Team testing biological treatment for pathogens that are killing honeybees and bats

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A researcher at Georgia State University is studying a new, biological treatment for bacterial and fungal pathogens that are killing honeybees and bats in record numbers.

Dr. Christopher Cornelison, a postdoctoral researcher, is testing how effective Rhodococcus rhodochrous, a species of bacteria, is in fighting pathogens affecting honeybees and bats.

In honeybees, Chalkbrood disease has contributed to the number of managed honeybee colonies in the U.S. being cut in half, a phenomenon known as Colony Collapse Disorder. Since 2006, White-Nose Syndrome has killed an estimated 7 million bats in North America, the steepest wildlife decline in the past century.

Cornelison grows the bacteria under certain conditions that enable them to inhibit the growth of fungi responsible for these diseases. The approach is unique because the bacteria do not need to make physical contact, unlike many probiotics. It's also non-toxic, allowing the honey to be edible for human consumption.

"Our bacteria produce a volatile chemical that's dispersed through the air and tremendously inhibits the growth of fungal and bacterial pathogens," Cornelison said.

Honeybees and bats are key to the ecosystem. One of every three bites of food in America is related to honeybee pollination, according to the

United States Department of Agriculture. Many crops such as almonds and other tree nuts, berries, fruits and vegetables depend on pollination by honeybees.

Bats play a crucial role in pest control. A single brown bat will eat its body mass equivalent in insects in one summer night, Cornelison said.

"If these species go extinct, we're losing something that we don't even comprehend the value of right now," he said.

Cornelison has achieved positive results in cell studies. In honeybees, no negative effects were found in toxicity trials exposing bees to the bacteria in the air or in their honey.

In bats, Cornelison found the bacteria slow fungal growth and permanently eliminated spore germination. In collaboration with University of California–Davis, he found the bacteria prevented the spread of fungi on bat skin without touching the skin.

Provided by Georgia State University