Fungi aids plants in scavenging nutrients from ancient soils

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Mycorrhizal fungi, which often manifest above the soil as mushrooms, can be critical to the survival of plants in impoverished soils.

A super fungi subset, discovered by scientists in two-million year old soils along WA's coastal plains, may be the key to plant survival in nutrient deficient soils.

Scientists now know the survival of plants in even the most impoverished

soils is often based on the co-existence between mycorrhizal fungi and the roots of a plant.

A study at a biodiversity hot spot at Jurien Bay, which boasts some of the oldest sandy soils on the plant, is showing the fungi exchanges the nutrients it gets from the soil for carbon that it gets from the plant.

The often-microscopic organisms do this by moving through the soils, attaching themselves to plant roots and assisting the plants in scavenging for soil nutrients.

The most interesting finding of the study was that this biodiversity hotspot may host some super fungi, UWA root ecologist Francois Teste says.

"These fungi assist plants in tough environments, and while we have known this for some time, what was interesting in this study was that as nutrients became extremely scarce in the older soils, we saw the first indication that the fungi was also struggling, and it started to show signs of stress," he says.

"Like the plants trying to survive, these important fungi also had to change their behaviour to survive, and a small portion of the fungi seemed to be able to cope with the impoverished conditions showing little signs of struggle.

"This research is all pointing towards the concept that that there might be a few super species of mycorrhizal fungi out there."

Mycorrhizal fungi, which sometimes manifest above the soil as mushrooms, can be critical to the survival of plants in impoverished soils.

Further studies examining phosphorus limitations in strongly weathered soils are also supporting the concept that there may be a subset of super mycorrhizal fungi with the ability to thrive where other fungi struggle.

However, further research is needed to isolate and identify these super fungi in the laboratory or glasshouses, Dr Teste says.

"What we need to do is to see if we can use them for management or other purposes such as restoration," he says.

Dr Teste says plants in nutrient rich or fertilised soils do not always need these fungi.

"Plants are doing many different things to cope and survive. Western Australia soils are incredibly interesting and valuable, and can teach us what is happening as soils age and get incredibly impoverished," he says.

"Plants have figured out how to survive in this type of environment but we are just discovering these tricky strategies now."

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