**Organic Materials Management: Compost Pile Critters**

**Adapted From:** <http://www.calrecycle.ca.gov/organics/homecompost/Critters/Default.htm>

**Level One—Primary Consumers**

This level is made up of herbivores: bacteria, [fungi](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Fungi), [actinomycetes](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm" \l "Actinomycetes" \o "Any of a group of generally low-oxygen–utilizing bacteria identified by a branching growth pattern that results in large threadlike structures.), [nematodes](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Nematode), mites, snails, slugs, earthworms, millipedes, sowbugs and worms.

The most productive members of a compost pile's food web are the bacteria, which are chemical decomposers. As a group, they can eat nearly anything. Some are so adaptable that they can use more than a hundred different organic compounds as their source of carbon because of their ability to produce a variety of enzymes. Usually, they can produce the appropriate enzyme to digest whatever material they find themselves on.

Every piece of organic matter you place in the pile is covered with varying amounts of bacteria. As they digest the organic material and break it down into its basic elements, they are also reproducing at an incredible rate. One gram of bacteria can become about 450 grams of bacteria in only three hours.

There are many kinds of specialized bacteria operating in different temperature ranges.

Psychrophil[Psychrophilic bacteria](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Psychrophilic) work best in temperatures of about 13 degrees C (55 degrees F), but can stay on the job even in near freezing conditions. This is why you will notice your compost pile sinking in the winter; these bacteria are busy breaking down organic matter. As these cooler bacteria go to work, their activity actually begins to heat up the pile. The increased temperature creates the ideal conditions for the next type of bacteria to arrive.

[Mesophilic bacteria](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Mesophilic) work best in temperatures of about 21 degrees C to 32 degrees C (70 degrees F to 90 degrees F), but can stay on the job in even hotter conditions. The activity of mesophilic bacteria can heat the pile up to even greater temperatures of 43 degrees C (110 degrees F).

Thermophilic[Thermophilic bacteria](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Thermophilic) become active when the temperature reaches between 40 degrees to 93 degrees C (104 degrees F to 200 degrees F). If you notice your compost pile steaming in the morning or on a frosty day, it's because these bacteria are busy at work, decomposing your organic waste. These bacteria generally last for up to five days, and then the pile begins to cool.

[Actinomycetes](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Actinomycetes) go to work next. These fine, gray-colored strands are a cross between the bacteria and fungi that often excrete vitamins and antibiotics as they consume the organic waste in your pile.

[Molds](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Mold) and [fungi](http://www.calrecycle.ca.gov/organics/Glossary/Default.htm#Fungi) get down to business along with the actinomycetes. Molds are actually a form of fungi. The presence of mold and fungi usually implies decay, although some molds are deliberately grown in laboratories for the production of antibiotics. They feed on decaying organic matter.

**Snails** are terrestrial mollusks, typically having a spirally coiled shell, broad retractile foot, and distinct head. They generally feed on living plant material but will attack fresh garbage and plant debris and will therefore appear in the compost heap.

**Slugs** are basically snails without the shell. They, too, feed on living plant material, fresh garbage, and plant debris, and will also show up in the compost heap.

**Millipedes** are nonpoisonous arthropods with cylindrical bodies of 20 to 100 segments, with two pairs of legs per segment. They feed mainly on decaying plant tissue but will also eat insect carcasses and excrement.

Photo of a sow bug**Sow bugs** are fat bodied crustaceans with delicate plate-like gills along the lower surface of their abdomens which must be kept moist. They move slowly, grazing on decaying vegetation.

Photo of a pill bug**Pill bugs** look similar to sow bugs and also graze on decaying vegetation, but are more flexible. They can roll themselves into a ball to protect themselves, which gives them their common nickname: "roly polys.”

Photo of a mite**Mites** are the second most common invertebrate found in compost. They have eight leg-like jointed appendages. Some can be seen with the naked eye and others are microscopic. Some scavenge in leaves, rotten wood, fungi, and other organic debris.

**Earthworms** also arrive at this stage and are generally welcomed by new composters. As a result of the worm's well-deserved reputation for being excellent decomposers, many people think that it's a great idea to add extra worms to their compost pile. This is unnecessary. Let the worms find their own way into the pile, when the conditions are right. They prefer the pile when it is cooler, so adding worms could lead to their quick demise in a hot, steamy pile. Earthworms will eat most things that have lived (organic matter).