

OR020*Food dissemination in ant colonies - from interactions to global distributions***Efrat Greenwald**, Ofer Feinerman

Collective nutrition is a fundamental process in the communal life of ants. During this process, food gathered by a small number of foragers is relayed between ants to satisfy the various nutritional demands of the entire colony. We are interested in understanding how the regulation of trophallaxis at the level of single pairs leads to the dissemination and resulting distributions of food as observed on the collective level. To approach this question, we have developed a novel experimental system that combines fluorescent labeling and a 2D barcode identification system. These enable us to continuously track the amount of food held in the crop of each and every identified ant, the amounts of food transferred during trophallaxis events, and of the distribution of food within the nest. We used this system to study the dissemination of liquid food within a *Camponotus sanctus* colony. The identification system allows us to construct the complete trophallaxis network from the time at which food was discovered and until steady state is reached. We show that workers tend to adopt one of three behaviors: (1) Foragers that alternate between collection and rapid dissemination, (2) delayed food distribution and (3) food storage. Such local decision rules dictate the timescales, spreading rates and food distribution at the level of the colony. We further study the dependency of the collective process on the nutritional makeup of the food source. These observations contribute to our understanding of the distributed dissemination activity by uncovering the underlying network structure and its regulation mechanisms at the level of single interactions.