

How honey bee gut bacteria help to digest their pollen-rich diet

December 12 2017



Scientists have uncovered which bacterial species in the bee gut allow them to digest their pollen-rich diet. Credit: Bob Peterson, Flickr

The honey bee gut is colonized by specialized bacteria that help digest components of the floral pollen diet and produce molecules that likely promote bee health. In a study publishing 12 December in the open access journal *PLOS Biology*, a group of researchers led by Philipp Engel at the University of Lausanne and ETH Zürich, Switzerland, have uncovered which bacterial species perform which specific digestive functions in the bee gut.

The authors measured the repertoire of simple chemical compounds - the so-called "metabolome" - from bee guts. They then compared the gut metabolomes of bees colonized with each bacterial [species](#) individually and in combination. By this method, the team identified what each bacterial species contributes to the bee digestion and the various strategies [bacteria](#) deploy to co-exist in the animal gut.

Of particular note, they identified one several species of the genus *Lactobacillus* that digests convert specific plant compounds called flavonoids - abundant in pollen and recently linked to the health of mice and humans through their breakdown by the gut microbiota. Another bee gut bacterial species, *Bifidobacterium asteroides*, triggered the production of bee hormones that can modulate the immune system and behavior of its host.

Honey bees, a principal pollinator in agriculture and natural environments, have suffered from colony declines in recent years. The gut bacteria in bees and their pollen-rich diet are known contributors to honey bees' health, and understanding the functions of the various bacteria could have implications for colony health as a whole.

"We took advantage of the key characteristics of the bee gut microbiota: its simplicity." says Philipp Engel, the corresponding author of the study. Contrary to [human gut microbiota](#), the bee gut is composed of only a few [bacterial species](#). This makes analyzing each member separately and determining its contribution to the overall metabolite changes in the gut feasible."

"We have identified many exciting metabolic functions of bee gut bacteria. The next step is to understand how these functions impact colony's [health](#) so that one day we can apply our findings in apiaries."

More information: Kešnerová L, Mars RAT, Ellegaard KM, Troilo M, Sauer U, Engel P (2017) Disentangling metabolic functions of bacteria in the honey bee gut. *PLoS Biol* 15(12): e2003467. doi.org/10.1371/journal.pbio.2003467

Provided by Public Library of Science

Citation: How honey bee gut bacteria help to digest their pollen-rich diet (2017, December 12) retrieved 25 April 2024 from <https://phys.org/news/2017-12-honey-bee-gut-bacteria-digest.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.