

Slavemaker Ants: Misunderstood Farmers?

A test of what once seemed too obvious to test—whether ant colonies suffer after being raided by slavemaker ants—suggests that some of the raiding insects have been getting unfair press.

One of more than 20 species called slavemakers, *Protomognathus americanus* ants are so tiny that a colony lives in an acorn. They plunder larvae and pupae from even smaller species' colonies and then raise the young captives to work in their own acorns.

That sounds bad for the slaves, but their losses don't seem to cause long-term harm, according to James F. Hare of the University of Manitoba in Winnipeg and Thomas M. Alloway of the University Toronto–Erindale. Hare described their studies last week in Atlanta at the annual Animal Behavior Society meeting.

Playing nice guy works out well for this slavemaker, Hare observes. The species conducts its raids in a way that permits the enslavable ants to continue thriving. So, is *P. americanus* enslaving or farming? Hare's compromise answer is this: "It's stewarding its resources."

A specialist in slave-making ants, Joan Herbers of Colorado State University in Fort Collins concurs that the biological costs of slavery remain open for discussion. One of the difficulties in sorting out costs, she notes, is that slavemakers raid differently in different places.

She and Susanne Foitzik of the University of Regensburg in Germany found that a slavemaker colony near Albany, N.Y., posts guards inside the raided nest to keep its residents from escaping. These raiders typically kill the adults in the raided colony. However, colonies of the same species in West Virginia don't post guards and about half the time, they let enough adults and young survive to continue the colony.

Hare reminisces that he became fascinated by ant-slavery questions while wondering about kin recognition. For one, the enslavable *Leptothorax* haven't evolved a preference for the scent of their own species over the slavemakers' scent. Hare found that the supposed costs of enslavement, which presumably would have led to the evolution of such a trait, hadn't been measured.

He and Alloway tried to fill that data gap. They set up two corrals outdoors during several summers of the late 1990s, each with five acorns filled by colonies of enslavable *Leptothorax longispinosus*. In one corral, the researchers also placed a *P. americanus* acorn, and in the other, they placed an additional *L. longispinosus* colony to even up the ant density.

When the enslavers raided, they allowed adult ants to flee. When raiders took a potential queen from the slave nest, they raised her and allowed her to fly off to start a new colony. At the end of the season, the researchers counted each age group of ants and found no significant difference between the slave-free corral and the one with raiders.

Hare and Alloway repeated the experiment with different slaves and a different slavemaker species, *Leptothorax duloticus*. "They're slavemakers from Hell," Hare says. When they raid, they kill adults, eat much of the brood, and take over the victim's acorn. They're also common in Hell, Mich., where Hare and Alloway set up the test. With these thugs, a season's raids left enslaved species at about one-third the strength of a corral of unharrassed acorns.

Entomologist Ron Rutowski from Arizona State University in Tempe described Hare's presentation in Atlanta as "convincing." He says it highlights a smoldering issue among biologists regarding human-related terminology. "Should scientists use the term 'transvestite' or 'rape' with animals?" muses Rutowski.

Hare compares *P. americanus* to anatomical parasites that have evolved to the point that they don't kill their host. Despite worries like Rutowski's, Hare calls such parasites "prudent."

—S. Milius