British Mycological Society promoting fungal science

What's your favourite fungus?

The One That Makes Plant Roots Work

Plants gain their nutrients by absorbing minerals and water from the soil using their roots. But they do get quite a lot of help from certain species of fungi. The relationship appears to have started because the plant roots alone are not able to supply the plant with all the nutrients it needs. The fungi associated with plant roots are called MYCORRHIZAS, which increase nutrient availability to the plant. The numerous hyphae of the fungi greatly increase the surface area available for absorbing minerals. The hyphae can also go looking for food; because they can grow to areas of fresh nutrients when local supplies become depleted. The relationship between the plant and fungus is mutualistic. That means that both sides gain something from having the other present. The plant pays for the privilege of using this fungus to bring it nutrients by sharing up to twenty-five percent of the products of its own photosynthesis with the fungus. The fungus benefits by taking readily available sugars from the plant. Despite this 'tax' on its activities, the plant grows much better than it could without the mycorrhiza.

Some mycorrhizal fungi form a mat of fungal tissue around the root; the fungal cells grow between the cells of the plant root, but never actually cross the plant cell walls. These are called 'ECTOMYCORRHIZAS'. In another mycorrhizal partnership (called ENDOMYCORRHIZAS) the fungal cells enter the plants cells. Inside the plant cells they make structures that absorb materials from the plant cytoplasm.

By greatly increasing the absorbing surface of a host plant's root system, mycorrhizas improve the plant's ability to tolerate drought and other extremes, like high and low temperatures and acidity.

It is thought that has many as 95% of all plants have mycorrhizal associations, showing just how important these types of fungi are for the growth of so many plants, including all the crop plants we need to feed the human population, and all the trees in all the forests.