Far from powerless: Ant larvae cannibalize eggs, are influenced by relatedness and sex

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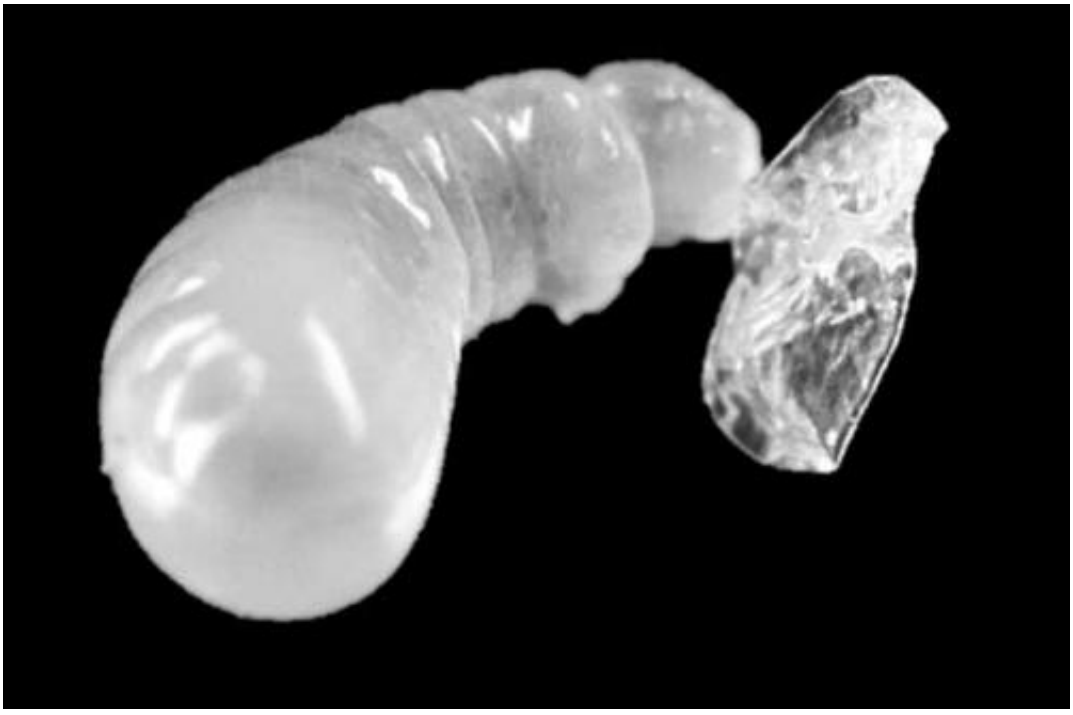

A larva of the ant species *Formica truncorum* cannibalizes an egg by piercing its shell and consuming the contents. Credit: Nick Bos

To the casual observer, the colonies of social insects like bees and ants appear to be harmonious societies where individuals work together for the common good. But appearances can be deceiving.

In fact, individuals within nests compete over crucial determinants of fitness such as reproductive dominance and production of male eggs.

The intensity of competition often depends on the level of kinship between colony members. This is because selfish individuals lose indirect fitness when their behavior harms close relatives. A new study by Eva Schultner and colleagues from the Universities of Helsinki, St. Andrews and Oxford reveals that in ants, such social conflict occurs even among the youngest colony members: the eggs and developing larvae.

In behavioral experiments conducted at Tvärminne Zoological Station in Finland, ant larvae acted selfishly by cannibalizing eggs, but levels of cannibalism were lower when relatedness among brood was high. In addition, male larvae engaged in cannibalism more often than female larvae.

Using evolutionary modeling, the researchers show that cannibalism is predicted to evolve when it carries a benefit to the cannibal (for example in the form of increased survival), and that the costs of consuming kin influence the intensity of cannibalism behavior. Differences in cannibalism benefits for male and female larvae on the other hand may be responsible for higher levels of cannibalism in males.

By exploring the evolutionary causes and consequences of selfish larvae behavior, the study published in *The American Naturalist* sheds new light on the evolutionary constraints of competition in social insect colonies, and demonstrates how in complex societies, even the youngest individuals are potential players in social conflict.

More information: Eva Schultner, Andy Gardner, Markku Karhunen, and Heikki Helanterä, "Ant Larvae as Players in Social Conflict: Relatedness and Individual Identity Mediate Cannibalism Intensity." The *American Naturalist* Vol. 184, No. 6 (December 2014), pp. E161–E174. www.jstor.org/stable/10.1086/678459

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