

Ants are friendly to some trees, but not others

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Tree-dwelling ants generally live in harmony with their arboreal hosts. But new research suggests that when they run out of space in their trees of choice, the ants can get destructive to neighboring trees.

The research, published in the November issue of the *American Naturalist*, is the first to document that ants bore into live trees, and it reopens a centuries-old debate on the relationship between ants and plants.

Ants and certain species of plants and trees have cozy relationships. Myrmecophytes, also known as ant-plants, have hollow stems or roots that occur as a normal part of their development. Ant colonies often take residence in these hollows. To protect their homes, the ants patrol the area around the tree, killing insects that want to eat the plant's leaves and sometimes destroying vegetation of other plants that might compete for precious [soil](#) nutrients and sunlight. The relationship is a classic biological mutualism. The ants get a nice place to live; the trees get protection. Everybody wins.

But while researching ant-plants in the Amazonian rainforests of Peru, Douglas Yu of the University of East Anglia and Glenn Shepard of Sao Paulo University were tipped off by the local people about a strange phenomenon. The natives showed the researchers several non-myrmecophyte trees with swollen scars called galls on their trunks and branches. When the researchers cut into the galls, they found that ants had excavated tunnels into the live wood.

"Ants are superb ecosystem engineers," David Edwards the lead author of the study said, "but this is the first example of ants galling trees to make housing."

Megan Frederickson, a Harvard biologist and member of the research team, searched 1,000 square kilometers of forest and found numerous galled trees inhabited by ants, suggesting the behavior is not uncommon. The galled trees were only found on the edges of "Devil's gardens"—ant-made forest clearings that surround stands of ant-plants. It appears, the researchers say, that when the colonies fill the available space in the ant-plants, they branch out and carve new nests into neighboring trees.

The discovery reopens a debate that raged among Charles Darwin and his contemporaries about the relationship between ants and plants. Darwin believed—rightly as it turned out—the hollow spaces in ant-plants occurred as part of the plant's normal development. Since the ants did no damage to the plant, the relationship could be considered a mutualism. Botanist Richard Spruce disagreed. He believed the ants bored the hollows themselves and that the trees needed ants "like a dog needs fleas." In Spruce's view, ants are parasites.

Studies in the 1960s showed definitively that ant-plant hollows occur normally, vindicating Darwin. But this latest finding that ants do gall non-myrmecophytic trees shows that Spruce wasn't so wrong after all.

More information: David P. Edwards, Megan E. Frederickson, Glenn H. Shepard and Douglas W. Yu, "A Plant Needs Ants like a Dog Needs Fleas: *Myrmelachista schumanni* [Ants](#) Gall Many Tree Species to Create Housing." *The [American Naturalist](#)* 174:5 (Nov. 2009).

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