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Widely Used Bee Antibiotic May Harm Rather Than Help

Honeybee populations have been mysteriously falling for at least five years in the United States, but the cause of so-called colony collapse disorder (CCD) is still largely unknown.

In a report published Nov. 2 in the online journal PLoS ONE, researchers say a widely used in-hive medication may make bees more susceptible to toxicity of commonly used pesticides, and that this interaction may be at least partially responsible for the continuing honeybee population loss.

The researchers, led by David Hawthorne of the University of Maryland, pre-treated healthy honeybees with the antibiotic oxytetracycline and then exposed the bees to two pesticides that are commonly used in bee hives to control parasitic varroa mites.

In both cases, the pre-treated bees

were much more sensitive to pesticide exposure than were bees that had not been treated.

The team suspected that oxytetracycline may interact with specific bee proteins called multiple drug resistance (MDR) transporters, making them less effective and therefore rendering the bee more at risk to the pesticides.

To test this hypothesis, they pre-treated the bees with another drug, verapamil, which is known to inhibit a particular MDR transporter. These insects showed increased sensitivity to five different pesticides, supporting the group's theory that MDR transporters, and specific combinations of independently safe chemicals, may play an important role in CCD.

Source: American Association for the Advancement of Science.

