

Interactions between termites and savanna dynamics



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Introduction

- Termites in savannas
 - Major eco-system engineers
 - Improve soil functioning
 - Nutrient cycling
 - Aeration
 - Porosity
 - Water infiltration and storage
 - However, very understudied
 - Sampling and taxonomy



Introduction

- We looked at three dynamics of savannas
 - Rainfall differences
 - Vegetation differences
 - Fire ecology
 - Within different savannas
 - Very little known about invertebrates
 - A single study on termites in southern Africa
 - Ferrar 1982

Introduction

- Conservation mandate
 - Maintenance of biodiversity
- Savanna biodiversity
 - Fire viewed as vital disturbance
 - Rainfall & vegetation also influential
 - Termites vital for savanna functioning
 - Therefore interactions between these factors and termites should be better understood



Key Questions

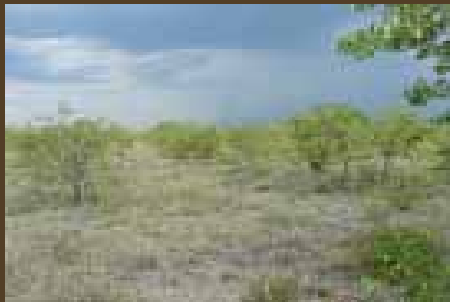
How does termite activity vary across savanna types in KNP?

How does termite activity vary with season in KNP across these savanna types?

How do different burning regimes affect termite activity within each savanna?

Methods

- Made use of the E.B.P.'s in KNP
- Tested four different fire regimes
 - Season, frequency and intensity of fires
- Four distinct savanna types
- Differ in vegetation and rainfall



Mopani

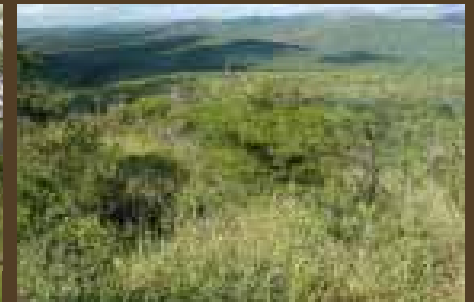
450 mm



Satara



Pretoriuskop

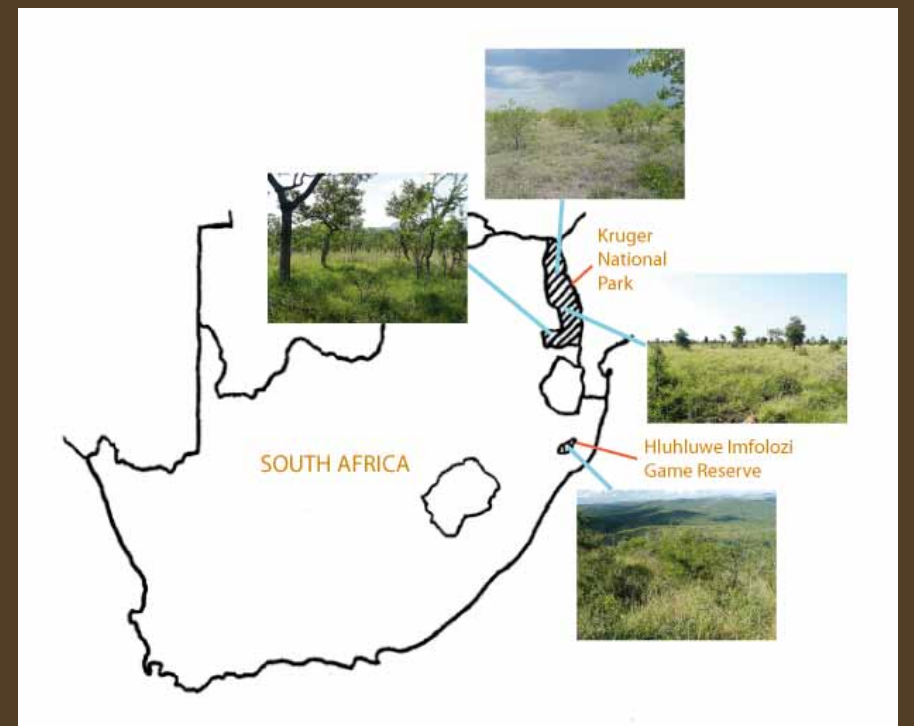


Hluhluwe

900 mm

Study sites

- Kruger National Park
 - Experimental burn plots
- Hluhluwe-iMfolozi Park
 - Used fire records



Experimental Design

- Replicated three times in each savanna type
- Four regimes
 - August annual
 - August triennial
 - December triennial
 - Long unburnt control site
 - Test season, frequency and intensity of fire
- Repeated across three seasons
 - Wet, transitional and dry

