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Effects of ectomycorrhizosphere bacterial strains on sporocarp production by the ectomycorrhizal fungus *Laccaria parva*

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Purpose: The effects of ectomycorrhizosphere bacteria on sporocarp production of the ectomycorrhizal fungus *Laccaria parva* were examined in vitro.
Methods: Three bacterial strains closely related to *Bradyrhizobium* were selected based on their affinity for *L. parva* strain LL02 in confrontation tests: strain 5_8_1_1 increased hyphal extension areas of strain LL02, strain 6_9_1_1 did not significantly affect hyphal extension areas, and strain 2_2_2_2 decreased hyphal extension areas. *L. parva* LL02 mycelia and a suspension of each bacterial strain were inoculated onto a surface-sterilized pine seedling in a glass bottle and then incubated for 3 months in an illuminated incubator.
Results: Plant biomass and the number of root tips did not differ significantly among the treatments, but the percentage of ectomycorrhizal roots was low in the treatment inoculated with strain 2_2_2_2. The frequency with which mature sporocarps occurred was lower in the control and 2_2_2_2 treatments compared with the 6_9_1_1 and 5_8_1_1 treatments. The total biomass of sporocarps was lower in the 2_2_2_2 treatment but higher in the 6_9_1_1 and 5_8_1_1 treatments. The ratio of biomass accounted for by mature sporocarps was low in the control, moderate in the 2_2_2_2 treatment, and high in the 6_9_1_1 and 5_8_1_1 treatments.
Conclusions: These results indicate that ectomycorrhizosphere bacteria affect the production and maturation of *L. parva* sporocarps and that the affinity between the fungi and bacteria is likely to underlie this interaction.