

# Infectious ants become antisocial

April 14 2015

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Looking after yourself, and trying not to infect others, is a good strategy to prevent disease from spreading - not only if you are a considerate co-worker, but also if you are an ant, meerkat or other social animal, as revealed by an epidemiological model developed by the groups of Professor Fabian Theis from the Helmholtz Center Munich and Professor Sylvia Cremer from the Institute of Science and Technology (IST) Austria. In a Theme Issue of the *Philosophical Transactions of the Royal Society B* on "The Society-Health-Fitness Nexus" published on 13 April 2015, they combine observations of hygienic interaction networks within ant colonies with epidemiological modeling to conclude that this strategy is best to prevent disease spread in social animal groups.

Infectious diseases can spread quickly in societies, but mutual hygienic care may act as countermeasure. Taking care of diseased individuals is not restricted to human societies, but also occurs in [social animal](#) groups, such as primates, and social insects. Sylvia Cremer and Line Ugelvig at IST Austria, together with Fabian Theis and Carsten Marr at the Helmholtz Center Munich, use ant societies as a model system to observe [ants'](#) sanitary response to pathogen exposure in the laboratory, and to determine their effects on disease dynamics using epidemiological modeling. In their study, they observed how garden ants (*Lasius neglectus*) react to being exposed to the fungal pathogen *Metarhizium* by cleaning themselves (self-grooming) or other ants (allogrooming), and how much allogrooming they receive from their healthy nestmates. The researchers then applied their theoretical model to determine whether the observed behavioral changes upon pathogen contact were adaptive in terms of reducing disease spread through the

colony.

Cremer and colleagues observed that when exposed to the fungus, ants cleaned themselves more frequently, yet drastically diminished cleaning of their healthy group members. This led to a social grooming asymmetry, where infectious ants received more sanitizing actions than they performed, yet this was not primarily due to increased received care, but by self-restriction of care performance. Epidemiological modeling predicts that the observed behavioral changes, i.e. increased self-grooming and decreased allogrooming by infectious ants helps to contain the pathogen's spread in the ant colony, being a generally beneficial strategy for all social animals threatened by an epidemic of whatever pathogen. Taking care of oneself but restricting contact to others in a phase where one may be a risk to the health of others is thus a strategy benefiting the whole society under pathogen attack.

Sylvia Cremer also co-authored the Theme Issue's introductory review paper on sociality and health.

Provided by Institute of Science and Technology Austria

Citation: Infectious ants become antisocial (2015, April 14) retrieved 6 May 2024 from <https://phys.org/news/2015-04-infectious-ants-antisocial.html>

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