Grass traits variability influences flammability in open savannas in the Cerrado

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Introduction

Tropical savannas - Mostly
composed by plants that can easily
burn

Bond & Van Wilgen, 1996
Introduction

Tropical savannas - Mostly
composed by plants that can easily
burn, improving fire occurrence and
spread

Bond & Van Wilgen, 1996
Introduction

Grasses – traits enhancing their capacity to burn and sustain fire

Introduction

Grasses – traits enhancing the capacity to burn and spread fire, being thus a flammable group

Introduction

Cerrado open savannas

80% of grass cover, high species richness

Coutinho, 1982
Introduction

Cerrado open savannas

80% of grass cover, high species richness

Major component of the fuel load

Rodrigues et al., in prep.; Rissi et al., 2017
Introduction

Cerrado open savannas

80% of grass cover, high species richness

Major component of the **fuel load**

More informations: Cassy Rodrigues poster presentation

“Fire frequency affects fire behavior in open savannas in the Cerrado”

Rodrigues et al., in prep.; Rissi et al., 2017
Introduction

Grasses – high flammability

Zanzarini et al., submitted
Introduction

Grasses – high flammability

Does all grasses burn the same way?

Zanzarini et al., submitted
Introduction

Grasses – high flammability

Does all grasses burn the same way?

What traits are related to the variability in grass flammability?

Zanzarini et al., submitted
Study area

Central Brazil

Southeastern Brazil
Methods

21 grass species during the dry season
10 individuals/species

Plant and flammability traits measurements:

- Dead biomass (%)
- Moisture content (%)
- Specific Leaf Area (cm²/g⁻¹)
- Maximum temperature °C
- Burn rate cm/s
- Burnt biomass %

= FLAMMABILITY (0-3)

Jaureguiberry et al. 2011; Pérez-Harguindeguy et al. 2013
Results
Results

Interespecific variability
Results

**Interespecific variability**

![Graph showing flammability and temperature for different species. The graph includes data points for 290 °C, 70 °C, and 512 °C.]
Results

Interespecific variability

High biomass amount
Results

Interespecific variability

Low biomass amount
Results

Interespecific variability

High biomass amount
Results

**Interespecific variability**

- **High biomass amount**
### Results

<table>
<thead>
<tr>
<th>Models</th>
<th>ΔAICc</th>
<th>wAICc</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Dead biomass</td>
<td>0.0</td>
<td>0.98</td>
</tr>
<tr>
<td>Moisture content</td>
<td>9.7</td>
<td>0.007</td>
</tr>
<tr>
<td>Specific leaf area</td>
<td>10.3</td>
<td>0.005</td>
</tr>
<tr>
<td>Moisture content + dead biomass</td>
<td>12.2</td>
<td>0.002</td>
</tr>
<tr>
<td>Specific leaf area + dead biomass</td>
<td>12.8</td>
<td>0.001</td>
</tr>
<tr>
<td>All variables</td>
<td>25.1</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Amount of dead biomass of each species
Conclusions

Not all grasses burn the same way!
Conclusions

Not all grasses burn the same way!

Interespecific variability is essential to the flammability and the way that savannas burn.
Conclusions

Interespecific variability is essential to the flammability and the way that savannas burn. Occur due to the differences in plant traits, as dead biomass amount of each species.
Conclusions

Interespecific variability is essential to the flammability and the way that savannas burn. Occur due to the differences in plant traits, as deducted biomass amount of each species, Influencing the fire behavior in the system.
Conclusions

High flammable species can enhance low flammable species to burn and to be consumed,
Conclusions

High flammable species can enhance low flammable species to burn and to be consumed, promoting fire spread.
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Maintaining the function of open savannas
Conclusions

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Mantaining the function of open savannas

Fire-ignitors

- *Trachypogon spicatus*
- *Axonopus aureus*
Conclusions

High flammable species can enhance low flammable species to burn and to be consumed, promoting fire spread in the community.

Mantaining the function of open savannas

**Fire-ignitors**
- *Trachypogon spicatus*
- *Axonopus aureus*

**Fire-sustainers**
- *Mesosetum ferrugineum*
- *Elionurus muticus*
Conclusions

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Maintaining the function of open savannas

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- **Fire-spreaders**
  - *Arthropogon villosus*
Conclusions

High flammable species can enhance low flammable species to burn and to be consumed, promoting fire spread in the community.

Mantaining the function of open savannas

- **Fire-ignitors**
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  - *Axonopus aureus*

- **Fire-sustainers**
  - *Mesosetum ferrugineum*
  - *Elionurus muticus*

- **Fire-spreaders**
  - *Arthropogon villosus*

- **Fire-stoppers**
  - *Sporobolus aeneus*
Thank you!

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