Title: How site fidelity leads to individual differences in the foraging activity of harvester ants

Abstract: We examined how differences in activity among individual foragers of the red harvester ant, Pogonomyrmex barbatus, could arise

from site fidelity. Using observations of individually marked foragers, we found that each day most foragers made a few foraging

trips, whereas only a few foragers made many trips. To determine whether only particular individuals are capable of high

foraging activity, we removed the foragers that made the most foraging trips on 1 day and examined the frequency distribution

of foraging the subsequent day. The most active foragers were replaced by other individuals. We then examined site fidelity of

foragers. Though foraging trails extend up to 20 m from the nest, observations of marked individuals showed that on successive

trips, a forager returns to sites within about 0.5 m. Foraging trip duration depended on search time and not on the distance from

the nest of the final destination. Thus, the more food available, the shorter the search time and the shorter the trip. Because

foragers return to the same site over and over within a day, a forager making many short trips to a high-quality patch can make

more foraging trips per day. Thus, variation in patch quality, rather than individual variation in foraging ability, could produce

the observed distribution of trip number. These results show that regulation of foraging in harvester ants does not require any

individuals to show others a particular location with abundant food. Instead, a decentralized system of interactions tunes the

numbers foraging to current food availability. Key words: individual foraging behavior, patch quality, Pogonomyrmex barbatus, search

time, site fidelity.

Summary: This article investigates individual differences in frequency of foraging trips and location of foraging sites for foragers.

In Code: NOT AT ALL!!!!!!!! We need to ook over this again.