

Soil fungus eats grasshoppers alive

Researchers with the US Department of Agriculture in Ithaca, New York are using a soil fungus to control grasshoppers. Grasshoppers are pests in the US and Canada, costing an estimated \$400 million per year in lost forage. The Australian soil fungus, *Entomophaga praxibuli* destroys grasshoppers, then uses them to spread its spores. The fungus spreads by sending up a hypha with a spore at its end. Hydrostatic pressure is used to shoot the spore through the air. When a spore lands on a grasshopper, it uses enzymes and mechanical force to penetrate the cuticle. The fungus then reproduces inside the insect. The fungus alters the behavior of the insect before the grasshopper dies, inducing it to climb to the end of a blade of grass or a plant stalk and remain there. Spores then emerge on hyphae through the dead insect's cuticle.

Grasshoppers can kill the native American fungal species, *Entomophaga grylli* by basking in the sun, thereby raising its body temperature. *E. grylli* is killed if exposed to a temperature of 40 C for 6 to 8 hours, but the Australian variety, *E. praxibuli*, can withstand higher temperatures and will kill even basking grasshoppers.

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