

Abstract

In natural ecosystems, all plants coexist with fungi. This results in various plant-fungus symbioses, either mutualistic, parasitic or endophytic. For example, the mycorrhizal symbiosis is a mutualistic association that occurs in ca 70 to 90 % of all terrestrial higher plants. Probably even more widespread association is endophytism, when a fungus colonizes different living plant tissues without causing a strong plant defense response. This bachelor's thesis summarizes some older as well as recent papers and reviews on the ecophysiology of the most widespread root endophytes, the Dark Septate Endophytes (DSE), and their impacts on plants.

DSE are ubiquitous root colonizers of terrestrial and aquatic plants. The most frequent DSEs isolated from the roots of different plants from Northern Hemisphere belong to the *Phialocephala fortinii* s.l. – *Acephala applanata* species complex (PAC). Although some of the PAC species are able to form ectomycorrhizal structures, most of them do not form any mycorrhiza-like structures in the root. Instead, they form inter- and intracellular microsclerotia and mostly melanised septate hyphae with thick cell walls.

In contrast to the mycorrhizal symbiosis, DSE do not necessarily influence the host nutrient uptake, but they may play a role in plant drought, extreme temperature and heavy metal pollution tolerance and in protection against pathogens and herbivores. DSE may have impact on plant communities by affecting the mycorrhizal fungi and other microorganisms in the mycorrhizosphere. Even though DSE are present in almost all plant families and are able to influence plant fitness and whole plant communities, their ecological role is still largely unexplored.

Key words

Plant-fungus interaction, dark septate endophytes, *Phialocephala fortinii* s.l. – *Acephala applanata* species complex, mycorrhizal symbiosis, ecophysiological function of dark septate endophytes