

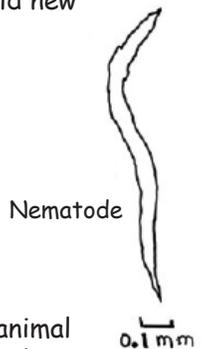
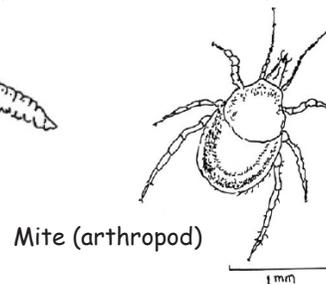
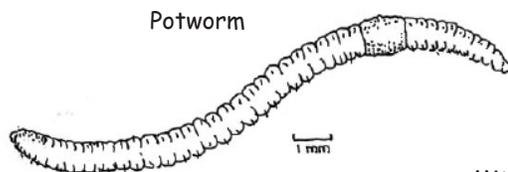
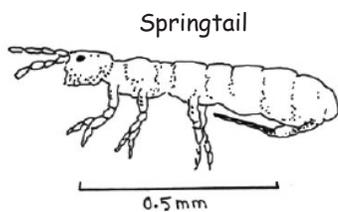
NATURE NOTES

"BLACK MAGIC" THAT WORKS FOR US!

When you walk across your yard to see what is happening down by the water, do you ever wonder what is happening right under your feet? The black stuff you are walking on is not just inert "dirt" — it is alive!

A lot goes on in the litter and soil covering the granite bedrock, but most of the action is invisible to our eyes. Six groups of actors carry out most of the work — bacteria, fungi, protozoans, nematodes, arthropods and worms. Each group plays a different role, and all are necessary. The result of all their activities is the natural process that we call "decomposition."

Why do we need decomposition? Well, all the biological material produced by "Green Magic"* ties up nutrients needed by future plants and animals. Fortunately, the billions of busy organisms in the soil work to break down dead things and release nutrients and carbon compounds, making them available for reuse. Along with replenishing supplies, some decomposers also hold them available and even assist plants to take them up and build new plant material.



Decomposers work along all food chains taking apart dead plants, dead plant eaters, dead animals, animal droppings and much more. Nutrients from some materials, such as flower petals, are quickly returned to the soil, but it takes many seasons to break down hard material like wood. Certain organisms, such as fungi and bacteria, have the enzyme cellulase, which is needed to break down cellulose.

As decomposition proceeds, small bits of organic matter are incorporated into the soil as humus which holds nutrients and water. Humus also contributes to soil structure by maintaining spaces for air and water movement.

Fascinating Fungi

Dig into the litter and you will find networks of yellow and white fungal threads called mycelia. These networks exist everywhere on the planet, and they form the vast bulk of fungal bodies. We usually become aware of them only when they produce their fruiting bodies — mushrooms.

Fungi also play a vital role in plant growth. They surround plant roots and even grow into them, helping plants absorb carbon, water and nutrients. About 90% of all land plants have mutually beneficial relationships with fungi. In turn, fungi receive sugars from the plant.

Recent research in British Columbia is showing some amazing ways that underground webs of fungi connect trees and plants together, moving resources among them, allowing large trees to subsidize young ones. A "wood wide web"!

Beneficial Bacteria

We often believe all bacteria are harmful and must be eradicated. But the essential process of decomposition could not proceed without them.

Pick up a handful of healthy soil and you will be holding billions of soil organisms including:

- kilometres of fungal threads
- 100 billion bacteria (10,000 different kinds!)
- 100 thousand protozoans
- 10 thousand nematodes
- 5 thousand insects, arachnids, molluscs, and worms
- 100s of species of algae

This page gives just a tiny sample of the known decomposition story. Much remains to be discovered. In the meantime we should respect this natural process, provided by nature at no cost to us. Leave dead plant materials where they fall; dead trees, litter and leaves are resources, not waste. Stay away from harmful chemicals and actions that kill soil organisms.

Soil fauna must have a fighting chance to continue to provide this essential service — "Black Magic"!

* see KLA 2015 spring newsletter