



Teacher Background

Ecology

The Sonoran Desert is a great place to watch ants. They are the most abundant animal in this habitat, and the lack of ground cover makes them easy to see. In the desert, most species of ants build underground nests that protect them from harsh conditions. Here they can store or even grow food, find ample water, and avoid the environmental extremes of the soil's surface.

One way to look at ant diversity is to classify them by the foods they eat:

Seed-harvester ants

Many desert ants harvest seeds that they use as food for their larvae. Seeds of several types of grass and annual plant species are preferred; seeds of perennial plants (especially cacti) seem not to be preferred. Seeds are stored in chambers toward the top of nests where dry conditions discourage germination. Ants have interesting behaviors when learning the different types of seeds that are available to them.

Pogonomyrmex workers have large squarish heads with powerful muscles for crushing seeds and unforgettable stings. The typical nest of many species has a prominent cleared area, with a central opening and several permanent trails radiating from it.

Over a dozen species of *Pheidole* live in the Sonoran Desert. Their workers come in two distinct forms: a small minor worker class and a much larger soldier class that crushes seeds, and sometimes enemies too.

Our desert *Solenopsis* is related to the infamous imported fire ant that is the scourge of the southeastern United States. The desert fire ant is a natural part of the Sonoran Desert community; unfortunately, it does resemble its eastern relative in its aggressive behavior and annoying sting.

Leaf-cutter ants

Another common group of ants in the Sonoran Desert are the leaf-cutting or fungus-growing ants. *Acromyrmex* ants are related to the larger leaf-cutting ants of the tropical Americas. *Acromyrmex versicolor* is common in the Sonoran Desert. Its workers collect leaves and other plant parts to insert into fungus masses, which grow in chambers deep within their underground nest. The fungus is completely dependent upon the ants for its care and propagation; the ants, in turn, eat a portion of the fungus as their sole source of solid food. Long columns of leaf-cutter ants search across the desert for plant matter for their fungus gardens when conditions permit in the fall and spring and on cool summer mornings; at other times, they remain underground. The fungus garden is started from a small plug of fungus brought by the queen from her home colony.

Honey pot ants

Another common food source in the desert is the liquid nectar of plants and the juice of other insects; however, both are available only seasonally. Honey pot ants (*Myrmecocystus*) have solved this seasonal problem with specialized members of the colony that store liquid food in their engorged gasters. When other colony members need food, these living storage vessels share their stored reserves.

Army ants

The ants described above eat seeds, fungus, or nectar. Some ants prefer meat; these are the desert army ants (genus *Neivamyrmex*). These ants raid the nests of other desert ants and occasionally take other prey as well. Because they are predatory and deplete the prey in any one area, they are nomadic and move from place to place. They have no permanent nest structures, and, instead, tend to live in temporary quarters such as hollows under trees or kangaroo rat nests.

Ants' ability to live in colonies and excavate deep nests where the seasonally abundant food of the desert can be stored has made them remarkably successful in the Sonoran Desert. Further, in this environment, ants are easily collected and observed; this has made them model organisms for studies of development, behavior, and ecology.

http://www.desertmuseum.org/books/nhsd_ants.php