



1 August 2017

Bacteria passed between generations benefit you more than others

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Bacteria passed straight to children have more healthcare benefits than if they are transmitted via the surrounding environment, new Oxford University research reveals.

Many insects and plant species carry beneficial bacteria, which provide a variety of services. Some provide nutrients, such as those living in aphids, the green and black fly which plague garden plants. Others help their animal hosts defend against parasites. However, while animals would die without some bacteria, they would hardly notice the absence of others. Why do we get this variation?

The study tracked the evolutionary history of 106 bacterial symbioses, in a range of animal, plant and fungi species.

The findings have revealed that how bacteria is passed and contracted is key to the intensity of symbiont relationships. When bacteria are passed vertically, straight from mother to offspring, they tend to be much better for their hosts than if they are transmitted via the environment (horizontally).

When bacteria are passed on vertically, hosts evolve to depend on them. Removing these bacteria can have a significant negative impact on the host. In the case of Aphids, also known as plant lice, individuals die if you take away their bacteria. In contrast, bacteria that are passed via the environment, has a smaller impact. Plants such as peas and beans acquire Rhizobia bacteria from the soil, which can extract nitrogen from the air and put it into a form that the plant can use. Rhizobia plays an important role in plant rotations, but the plants do not die without them.

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The study represents a first step towards improving understanding of symbiotic relationships and their benefit or lack of benefit, for animal, plant and insect species. As humans interact with a lot of bacteria, with further research, the work could be used to inform medical understanding.

Reference: **The evolution of host-symbiont dependence**
(<https://www.nature.com/articles/ncomms15973>)

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