

Abiotic Stresses Shift Belowground *Populus*-Associated Bacteria Toward a Core Stress Microbiome



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Background

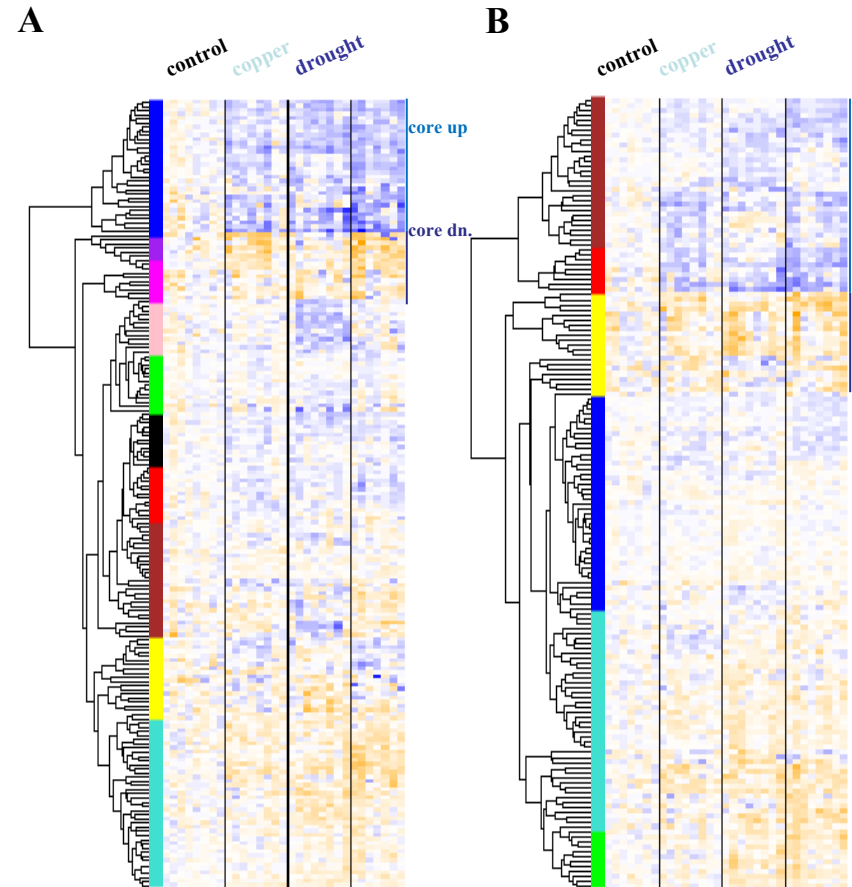
- The plant microbiome acts as an extension of the host genotype that can respond to mitigate stressors in the environment, yet a systematic understanding of how the microbiome accomplishes this is unknown.
- This study reveals the core genera in the microbiome of *P. deltoides* changes in abundance in response to abiotic stresses.

Science

- *P. deltoides* rooted cuttings were inoculated with a wild microbiome and were subjected to abiotic stresses of water limitation, shading, and copper toxicity which resulted in reduced plant growth and altered physiology.
- Physiological and transcriptional analyses demonstrated specific host responses to individual stresses.
- Bacterial community analyses via 16S amplicon sequencing of the microbiome identified “core stress OTUs” either increased or decreased in abundance, depending on the specific stressor.

Significance

- This study identifies a common “stress microbiome” which suggest the potential to predictably modulate the microbiome to optimize plant growth and fitness.



Microbiome response to stress

A) Bacterial OTUs up (blue) or down (orange) in response to stress in root. B) Bacterial OTUs up or down in response to stress in soil.

