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WOOD-WIDE WEB

Its not a secret that not only sentient beings can communicate with each other but trees and plants too. In our world full of unexpected phenomenons, nothing can live alone and even far tiny part of something connect with some other tiny part.

The variety of reserch about underground communication has borne out the concept that many things we can't see have connection between micro and macro world.

The huge class of living things such as plants has connection through mycorrhizal network or other name of this is wood-wide web.

Mycorrhizal network is the labyrinth of fungal connections between roots.

But you shouldn't confuse it with 'the mycelia': it's the main body of fungi, the opposite side of well-known fruiting bodies – mushrooms.

The mechanism of fungal connection is based on a number of chemical reactions, biochemical signals, transmission of water, carbon, micronutrients and hormones.

The fungi integrates into the physical structure of the root, exectly – to the living root tissue during active plant growth.

Through mycorrhization realized integration between plant and fungus: plants obtain phosphate and other minerals, such as zinc and copper, from the soil. The fungus obtains nutrients, such as sugars from plant root.

And both sides of the integration got their benefits. For plants it's the best existence in poor soils and fungi obtain about 20% of the total carbon accessed by plants. Also mycorrhizae acts as a physical barrier to a pathogens and provide an induction of generalized host defence mechanisms, which something involves the production of antibiotics compounds by the fungi.

And plus that, fungi plays a protective role for plants rooted in soils with high metal concentrations like acidic and contaminated soils.

That's how mycorrhizal network communicate with root system of plants.

And lets consider how does this conversation works between different species.

Conversation between different species

Suzanne Simard, a professor of forest ecology in the University of British Columbia, did a lot of reserches adout trees and plants and how do they work and communicate. And one which catchs me a lot is about Conversation between different tree species.

She did an experiment in forest. She put the plastic bags over 3 species of tree: birch, fir and cedar, with the general amount of 80. And with the help of giant syringe, injected the radioactive gas - carbon-14 into the bag of birch and stable isotope carbon-13 into the bag of fir and cedar. When the hour was passed and the trees should suck up the carbon dioxide, turn it into sugars, down into their roots, she pulled the bag of and checked the presence of carbon with the Geiger counter. The birch had taken up the radioactive gas and share it with fir. The cedar was by its own and share with no one. The C-13 and C-14 was showing that birch and Douglas fir were in conversation. One more interesting fact is that it turns out at that time of the year. Like in summer birch send more carbon to fir, especially when fir was shaded. But in autumn the opposite dependence – the fir was sending more carbon to the birch because the fir was still growing while the birch was leafless.

By the further experiment was found out that they were conversing not only through carbon-change but and nitrogen, phosphorus, water, defense signals and allele chemicals and hormones – all kind of information.

The other experiment was carried out with the purpose to check do mother trees recognized their kin between stranger's seedlings. And it turns out that mother trees do distinguish their kin and creating supporting vaster mycorrhizal network for them and send them more micronutrients below ground. However, mother trees also share small amounts of resourses with strangers and by the way, suggesting mechanisms function with community-level selection too. When the mother trees are injured or dying the send the messages of wisdom through the mycorrhizal network to their kids – the radioactive carbon's way from the body to the roots and mycorrhizal network to neighboring seedlings. This facts have increase the resistance of seedlings to future stress.

The result of this experiment is solid evidence of existing of massive belowground communication network.

The science of plant communication and behavior is only scratching the surface of how Nature works.

The plants communicate with each other in numerous ways to promote the stability, or equanimity, of the greater community.