

INSIDE JEB

Bumblebees feel bloom humidity when choosing where to sip



Bumblebees have an amazing array of senses to tell them whether a flower is worth the effort. Using blooms' pungent scents, their vivid shades and dancing electric fields, bumblebees can learn to discriminate between the flowers that are well stocked with nectar and those that are not. But Heather Whitney and Sean Rands from the University of Bristol, UK, and Natalie Hempel de Ibarra from the University of Exeter, UK, knew that other nectar-sipping insects can also detect the humidity of the air surrounding a flower to tell them when the bloom will provide sustenance. Could bumblebees also feel when the air surrounding a bloom is humid, possibly indicating that the flower is brimming with nectar?

Michael Harrap from the University of Bristol, UK, designed and built fake blooms from perforated plastic screw-top lids – creating humidity either

actively by pumping moistened air through these perforations or passively using wet sponges beneath the lid. He also covered the lids with gauze and provided a tiny well filled with sugar syrup at the centre of the simulated bud, to reward the bees that were bold enough to visit. But bumblebees are notoriously finicky, so Harrap also made sure that the blooms were the same temperature and appeared identical to each other, to ensure that the only difference from the bees' perspective was the humidity of the air above the disc. After Henry Knowles from the University of Bristol, UK, verified that the fake flowers were as humid as genuine blooms, the team offered the bees a choice between the humid and dry fake flower heads, recording whether the bees landed on the flowers and attempted to sip, or simply touched down before taking off again.

The bumblebees categorically preferred the humid flowers and, when the team checked whether the insects were capable of learning that humid flowers tended to provide nectar, the bees picked up quickly that the humid flowers were the most profitable. However, the air around some flowers is less moist than others and it seems that bumblebees are also capable of learning to visit drier flowers, so long as they get their nectar reward. Humidity is just another aspect of the sensory pallet that bumble bees call on when choosing which blooms to frequent.

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