

# Probiotics to protect bees from an infection associated with colony collapse disorder

May 17 2018

---

Adding probiotics to bees' food helps make them more resistant to noserosis, a fungal infection associated with colony collapse disorder that has been observed in Europe and North America over the past 20 years. Probiotics can decrease the mortality rate of this infection in bees by up to 40%, report researchers at Université Laval in the most recent edition of *Frontiers in Ecology and Evolution*.

Noserosis, also called nosema disease, is caused by *Nosema ceranae*, a single-celled fungus of Asian origin that bees ingest with their food and that grows in the cells of their intestinal walls. "Under normal conditions, this fungus does not cause any problems for bees," explains Nicolas Derome, professor at the Faculty of Science and Engineering at Université Laval and lead author in the study. "But when bees are subjected to stress, the microorganism can evade their immune system, causing an infection that can impair their ability to forage, hinder larval care, disturb the bees' orientation, and increase mortality."

Currently, noserosis is treated with antibiotics, but their efficacy is declining as resistant strains of the fungus have emerged. "In addition, these products can kill beneficial bacteria in the intestinal microbiota of bees," says Derome. "We had to find other solutions to combat this disease, and that's what gave us the idea to test probiotics."

The researchers measured the effectiveness of four probiotics on the prevention and treatment of noserosis in bees placed in laboratory cages. Two of these probiotics, Bactocell and Levucell, are commercial

products used in pork, chicken, shrimp, and salmonid farms. The other two probiotics are bacteria that researchers have isolated from the intestinal microbiota of healthy bees. The four probiotics were administered to the bees by mixing them with sugar syrups.

After two weeks of testing, the researchers found that the mortality rate of [infected bees](#) was 20 to 40% lower in those receiving probiotics than in the control group. The four probiotics tested showed similar efficacy. "Our results suggest that bacteria in the microbiota of bees can be as effective as commercial probiotics in treating nosemosis," says Derome. "It's important to note that given a very high infection rate, the probiotics tested did not reduce the number of fungi present in bees, but they allowed the bees to better tolerate them."

The researcher and his team intend to take advantage of the protective properties of the probiotics present in bees' microbiota to develop new ways of combating nosemosis. "The tests we've conducted in bee colonies suggest that a particular [probiotic](#), called *P. apium*, is our best candidate. We have also identified other promising microbial strains and now hope to develop a combination of probiotics to combat nosemosis in bees. However, the real solution to this disease is to identify and correct the sources of stress disrupting the [bees](#)," concludes the researcher.

**More information:** *Frontiers in Ecology and Evolution*, [DOI: 10.3389/fevo.2018.00058](#)

Provided by Laval University

Citation: Probiotics to protect bees from an infection associated with colony collapse disorder (2018, May 17) retrieved 27 April 2024 from <https://phys.org/news/2018-05-probiotics-bees-infection-colony-collapse.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.