Bees use invisible heat patterns to choose flowers

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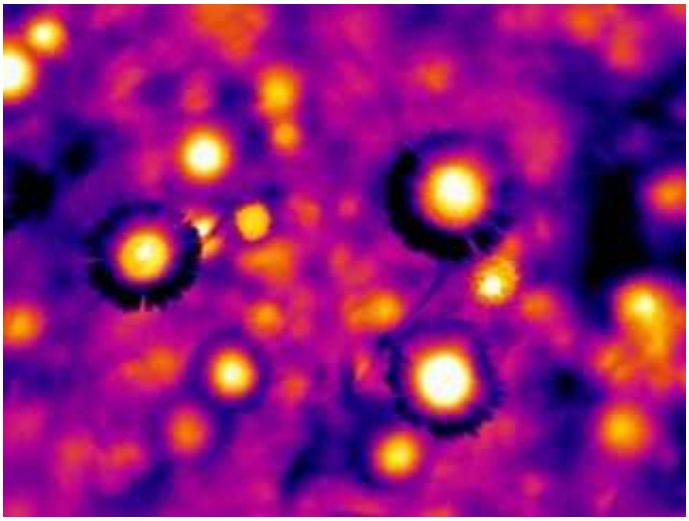


Floral heat patterns from daisies. Credit: University of Bristol

A new study, led by scientists from the University of Bristol, has found that a wide range of flowers produce not just signals that we can see and smell, but also ones that are invisible such as heat.

In the hidden world of flower-pollinator interactions, heat can act not only as life-sustaining warmth, but can also be part of the rich variety of sensory signposts that flowers use to provide advertisement and information for their insect pollinators.

The majority of flowers examined, including many common in gardens,

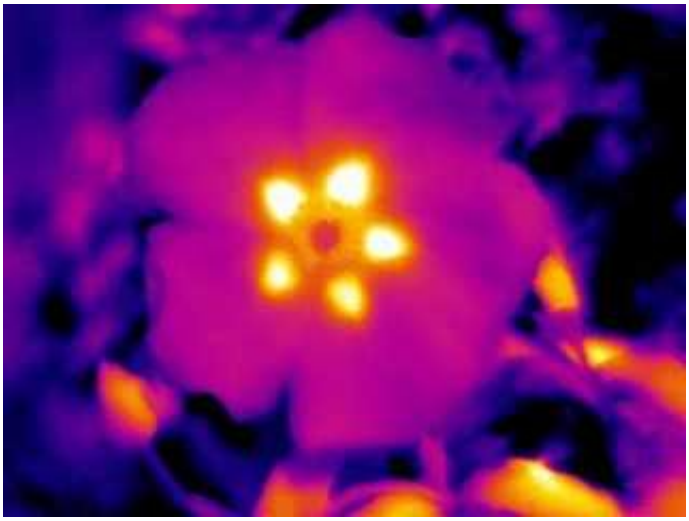
such as poppies and daisies, had complex patterns of heat across their petals, echoing the colourful patterns that we see with our own eyes.

On average these patterns were 4-5°C warmer than the rest of the flower, although the patterns could be as much as 11°C warmer.

The Bristol Scientists made artificial flowers that copied these heat patterns, but did not include the corresponding colour patterns.

While these artificial flowers look identical to human eyes, and we are not able to tell them apart, it is a different case for foraging bumblebees.

Bumblebees, who visit a wide range of different flowers, were found to be able to use these patterns to distinguish between different flowers and the rewards that they provide.



Floral heat patterns from rock rose. Credit: University of Bristol

The study's lead author, Dr Heather Whitney, from the University of

Bristol's School of Biological Sciences, said: "The presence of multiple cues on flowers is known to enhance the ability of bees to forage efficiently, so maximising the amount of food they can take back to sustain the rest of their colony.

"Climate change might have additional previously unexpected impacts on bee-flower interactions by disrupting these hidden heat patterns."

Floral heat patterns from poppies. Credit: University of Bristol

The study is published in *eLife*.

More information: Michael JM Harrap et al. The diversity of floral temperature patterns, and their use by pollinators, *eLife* (2017). DOI: 10.7554/eLife.31262

Provided by University of Bristol