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Developing a translatable model system to investigate the chemistry of fungal-host ectomycorrhizal interactions

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ABSTRACTS – Posters

Developing a translatable model system to investigate the chemistry of fungal-host ectomycorrhizal interactions

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To establish translatable methods for studying chemical communication between ectomycorrhizal (EcM) symbionts and their host plant, a model system has been developed. This study investigates a model fungus *Suillus punctipes*, known as the spicy bolete, a fragrant edible mushroom whose plant host in the southeast is (often) the Loblolly pine, *Pinus taeda*. While the EcM fungal plant host relationship is characterized by the well-known exchange of essential nutrients and carbon, the chemical communication between the fungi and plant-host is poorly understood. To address this knowledge gap, we investigate different phases of the fungal host-plant colonization, with the consequent objectives: 1) the identification of fungal volatile organic compounds (VOCs) emitted by *S. punctipes* as part of the early stages of fungal-host plant colonization, using gas chromatography-mass spectrometry (GC-MS); 2) to identify the non-volatile compounds (nVCs) produced in the fungal-host interaction, where compounds are purified from *P. taeda* root and spiked into *S. punctipes* cultures, with the bio-transformed products (plant derived fungal metabolites) identified through tandem liquid chromatography mass spectrometry (LC-MS/MS); and 3) to quantitate fungal-host nVCs in an EcM inoculated tree population to establish a chemical profile of late stage fungal-host interactions.

This poster highlights the development of a robust model to aid in the study of chemical communication pathways between symbionts by offering a clearer understanding of the complex interactions of organisms in the forest ecosystem.