Fungal response to wildfire in a southeastern wildland-urban interface

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Introduction

Fungi are critical to ecosystem function

Fire and urbanization disturbances select for fungi with different ecosystem functions

Wildfires in the southeastern temperate zone are rare, but increasing

Local fungal communities have not experienced fire disturbance or fire at the urban interface

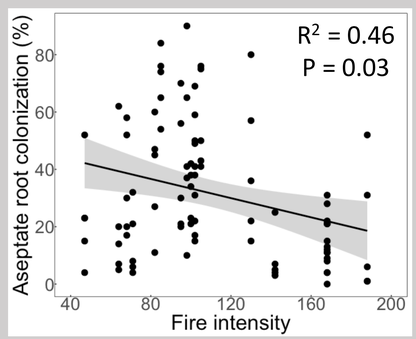
Questions

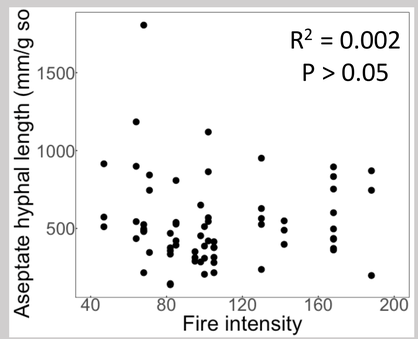
Q1: How does abundance of (A) AM fungal and (B) decomposer hyphae in roots and soils shift with fire intensity and urbanization?

Q2: Does plant community composition affect post-fire fungal abundance?

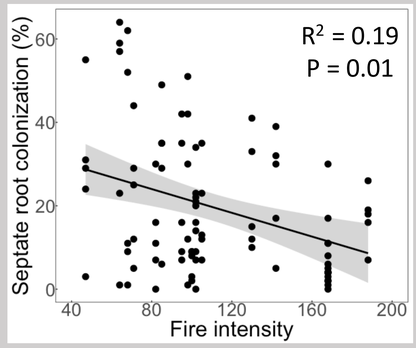
Results

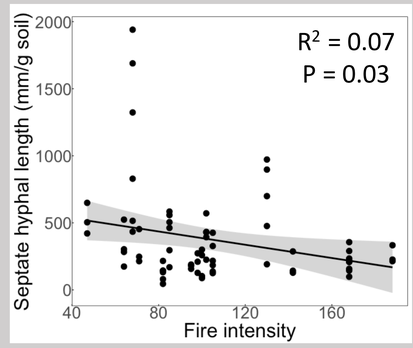
1A. Symbiotic AMF (aseptate hyphae) abundance decreased with fire intensity in roots
AM fungi in roots are more sensitive to fire than those in soils



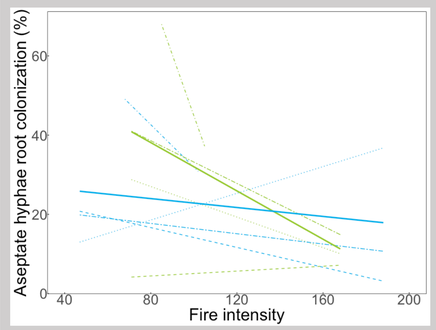


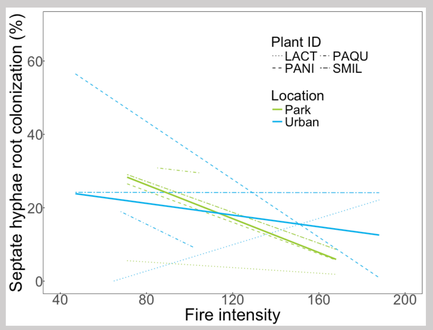
1B. Decomposer/pathogen (septate hyphae) abundance decreased with fire intensity in roots and soils



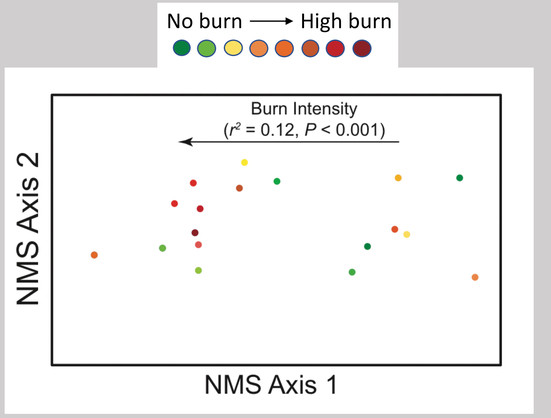


2A. Fungal abundance in common plant species (4) decreases along fire intensity gradient: *Lactuca spp.*, *Parthenocissus quinquefolia, Panicum spp.,* and *Smilax spp.*





2B. Plant communities differ across fire intensity gradient



Methods

Fungal abundance in soil and roots examined 1.5-2 years post-fire

18 sites (9 park, 9 urban)

- Soils: hyphal extraction and staining
- Roots: surface sterilization and staining
- Surveyed plants (13 spp.) and soils Microscopy to assess colonization

Discussion

AM fungal colonization in roots decreased with fire intensity but not in soils (1A), suggesting that AM fungal recovery in roots lags behind soils

Decomposer and pathogen colonization decreased in roots and soils (1B) suggesting a buildup of litter to fuel future fires

Changes in plant communities (2B) across fire intensity gradient could be influencing fungal colonization

Future Directions

Sequence fungal community composition for decomposer and AM fungal groups

Acknowledgements

Kivlin lab— University of Tennessee
Breedlove, Dennis Fund Award — UT Herbarium

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