A simplified synthetic bacterial community improves plant resistance to disease

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Video Byte

Keywords: low-abundance bacteria, high-abundance bacteria, synthetic community, community simplification, root-rot disease, *Fusarium oxysporum*, *Astragalus mongholicus*, bacteria, bacterial community, disease resistance, plant disease, fungal disease, soil microorganisms, soil bacteria, fungal pathogen, synthetic microbial community, rhizosphere, *Stenotrophomonas*, *Rhizobium*, *Ochrobactrum*, *Advenella*, Microbiome

Posted Date: March 1st, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1405885/v1>

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Abstract

Soil not only provides the water and nutrients necessary for plant growth but also hosts a huge reservoir of microorganisms with important positive and negative effects on plant health. Scientists are now looking toward harnessing these soil microorganisms to design synthetic microbial communities that can help control plant disease. A team of researchers recently investigated the relationship between soil microorganisms and diseased plants of *Astragalus mongholicus*, a member of the pea family. They found that bacteria with particular growth-promoting or disease-inhibiting abilities colonized the roots of plants with fungal root-rot disease and the surrounding soil. The researchers then showed that two synthetic communities composed only of these bacteria but varying in complexity had similar capacities to control disease and that the four species forming the simple community (SCIII) protected the plants synergistically: fungal pathogen growth was inhibited by the three species with relatively high abundance in the environment, while the single rare species promoted plant disease resistance. These findings highlight the importance of including relatively rare bacterial species in synthetic communities and suggest that only a small number of microbial species may be needed to improve plant resistance to disease.