

OR001*Natural selection on the regulation of foraging in harvester ants***Deborah M. Gordon**

A long-term study of a population of colonies of the desert seed-eating ant *Pogonomyrmex barbatus* has made it possible to investigate how natural selection is shaping collective behavior. It appears that colonies that regulate foraging so as to conserve water in current drought conditions are more likely to have offspring colonies. Behavioral studies show that colonies regulate foraging activity according to food availability and current humidity. The collective behavior that regulates foraging activity is based on positive feedback from interactions of outgoing and returning foragers. Demographic data and observations of foraging activity show no evidence of any behavioral or ecological differences between the two lineages of this dependent-lineage population. There is variation among all colonies in the regulation of foraging activity, and we are investigating how this variation arises from differences among colonies in how individual ants respond to interaction. Using microsatellite variation at 5 loci, we matched parent and offspring colonies, as colonies founded by daughter queens of a known parent queen, for 270 colonies of known age. We were able to estimate a life table for this population of colonies and to estimate the female component of colony lifetime reproductive success. Only about 25% of colonies have offspring colonies, and surprisingly, we found no evidence of reproductive senescence in the 20-30 lifespan of a colony. There is evidence of heritability from parent to offspring colonies in the regulation of foraging, and we are investigating this further. Since variation among colonies in the regulation of foraging behavior is associated with variation in colony lifetime reproductive success, it appears that natural selection is shaping collective behavior so as to favor less foraging activity in poor conditions.