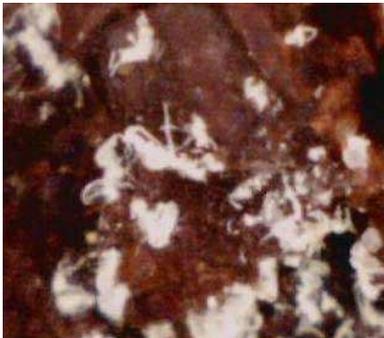


# Worm Bin Creatures

## Bacteria

Bacteria are the most numerous organisms in the vermicompost system, and the primary decomposers of organic matter on earth. They work on organic material by secreting enzymes which break the bonds holding molecules together, thus simplifying and reducing the molecules to their component elements for absorption. As bacteria simplify the organic matter they make it available to earthworms and other organisms in the system, as well. On the same size scale as bacteria are thousands of other species of micro organisms, feeding on decaying organic matter and each other, forming a complex, microscopic ecosystem called the soil food web.

## Moulds & Fungi



It's not just arthropods and bacteria decomposing the organic material in the worm bin! Moulds and fungi are common organisms in a healthy worm system. They feed on decaying organic matter with tiny, hair-like hyphae, secreting enzymes which break down and simplify the organic material. They are also an additional food source to other organisms in the system, including earthworms.

Moulds and fungi can also serve as an indicator, telling us if the feeding rate is adequate. Because they grow most prolifically in still, quiet environments, large amounts of mould and fungi indicate there is more food than the system can quickly manage and the feeding rate should be decreased.

Mould and fungi pose no threat to the garden or the animals living in the worm bin, but can cause irritation to humans with mould allergies. If you are allergic to moulds, your bin should be kept outdoors or in a garage or basement that is well ventilated to reduce or eliminate irritation.

## Mites



Mites are the one of the most common invertebrates found in compost. They have eight leg-like jointed appendages. Some can be seen with the naked eye and others are microscopic. Some can be seen hitching rides on the back of other faster moving invertebrates such as worms, millipedes and beetles. Some species eat fungi, yet others are predators and feed on nematodes, eggs, insect larvae and other mites and springtails. Some are both free living and parasitic. One very common compost mite is globular in appearance, with bristling hairs on its back and red-orange in colour. Most mites are not harmful to you, your worms, or your plants. Brown predatory mites are very rarely found in worm bins.

### Conditions That Can Lead To Mite Infestation

Too much water - Bedding that is too wet creates conditions that are more favourable to mites than worms. Avoid excessively wet beds by improving drainage, and turning bedding frequently.

Overfeeding - Too much food can cause an accumulation of fermented feed and heat up worm beds plus lower the pH of the beds. Adjust feeding schedules so that all feed is consumed within a few days. Modify feeding

schedules as the seasons (and temperatures) change because worms consume less food in colder temperatures. Maintain beds around a neutral pH 7.

Excessively wet or fleshy feed - Vegetables with a high moisture content, pulp from juicing, waste can cause high mite populations in worm beds. Limit the use of such feed, and if high mite populations are discovered, discontinue the use of this feed until mite populations are under control.

## **Ways to reduce mite populations**

1. Uncover the worm beds and expose them to light for several hours to allow bedding to dry a bit. Reduce the amount of water and feed.
2. Place pieces of watermelon or potato slices on top of the worm beds. Mites are attracted to the sweetness of the rinds or peels and will accumulate on them. The rinds or peels can then be removed and dropped in water or buried.

Remember that mites are a common invertebrate in vermicomposting systems. You only need to take action if their numbers overtake your system.

## **Sow or pill bugs (Isopoda)**



Sow Bugs also known as woodlice or roly poly 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. They shred and consume some of the toughest materials, those high in cellulose and lignins. They may be found through all areas of the bin, except the bottom where there is primarily finished vermicompost, but are most commonly found in the loose surface layers. Sow and pill bugs are considered omnivores, meaning they will feed on both living and dead organic matter. They are sometimes considered garden pests, though they are more commonly found in compost

and organic debris piles. In the worm bin they are highly beneficial organisms. Sow bugs have a segmented, armoured shell similar in appearance to that of an armadillo, are brown to grey in colour, have seven pairs of legs and two antennae. They are beneficial in the bin but can harm young plants.

## **Centipedes & millipedes**



These long, slow moving, wormlike animals are found in small numbers throughout all layers of the worm bin, where they feed on decaying organic matter.

Millipedes are long and segmented, with two pairs of legs per body segment and two antennae with which they sense their environment. Colours range from black to red, but those species found in the worm bin are commonly brown or reddish-brown. The millipede has an armoured shell for

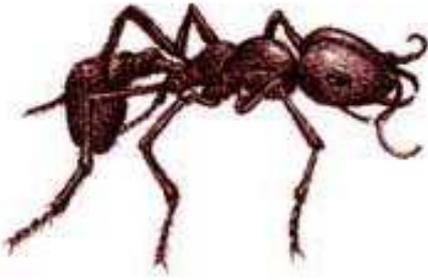
protection and coils into a ball, like a pill bug, when threatened.

