

Follow all of ScienceDaily's
latest research news and
top science headlines!

Science News

from research organizations

[Print](#)
[Email](#)
[Share](#)

Common pesticide damages honey bees' ability to fly

Date: April 26, 2017

Source: University of California San Diego

Summary: Biologists have provided the first evidence that a widely used pesticide can significantly impair the ability of otherwise healthy honey bees to fly. The study, which employed a bee "flight mill," raises concerns about how pesticides affect honey bee pollination and long-term effects on the health of honey bee colonies.

Share:

RELATED TOPICS

Plants & Animals

- > Agriculture and Food
- > Insects (including Butterflies)
- > Food and Agriculture

Earth & Climate

- > Exotic Species
- > Weather
- > Grassland

Science & Society

- > Poverty and Learning
- > Land Management
- > World Development

RELATED TERMS

- > Honey
- > Bee sting
- > Pollination management
- > Honeybee
- > Beekeeping
- > Pesticide poisoning

FULL STORY



A honey bee (*Apis mellifera*) is harnessed for study on a flight mill in biology professor James Nieh's laboratory, UC San Diego.

Credit: Simone Tosi, UC San Diego

Biologists at the University of California San Diego have demonstrated for the first time that a widely used pesticide can significantly impair the ability of otherwise healthy honey bees to fly, raising concerns about how pesticides affect their capacity to pollinate and the long-term effects on the health of honey bee colonies.

Related Stories



Nutrition Matters: Stress from Migratory Beekeeping May Be Eased by Access to Food

Aug. 24, 2016 — In the first large-scale and comprehensive study on the impacts of transporting honey bees to pollinate various crops, research shows that travel can adversely affect bee health and lifespan. Some of ... [read more »](#)



Transmission of Viruses Between Eastern and Western Honey Bees Are Rare

Apr. 1, 2016 — Interspecific transfers of viruses between the western honey bee (*Apis mellifera*) and the eastern honey bee (*Apis cerana*) are rare, even if honey bees are kept in close proximity, new research ... [read more »](#)

How DNA and a Supercomputer Can Help Sustain Honey Bee Populations

Nov. 13, 2015 — To uncover what plants honey bees rely on, researchers are applying DNA metabarcoding to pollen analysis. A new method uses three loci to characterize pollen samples collected by honey bees. This ... [read more »](#)



Highly Contagious Honey Bee Virus Transmitted by Mites

June 7, 2012 — Researchers report that the parasitic 'Varroa' mite has caused the deformed wing virus to proliferate in honey bee colonies. This association is now thought to contribute to the world-wide ... [read more »](#)

Strange & Offbeat

PLANTS & ANIMALS



Mystery of the Missing Mercury at the Great Salt Lake

Previous research has shown that foraging honey bees that ingested neonicotinoid pesticides, crop insecticides that are commonly used in agriculture, were less likely to return to their home nest, leading to a decrease in foragers.

A study published April 26 in *Scientific Reports* by UC San Diego postdoctoral researcher Simone Tosi, Biology Professor James Nieh, along with Associate Professor Giovanni Burgio of the University of Bologna, Italy, describes in detail how the neonicotinoid pesticide thiamethoxam damages honey bees. Thiamethoxam is used in crops such as corn, soybeans and cotton. To test the hypothesis that the pesticide impairs flight ability, the researchers designed and constructed a flight mill (a bee flight-testing instrument) from scratch. This allowed them to fly bees under consistent and controlled conditions.

Months of testing and data acquisition revealed that typical levels of neonicotinoid exposure, which bees could experience when foraging on agricultural crops -- but below lethal levels -- resulted in substantial damage to the honey bee's ability to fly.

"Our results provide the first demonstration that field-realistic exposure to this pesticide alone, in otherwise healthy colonies, can alter the ability of bees to fly, specifically impairing flight distance, duration and velocity" said Tosi. "Honey bee survival depends on its ability to fly, because that's the only way they can collect food. Their flight ability is also crucial to guarantee crop and wild plant pollination."

Long-term exposure to the pesticide over one to two days reduced the ability of bees to fly. Short-term exposure briefly increased their activity levels. Bees flew farther, but based upon other studies, more erratically.

"Bees that fly more erratically for greater distances may decrease their probability of returning home," said Nieh, a professor in UC San Diego's Division of Biological Sciences.

This pesticide does not normally kill bees immediately. It has a more subtle effect, said Nieh.

"The honey bee is a highly social organism, so the behavior of thousands of bees are essential for the survival of the colony," said Nieh. "We've shown that a sub-lethal dose may lead to a lethal effect on the entire colony."

Honey bees carry out fundamentally vital roles in nature by providing essential ecosystem functions, including global pollination of crops and native plants. Declines in managed honey bee populations have raised concerns about future impacts on the environment, food security and human welfare.

