

# Growth dynamic of dual culture systems comprising ectomycorrhizal fungi and mycorrhiza helper bacteria

**Session: Plant response/adaptation to low resource availability**

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Ectomycorrhizal fungi are ubiquitous root symbionts that associate with the majority of forest trees and often have a crucial role on plant survival and growth in impoverished soils. Within the vast community of soil microorganisms, the mycorrhiza helper bacteria (MHB) are recognizably one of the groups that most directly affect fungal growth and mycorrhiza establishment. Although their positive effect on the mycorrhizal partnership has been previously reported, the specificity of such association is high and the dynamics not yet fully understood. Many studies evaluated the impact of bacteria on fungal growth but the reciprocal has received little attention. The present study aimed to evaluate the growth dynamics of co-culturing fungi and bacteria, under both perspectives. *Bacillus pumilus* was chosen for its capability to promote the growth of *Suillus granulatus* in a dual culture system with a low nutrient medium. To assess the impact of fungal exudates on bacterial growth, different quantities of fungal culture medium were added to MMN medium containing a *Bacillus pumilus* inoculum and bacterial growth was monitored. To evaluate the influence of *Bacillus pumilus* on fungal growth, an experiment was setup where the bacterium was added at two different phases of fungal growth, lag phase and exponential phase. A control without bacteria was also performed. Bacterial growth was monitored through OD readings and fungal growth was assessed through dry weight and ergosterol content. The experience was held for 33 days, with sampling every three days. Triplicates for each treatment were performed. Results from the first experiment showed that fungal exudates influenced the growth of bacteria with a pronounced extension of the lag phase. In the second experiment, fungal growth was completely inhibited when bacteria was added at the fungal lag phase. A different outcome was observed when the bacterium was added in the exponential phase. Results suggest that the regulation of the concentration at which the bacterium is present may be a key factor to optimization of the use of bacteria as MHB.

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