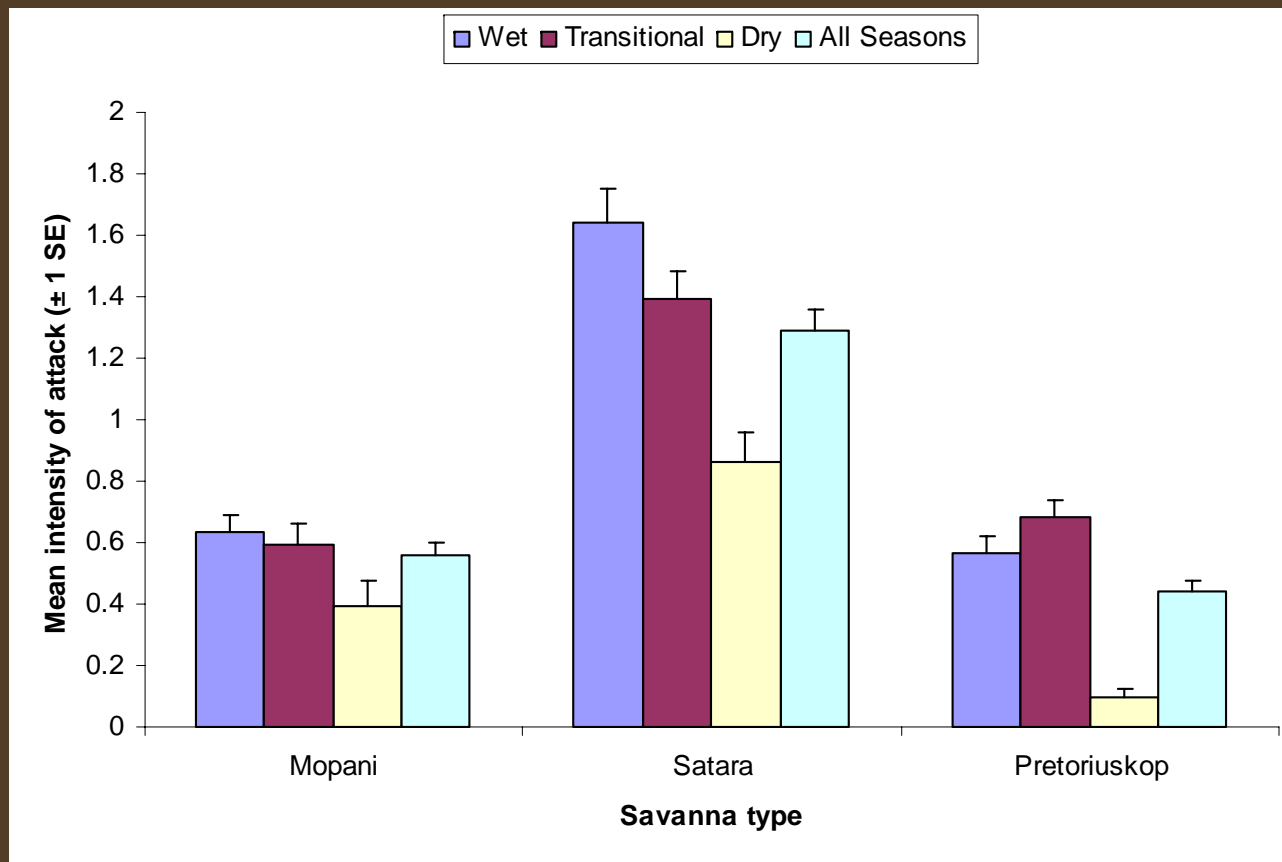
Experimental Design

- On each plot
 - 40 toilet rolls (cellulose baits), spaced 5 m apart
 - 20 buried, 20 on the surface
 - Checked at intervals of 7, 14, 28 and 56 days
 - Assessed for termite activity and termites sampled



