

Acacia longifolia as a host of a microbial guesthouse – a study in root-nodules following a fire event

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BACKGROUND

Plant-microbe interactions can trigger biological invasions

especially...

Mutualisms

When plant hosts are promiscuous and microbial partners are not restricted

The identification of microbiomes is important, making invasive process an opportunity to study adaptation

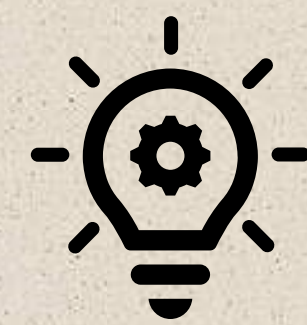
Adding climate change scenario...

Wildfires could constitute a challenge rendering its high frequency and unpredictability

Acacia longifolia is one of the most aggressive invaders worldwide

As a member of Fabaceae family...

Symbiotic interactions with nitrogen-fixing bacteria occur inside root-nodules, promoting growth



1

How root-nodules structure change with fire?

Who are the microbial partners associated with *A. longifolia*?

2

3

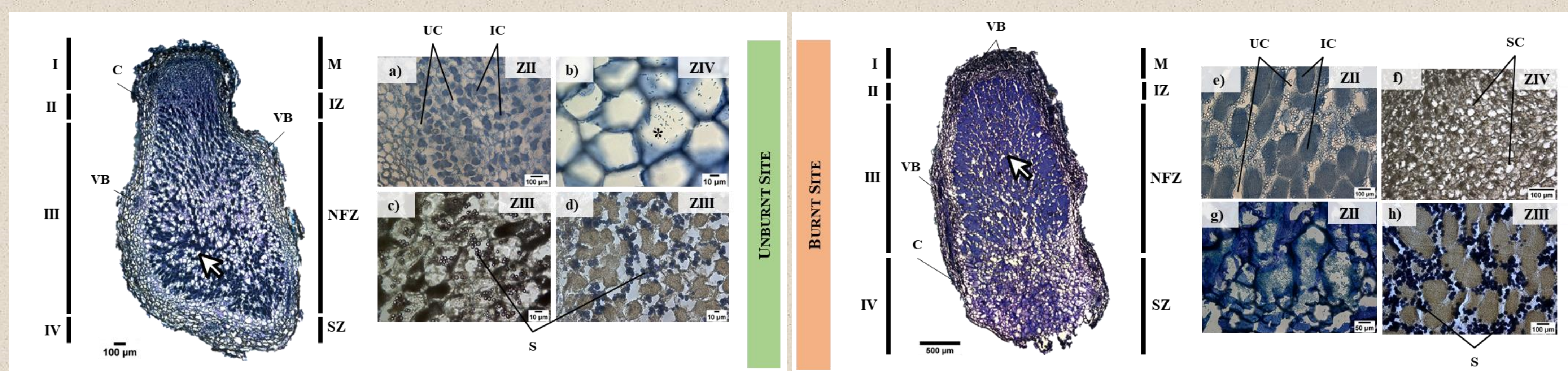
How these microbial partners change following a fire?



