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**Abstract:** The article discusses research on the fungus *Ophiocordyceps unilateralis* reported by scientist David Hughes and his team in the September 2009 issue of "American Naturalist." The findings regard ants that are infected by the fungus and climb to a low-hanging tree leaf to die. These conditions are shown to be just right for the growth of a spore-bearing spike from the ant's neck.

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### **Death-grip fungus made me do it**

#### **Parasite benefits when host ants bite low-hanging leaves**

The line between fungus biology and late-night television just got blurrier.

A fungus that attacks living ants apparently manipulates their behavior for its own benefit, a team reports in the September *American Naturalist*.

When the *Ophiocordyceps unilateralis* fungus strikes, an infected ant climbs to a leaf not far off the ground, bites in and dies with jaws locked in place. Experiments now show that these low-hanging leaves give the fungus prime conditions for growing a spore-bearing spike out of the ant's neck, says study coauthor David Hughes of Harvard University.

"For me, it is convincing evidence of manipulation," says parasitism researcher Frederic Thomas of France's CNRS research station in Montpellier.

As far back as the 1920s, biologists had proposed that *Ophiocordyceps* infections turned ants into tree biters that latched onto leaves, twigs or the bark depending on which fungal species attacked. The possibility of fungal influence on the sick ant "was just crying out to be looked at," Hughes says.

Hughes and an international team studied *O. unilateralis*' effects on ants in a Thai forest. The researchers found natural graveyards of dead ants belonging to the species thought to be the fungus's main host. The ants were clamped onto leaves not far above the ground, typically just some 25 centimeters up. This first meter above the forest floor has

more fungus-friendly humidity than the zones of the tree five meters and higher, the team reports.

Selecting dead ants at an early stage of infection, the researchers moved some of the carcasses onto the forest floor and moved others high into the canopy.

The fungus in ants that were relocated to the leaf litter didn't fare well, and the ants soon disappeared. Foragers may have eaten them, or rain swept them away. The high canopy didn't suit the fungus either. Inspections of ant corpses that were moved up there revealed deformed fungal growth that didn't produce spores.

Leaves near the tree base proved just right, though. A fibrous fungal spike grew out of the necks of ants there and bore a segmented, red-orange lump.

Forming that lumpy body allows the fungus to reproduce a clear benefit, says Shelley Adamo of Dalhousie University in Halifax, Canada. But she adds, "The much harder question is whether the fungus is 'manipulating' its host."

The suggestion seems reasonable in this case, she says, but she notes that a colony-dweller might leave the nest when dying from a potentially contagious infection without necessarily falling under the direct control of the parasite.

PHOTO (COLOR): This ant latched on to a leaf before dying from a fungal infection (parasite shown sprouting from the dead ant's neck).

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By Susan Milius

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