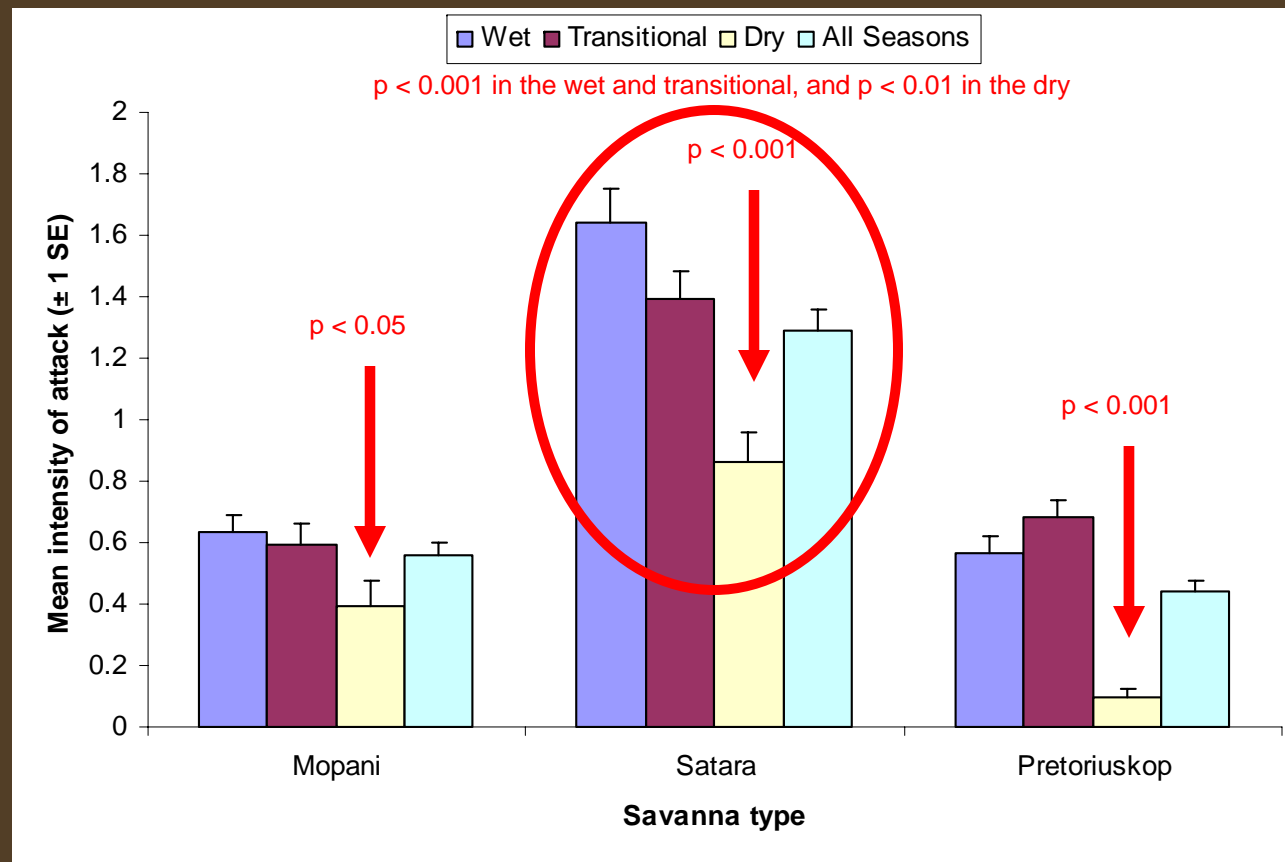
Intensity of attack

- Across savanna types and seasons



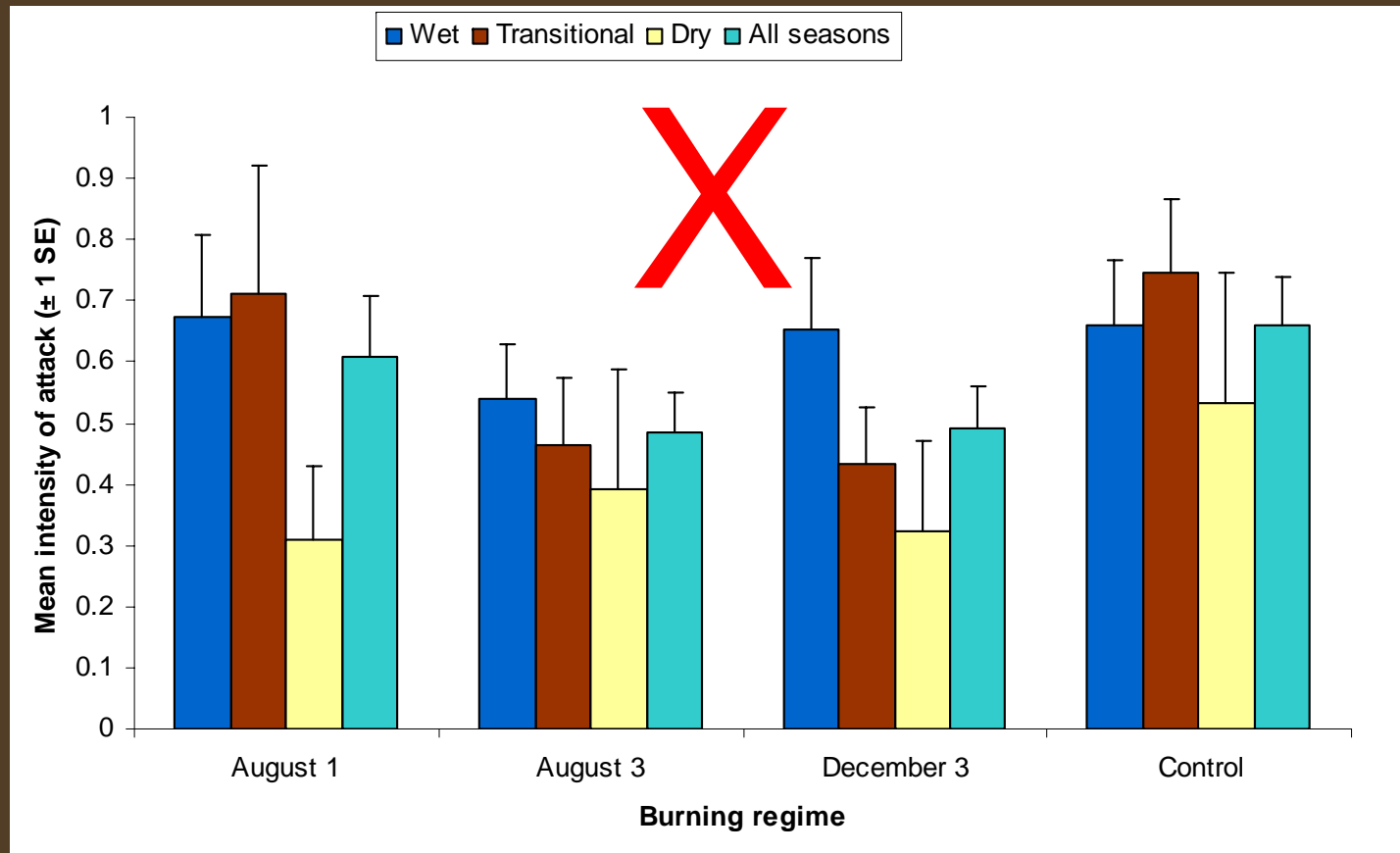
Intensity of attack

- Across savanna types and seasons



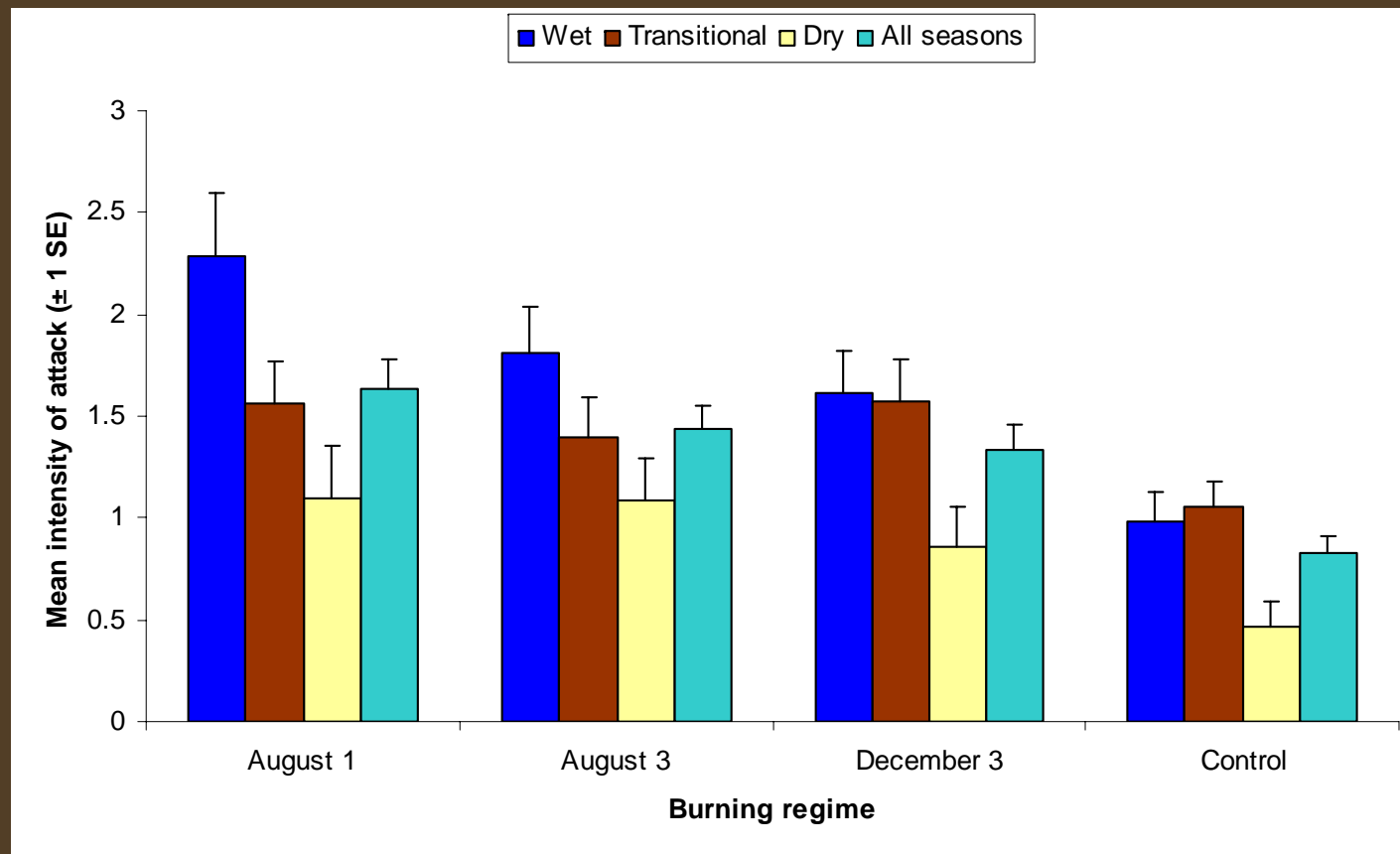
Intensity of attack

- Across burning regimes at Mopani



