

Nicotine enhances bees' activity

May 16 2017



Nicotine-laced nectar can speed up a bumblebee's ability to learn flower colors, according to scientists at Queen Mary University of London (QMUL). Credit: D.Baracchi/QMUL

Nicotine-laced nectar can speed up a bumblebee's ability to learn flower colours, according to scientists at Queen Mary University of London

(QMUL).

The researchers used artificial [flowers](#) in a tightly-monitored flight arena in the laboratory to mimic how flowering plants use animals as pollen carriers and reward pollinators with sugars found in floral [nectar](#).

The team sought to understand whether [nicotine](#) plays a role in the bees' ability to learn flower colours. In an experiment, 60 bees had to choose between flowers that had a sugar solution and another that was laced with nicotine - differentiated by the colour of the flower.

The bees learned about the flowers with reward (ones that contained the sugar solution) faster if it had been laced with nicotine, even at very low concentrations. The bees maintained a predisposition for the flower even after the reward had been removed, resulting in 'addiction-like' behaviour from the bee.

Professor Lars Chittka from QMUL's School of Biological and Chemical Sciences, said: "Flowers typically [reward](#) pollinators 'honestly' with rewards such as [sweet nectar](#), but nature's trick box is endlessly resourceful: some plant species gain an unfair advantage over competing species by spiking their nectar with addictive substances, such as nicotine in tobacco flowers.

"Here we find that bees not only remember such flowers better, but even keep coming back for more when these flowers are demonstrably poorer options, as if they were truly hooked on these flowers."

The research, published today (Tuesday 16 May) in the journal *Scientific Reports*, adds to the Chittka lab's understanding of how bees - insects with a brain no bigger than a pinhead - can perform complex tasks.

Previously the lab has shown that bees can be trained to roll balls,

effectively scoring a goal, and pull strings to obtain food. They have also shown, with researchers at Royal Holloway, University of London, that bumblebees that have been infected by parasites seek out flowers with nicotine in the nectar, likely to fight off the infection. The nicotine appears to slow the progression of disease in [infected bees](#) but has harmful effects when consumed by healthy bees.

The current research suggests that plants might manipulate pollinator behaviour for their own good, using psychoactive substances such as nicotine in the nectar.

Co-author Dr David Baracchi who is now based at the University of Toulouse in France said: "I am convinced that what we found with this study is just the tip of the iceberg. Plants may have hundreds of metabolites in their nectars and it is possible that many of them have to some degree similar psychoactive properties."

A potential concern is that nicotine acts on the same parts of the nervous system as neonicotinoids - popular pesticides that might make some flowers addictively attractive to [bees](#) - even though these substances are toxic for insects.

Provided by Queen Mary, University of London

Citation: Nicotine enhances bees' activity (2017, May 16) retrieved 25 April 2024 from <https://phys.org/news/2017-05-nicotine-bees.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--