

Copper sulfate found to be toxic to stingless bees

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Copper sulfate has been used in agriculture since the 1800s, at least. In the U.S. it is widely used as a fungicide on organic and conventional crops, and it is also found in some fertilizer products.

A new study from the Federal University of Vicosa in Brazil has found that [copper sulfate](#), when used as a leaf fertilizer, is lethal to the native Brazilian bee known as *Friesella schrottkyi*. In addition, the study, which was published in the *Journal of Economic Entomology*, found that sublethal exposure also affected the bee's behavior.

"This could have implications for growers who use copper sulfate as a leaf fertilizer, and as a fungicide," said Dr. Raul Narciso Guedes, one of the co-authors.

To better understand how copper sulfate applications might affect *Friesella schrottkyi*, the researchers collected four beehives and observed the activity of adult worker [bees](#). Two commercial leaf fertilizers common to Brazil were tested, including copper sulfate (with 24 percent sulfur), and a micronutrient mix that contained much smaller concentrations of heavy metals. The bioinsecticide spinosad was used as a positive control because it's well known to be lethal to bees.

The researchers were surprised to find that, under oral exposure, the copper sulfate fertilizer killed all of the test bees within 72 hours, and was more lethal than the spinosad control. Copper sulfate and spinosad also led to the bees eating twice as much food as non-exposed bees,

further underscoring the risk of exposure to copper sulfate. Take-off and flight activity was also much higher for workers exposed to copper sulfate. Simple contact with copper sulfate (such as brushing on legs) did not result in such severe effects, but did continue to increase food ingestion.

Stingless bees are the prevailing wild pollinators in this region and are more efficient than honey bees, which is partially why the researchers chose to study the effects of copper sulfate on *Friesella schrottkyi*.

"When considering agricultural production as a potential threat to Neotropical stingless bees, the problems likely go beyond pesticide use," the authors wrote. "Leaf fertilizers seem to deserve attention and concern regarding their potential impact on native pollinators, notably Neotropical stingless bees such as *F. schrottkyi*."

More information: Leaf Fertilizers Affect Survival and Behavior of the Neotropical Stingless Bee *Friesella schrottkyi* (Meliponini: Apidae: Hymenoptera) DOI: [dx.doi.org/10.1093/jee/tow044](https://doi.org/10.1093/jee/tow044) , [jee.oxfordjournals.org/content ... 016/04/09/jee.tow044](http://jee.oxfordjournals.org/content...016/04/09/jee.tow044)

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