

Thrips soldiers found able to ward off fungus

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Kladothrips. Image: Monica De Facci, Lund University

(Phys.org) -- Researchers studying the tiny bugs known as thrips have made two discoveries concerning one species: *Kladothrips intermedius*. The first is that though such thrips soldiers have big forearms, they don't seem to gain any advantage from them in battle. The second is that the soldiers create a body coating that is able to ward off a type of fungus that invades their nests. The research team, a combined mix of Canadians and Australians studying the native Australian species, have published the results of their study in the journal *Biology Letters*.

Ever since scientists began looking at this particular species of thrips, the assumption has been that the big forearms on the soldiers allowed them to squeeze invading enemies (generally another species of thrips that prefer to take over the nests of others rather than create their own) killing them to protect the nest. So-called dispersers of the same species don't have big forearms, the thinking went, because they don't defend the gall (a bulbous hollow on a plant the thrips create for their nests), instead they venture out and create new galls.

But the researchers discovered by staging fights between soldier thrips of different [species](#) in a small arena, that the soldier thrips don't really make use of their big forearms, and aren't really effective fighters anyway, at least not when it comes to fighting enemies that are near to them in size.

Because *Kladothrips intermedius* seem to do a better job of warding off the [fungus](#) *Cordyceps bassiana*, which grows on the bodies of insects, than do other bugs, the team immersed a group of a hundred soldiers and another hundred dispersers in water and then collected the residue left behind for testing. They found that the residue from the soldiers contained antifungal ingredients but the residue from the dispersers did not. Thus it appears the [soldiers](#) are good at protecting the gall, just not so much from the enemies that everyone thought.

This new study while answering questions about the antifungal abilities of *Kladothrips intermedius*, raises new ones about the large forearms. If they don't help the [thrips](#) in battle, why do they have them? Perhaps, as researchers have found with crayfish in another [study](#), the big limbs are simply meant to help the males bluff their way out of fights.

More information: Antifungal activity in thrips soldiers suggests a dual role for this caste, *Biology Letters*, Published online before print April 11, 2012, [doi: 10.1098/rsbl.2012.0184](https://doi.org/10.1098/rsbl.2012.0184)

Abstract

The social insect soldier is perhaps the most widely known caste, because it often exhibits spectacular weapons, such as highly enlarged jaws or reinforced appendages, which are used to defend the colony against enemies ranging in size from wasps to anteaters. We examined the function of the enlarged forelimbs of soldiers (both male and female) of the eusocial, gall-inhabiting insect *Kladothrips intermedius*, and discovered that they have little impact on their ability to repel the specialized invading thrips *Koptothrips* species. While the efficacy of the enlarged forelimb appears equivocal, we show that soldiers secrete strong antifungal compounds capable of controlling the specialized insect fungal pathogen, *Cordyceps bassiana*. Our data suggest that these thrips soldiers have evolved in response to selection by both macro- and micro-organisms. While it is unknown whether specialized fungal pathogens have been major selective agents in the evolution of the soldier caste in general, they were probably present when sociality first evolved and may have been the primordial enemies of social insects.

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