

Soil microorganisms and Plants – An inseparable connection

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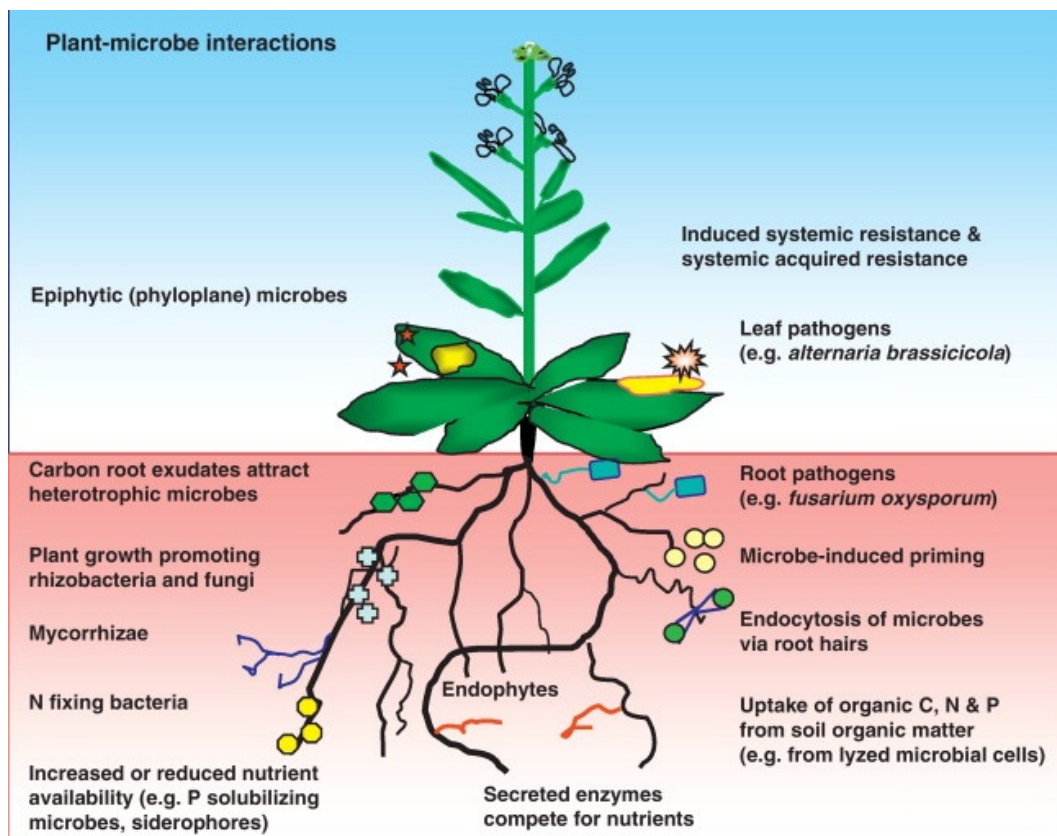


Soil microorganisms include bacteria, fungi, protozoa, and viruses. They support plant growth ensuring availability of food for all living organisms on the earth. They are also a deciding factor of maintaining various services and functions offered by any ecosystem vital for all living organisms. Such an amazing contribution of soil microorganisms is possible due to their ability to perform diverse reactions while living alone or associated with plants.

There are various interactions between plants and microorganisms which are either detrimental to plants or vital for the survival of the both partners. They live in soils surrounding roots which is known as the rhizosphere. Rhizosphere soils are generally enriched with simple carbon containing simple substances such as sugars which are released by plant roots and microorganisms thrive on them. However, these chemical substances available in the rhizosphere varied between plant species and their growth stages. Therefore, the number and

the diversity of microorganisms living in the rhizosphere vary with the quality of substances available in the rhizosphere.

A vast majority of microorganisms live in the rhizosphere and promote plant growth mainly providing nutrients necessary for plant growth. A few bacterial species can fix atmospheric nitrogen and provide nitrogen directly to plants while living inside of the roots. There are many species of bacteria that live in the rhizosphere and dissolve precipitated forms of phosphates so that plant roots could take up phosphate ions. Ability of bacteria and fungi to secrete growth hormones promotes root and shoot growth. There are soil microorganisms who could suppress or kill growth of plant pathogens. Some of them improve the plant growth indirectly by providing nutrients through decomposition of organic matter. These interactions between plant root and soil microorganisms differ according to the plant variety and growth conditions.



Various interactions between plants and microorganisms (source: Schenk et al., (2012))