



A Seed Harvesting Ant in a Florida Plant Community

The Florida Harvester Ant, *Pogonomyrmex badius*, is another animal of western affinity, whose evolution is closely tied to the plants in its habitat. Like most of its close relatives the Florida species of *Pogonomyrmex* is a seed eating ant. Workers collect seed after it has fallen from plants, and store them in underground chambers. We have found seeds of *Ceratiola erecoides* (Florida Rosemary) and *Palafoxia faeyi* (Palafoxia) in the seed chambers. Foragers have been intercepted as they retrieved seeds of *Pinus clausa* (Sand Pine), *Richardia brasiliensis* (Richardia), *Diodia virginiana* (Diodia), *Befaria racemosa* (Tarflower), *Pityopsis graminifolia* (Golden Aster), *Froelichia* spp. It seems as though *P. badius* will accept most seeds, however, the greatest proportion of the seed part of their diet may be seeds of *C. erecoides* (Florida Rosemary). This may be due to the fact that this ant species requires open sandy soil for nesting, a defining characteristic of Rosemary balds, where the dominant plant species is a copious seed producer.

The closest relatives of *P. badius* are found only west of the Mississippi river. Within a colony, workers are identical in size and shape (monomorphic). Only in the Florida species are workers of a colony variable in size and shape (polymorphic). In these colonies, some workers have disproportionately large heads (3 times the head size of ants with body lengths half as much). This system provides a unique opportunity to study the evolution of this phenomenon, called polymorphism, in ants, since closely related species can be compared. Our research has led us to believe that polymorphism has evolved in *P. badius* because they have evolved a seed milling caste (or group of individuals that perform a specific task). What has allowed this species to evolve a special seed milling caste but has prevented the other species from doing so, is the fact that in Florida, the seed harvesting ants eat fewer seeds. A comparison of diet among species of *Pogonomyrmex* has revealed that the diet of *P. badius* is made up of only 58% seed while the diet of *Pogonomyrmex* species from the deserts of the southwest range from 79-89% seed. While every worker in a monomorphic species needs to be equally well adapted to seed milling, since they eat little else, the Florida species can afford to make a special group of workers that do nothing but mill seeds since other workers can eat other items (dead arthropods) while seeds are being milled.

We hypothesize that Omnivory may be a response to life among fire adapted plant species. While desert ant species live among plants that are closely tied to seasonal rains, the Florida species finds itself relying on plants that may only seed after fires, which are less reliable in time. When faced with the problem of long periods of seed droughts, this species became better at processing an important resource and less dependant on its abundance.

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