

Common pesticide damages bees' ability to fly

A common pesticide damages the honey bee's ability to fly, according to ground-breaking new research.

The study provides the first evidence that a widely used pesticide alone can harm the flight of bees.

Biologists have shown that the crop spray 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 bee colonies.

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



Honey bees carry out fundamentally vital roles in nature by providing essential ecosystem functions, according to scientists

The new study, published in the journal Scientific Reports, describes in detail how the neonicotinoid pesticide thiamethoxam damages honey bees.

Thiamethoxam is used in crops such as corn, soybeans and cotton.

To test whether the pesticide impairs flight ability, the researchers designed and constructed a flight mill - a bee flight-testing instrument - from scratch. The apparatus 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 bees' ability to fly.

Doctor Simone Tosi, of University of California San Diego, said: '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.'

'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.'



Biologists have shown that the crop spray can 'significantly impair' the ability of otherwise healthy honey bees to fly

Dr Tosi said 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.

Professor James Nieh, of UC San Diego, said: 'Bees that fly more erratically for greater distances may decrease their probability of returning home.'

He said the pesticide doesn't normally kill bees immediately, but it has a more 'subtle' effect.

Prof Nieh said: 'The honey bee is a highly social organism, so the behaviour of thousands of bees are essential for the survival of the colony.'

'We've shown that a sub-lethal dose may lead to a lethal effect on the entire colony.'



The pesticide examined by researchers doesn't normally kill bees immediately, but it has a more 'subtle' effect, according to

scientists (stock photo)

He said 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 the future impact on the environment, food security and human welfare.

Prof Nieh said neonicotinoid insecticides are neurotoxic and used around the world on a broad variety of crops, including common fruits and vegetables, through spray, soil and seed applications.

Evidence of the insecticides has been found in the nectar, pollen and water that honey bees collect.

Prof Nieh added: 'People are concerned about honey bees and their health being impaired because they are so closely tied to human diet and nutrition.

'Some of the most nutritious foods that we need to consume as humans are bee-pollinated.'