

# Interview: May Berenbaum

***On the role of cell phones, pesticides and alien abductions in the honeybee crisis***

By David Zax

*Honeybee populations in more than 20 states have mysteriously crashed. May Berenbaum, of the University of Illinois at Urbana-Champaign, studies “colony collapse disorder” and its consequences.*



**There was a major decline in bee populations 20 years ago. Why is this more troubling?**

In the '80s the cause was clear: the accidental introduction of a parasitic mite that saps honeybees of vitality. This time, the bees are simply disappearing. There are no dead bodies. It's as if they're not coming home. Among the hypotheses is that their navigation system is perturbed. Honeybees have an incredibly sophisticated system for finding floral nectar and pollen sources, providing directions to their nest mates to promising nectar and pollen sources, recruiting them to these sources, and having everybody come home safely. And that's not what appears to be happening.

**What could be causing this?**

Name something and it's been suspected. A British paper [suggested] that cell phone transmission is interfering with bee navigation. There's absolutely no evidence for it. People have also suggested jet contrails, wireless Internet, changes in the earth's magnetic field. More plausibly, high-fructose corn syrup, used to supplement honeybee diets, is not nutritionally very complete and has been shown to influence behavior. Some new pesticides that are known to affect behavior are in wider use, and those may be a factor. People are also suggesting a sort of multiple stress disorder.

**Is this really a crisis?**

It's a crisis on top of a crisis. [It had previously been projected that] commercial beekeeping [might] cease to exist in the United States by 2035 – and that was before colony collapse disorder. And we can't count on wild pollinators because we've so altered the landscape that many are no longer viable.

**It's not just about running out of honey?**

Honey is trivial compared with the importance of pollination. The two-billion-dollar almond industry in California depends entirely on honeybees. Blueberries, melons, squashes – all kinds of crops rely heavily on honeybees. Over three-quarters of flowering plants – the foundations for most terrestrial food chains – depend on [honeybees and other animal] pollinators. Yet we know pathetically little about most of them.

**Why can't we just pollinate these flowers ourselves?**

First of all, we're talking about thousands of acres. Secondly, flowers are very complicated. They're designed to keep out inappropriate visitors. They don't want any visitor to be able

to take pollen away, so it's not a simple problem of dusting an orchard with pollen and hoping it gets to tiny stigmatic surface of the flower where it needs to go in order to fertilize the female cells.

**This is probably the wrong question, but aren't bees a little scary?**

They're scary in that they have no business being so smart. They're organized and capable of unbelievable feats, such as communicating exact locations to their nest mates by orienting to polarized light and the sun. I can't drive to Decatur without MapQuest, and these bees find their way over much vaster distances. Honeybees air-condition their homes, know when more foragers are needed, know when more nurses are needed.

**I'll offer my theory about their disappearance: Honeybees know something we don't know and they're getting out.**

I like the theory that visitors from another planet have decided they were going to abduct the smartest organisms on the planet, and they've picked the honeybees.

**More generally, you've mused on how intertwined human affairs are with bugs in one of your books, *Bugs in the System*. How has the fate of human societies depended on bugs in the past?**

The outcome of more wars has depended on insects than all the weapons combined. Insects as vectors of disease – typhus, malaria, yellow fever. Often armies are defeated not by brilliant generals, but by disease-carrying insects. Napoleon's attempt at conquest of Russia was a complete bust in large part because of the staggering losses to typhus. Typhus played a role in probably 90 percent of the troop loss. So but for the body louse, they'd be speaking French now in Moscow.

**You've also written several books of popular essays about entomology. How can there be so much to write about bugs?**

Well, there's a million of 'em. Talk about job security. And frankly, they interact with people in more different ways than any other group of organisms. Even culture, symbols – metamorphosis, this transcendent theme in literature around the world. It's been argued that pyramids are basically deified dung pats, that they are inspired by scarab beetles, who emerge from dung pats after this period of quiescence. We're just surrounded by insect symbols, we make use of insects, wars have been fought over insect products. A silk thread can sustain a greater weight than a steel cable of comparable dimensions. This is insect spit! Basically, it's caterpillar spit.

**I don't like bugs at all. When most people study these bugs, do they get over their aversion?**

That's one reason I teach a course here we call "general education," a course for nonscientists. I don't expect people to become entomologists or even necessarily to love bugs, but at least to think before reflexively stepping on them. They are just capable of the most amazing things, and many of the things that they do we couldn't survive on this planet without them doing. Waste disposal – it's a dirty job, someone's got to do it. Without insects, this world would be a filthy place. They're about the only things that can break down dead bodies and take care of dung. So these things, we just take them for granted. They're small, therefore they're insignificant. But frankly, tiny diamonds aren't insignificant.

*Smithsonian.com, June 2007*