



The underlying dynamics of collective responses to external cues in clonal raider ant colonies

Author(s): Asaf Gal, Asaf Gal , Jonathan Saragosti , Daniel Kronauer , Asaf Gal

Institution(s): The Rockefeller University, New York, USA ; The Rockefeller University, New York, USA ; The Rockefeller University, New York, USA ; The Rockefeller University, New York, USA ; The Rockefeller University, New York, USA

Ant colonies process sensory information collectively, and respond to cues from the environment in a coherent manner. This coherence is achieved by a strong interaction between ants, which is used to share information between individuals, and coordinate their collective response. We use the clonal raider ant *Ooceraea biroi* to conduct controlled and configurable behavioral experiments probing the underlying response dynamics of colonies to external cues and signals. We place ant colonies of controlled size, age composition and reproductive state in an arena that allows for fast temperature switching of independent zones, and follow their behavior in response to perturbations of various amplitude, duration and spatiotemporal profile. Following these perturbations, the colony response varies from subtle changes in individual and collective behavior to emigrations to new nest sites. The ants in these experiments are individually tagged and video tracked, enabling the relation of individual response features to the emergent collective dynamics. Here I will present a first set of experiments, in which we track the behavior of colonies in response to spatially homogenous perturbations. I will discuss the dynamical properties of the different regimes of the behavior, and their implications for understanding the underlying dynamical processes of the collective response.