FINDINGS

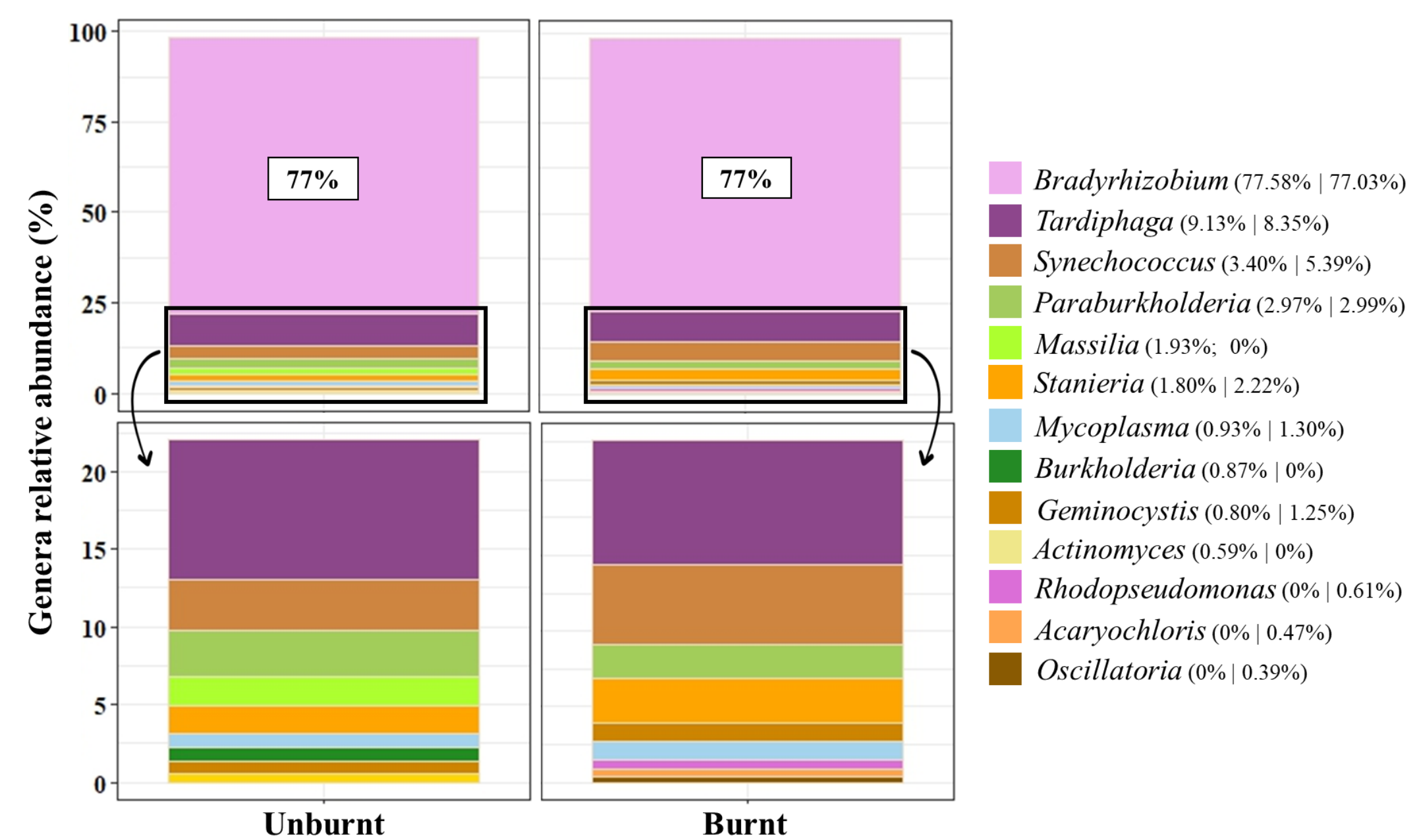
A similar structure, but...

More **INFECTED CELLS** & more **STARCH** accumulated in burnt site



A microbiome was identified...

TOP 10

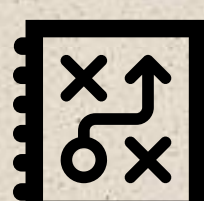


Bacteriome

A common top 3 was found...