Neonicotinoid insecticides are neurotoxic and used around the world on broad varieties of crops, including common fruits and vegetables, through spray, soil and seed applications. Evidence of these insecticides has been found in the nectar, pollen and water that honey bees collect.

"People are concerned about honey bees and their health being impaired because they are so closely tied to human diet and nutrition," said Nieh. "Some of the most nutritious foods that we need to consume as humans are bee-pollinated."

Story Source:

Materials provided by **University of California San Diego**. *Note: Content may be edited for style and length.*



Banded Mongooses Target Family Members for Eviction



What Can We Learn from Dinosaur Proteins?



Wax Worm Caterpillar Will Eat Plastic Shopping Bags: New Solution to Plastic Waste?

EARTH & CLIMATE



The Radiohead Ant: A New Species of 'Silky' Ant Grows Fungus Gardens for Food



Ant Agricultural Revolution Began 30 Million Years Ago in Dry, Desert-Like Climate



Ridding the Oceans of Plastics by Turning the Waste Into Valuable Fuel



This Timid Little Fish Escapes Predators by Injecting Them With Opioid-Laced Venom

FOSSILS & RUINS

Sea Scorpions: The Original Sea Monster

Giant Sloth Was Vegetarian: Diet of Fossil Megatherium Decoded



Early Dinosaur Cousin Had a Surprising Croc-Like Look

'What Do Old Books Smell Like?' Preserving Smells as Important Cultural Heritage

Journal Reference:

1. Simone Tosi, Giovanni Burgio, James C. Nieh. **A common neonicotinoid pesticide, thiamethoxam, impairs honey bee flight ability.** *Scientific Reports*, 2017; 7 (1) DOI: 10.1038/s41598-017-01361-8

Cite This Page:

MLA	APA	Chicago
-----	-----	---------

University of California San Diego. "Common pesticide damages honey bees' ability to fly." ScienceDaily. ScienceDaily, 26 April 2017.

<www.sciencedaily.com/releases/2017/04/170426093454.htm>.

Powered by Google



Termite Treatment Service - HiTech...

Ad hitechtermite.com

Using Spearmint And Lemongrass...

sciencedaily.com

Largest selection of Warre - Cedar...

Ad thewarrestore.com

Fungus Foot Baths Could...

sciencedaily.com

Underwear Has Evolved

Ad MackWeldon.com

Human Urine As A Safe,...

sciencedaily.com

Common crop pesticides kill...

sciencedaily.com

New data unearths pesticide peril in...

sciencedaily.com

Recommended Articles

Diesel exhaust alters half of flower scents honey bees use to find food

Catharine Paddock PhD, Medical News Today, 2015

Scientists discover how bees naturally immunize their offspring

Catharine Paddock PhD, Medical News Today, 2015

New method finds 57 pesticides in poisoned honey bees

Catharine Paddock PhD, Medical News Today,

Monsanto Forms Honey Bee Advisory Council

GenomeWeb, 2013

Could bee bacteria provide alternatives to antibiotics?

Catharine Paddock PhD, Medical News Today, 2014

Honey Bees Reveal Link Between Sugar Sensitivity And Metabolic Disorders

Catharine Paddock PhD, Medical News Today, 2012

Genome BC Funds \$5.7M Project to Research Healthier Honey Bees

GenomeWeb, 2011

Forrest Innovations Aims to Use RNAi to Combat Citrus Disease, Control Mosquitos

GenomeWeb, 2015

USDA Clears RNAi-modified Potato, Alfalfa

GenomeWeb, 2014

UPMC Researchers Get Funding to Study Link between Pesticides and Parkinsons Disease

GenomeWeb, 2014

Free Subscriptions

Get the latest science news with ScienceDaily's free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

 [Email Newsletters](#)

 [RSS Feeds](#)

Follow Us

Keep up to date with the latest news from ScienceDaily via social networks:

 [Facebook](#)

 [Twitter](#)

 [Google+](#)

 [LinkedIn](#)

Mobile Apps

Get the latest news from ScienceDaily via our free mobile apps, available for download on the following platforms:

 [iPhone/iPad](#)

 [Android](#)

Have Feedback?

Tell us what you think of ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

 [Leave Feedback](#)

 [Contact Us](#)

[About This Site](#) | [Editorial Staff](#) | [Awards & Reviews](#) | [Contribute](#) | [Advertise](#) | [Privacy Policy](#) | [Terms of Use](#)

Copyright 2016 ScienceDaily or by third parties, where indicated. All rights controlled by their respective owners.

Content on this website is for information only. It is not intended to provide medical or other professional advice.

Views expressed here do not necessarily reflect those of ScienceDaily, its staff, its contributors, or its partners.