

These towering Douglas firs depend on networks of tiny fungus for water and other nutrients.

We typically see only the fungal fruits that poke above the soil—mushrooms!

But a lot is happening under the surface...

Let's dive below ground to take a closer look.

Living fungal threads called hyphae connect the mushroom to an underground network of activity.

Ants help maintain healthy soil, aerating dirt, circulating water, and moving nutrients around.

Tiny moss mites dine on miniature worms called nematodes...

Nematodes consume single-celled amoebas, far smaller than our eyes can see...

Amoebas devour even tinier bacteria...

And bacteria also need to eat! They feed on the remains of previous generations of forest dwellers. In nature, nothing is wasted.

The fungal hyphae decompose matter, too, and we can follow them toward the roots of the Douglas fir.

The fungus wraps around the root tip. Viewing a slice through the root, we see hyphae pushing into the spaces between the tree's cells.

At the molecular scale, a chemical exchange takes place. The fungus supplies the tree with much-needed minerals, while the tree provides the fungus with energy-rich sugars.

Nutrients for energy: a fair trade.