

# The humidity of flowers acts as an invisible attractor for bumblebees

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As well as bright colors and subtle scents, flowers possess many invisible ways of attracting their pollinators, and a new study shows that bumblebees may use the humidity of a flower to tell them about the

presence of nectar, according to scientists at the Universities of Bristol and Exeter.

This new research has shown that bumblebees are able to accurately detect and choose between [flowers](#) that have different levels of [humidity](#) next to the surface of the flower.

The study, published this week in the *Journal of Experimental Biology*, showed that bees could be trained to differentiate between two types of artificial flower with different levels of humidity, if only one of the types of flower provided the bee with a reward of sugar water.

To make sure that the artificial flowers mimicked the humidity patterns seen in real flowers, the researchers built a robotic sensor that was able to accurately measure the shape of the humidity patterning.

Dr. Michael Harrap carried out the research whilst based at the University of Bristol's School of Biological Sciences and is lead author of the study. He said: "We know that different species of plants produce flowers that have distinct patterns of humidity, which differ from the surrounding air. Knowing that bees might use these patterns to help them find food shows that flowers have evolved a huge variety of different ways of attracting pollinators, that make use of all the pollinators' senses."

Professor Natalie Hempel de Ibarra, Associate Professor at the University of Exeter's School of Psychology, explained: "Our study shows that bumblebees not only use this [sensory information](#) to make choices about how they behave, but are also capable of learning to distinguish between humidity patterns in a similar way to how they learn to recognize the color or smell of a flower."

Dr. Sean Rands, Senior Lecturer in the University of Bristol's School of

Biological Sciences, added: "If humidity patterns are important for attracting pollinators, they are likely to be one of several different signals (such as color, scent and pattern) that a flower is using at the same time, and could help the bee to identify and handle the flower more efficiently.

"The effectiveness of humidity patterns may depend upon the humidity of the environment around the flower; [climate change](#) may affect this environmental humidity, which in turn could have a [negative effect](#) on a visiting bee because the effectiveness of the humidity pattern will be altered."

**More information:** Michael J. M. Harrap et al, Bumblebees can detect floral humidity, *Journal of Experimental Biology* (2021). [DOI: 10.1242/jeb.240861](#)

Provided by University of Bristol

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