

Research Published by: [Journal of Insect Science](#)

Imagine a perfect summer evening, enjoying a delightful meal on your patio with fairy lights twinkling around you. However, this tranquillity is often disrupted by the presence of mosquitoes, leading to slaps, squeals, and a hurried retreat. This raises the question of how to enjoy outdoor evenings without these pesky bloodsuckers. While mosquito repellents and vapour-emitting devices aim to create a mosquito-free environment, it is essential to understand their impact on other insects, especially those we want to protect. To address this concern, a recent study published in the *Journal of Insect Science* investigated the effects of a vapour-producing device, Thermacell Repellents' MR300 Portable Mosquito Repeller, on honey bees (*Apis mellifera*).

The Experiment:

The researchers, in collaboration with Margaret Couvillon, Ph.D., an assistant professor in the Department of Entomology at Virginia Tech University, examined the impact of the Thermacell device on foraging honey bees. The device utilizes parathrin, a synthetic insecticide, as a repellent. The study trials were conducted between 4 p.m. and 8 p.m., corresponding to the expected usage time of the device. Initially, Couvillon expressed skepticism about the presence of bees during this period, but she was proven wrong.

To conduct the experiment, the bees were trained to feed from specific feeders. These feeders, filled with enticing scented sugar water, were placed 1 metre away from an observation hive. Once the bees discovered the feeding station, the researchers gradually moved the feeder 10 to 15 metres away, repeating the process multiple times. Additionally, each bee that visited the feeder was tagged for identification purposes.

Evaluation Measures:

To assess the impact of the vaporized mosquito repellent, the researchers compared two feeders: one placed inside the insecticide plume (treatment) and the other outside it (control). The study focused on four key behaviours that reflect the honey bee's perception of reward: foraging frequency (how often bees visited the feeder), waggle dance propensity (how many bees communicated the food location to their peers), waggle dance frequency (how many times bees performed the waggle dance), and feeder persistence (how many bees returned to an empty, unscented feeder the following day).

Results and Implications:

Surprisingly, the researchers observed no significant differences in the assessed behaviors between the treatment and control feeders. From the perspective of reward, both feeders were equally appealing to the honey bees. This finding contradicts expectations of potential harmful effects from the insecticide. However, it emphasizes the importance of dosage and toxicity levels in determining the [impact on honey bees](#).

While honey bees have previously shown vulnerability to pyrethroids, the specific insecticide used in this study, little research has explored the effects of pyrethroids as a vapour rather than through contact or ingestion. Additionally, studies have suggested that honey bees may possess greater tolerance to allethrin compared to mosquito species. Furthermore, the bees' strong attraction to the food source resulted in extended exposure to the vaporized repellent during the testing period.

Although this study focused solely on honey bees and specific behaviors, it acknowledges that potential impacts on honey bees may exist beyond the assessed parameters and timeframe. Furthermore, the study did not investigate the effects of the vapour plume on other bee species or beneficial insects. Therefore, the safety of this mosquito repellent for bees remains uncertain. However, the study provides valuable insights by demonstrating that the tested mosquito repellent did not immediately harm [honey bees](#) or diminish their interest in a rewarding food source, serving as a starting point for further research.

Source: entomologytoday.org