

## Plotting and treachery in ant royal families



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**Social insects - ants in particular – are usually thought of as selfless entities willing to sacrifice everything for their comrades. However, new research suggests that ant queens are also prepared to compromise the welfare of the entire colony in order to retain the throne.**

A team from the University of Copenhagen, led by postdoc Luke Holman of the Centre for Social Evolution, describes in the renowned journal *Proceedings of the Royal Society B*, published on the 24th February, that ant queens are much more devious than previously thought.

Often, an ant colony has more than one queen. Multiple queens can produce a larger initial workforce in incipient colonies, increasing the chance the colony will survive the hazardous first year. But queens do not happily cohabit forever; soon after the young workers hatch, they begin to slaughter surplus queens until only one remains.

Ant queens were found to cleverly adjust how many new workers they produce for the colony. Queens produce fewer workers when sharing the colony with other queens, especially if the colony already has many developing workers. Queens therefore seem to know when they can expect a showdown for the throne, and conserve energy accordingly.

Such strategic investment in worker production is complemented by sophisticated chemical communication by queens. Ants have been called “walking chemical factories”, because they produce many different odours for tasks such as recognising friends and enemies and signalling their status and role within the colony. Olfactory cues also indicate whether a queen is healthy and fertile. The Copenhagen team found that queens which were fertile had stronger chemical signals, and were also more likely to be spared execution by workers. Workers therefore appear to be selecting the fertile queen as their ruler based on smell.

“Execution of the most selfish ant queens by workers would increase the incentive for queens to be team-players that work hard to help the colony. This rudimentary “legal system” could have helped ants to evolve their highly advanced societies, just as in humans”, says lead author Luke Holman. Co-authors of the study were Patrizia d’Ettorre (now a professor at Paris University) and Stephanie Dreier, who have studied the evolution of social insect behaviour, communication and survival strategies for several years.

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