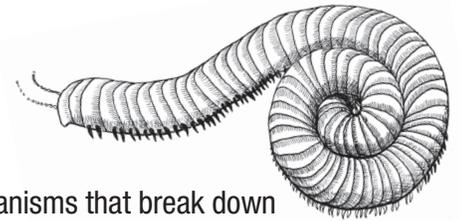


# DECOMPOSERS IN A COMPOST PILE



Compost is produced through the hard work of a number of different decomposer organisms that break down organic material and convert it into finished compost. These decomposers are naturally present on the organic materials that you add to your compost pile, and also exist in the areas surrounding your compost system.

## COMPOST ECOSYSTEM

Decomposers in a compost pile are part of a complex compost ecosystem in which food, water, air, and shelter are provided by the material within the compost pile. If any of those essential ingredients are missing, the organisms either slow down or stop working altogether. This web of interdependence is the driving force behind the production of compost.

Some organisms feed on decomposing plant materials, while others feed on other organisms. The two main categories of decomposers are chemical and physical decomposers.

**Chemical decomposers** work by using chemicals in their bodies to break down organic matter into simple compounds for energy. This is similar to how the acids in our stomachs dissolve the food we eat. Chemical decomposers are mostly microorganisms that cannot be seen without a microscope. Examples of chemical decomposers include bacteria, protozoa, and fungi.

Bacteria are the most abundant of the microorganisms found in a compost pile and perform the majority of the decomposition. An important by-product of their work is the generation of heat, which can warm up the pile and attract other heat-loving organisms to assist with the breakdown process.

**Physical decomposers** work by feeding on the organic materials in a pile. Similar to how we use our teeth to break up large pieces of food, physical decomposers chew, grind, and squeeze the materials into smaller pieces. After digestion, they excrete waste products which are then broken down even further by the chemical decomposers. Physical decomposers are mostly macroorganisms that can be seen without a microscope. Examples of physical decomposers are worms, mites, flies, and snails.

Earthworms do a large amount of the decomposition work among the macroorganisms. Several species of worms dig tunnels and feed on the decomposing materials in the compost pile. The spaces that the worms create as they move through the compost pile allow air, water, and nutrients to circulate, creating the necessary conditions for many of the other organisms to thrive.

## COMPOST FOOD WEB

All of the decomposer organisms in the compost ecosystem are linked by a “what eats what” food web, wherein organisms are classified according to what they eat. There are three levels of consumers in the compost food web: primary, secondary, and tertiary. This web structure keeps the different populations under control and maintains a healthy and balanced compost pile.

**Primary (first level) consumers** feed directly on dead plant materials (and other decomposers that have died) in the compost pile. This group consists of chemical decomposers such as bacteria and fungi, but also includes larger physical decomposers such as snails, slugs, beetle mites, worms, and flies.

**Secondary (second level) consumers** feed on primary consumers and their waste products. This group consists of physical decomposers which include springtails, mold mites, and nematodes.

**Tertiary (third level) consumers** feed on secondary (and sometimes tertiary!) consumers. This group consists of fast-moving consumers which include centipedes, pseudoscorpions, predatory mites, and rove beetles.

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The NYC Compost Project, created by the NYC Department of Sanitation in 1993, works to rebuild NYC's soils by providing New Yorkers with the knowledge, skills, and opportunities they need to produce and use compost locally. **Learn more at [nyc.gov/compostproject](https://nyc.gov/compostproject).**

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