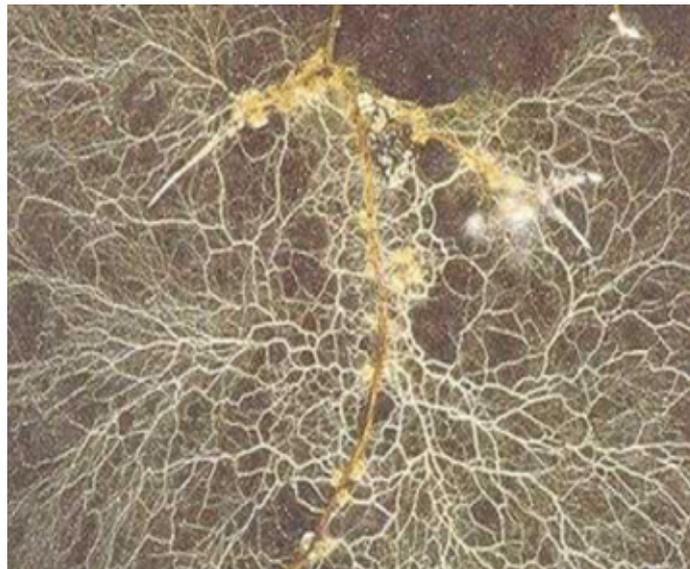


The Remarkable World Of Fungi Part 3

Mycorrhizae are associations between fungal hyphae and the roots of plants.

Almost all terrestrial plants, including wild plants, trees and commercial crops will form mycorrhizal associations with fungi in the soil. These mycorrhizae are vitally important for the growth and health of the plants.

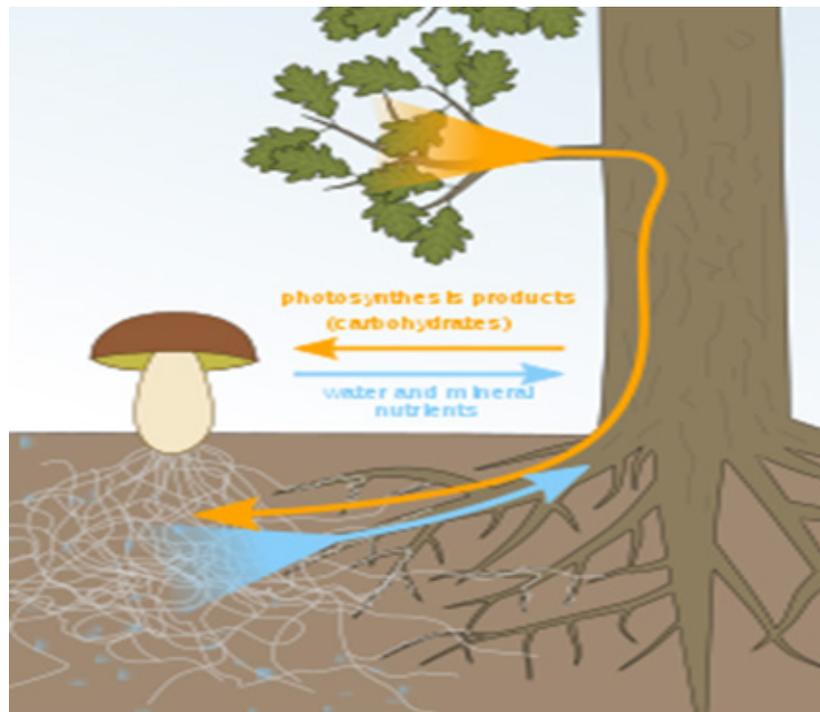


A mycorrhizal fungus penetrates plant roots via its hyphae creating a matted network of mycelium

Mycorrhizal fungi are present in almost all soils in greater or lesser amounts. They vary according to the soil type and location, so those that are present in a clay soil in Scotland may not be present in a sandy soil in the south of England. Many species are thought to be specialists, only associating with specific plant species, while others seem to interact with a wide variety of plants.

The interaction between fungi and plants is characterised by fungi extracting food (carbohydrates and sugars) that they need from the plants and, in return, supplying the plants with some of the nutrients and water that they require. Thus both the fungi and the plants flourish because of the association.

This is known as a symbiotic relationship



This diagram illustrates how the hyphae of the mycorrhizal fungi interweave with tree roots

Through their enormous collecting network of hyphae in the soil, the fungi help to supply nutrients, especially phosphorus, to the plant roots they are associated with. This has remarkable effects on plant growth, particularly in soils which are not very fertile. In soils containing little phosphorus, plants with mycorrhizae have been shown to grow up to 20 times faster than those without.



The survival of plant seedlings may also be up to five times greater if they have mycorrhizae to help them collect nutrients and water from the soil. Helping plants to obtain phosphorus from the soil may also give them increased drought tolerance, as this is one of the effects of improved phosphorus nutrition.

Mycorrhizal fungi can often form associations with many different kinds of plants at the same time. The fungal hyphae of several different kinds of fungi is like a giant underground network connecting most of the plants in a habitat together. It is possible, although not proven, that this enables different plants to exchange nutrients between them via the fungal hyphae. This greatly improves the chances of seedlings surviving, because they are not just dependent on their tiny root system, but have access to the great underground collecting network.

The presence of a good network of mycorrhizal fungi in the soil is therefore of vital importance for good plant growth in most habitats. Where the fungi are absent, or only present as isolated spores in the soil, plant growth will be reduced, apart from those species which do not require mycorrhizae. Most of these are what are commonly termed weed species.

Mycorrhizae also help to develop good soil structure through production of a protein which helps to stick small particles of soil together to form larger ones. This means that water can move more easily through the soil and provides more air spaces and thus air, for soil organisms and plant roots.

