

#6 THE LIVING SOIL: FUNGI

Fungi are microscopic cells that usually grow as long threads or strands called hyphae, which push their way between soil particles, roots, and rocks. A single hyphae can span in length from a few cells to many yards. Hyphae may group into masses called mycelium or thick, cord-like “rhizomorphs” that look like roots. Fungal fruiting structures (mushrooms) are made of hyphal strands, spores, and some special structures like gills on which spores form. A single individual fungus can include many fruiting bodies scattered across an area as large as a baseball diamond.

WHAT FUNGI DO?

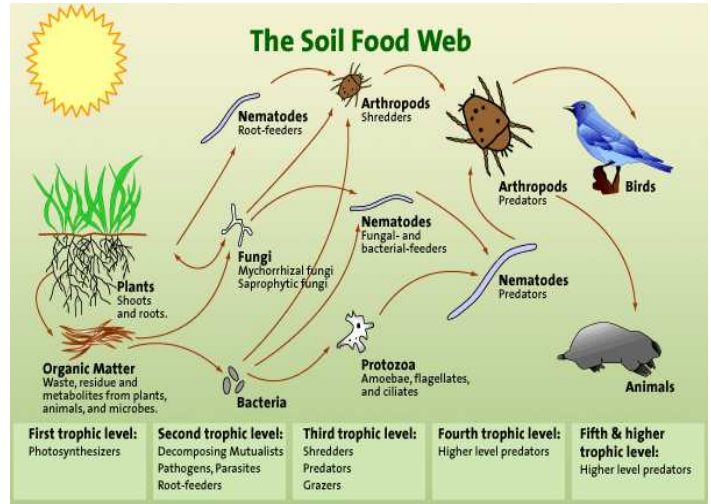
Fungi perform important functions such as water dynamics, nutrient cycling, and disease suppression, and are important as decomposers in the soil food web by converting hard-to-digest organic material into forms that other organisms can use. Fungal hyphae physically bind soil particles together, creating stable aggregates that help increase water infiltration and soil water holding capacity.

PHOTO: Mycorrhizal fungi link root cells to soil particles. This photo shows sand grains bound to a root by hyphae from endophytes (fungi similar to mycorrhizae) and by polysaccharides secreted by the plant and the fungi.

CREDIT: Jerry Barrow, USDA-ARS Jornada Experimental Range, Las Cruces, NM.



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THE SOIL FOOD WEB ORGANISMS AND THEIR INTERACTION

The living component of soil is complex and has different compositions in different ecosystems. The soil food web is a diagram illustrating the community of organisms living all or part of their lives in the soil. This diagram shows the series of conversions (represented by arrows) of energy and nutrients as one organism eats another. The primary producers fuel all food webs: the plants, lichens, moss, photosynthetic bacteria, and algae that use the sun’s energy to fix carbon dioxide from the atmosphere.

As organisms decompose complex materials, or consume other organisms, nutrients are converted from one form to another, and are made available to plants and to other soil organisms. All plants depend on the food web for their nutrition.



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