Chemical Basis of Social Interactions Among Ants

Ants are highly social insects that use chemical compounds on their exoskeleton called cuticular hydrocarbons (CHCs) as a way to identify nest mates and reject intruders. In order to protect themselves and lower the chance of invasion by outsiders, colonies would benefit from continuously changing their CHC profiles over time. Similarly, colonies can only respond to changes in the queen's health status if the CHC profile shifts when she becomes ill or dies. In this study, I tested whether and why CHC profiles change over time in the harvester ant, *Pogonomyrmex rugosus*. I split three laboratory colonies divided into three colony fragments; one queen-right group with the queen and workers, and two queen-less fragments with only workers. Over a period of three months, I compared the aggression ants from these fragments showed toward each other by placing an unconscious individual into a test ring of five other individuals from each fragment for two minutes. All interactions from the five individuals towards the unconscious individual were recorded as levels of aggression ranked from one to four, one being antennation and a four being biting or stinging. Individuals throughout the experiment were frozen for later chemical analysis of CHCs. Preliminary results show that all groups have a significant increase in aggression over time. Further results will be shown at the conference.