viruses. When the researchers added nonanal to these traps, their catch increased by about 50%, they [report](#) online this week in the *Proceedings of the National Academy of Sciences*.

The findings help explain why West Nile fever crosses from birds to humans so easily, says Leal. There are practical upshots as well. Coupled with certain design improvements, nonanal might make mosquito traps so efficient that they can become a new weapon in the fight against mosquitoes. That would be welcome, Leal says, because spraying insecticides is controversial.

"It's beautiful work," says Bart Knols, a Netherlands-based medical entomologist who has studied chemical attraction in malaria mosquitoes. "They've gone all the way from the chemical analyses to the field. ... You don't often see that in one paper." Knols says that the study could lead to major improvements in disease surveillance. But he's skeptical that traps can ever catch enough mosquitoes to make a serious dent in populations.

Follow **ScienceNOW** on [Facebook](#) and [Twitter](#)

[ENLARGE IMAGE](#)



Bait. Researchers collected odor profiles from human forearms wrapped in aluminum foil. One component, nonanal, proved irresistible to *Culex* mosquitoes (inset).

Credit: S. Zainulabuddin and W. S. Leal, PNAS Early Edition (2009); (mosquito inset) USGS

ADVERTISEMENT

STAY PLUGGED IN



Gender and STEM Faculty Positions and More

with *Science* PODCAST

ADVERTISEMENT

AAAS
MEMBERCENTRAL



the official website
for AAAS members

[SIGN UP NOW!](#)

ScienceNOW. ISSN 1947-8062

Email | Print | **Share** 0 tweet More



Login Your name (required)

Share This Page

What's on your mind...

Follow
Cancel Post

Echo 17 Items

[Admin](#)



Harshad

Yes, but noanal is one of the myriad compounds that mosquitoes are attracted from human sweat. Why not try those in the baits.

Tuesday, August 10, 2010, 2:39:33 AM – Flag – Like – Reply



doc beeb

perhaps there's a scent that could mask or interfere with nonanal that might block the receptor in the birds

Sunday, November 08, 2009, 5:53:40 PM – Flag – Like – Reply



Jacob E John

odour-scent traps are a good way of keeping the mosquitoes away.

all the best

Saturday, November 07, 2009, 8:48:55 PM – Flag – Like – Reply



DP Mohapatra

Its an exciting research finding. I liked both the original article in the PNAS and this commentary too. Excellent work.

Friday, October 30, 2009, 8:43:51 PM – Flag – Like – Reply



Alexander from Oregon

So, does citronellal distract mosquitoes or just saturate their olfactory system?

Thursday, October 29, 2009, 2:23:43 PM – Flag – Like – Reply



Robert Toein

Gene Behind Mosquitoes Identified (Labslink.com show on Oct 2, 2009). Mosquitoes can also be our allies in the fight against this common foe, which kills almost one million people a year and heavily impairs the economies of affected countries.

Thursday, October 29, 2009, 1:44:16 PM – Flag – Like – Reply



Shamus

Actually pretty impressed that their hypothesis was followed up with field tests that backed up their assumptions. Malaria and other diseases passed thru blood and spread by mosquitos are serious issues as well, and so this is welcome research all around.

Wednesday, October 28, 2009, 10:35:02 AM – Flag – Like – Reply



Matt Langley

You don't have to catch enough mosquitoes to make a dent in the population, just enough to make sensitivity to nonanal a breeding disadvantage, and maybe the mosquitoes will evolve to use other cues which are more unique to birds.

Wednesday, October 28, 2009, 9:37:00 AM – Flag – Like – Reply



Rianne Lampers

Very interesting article. Now I would like to know why some humans get bitten more than others. For instance, I hardly ever get bitten, while my partner is a regular victim. Is this because he has more nonanal than I have?

Wednesday, October 28, 2009, 7:20:24 AM – Flag – Like – Reply



Guest

Now what can be done is to spread a genetic mutation in mosquitoes that would stop them liking "our" smell. This mutation should be attached to its reproductive ferromone production gene.

Wednesday, October 28, 2009, 6:20:04 AM – Flag – Like – Reply



rome john

i want to see the whole part of cell

Wednesday, October 28, 2009, 2:13:37 AM – Flag – Like – Reply



JK

I love this article and experiment.

Great works

Tuesday, October 27, 2009, 10:35:22 PM – Flag – Like – Reply



Casey

Used and cited this for school work.
Thanks!

Tuesday, October 27, 2009, 10:13:18 PM – Flag – Like – Reply



Guest

mosquitos are wonderful insects!

Tuesday, October 27, 2009, 9:46:59 PM – Flag – Like – Reply



EvoDevo

Maybe if we wear those tin foil sleeves...

Tuesday, October 27, 2009, 9:46:38 PM – Flag – Like – Reply



EvoDevo

Is there any way to block the release of nonanol from our own skin, to reduce our attractiveness to mosquitos?

Tuesday, October 27, 2009, 9:45:49 PM – Flag – Like – Reply

Liked by Guest



Web design company

GREAT ARTICLE ON MOSQUITOES! THANKS FOR SHARING SUCH GOOD INFO!

Tuesday, October 27, 2009, 6:12:02 PM – Flag – Like – Reply