Populus trichocarpa and *Populus deltoides* Exhibit Different Metabolomic Responses to Colonization by the Symbiotic fungus *Laccaria bicolor*

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Background

- The goal of the study was to investigate the metabolic signaling responses, and the timing of the molecular factors involved in the establishment of the *Populus-Laccaria* mutualistic association in two poplar species with contrasting ease of colonization.

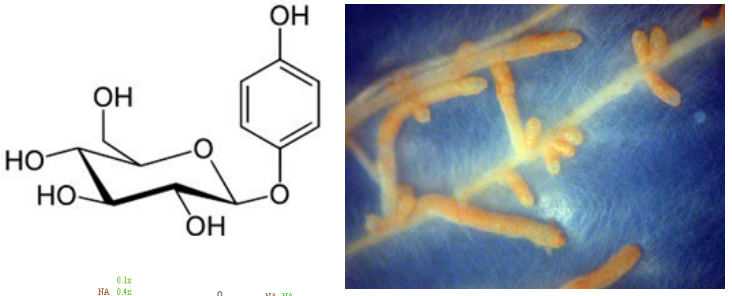
Science

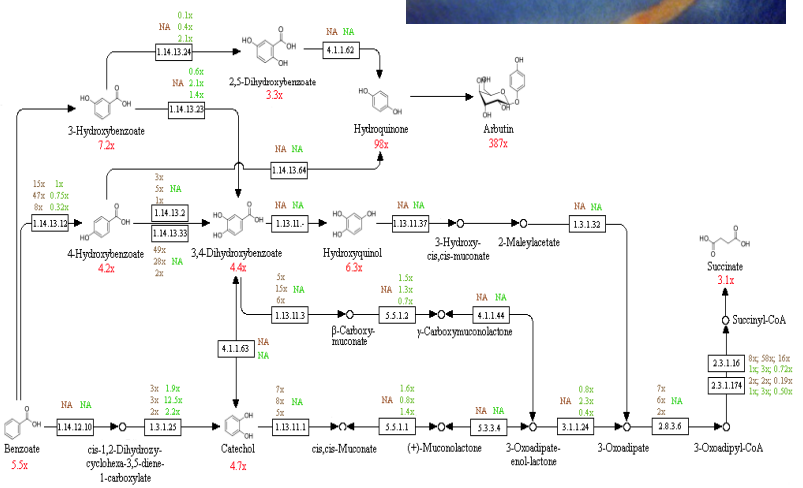
- *P. trichocarpa* is readily colonized, whereas *P. deltoides* maintains a defense response with accumulations of salicin, tryptophan, and 1-*O*-caffeoylquinate.
- Colonization of *P. trichocarpa* leads to accumulations of glycerol and fatty acids, a decline in the plant-derived phenolic-based defense network, substituted with a fungal-derived network based on hydroquinone, arbutin, its glucoside, and alkaloids.
- MiSSP7-defective *L. bicolor* with impaired symbiosis still accumulate arbutin, mannitol, and alkaloids, but not trehalose

Significance

- *Coupling transcript responses with metabolomic data indicates that L. bicolor* uses the benzoate degradation pathway to generate succinate and fumarate and drive the main aromatic responses associated with the establishment of symbiosis

Arbutin, a key metabolite accumulating with symbiosis





***L. bicolor* uses benzoate degradation pathway to generate succinate and accumulate phenolic metabolites**

Tschaplinski et al. In Press. *Molecular Plant-Microbe Interactions*.