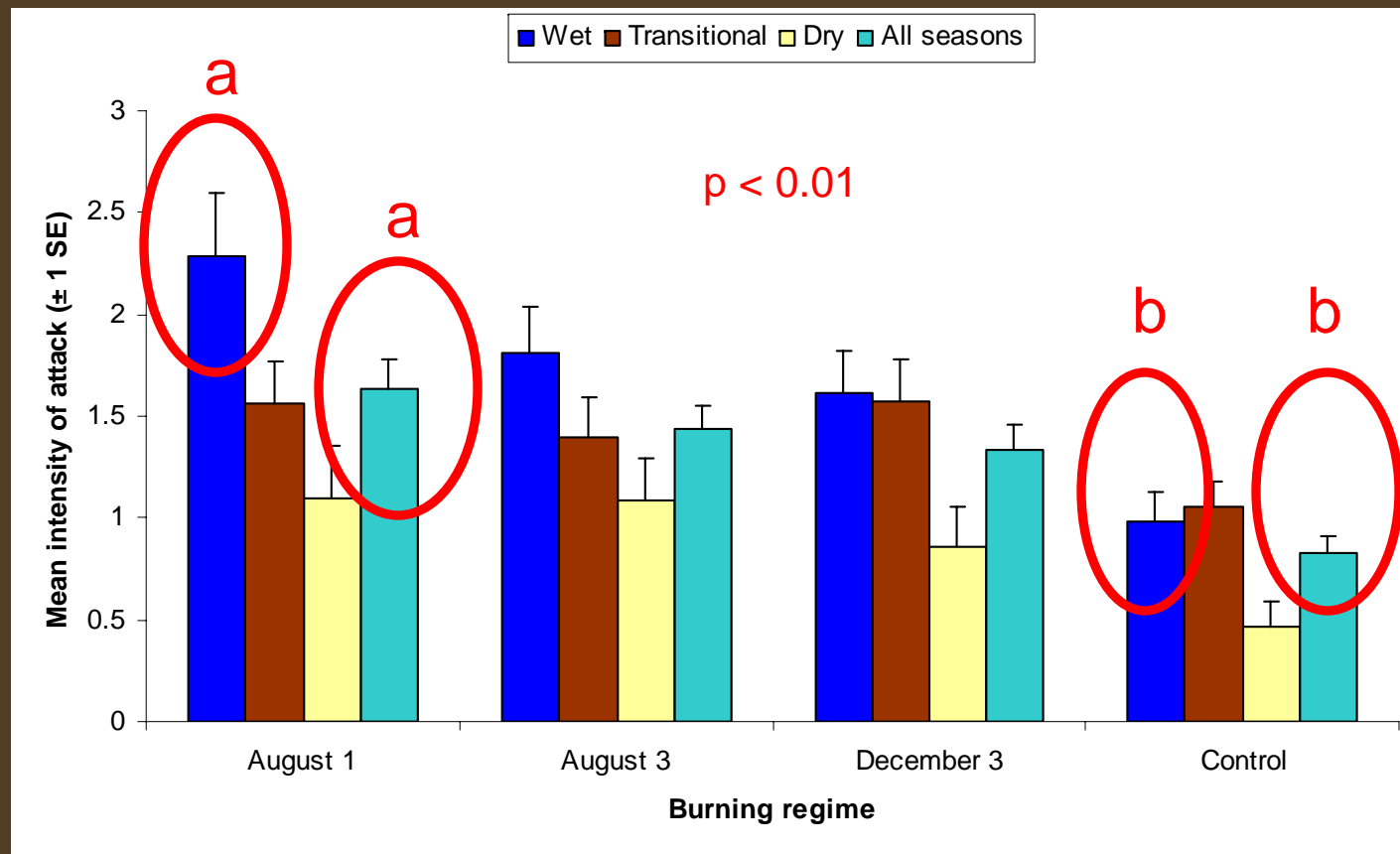
Intensity of attack

- Across burning regimes at Satara



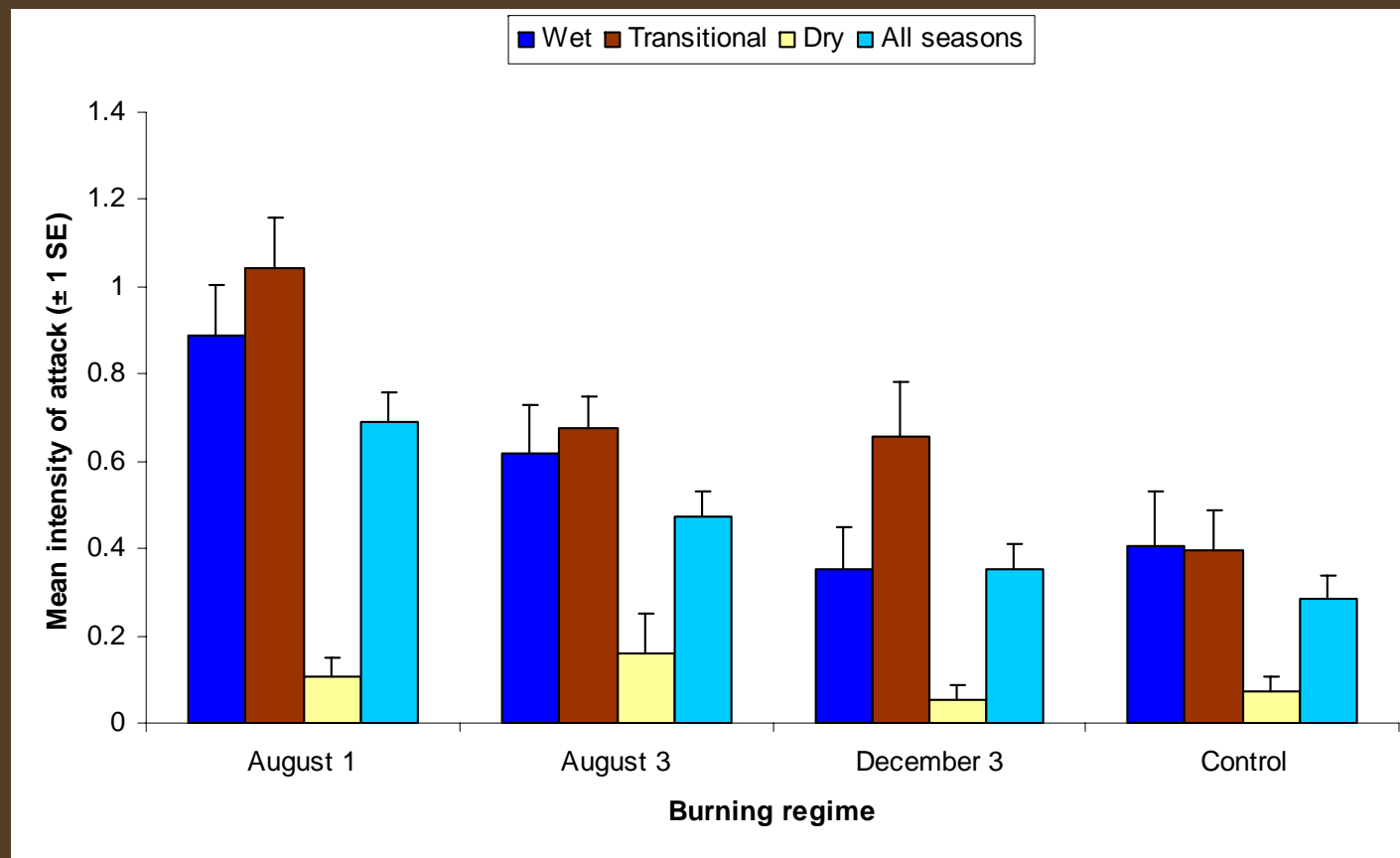
Intensity of attack

- Across burning regimes at Satara



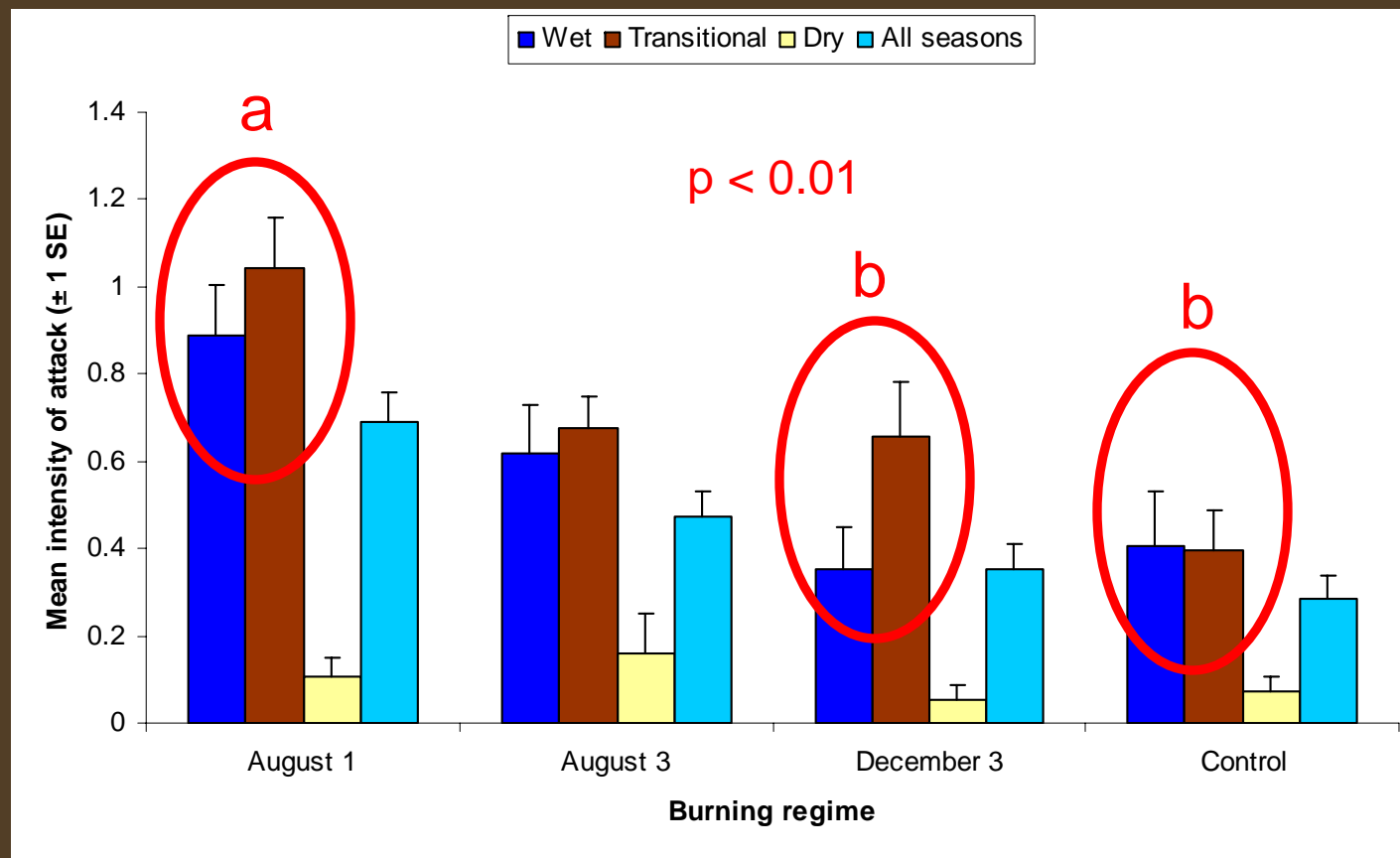
Intensity of attack

- Across burning regimes at Pretoriuskop