Centipedes resemble millipedes, but their bodies are more flattened and less rounded at either end. They possess one set of legs on most of their body segments and a large pair of pincers which originate behind the head. The centipede is generally more reddish than the millipede, is very fast moving and is generally found only on the surface of the worm bin.



It's unusual to have many centipedes in a worm bin and one or two are no problem. However, because these arthropods will eat worms as well as other organisms it's a good idea to keep their numbers low. The only way to control centipedes is to remove them by hand which should be done carefully. While not poisonous to humans, they can give a nasty bite with their impressive pincers!

## Ants



Ants feed on fungi, seeds, sweets, scraps, other insects and sometimes other ants. Compost provides some of these foods and it also provides shelter for nests and hills. Ants may benefit the compost heap by moving minerals especially phosphorus and potassium around by bringing fungi and other organisms into their nests. The presence of ants is an indication of dry bedding. Moisten the bedding a bit and most ants will find some place else to live. If your bin has legs, place the legs in a can of water that has had a drop of dish soap placed in it to reduce the surface tension of the water so the ants can't walk across the water. Petroleum jelly on the legs also restricts access.

## Springtails



Springtails are extremely numerous in compost. They are very small wingless insects (the maximum size is 6 mm/0.2 in. in length; 1 to 2 mm/.05 in. avg. length) and can be distinguished by their ability to jump when disturbed. They run in and around the particles in the compost and have a small spring-like structure (called a furcula) under the belly that catapults them into the air when the spring catch is triggered. A springtail 5-6 mm in length can jump 75-100 mm. Springtails that do not have a furcula cannot "spring".

Springtails come in many colours such as white, yellow, grey, red, orange, metallic green, and lavender. They chew on decomposing plants, pollen, grains, and fungi and are beneficial organisms in the bin. Springtails usually diminish in numbers when the bedding dries out a bit.

## Pot worms (*Enchytraeidae*)



Sometimes called white worms, these small, white, threadlike worms are found in worm bins when there is a quantity of finished material. They are beneficial organisms that feed on decaying organic matter and are considered a prized tropical fish food. Some worm growers culture this species of worm for the pet food market. While usually found when the bedding in the bin is slightly acidic, their presence does NOT indicate a pH problem and pH adjustment is not recommended.

Pot worms are white, segmented worms, frequently mistaken for baby redworms. Their bodies are nearly transparent and their digestive system quite visible when viewed through a hand lens. Pot worms do not feed on living plants and pose no threat to the garden or people.

## Soldier Fly Larvae



Black Soldier flies (Diptera: *Stratiomyidae*) are true flies that resemble wasps in their appearance and behaviour. These flies do not bite or sting. Adult flies are often found on flowers and vary in colour from black, metallic blue, green or purple, to brightly coloured black and yellow patterns. You can tell that they are flies and not wasps because flies have just two wings, unlike wasps that have four wings. When at rest, the wings are folded scissor-like across their abdomens.

The larvae are very aggressive consumers in the worm bin. So much so that the passive worms may temporarily retreat to the lower parts of the bin until the soldier fly larvae have grown into adults and flown away. If your worms do retreat be sure you have food in the lower parts of your bin so they don't starve. The larvae change in colour from off white, to light brown, to grey. Some describe them as big, ugly, segmented maggots. They have about 10 segments and are somewhat flat on the underside. One end is round and the other end comes to a slight point.



The larvae are found in large groups in the organic material, and can tolerate very hot conditions. When disturbed, they will retreat from the light, just as worms do.

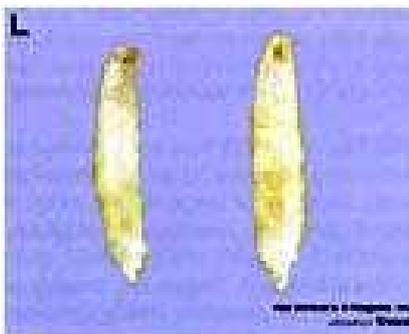
## FRUIT FLIES:



A Fruit Fly is about one third the size of the housefly. Adults have red eyes and yellow-brown bodies. Life cycle from egg to adult is approximately 10 days. Eggs are laid near or on top of fermenting materials, such as decaying fruit and vegetable matter. They are attracted to any area where moisture has accumulated. Flies are natural organisms in any decomposition system.

Always keep moist newspaper on top of your worm bin to make it difficult for the female flies to lay eggs in the food waste.

To reduce existing fruit fly populations you can use a trap.



### Fruit Fly Traps

Simple bait traps made using a small plastic bottle can be effective against the adults. Two drops of soap to break surface tension is mixed with fruit juice. Fruit flies are attracted to the fruit juice and become trapped when they land to lay eggs. The trap can be even more effective by placing cling wrap over the mouth of the bottle and punching holes in the centre of the cling wrap with a needle. The holes are made just big enough for the fruit fly to enter. The flies will be attracted by the juice, enter through the holes but cannot find their way out.