ScienceNews
MAGAZINE OF THE SOCIETY FOR SCIENCE & THE PUBLIC
http://www.sciencenews.org/view/generic/id/37180

HONEYBEES PLAY FOLLOW-THE-LEADERS

By **Laura Sanders**
:

Flying high and fast, elite streaker honeybees lead the way to a new hive

She buzzes through the springtime air at breakneck speed, whizzing past slower bees as she makes, forgive me, a beeline to her new home.

She is an *Apis mellifera* streaker, a honeybee, and researchers just found that her fast flight is what guides her 10,000 hive-mates to new digs.

Her mad dash has finally been caught on film and a report on it is slated to appear in an upcoming *Journal of Experimental Biology*.

When a hive moves to a new home, only 3 to 5 percent of the bees in the hive, likely the older bees, know where to fly. A long-standing question has been: How do they lead the rest of their group to the right spot?

"This has been a mystery as long as beekeepers have been watching bees," says coauthor Thomas Seeley of Cornell University. Seeley teamed up with engineers Kevin Schultz and Kevin Passino from Ohio State University in Columbus to solve the riddle.

Come spring, a faction of bees will often leave an overcrowded hive, like "grain pouring down a chute," describes Seeley. Then, after a day or two of waiting in a buzzing, beard-shaped cluster on a nearby tree branch, the swarm flies directly to its new home. Figuring out how the swarm is able to stay on track could answer basic questions about how bees — which Seeley calls "paragons of cooperation" — communicate.

Researchers had two ideas of how the scouts are able to guide their hive-mates in flight. One possibility is called the subtle guide hypothesis, in which the guides direct bees inconspicuously. The streaker model is the other possibility. To figure out where to fly, a bee simply looks up to the top of the swarm and adjusts its course based on the streaker bees' direction.

To test these two models, the team went to a treeless island off the coast of Maine, set up boxes as new, empty homes for the hive and waited for them to fly. Because the bees had nowhere else to go, they chose the hive boxes. Schwartz used a high-definition camera to catch the swarm at a spot on its predicted route, and then meticulously analyzed the video footage, pinpointing individual streakers flying at the top of the pack. Because the camera pointed up, the distance a bee was from the camera could be calculated by its apparent size.

This research isn't the first to suggest the idea of a streaker. Earlier work using still photography showed that a swarm contains a small minority of speedy bees, but researchers couldn't tell which way the speedy ones were flying, and therefore if they were guiding the pack.

One of the first researchers to tackle the streaker problem, Madeleine Beekman of the University of Sydney, says, "Our work was not able to really show that the fast-flying bees flew in the direction of travel. Schultz et al. have managed to show this conclusively, and this is an important step forward."