

# Variation in antibiotic bacteria in tropical forest soils may play a role in diversity

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Dry tropical forest where soil samples were collected. Credit: Dr. Jennifer Powers

Antibiotic-producing bacteria in soil are the source of many antibiotics used to combat diseases in humans and plants. But, surprisingly little is known about how these microbes impact tropical plant communities and ecosystems, where plant diversity, competition, and pathogen pressures

are high.

A study published October 28 in the journal *Biotropica* represents a step toward a better understanding of the role antibiotic-bacteria play in the ecology of [tropical forests](#). University of Minnesota researchers, led by Kristen Becklund, found that [antibiotic production](#) by [soil bacteria](#) was widespread, but that the abundance and activity of the microbes varied across the landscape depending, in part, on nutrient availability.

"Our results suggest substantial differences in the capacities of [microbial communities](#) to suppress soil-borne diseases in tropical forests," says Becklund. "The fact that we are seeing all this variation is exciting because it means that these bacteria may be influencing diversity in tropical forests."

Differences in the capacities of microbial communities to suppress soil-borne diseases in tropical forests could impact the composition of the forest itself. Antibiotics in soil are believed to act as weapons that allow microbes to kill their competitors, including pathogens. This antibiotic inhibition can lead to declines in populations of [plant pathogens](#) and can even result in the development of disease-suppressive soils. Because different plants are susceptible to different pathogens and diseases, variation in the abundance, effectiveness and specificity of microbially-produced antibiotics has the potential to influence not only plant disease and productivity, but also the composition of tree species in the forest.

"This study is an initial first step to open the black box of microbial community function in tropical forest soils," says Powers.

Future studies will focus on the causes of the variation in density and activity and the potential consequences for tropical forest communities.

Provided by University of Minnesota

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