First study to compare citrus varieties with combination of metabolomics and microbiome
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They collected roots from healthy and infected Lisbon lemon and Washington Navel orange trees grown in greenhouses at the same time and under the same conditions.

They found that both varieties experienced a reduction in root sugars and amino acids when exposed to HLB. However, they also found differences. While the concentration of malic acid and quinic acid (two metabolites involved in plant defense) increased in the navel roots, they decreased in the lemon roots. They also found that the beneficial bacteria *Burkholderia* increased substantially in navel plants but not in lemons, which contradicts previous studies.

"Overall, this is the first study to compare two varieties of citrus using a combined metabolomics and microbiome approach and demonstrates that scion influences root microbial community composition and, to a lesser extent, the root metabolome."

There is evidence to suggest that the causal bacterium moves to the root system soon after a plant becomes infected. A key strategy for preserving the health of an infected tree is root system management and research on different responses to HLB may help devise new variety-specific preventative and treatment measures.


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