Tiny transmitters glued to the backs of bees for the first time

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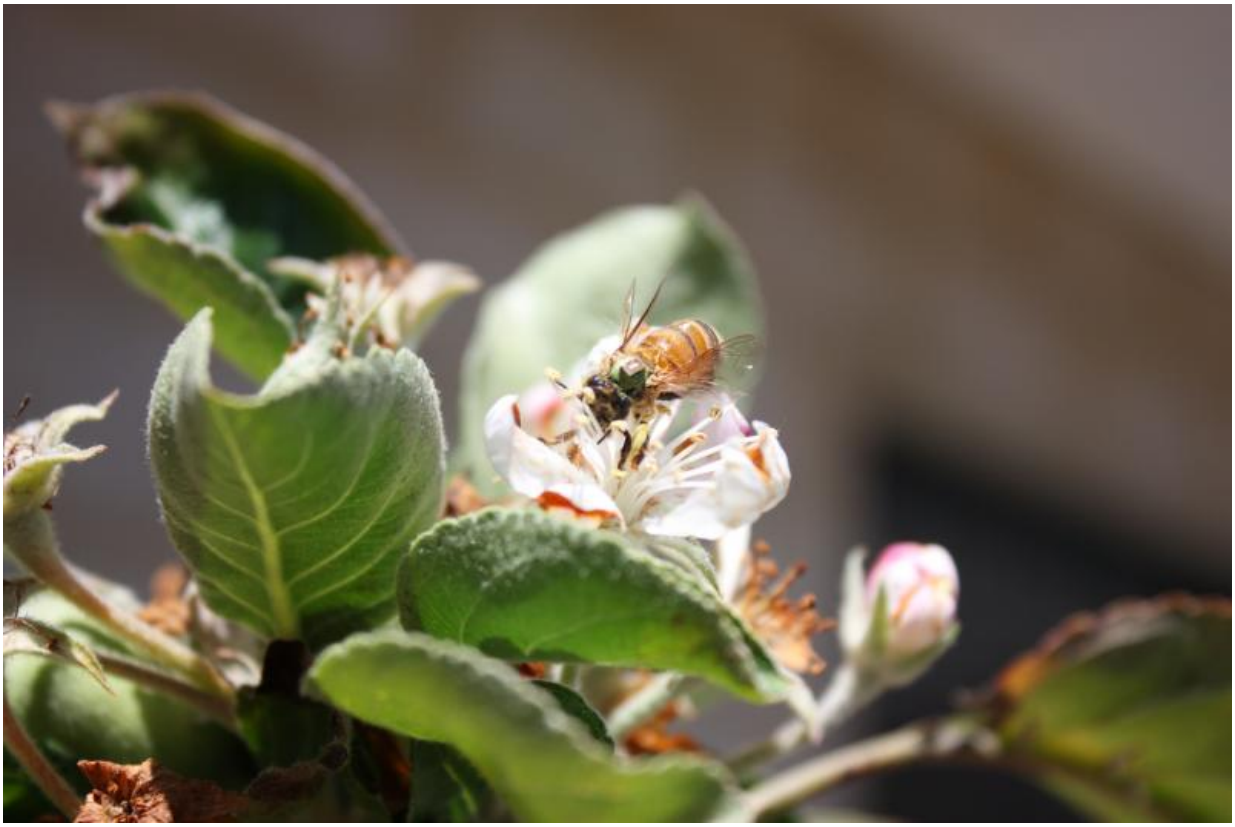

James Cook University researchers in Australia are creating a buzz in bee research, gluing tiny transmitters to the backs of the insects for the first time.

Lead researcher, JCU's Dr Lori Lach, said the team glued Radio-Frequency Identification (RFID) chips to the backs of 960 bees, providing new insights into how disease affects the threatened insects.

"We just had to hold them in our hands and hope the glue dried quickly. It was actually quite a process - they had to be individually painted, then individually fed, then the tag glued on. Then individually scanned so we knew which tag was on what color and treatment bee and which hive it was going into. It all had to happen within about eight hours of emergence because as the day goes on they start learning how to fly and they get better at stinging."

It was a unique use of the technology and allowed the bees to be monitored individually for the first time.

"No one had looked at bees at this level before, to see what individual bees do when they are sick," said Dr Lach.

Scientists infected half the insects with a low dose of nosema spores, a gut parasite common amongst adult honeybees, while the rest remained disease free.

Using the RFID tags in combination with observations at the hives and artificial flowers, the researchers were able to see how hard the bees worked and what kind of material they gathered.

The species of nosema used in the study (Nosema apis) has long been thought to be benign compared to the many other parasites and pathogens that infect honey bees, and no one had previously looked for the effect of nosema on behavior with such a low dose.

"We knew dead bees couldn't forage or pollinate," said Dr Lach. "But what we wanted to investigate was the behavior of live bees that are affected by non-lethal stressors."

In a just published paper, researchers say infected bees were 4.3 times less likely to be carrying pollen than uninfected bees, and carried less pollen when they did. Infected bees also started working later, stopped working sooner and died younger.

Dr Lach said nosema-infected bees look just like non-infected bees, so it's important to understand the behavioral changes the parasite may be causing.

"The real implications from this work are for humans. About a quarter of our food production is dependent on honey bee pollination. Declines in the ability of honey bees to pollinate will result in lower crop yields."

More information: "Parasitized honey bees are less likely to forage and carry less pollen." *Journal of Invertebrate Pathology*, 2015.

Provided by James Cook University