

The Impact of Mycorrhizal Associations on Plant Stress Tolerance and Growth

Qian Bian*

Department of Plant Virology, Fujian Agriculture and Forestry University, Fujian, China

DESCRIPTION

The studies of mycorrhizal fungi reveal complex connection between these microbes and the plants they feed on. Although mycorrhizal fungi are associated with plant health, they play an important role in disease development and treatment. In this article, the complex connection between mycorrhizal fungi and fungal diseases were explained to develop an effective method to reduce fungal diseases. Mycorrhizal fungi are a type of fungus that forms symbiotic relationships with plant roots. These fungi, often referred to as mycorrhizae, envelop the plant's roots in a fine network of hyphae, creating a mutually beneficial relationship. In return for nutrients, the fungi receive carbohydrates produced by photosynthesis. This symbiotic relationship is important for plant growth, nutrient uptake and disease resistance.

Fungal diseases: Fungal diseases are a significant threat to plant health, causing widespread damage and economic losses. These diseases can be caused by various fungal pathogens, including species of Ascomycota, Basidiomycota and Deuteromycota. Fungal diseases can affect plants at any stage of growth, from seedlings to mature plants.

Mycorrhizal fungi: Mycorrhizal fungi can play both positive and negative roles in plant disease development. On the one hand, some mycorrhizal fungi can act as biocontrol agents, suppressing the growth of fungal pathogens and promoting plant health. On the other hand, certain mycorrhizal fungi can facilitate the spread of fungal diseases by improving the pathogen's ability to colonize plant tissues.

Role of mycorrhizal fungi in disease development

Studies have shown that mycorrhizal fungi can influence disease development in various ways. For example: Some mycorrhizal fungi can improve the production of defense compounds in plants, making them more resistant to fungal pathogens. Other mycorrhizal fungi can increase the availability of nutrients for fungal pathogens, promoting their growth and colonization. Some mycorrhizal fungi can even form associations with fungal pathogens, facilitating their transmission and spread.

Fungal diseases in agricultural systems: Fungal diseases are a significant concern in agricultural systems, where they can cause significant yield losses and economic impacts. Mycorrhizal fungi can play a beneficial role in managing these diseases by suppressing fungal pathogens through competition or antagonism, improving plant defense responses and improving soil structure and fertility.

Fungal diseases in forest ecosystems: Fungal diseases are also an important consideration in forest ecosystems, where they can affect tree health and stand structure. Mycorrhizal fungi can influence disease development in forests by modifying soil chemistry and nutrient availability, shaping tree root architecture and defense responses and influencing the composition of fungal communities.

Fungal diseases in human health: While mycorrhizal fungi are primarily associated with plant health, they can also impact human health. Some mycorrhizal fungi can produce toxins that contaminate food crops and other mycorrhizal fungi can cause opportunistic infections in humans.

Advancements in future directions

Investigating the mechanisms underlying mycorrhizal-fungal pathogen interactions, developing new strategies for exploiting mycorrhizal fungi as biocontrol agents and exploring the potential applications of mycorrhizal fungi in human medicine.

CONCLUSION

In conclusion, mycorrhizal fungi play a complex and multifaceted role in plant disease development. While some mycorrhizal fungi act as biocontrol agents, others facilitate the spread of fungal diseases. Understanding the complex relationships between mycorrhizal fungi and fungal diseases is important for developing effective strategies for disease management in agricultural systems. In the prospect, advancements in study will focus on the interactions between mycorrhizal fungi and fungal pathogens, utilizing mycorrhizal fungi as biocontrol agents and investigating their potential applications in human medicine.

Correspondence to: Qian Bian, Department of Plant Virology, Fujian Agriculture and Forestry University, Fujian, China, Email: bianian@qi.edu.cn

Received: 19-Aug-2024, Manuscript No. VMID-24-34278; **Editor assigned:** 22-Sep-2024, PreQC No. VMID-24-34278 (PQ); **Reviewed:** 05-Sep-2024, QC No. VMID-24-34278; **Revised:** 12-Sep-2024, Manuscript No. VMID-24-34278 (R); **Published:** 19-Sep-2024, DOI: 10.35248/2161-0517.24.13.297

Citation: Bian Q (2024). The Impact of Mycorrhizal Associations on Plant Stress Tolerance and Growth. Virol Myco. 13:297.

Copyright: © 2024 Bian Q. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.