

New research shows ants able to discern difference between threat levels

5 July 2011, by Bob Yirka



Temnothorax longispinosus. Image credit: Antweb.org

(PhysOrg.com) -- In an interesting study designed to determine how well ants are able to gauge a threat, Inon Scharf and his colleagues at Johannes Gutenberg University in Mainz, Germany, have shown that even simple ants are able to clearly distinguish between serious threats and those that aren't so dire. In their paper, published on *Ethology*, the team found that a species of forest ant, *Temnothorax longispinosus*, are able to tell on sight if an invader is a serious threat, or just a mild one, and to react more stringently when the stakes are higher.

To find out just how good ants are at distinguishing between threats, Scharf and his team assembled four different types of ants in their lab. The first was another [species](#) of ant unknown to *T. longispinosus*, the second were ants of the same species but from another [nest](#); the third were ants from a different but familiar species, and the fourth were so-called slave-making ants; a very serious threat due to their tendency to kill off the queen and steal the young to enslave them as workers in their own nests.

Temnothorax longispinosus, a forest dwelling ant specific to the American Northeast, generally have

two forms of defense; they either bite and sting intruders or try to drag them out of the nest. In the study, the researchers found that upon discovering a slavemaker ant in the nest, *T. longispinosus*, came at the intruder with spread mandibles and began biting and stinging for all they were worth. When discovering any of the other ants in their nest, though, they instead opted for dragging, with different degrees of effort, based on the apparent degree of threat. The competitor ants were immediately dragged out, while the efforts to do the same with the familiar but different species ants were less urgent, and the species unknown to the ants were rarely attacked at all.

From the study it appears that the ants have adapted to defending their nest in ways that are the most efficient; they only go full out when the threat is so severe that the survival of the nest is at stake. Dragging an intruder out involves fewer [ants](#) and doesn't interfere with ongoing food retrieval activities.

More information: Differential Response of Ant Colonies to Intruders: Attack Strategies Correlate With Potential Threat, *Ethology*, [DOI:10.1111/j.1439-0310.2011.01926.x](https://doi.org/10.1111/j.1439-0310.2011.01926.x)

Abstract

Animals are often threatened by predators, parasites, or competitors, and attacks against these enemies are a common response, which can help to remove the danger. The costs of defense are complex and involve the risk of injury, the loss of energy/time, and the erroneous identification of a friend as a foe. Our goal was to study the specificity of defense strategies. We analyzed the aggressive responses of ant colonies by confronting them with workers of an unfamiliar congeneric species, a non-nestmate conspecific, a co-occurring congeneric competitor species, and a social parasite—a slave-making ant. As expected, the latter species, which can inflict dramatic fitness losses to the colony, was treated with most aggression. A co-occurring

competitor was also attacked, but the ants used different behaviors in their responses to both enemies. While the slavemaker was attacked by biting and stinging and was approached with spread mandibles, the competitor was dragged, a behavioral strategy only possible if the defending ant is similar in size and strength to the opponent. Non-nestmate conspecifics were treated aggressively as well, but less than the slavemaker and the co-occurring competitor, presumably because they are less easily recognized as enemies. An unfamiliar congeneric species was rarely attacked. This first detailed study comparing the aggressive responses of ant colonies toward slave-making ants to other species posing different threats indicates that the responses of ant colonies are adjusted to the risk each opponent poses to the colony.

via [BBC](#)

© 2010 PhysOrg.com

APA citation: New research shows ants able to discern difference between threat levels (2011, July 5) retrieved 23 November 2020 from <https://phys.org/news/2011-07-ants-discern-difference-threat.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.