



PLANET EARTH

Some Bees Are Busier Than Others

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It may be time to leave "busy as a bee" with other dubious animal similes like "happy as a clam" and "drunk as a skunk." That's because some bees, it turns out, aren't all that busy. A small group of hive members do the bulk of the foraging, while their sisters relax at home. But their lifestyles aren't permanent. If the busy bees disappear suddenly, the lazier ones will step up to take their place. Scientists figured this out—somewhat incredibly—by gluing tiny RFID tags to over a thousand honeybees. (An RFID tag is the same miniature transponder that a vet might inject into your dog, that's replacing barcodes on some merchandise and library books, and that makes your public transit card work.) Each beehive in the experiment had a pair of laser scanners over a walkway at its entrance. As bees passed through, they were recorded like items in a checkout lane. Using two scanners let the scientists tell whether bees were coming or going.



Two RFID tags (for good measure) on the back of a worker bee. Paul Tenczar, a researcher in Gene Robinson's lab at the University of Illinois, Urbana-Champaign, and colleagues at the university set up five experimental bee colonies. Each colony started with about 2,000 day-old bees, a subset of which were tagged. For the next month, the bees busily (it seemed) came and went, flying to nearby flowers and bringing back nectar and pollen for the colony. Data from the scanners at the hive entrances revealed that the bees weren't all doing the same share of work. In fact, only about **20 percent of bees accounted for 50 percent of the foraging activity**. This was consistent across all five hives—the workers doing half the foraging ranged from 16 to 21 percent. This consistency suggests the other bees aren't just slackers, Robinson says. There may be an optimal ratio of busy to less-busy bees—though it's not clear why. "The harder a bee forages, the shorter its lifespan is," he says. Some bees may hold back, while others work hard, to ensure that there's a wider range of lifespans among the worker bees. To find out whether the slackers were capable of doing more, the researchers removed a group of busy bees from two of the colonies. These colonies were kept in enclosed spaces, where the bees foraged at feeders. For

one hour, the researchers killed every bee that came to a feeder. Since they were out foraging, these bees were more likely to be the busy kind—so the researchers could assume that they'd disproportionately removed hard-working bees from the colonies. For the rest of that day, each colony had barely any visits to the feeders. But the next morning, foraging returned to its usual levels. The slacker bees had stepped up. "When we removed the highly active bees, others increased their activity, as if to replace the ones we removed," Robinson says. "This was surprising." Initially, the scientists had assumed busier bees were special in some way—the A-team foragers of the colony. But they found that the other bees are able to work just as hard. As long there are enough busy bees, though, the rest will relax a little. So "as strategically lazy as a bee" might be a better simile. As long as entomologists are ruining things, maybe they'll learn next that bugs in a rug aren't really snug.

Image: top, [Rebecca Leaman](#) (via Flickr); bottom, Tenczar et al.

Tenczar, P., Lutz, C., Rao, V., Goldenfeld, N., & Robinson, G. (2014). Automated monitoring reveals extreme interindividual variation and plasticity in honeybee foraging activity levels *Animal Behaviour*, 95, 41-48 DOI:

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