

Mycorrhizae: Forests' Secret Weapon

A variety of anthropogenic global changes such as elevated atmospheric CO₂, prolonged drought periods and N deposition affect our planet's forest ecosystems. Mycorrhizae are symbioses between fungi and plants, which may help forests deal with the above-mentioned global changes.

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CO₂-Emission

CO₂ enrichment is the only global change that affects plant growth positively. Fungal growth is improved as well. But not all mycorrhizal fungi show the same efficiency in providing their hosts with nutrients, so not all trees can profit from the additional carbon to the same extent.

Nitrogen Deposition

N-deposition reduces the biodiversity of mycorrhizal fungi. This has a negative effect on their hosts. Moreover, ectomycorrhizal fungi tend to use the surplus of N for their own growth rather than sharing it with their host. Consequently, not even mycorrhizal fungi can save our forests from this threat.

Drought

With climate change, precipitation patterns are changing. In certain regions, this will lead to longer dry periods. Mycorrhizal fungi can help trees to access nutrients during such dry periods. They may also facilitate the recovery after droughts.

Ectomycorrhizae (ECM)

Ectomycorrhizal fungi only infect the intercellular space of the root. This type of mycorrhizal fungus is most common in temperate and boreal zones of the globe. ECM fungi can access organic nitrogen better than AM fungi.

Arbuscular Mycorrhizae (AM)

AM fungi are the most common type of mycorrhizal fungi. They appear all over the globe but are most prevalent in the tropics. The fungal hyphae infect not only the intercellular rooms but also the root cells. Their abilities to access organic nitrogen are more limited than those of ECM fungi.

NUTRIENTS ↑
↓ SUGARS

The fungi feed of sugars provided by the plant and offer nutrients such as Nitrogen and minerals in return. Through this relationship, mycorrhizal fungi modify the effects of different environmental stressors on trees.

90%

90% of all vascular plants form symbioses with mycorrhizal fungi.

