Title: Interaction rate informs harvester ant task

Abstract: Social insect colonies operate without central control, and colony organization results from the ways that individuals respond to local information. We investigated how temporal information, in particular the rate of interaction among workers, stimulates foraging activity in the red harvester ant (Pogonomyrmex barbatus). Patrollers scout the foraging area each morning. Previous work showed that the patrollers’ safe return to the nest stimulates the foragers to leave the nest; if the patrollers do not return, the foragers do not emerge. Here, we tested whether contact with returning patrollers must occur at a particular rate to stimulate foraging. We varied the rates at which we introduced patroller mimics, glass beads coated with an extract of the cuticular hydrocarbons of patrollers. A return rate of 1 patroller mimic every 10 s stimulated the highest level of foraging activity. We found that the onset of foraging depends on the rate of patroller return. Adding beads coated with patroller hydrocarbons at a rate of 1 per 10 s caused otherwise undisturbed colonies to forage 17.9 6 19.7 (standard deviation) min faster than colonies that received blank control beads. These results show that rate is a crucial source of information in the network of interactions among workers. Key words: cuticular hydrocarbons, foraging behavior, interaction rate, social insects, task allocation.

Summary: This article mainly goes over the results of the expirements in which Gordon replaced patrollers with beads coated with cuticular hydrocarbon’s associated with patrollers. This allowed her to use the rate of return of patrollers and correlate it with the foraging rate during the rest of the day along with the delay associated with the same rate.

Reference in our model: the threshold windows we have for conversion into other tasks however one thing to note is that we are currently doing nothing with regards to the time delay which is also asscociated with the rate of return.

Citation: