Common Soil Organisms

As you explore the world around and below you, keep an eye out for these organisms (living things) that live in those places.

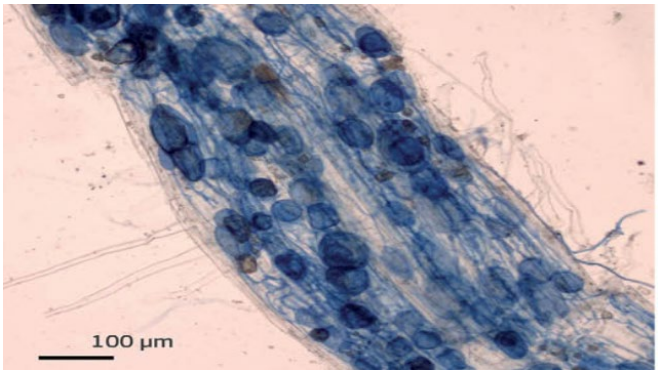
Images and organism information were adapted from the 2016 Global Soil Biodiversity Atlas unless otherwise noted.

Fungi – There are many types. Here are a few.



Macrofungi

Pictured is a fungus belonging to the group Basidiomycota, which contains the common mushroom. The visible part of fungi is their reproductive structures. Fungi use their reproductive structures to make more of themselves and spread to other areas. Unlike the mushrooms in your kitchen, most wild mushrooms aren't good to eat, and some are very toxic



Mycorrhizal fungi

Mycorrhizal fungi have a special relationship with specific plants; they give plants nutrients from the soil to get sugars from the plants in return. They form networks to gather soil nutrients and exchange them with plants through webs of microscopic, root-like, hyphae. The hyphae extend throughout the soil and connect to the plant either from inside or outside of the plant's roots. Pictured is a view through a microscope of plant roots and mycorrhizal fungi that was stained for visualization.

The Power of the Sun – Soil organisms that get their energy from the sun.



Lichen

(zoomed in view)

Lichen are the result of fungi and algae coming together to form a distinct entity that can live in many different environments. You can even see them on the surfaces of rocks, where they live in the little nooks and crannies. They survive off of the nutrients in the rocks themselves and the matter that gathers in its nooks. They even live on the surface of soils in deserts!

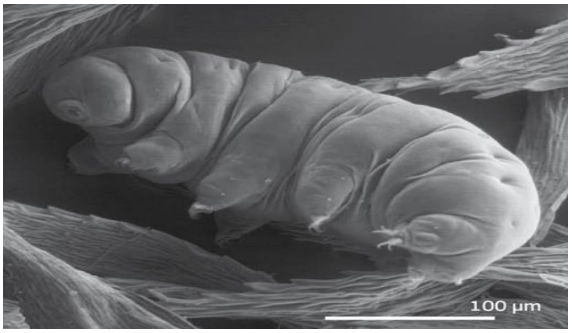


Plant roots

(belowground view)

Plants hold themselves to the ground by extending their roots into the soil, just as we ground ourselves with our feet. Roots are also used by plants to uptake water and nutrients for their growth.

Microfauna – The tiny soil animals.



Tardigrades

Tardigrades live in the water held by soil. That's why they are cutely called the "water bear"! They are also called "moss piglets" because they live in mosses too! They are extremely small animals that can't be seen using solely your eyes.



Nematodes

Similar to tardigrades, nematodes also live in the water held by soil. Under the microscope, you can see their worm-shaped bodies.

Mesofauna – The middle-of-the-road soil animals.



Mites

Mites live in a variety of habitats, but over 40,000 species of mites live in the soil. They are closely related to spiders. They like to eat many things such as bacteria, plants, and other tiny animals.



Springtails

Springtails mostly like to live among the leaf litter covering the soil surface, but they also live inside the soil. They are good jumpers. Most springtails have a spring-like structure on their body that allows them to jump distances several times the length of their bodies.



Protura

Protura are found in lots of different environments, such as woodlands, grasslands, and farmland. They live in leaf litter, moss, decaying wood, and moist soils with lots of organic matter. They are mostly colorless but can have yellowish bodies. As pictured, their bodies are pointed at each end, and they lack wings.



Diplura

Diplura look similar to earwigs but are entirely different animals. Similar to earwigs, they have a pair of limbs on the rear of their body. These limbs can be pincers or threadlike structures. Their heads have antennae that are long and look like beaded strands. They seem to live everywhere! They live in wood, leaf litter, mosses, throughout soil's layers, underneath rocks or logs, and even in termite and ant nests.



Pseudoscorpions

Pseudoscorpions have a similar body shape to scorpions, but do not have a venomous stinger. For this reason, they are also called "false scorpions".They live in many places including caves, leaf litter, soil, mosses, lichens, ant and bee nests, underneath rocks, and within the dens of ground-dwelling mammals.

Macrofauna – The BIG soil animals.



Ants

Ants are social insects and live in groups known as colonies. They have homes called nests that can be high above the ground in tree canopies, or on the soil surface, or underground. Ants that nest underground build tunnels that lead to larger room-like holes that have specific purposes, such as nurseries for young ants. Individual ants have specific jobs as the colony divides up the roles.



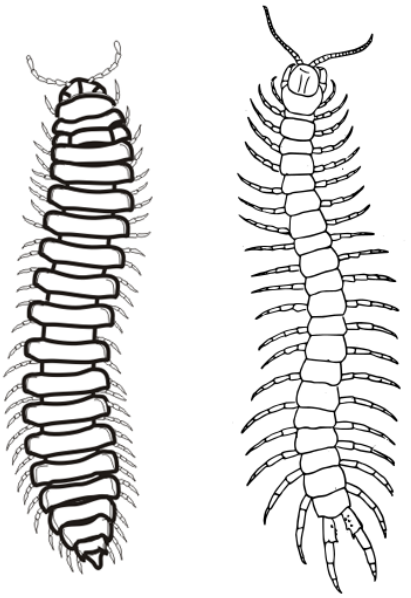
Termites

Termites are another social insect that likes to eat dead plant material. They are known for eating dead wood, dry grasses, and even soil. They might take a chunk out of unprotected wooden buildings. They build and can live in tunnels of dead wood. They travel through tunnels in the soil.



Isopods

The isopods that dwell in the soil are commonly called woodlice or pill bugs. They can live in a range of soils from the dry soils in deserts to the soaked soils of wetlands. During the daytime, they hide under rocks, bark, and logs as they are typically active at dusk and night.



millipede centipede

Myriapods

Myriapods are a group of soil animals that have long, segmented bodies with lots of legs. They can have 8 to 750 pairs of legs. That's up to 1500 legs! Centipedes and millipedes belong to this group. They typically live in the soil in both deep and shallow soil layers. The bigger myriapods dig, but the smaller ones can squeeze through cracks in the soil. They hide from the light under rocks, logs, bark, leaf litter, or find dark places in tree hollows, stumps, and caves. Photo credit: Drago, Leandro; Fusco, Giuseppe; Minelli, Alessandro; Kingsley, J. Sterling; modified by Animalparty.



Earthworms

Earthworms vary in size. They can be as short as an inch to almost 10 feet long (a few cm to 3 m). In general, there are three groups of earthworms: 1) epigeics, which live in the litter layer above the soil, 2) anecics, which live in vertical underground tunnels that come up to eat in the litter layer, and 3) endogeics, which live completely within the soil.



Beetles

Beetles typically have hard front wings that shield their body. Most are very tiny. Their bodies are usually less than a ¼ of an inch (5 mm) long. The beetles that live on land can be found in soil, leaf litter, decaying wood, animal waste, dead animals, the fruiting bodies of many types of fungi, and under logs and stones.



Soil insect larva

Pictured is a young cicada, which spends most of its life underground. 95% of insects spend a part of their life in the soil at some point.


Spider


Scorpion

Spiders and scorpions

Spiders and scorpions have 8 legs compared to other insects which have 6 legs. They mostly eat insects. All spiders produce silk that they make within their body. These webs can be used to catch insects to eat. Scorpions have a venomous stinger on their rear that delivers a toxic sting.

Gastropods



Snails and slugs belong to the group gastropoda. You can tell a snail and slug apart by how noticeable their shells are. Snails have easily seen shells, while slugs have smaller ones, none at all, or have a shell inside their body. Pictured is a Wisconsin slug named the Three-band gardenslug (KKPCW, The Creative Commons).



Ground-nesting bees

Some bees live in hives, but most of them live in the soil. Almost 70% of known species do! These bees do not live in colonies like their social, hive-living counterparts. Ground-nesting bees are not aggressive, but they can sting. It is good practice to keep a respectful distance to not disturb them.

Megafauna – The REALLY BIG soil animals.


American Badger

These animals are not so big compared to us, but they are the largest of the soil animals. In order to be considered a soil megafauna, they must both live and feed underground. Megafauna typically are either mammals, reptiles, or amphibians. Generally, their bodies are well-suited for life underground. Mammals tend to have long claws for digging as well as short tails and hair for easy movement in the soil and surface litter layer. Pictured with its long claws is the American Badger (H. Rieser, National Park Service). Reptiles and amphibians tend to have flat, thin, or limbless bodies for smooth movement in the soil and litter. Since their homes are usually very dark places, some of them "see" their environment with other senses than their eyes. Some can use sound, while others have specialized hairs to sense their environment and prey.

References

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