

Ants use brawn and brains to haul heavy loads

July 28 2015, by Marlowe Hood



Ants are among the very few animals, besides humans, that organise among themselves to collectively carry loads far heavier than an individual member of their species

Ants have an astonishing ability to mix collective muscle with individual initiative for heavy lifting, a study published Tuesday has revealed.

In experiments, researchers showed how a dozen or more ants working

in unison to haul, say, a large insect can adjust their course based on intelligence provided by a single ant joining the effort.

Realising somehow that the group is off-course or headed for trouble, the "scout" subtly signalled a needed change in direction by tugging at a different angle.

Rather than resisting, the others fell into line.

"The individual ant has the idea of how to pass an obstacle but lacks the muscle power to move the load," explained Ofer Feinerman, the study's main architect and a researcher at the Weizmann Institute of Science in Israel.

"The group is there to amplify the leader's strength so that she can actually implement her idea," he told AFP.

Just as surprising, the same ant that took the lead will, 10 to 20 seconds later, yield that role to another new arrival with more up-to-date information.

"As far as we can tell, the scout is no different than the other ants," Feinerman said by email.

"No one designates the leader, she—not he—designates herself because she has current knowledge about the correct direction."

Rowing in unison

Ants are among the very few animals, besides humans, that organise among themselves to collectively carry loads far heavier than an individual member of their species.

One of the challenges, for ants or humans, is finding a balance between synchronised action, or conformity, on the one hand, and the flexibility needed to adapt, on the other.

Animals living in groups—a school of fish, a flock of sheep—have evolved to act in concert, a quality needed for coordinated movement.

This is what allows the ants to pull together, rather than apart, Feinerman said.

But sometimes this so-called "behaviour conformism" is a drawback, which is where the information-bearing scouts come in.

The interplay of group and individual effort can be compared to the relationship between a eight-person team rowing in unison and their coxswain, who steers the boat and keeps an eye on the competition.

"One difference, though, is that to guide the load the [lead] ant must pull as well," Feinerman said.

"While all the ants 'row' in the same direction that the boat is moving, the leader rows in the direction she knows to be correct."

The researchers speculate that an ant temporarily assumes leadership simply by showing up, and that "she does not need to communicate her presence," Feinerman added.



There is an optimal number of ants—about 15—for reaching maximum speed when hauling

The ant chosen for the experiments, *Paratrechina longicornis*, is an invasive species found worldwide. In summer, they typically transport large – at least compared to their three-millimetre bodies – insects to their nests for consumption.

The study, published in *Nature Communications*, also discovered that there is an optimal number of ants—about 15—for reaching maximum speed when hauling.

For the experiments, the scientists used Cheerio cereal that had been stored in a bag of cat food overnight to make it attractive to the [ants](#).

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