Bradyrhizobium was the dominant partner, followed by *Tardiphaga*, an Alphaproteobacteria and *Synechococcus*, a cyanobacteria

Additional nitrogen-fixing bacteria (i.e., more diversity) were identified in burnt site, emphasizing the importance of this process for plant establishment



METHODS



Structural study

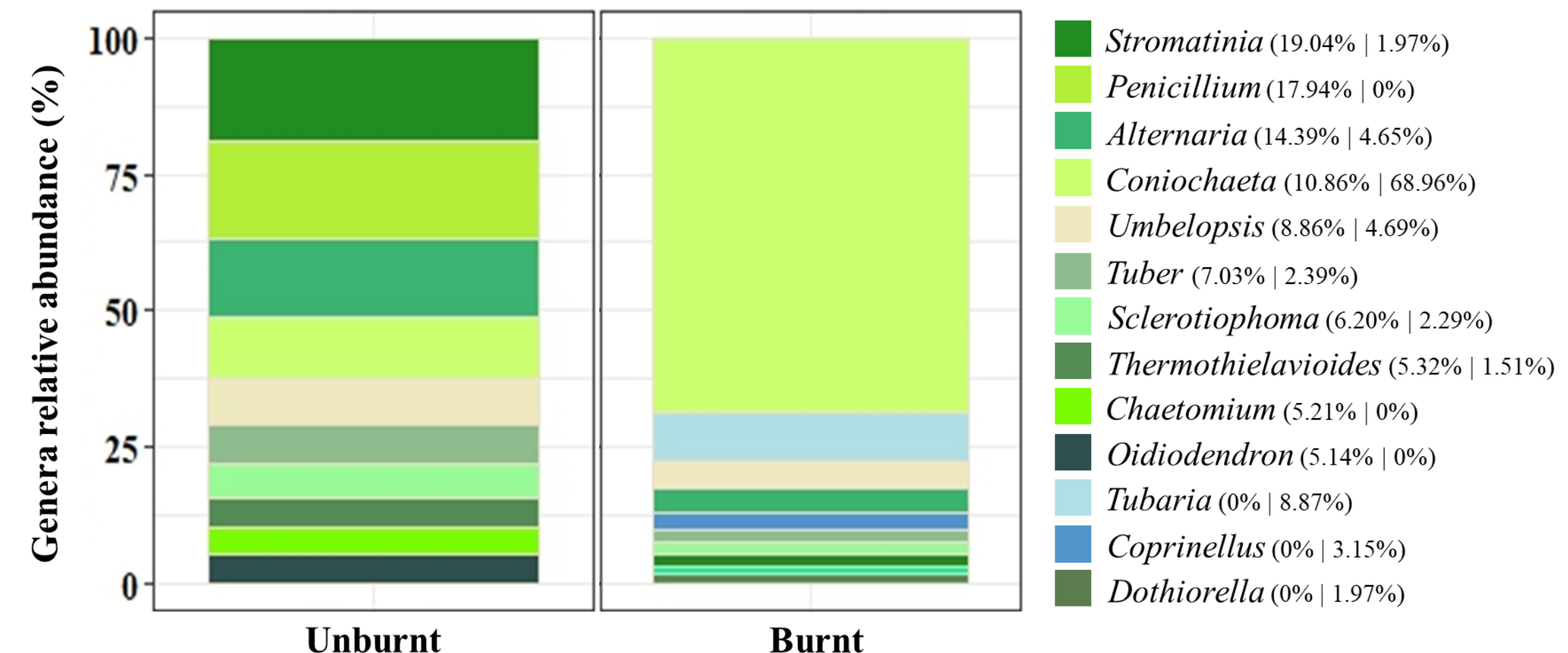
Histological studies were performed following observation of semi-thin sections obtained using a microtome, after fixation, embedding in paraplast and staining with Toluidine Blue, Lugol or Löffler solution



Microbiological study

Next Generation Sequencing through Nanopore technology targeting for 16S and 25S-28S rRNA genes was performed for bacterial and fungal identification

TOP 10



Mycobiome

For the first time, we describe the presence of a mycobiome inside root-nodules.

Burnt and unburnt sites had significant differences, both including genera already described as plant endophytes

Coniochaeta was dominant in the burnt site, suggesting its role as a facilitator for symbiotic associations

Tripartite symbiosis (i.e., bacteria-fungi-plant) seems to facilitate *A. longifolia* establishment, playing a key role in dispersal and invasive success

FUNDING

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