

# Bees That Resist Mites Are Busy Groomers

**W**e're not the only ones to brush off an annoying mosquito or other buggy pest.

Honey bees, when plagued by tiny tracheal mites, will use their legs like a fine-tooth comb to rid themselves of the life-threatening parasites. But, as entomologists with the Agricultural Research Service recently confirmed, some honey bees groom themselves more fastidiously than others.

For the first time, ARS bee researchers Robert Danka and Jose Villa provoked grooming responses in honey bees by placing tracheal mites directly onto individual bees. Tracheal mites invade the breathing tubes, or airways, of adult honey bees—eventually harming or killing the important pollen carriers.

The scientists, who work in the agency's Honey Bee Breeding, Genetics, and Physiology Research Unit at Baton Rouge, Louisiana, wanted to compare how a line of genetically resistant bees groomed when faced with tracheal mites—in contrast to the reactions of a line of susceptible bees.

While grooming has been considered the primary means by which resistant bee populations are able to fend off damaging infestations of tracheal mites, it hasn't been clear exactly how genetically resistant bees' hygiene habits differ from those of other bees.

So Danka and Villa studied 500 honey bees—resistant and susceptible—watching how each reacted to the arrival of an adult female mite on its thorax. They gently transferred each minuscule mite to the host bee via the most delicate instrument available: an eyelash mounted to a small stick. The bees were housed in a glass-walled observation hive.

"The mites are most vulnerable when they're moving around on a bee," says Danka. "Small and soft, they can't survive for long, except for inside the bee's breathing tubes."

The researchers closely monitored each test bee's grooming behavior for 7 minutes.

Resistant bees appear to be more sensitive in terms of their ability to detect and respond to parasitic mites on their bodies. "More resistant bees groomed than susceptible bees," says Danka. "Resistant bees also groomed themselves more often on the side with the mite, and they groomed more persistently."

But the study also seemed to show that the resistant bees' tenacious grooming didn't necessarily result in fewer mites. Danka explains why this might be a hasty conclusion, though. "We just took a brief, 7-minute snapshot within the first few days of a young bee's life," he says. "In a real colony, potential bee hosts may be challenged by many more mites over a

much longer time, and so more-persistent grooming would likely have a greater impact."—By **Erin Peabody**, ARS.

*This research is part of Plant, Microbial, and Insect Genetic Resistance, Genomics, and Genetic Improvement (#301) and Crop Production (#305), two ARS National Programs described on the World Wide Web at [www.nps.ars.usda.gov](http://www.nps.ars.usda.gov).*

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**This micrograph shows a bee trachea infested with mites. (Magnified about 220 times.)**