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Forget Mice, Elephants Really Hate Ants

by Elsa Youngsteadt on 2 September 2010, 12:22 PM | [Permanent Link](#) | [0 Comments](#)

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A nose full of biting ants can really spoil your appetite. Especially if your nose is 3 meters long. African bush elephants (*Loxodonta africana*) avoid this discomfort by refusing to munch on acacia trees that house swarming ant colonies. Their aversion, a new study suggests, helps maintain the savanna's delicate balance between forest and prairie.

Trees and grasses constantly vie for control of the savanna, but wildfires, drought, variable soil chemistry, and giant herbivores prevent either plant from taking over. Not enough fire to keep the trees in check, and the canopy will close in; too many elephants eating the trees, and the

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Yuck. Elephants won't eat acacia trees that are defended by ants.

Credit: Kathleen Rudolph

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savanna would become grassland. Or so scientists thought. They seem to have underestimated the acacia's ability to defend itself.

Unlike many acacia trees that are stripped bare by elephants, whistling thorn trees (*Acacia drepanolobium*) seemed immune. The trees bristle with the 5-centimeter-long thorns typical of many acacias, but some of the spikes also swell into hollow bulbs the size of ping pong balls. *Crematogaster* ants colonize the empty thorns and feed on nectar secreted from the plant's leaves. That makes a whistling thorn tree the ants' territory—which they defend against intruders. Todd Palmer, an ecologist at the University of Florida in Gainesville, wondered whether the tiny bodyguards could really protect trees from the world's largest land animal.

Palmer and ecologist Jacob Goheen of the University of Wyoming in Laramie posed that question to six taste-testers: orphaned elephants living in a natural setting at a Kenyan rehabilitation center. The researchers harvested branches from whistling thorn trees, clipped open the ant houses, and shook the insects off; then they dipped half of the branches back into the tub of displaced ants. They also collected limbs of the thorny but ant-free *A. mellifera* tree and dunked half of those in the ant vat, too. The elephants promptly chowed down on branches of both plant species when they were antless, the team [reports](#) online today in *Current Biology*. But an hour later, the elephants still hadn't touched the ant-infested branches, not even the usually tasty *A. mellifera*.

The aversion occurs in the wild, too. The team forced ants to evacuate entire trees by smoking them out, then allowed varying numbers of ants to recolonize different trees. A year later, trees with fewer ants had more branches shredded by elephants, but those with the highest density of ants remained untouched.

That, in turn, is enough to have a visible effect on the entire savanna. On sandy soil where whistling thorn trees can't grow, elephants devastate trees, just as ecologists always expected. But on clay soils, where whistling thorn thrives, satellite images show that the trees flourish whether elephants are present or not. "These little tiny ants



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are making a difference we can see from outer space," Goheen says. "Ants take herbivory out of the picture."

"The big deal [about this study] is the scale," says Lee Dyer, an ecologist at the University of Nevada, Reno. Most studies of ant-defended plants tend to parse out the interaction at the scale of the individual plant, but this study shows an impact on the whole savanna. Dyer thinks ants could be having landscape-scale effects in other ecosystems too, including forests in the American tropics where some common plant species are defended by ants.

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