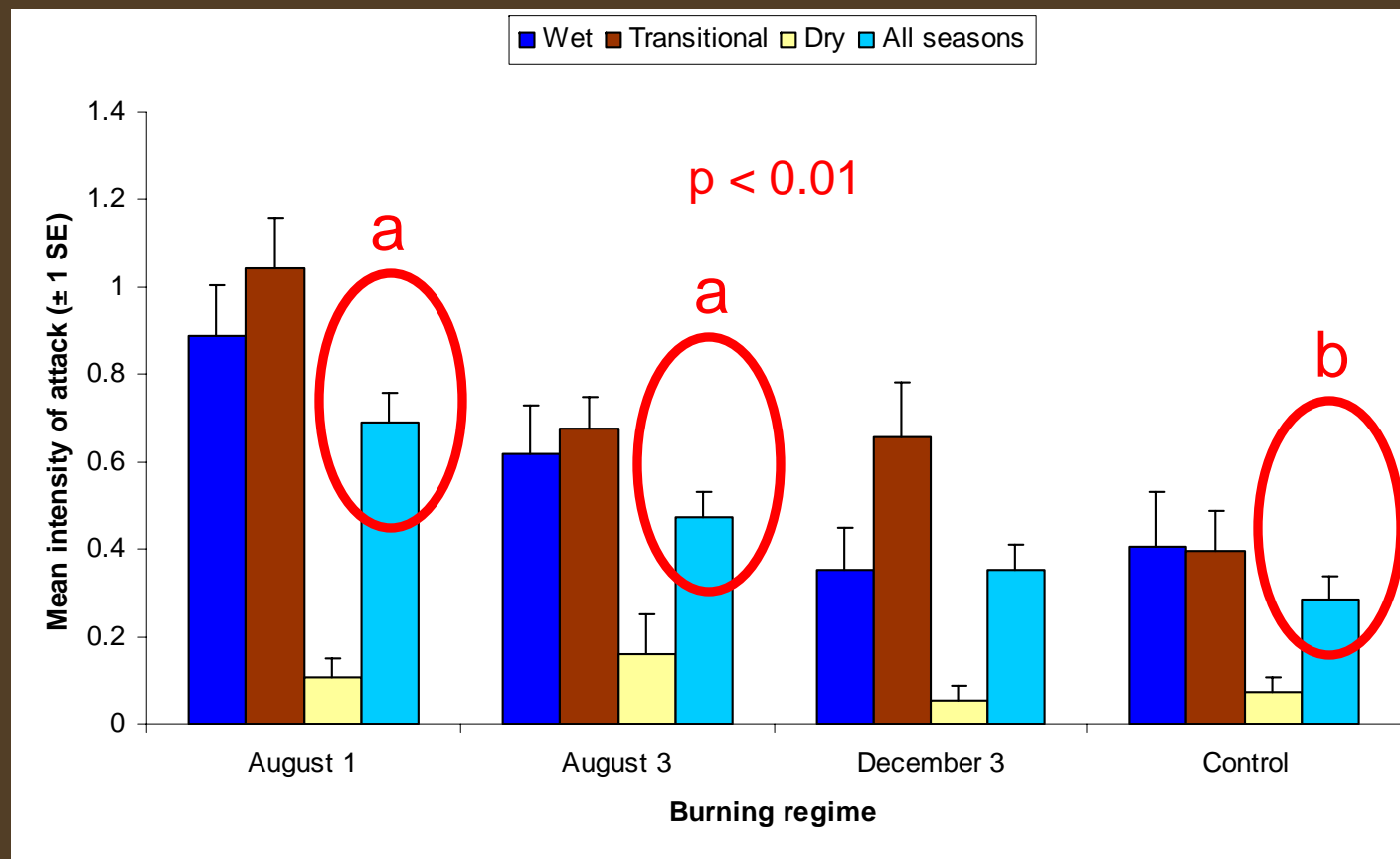
Intensity of attack

- Across burning regimes at Pretoriuskop



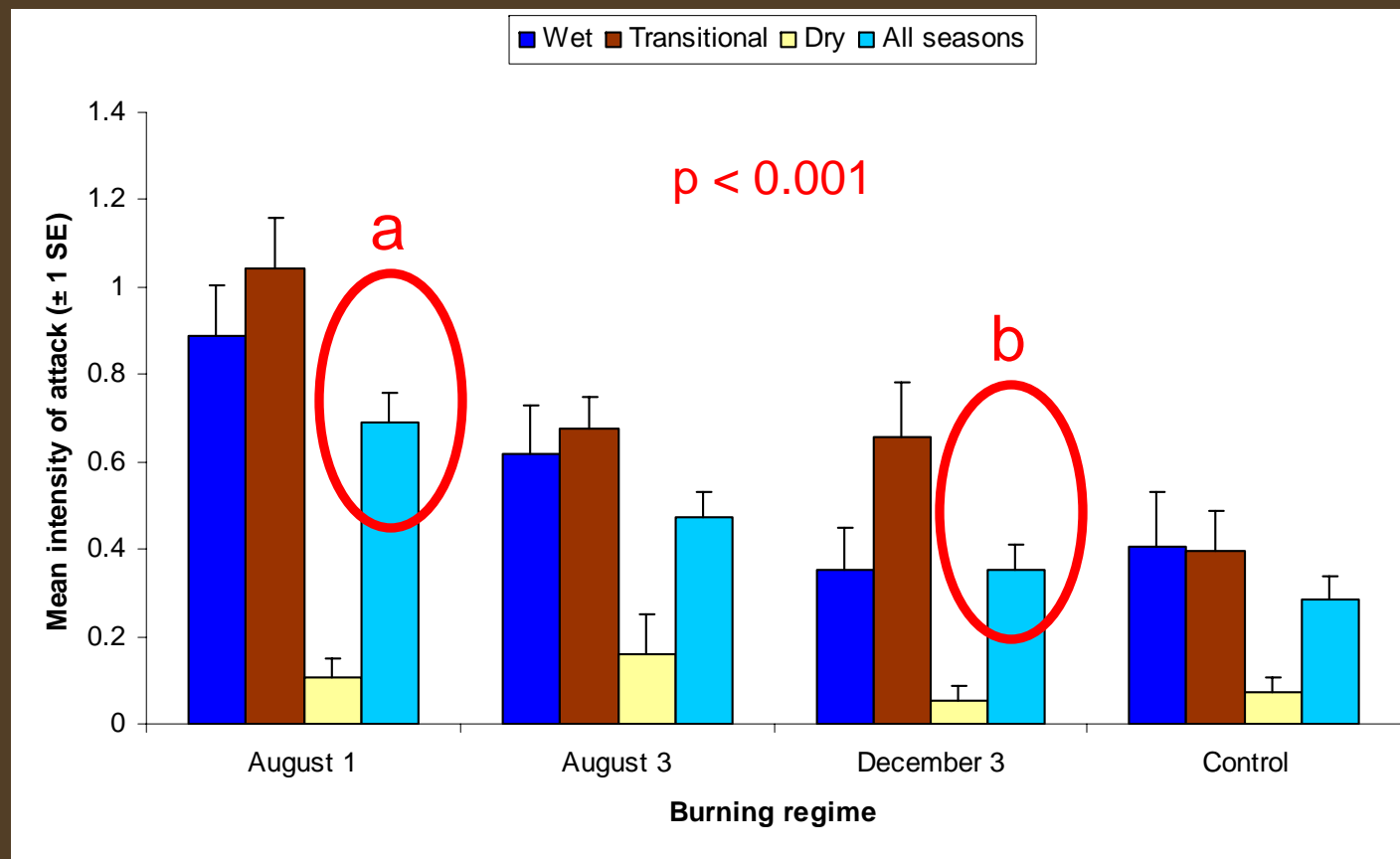
Intensity of attack

- Across burning regimes at Pretoriuskop



Intensity of attack

- Across burning regimes at Pretoriuskop



Across savannas

Much higher levels of activity at Satara

- Why??
 - Positive feedback loop with grazing?
 - Similar results in Hluhluwe-iMfolozi Park
- Very little activity in the dry season
 - Termite activity dependant on rainfall events



Fire ecology

- More differences in mesic savannas
 - Nothing happening at Mopani
 - Vegetation relatively unaffected by fire
 - Similar results for ants (Parr et al. 2004)
 - Most differences at Pretoriuskop
 - Vegetation differences more pronounced



Fire ecology

- More activity on annually burnt plots
 - More large herbivores present?
 - Positive feedback loop with grazing?
 - Particularly at Satara
 - Less available forage for termites?



Early conclusions

- Results still preliminary
- Identification ongoing
- But...
 - Differences across savannas
 - Fire does seem to have some effect
 - Potential implications for conservation

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