

# BUSH ENCROACHMENT IN MAKAPASTAD COMMUNAL AREAS, NORTH WEST PROVINCE

By

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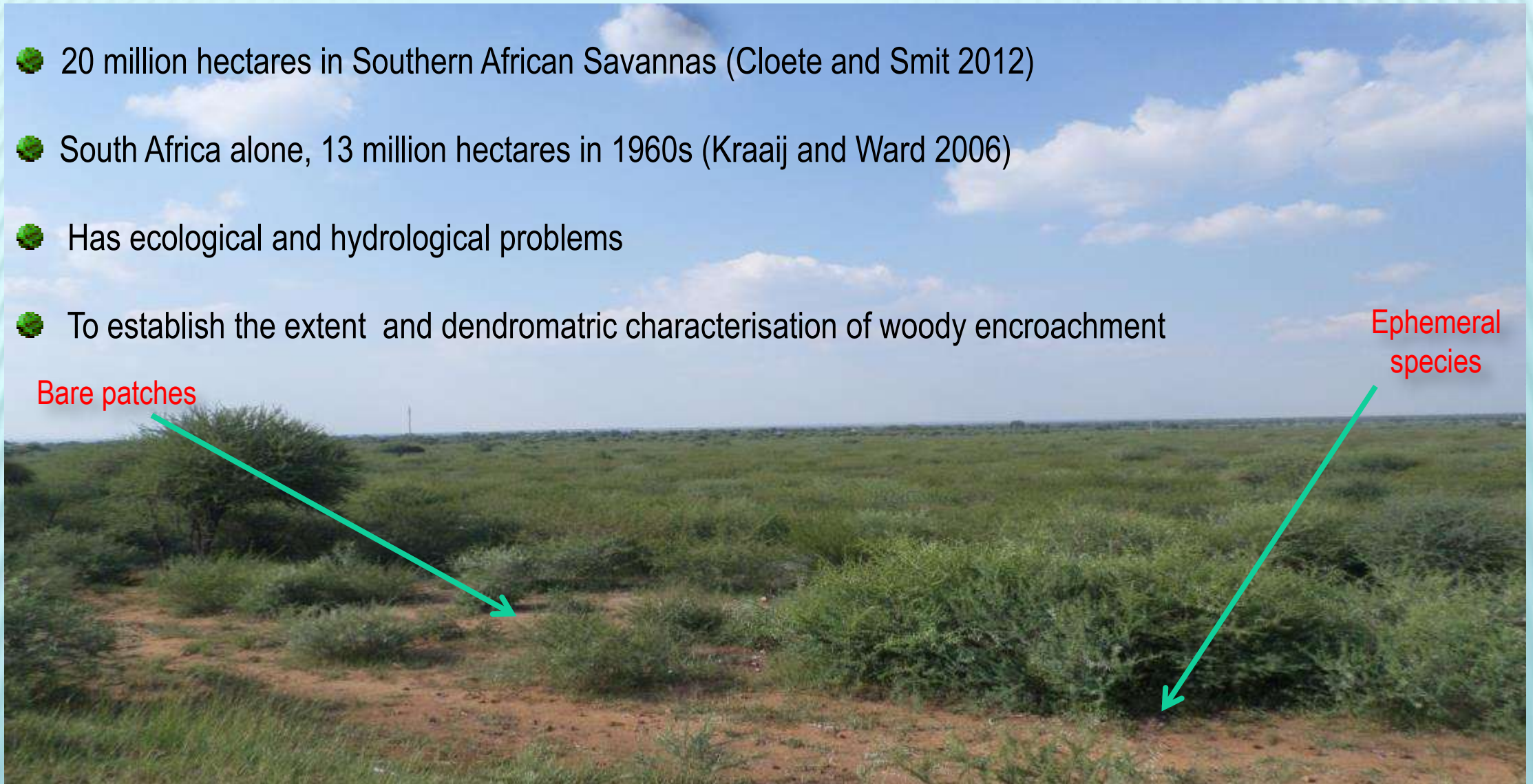


# INTRODUCTION

- 20 million hectares in Southern African Savannas (Cloete and Smit 2012)
- South Africa alone, 13 million hectares in 1960s (Kraaij and Ward 2006)
- Has ecological and hydrological problems
- To establish the extent and dendromatric characterisation of woody encroachment

Bare patches

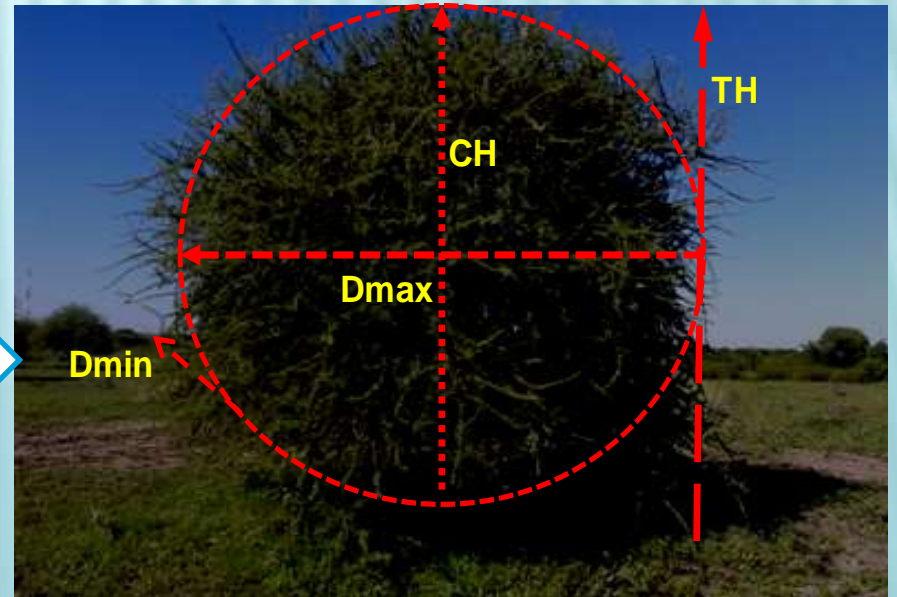
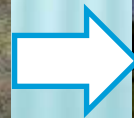
Ephemeral species



# STUDY SITES AND METHODS

- Radi, Maseding and Kgomokgomo areas
- Three encroached sites of 50 X 50 m<sup>2</sup>/area
- Eight 25 m<sup>2</sup> plots/site
- Frequencies, density and tree equivalents

- Canopy area =  $\pi \left( \frac{D_{max} \cdot D_{min}}{4} \right)$  and volume =  $\frac{4}{3} \pi \left( \frac{D_{min}}{2} \cdot \frac{D_{max}}{2} \cdot \frac{CH}{2} \right)$



# RESULTS AND DISCUSSION

## Woody species composition

**Table 1:** Mean species frequencies at Radi

Species	Life form	Frequency (%)
<i>A. laricinus</i>	Shrub	1.50±1.7 <sup>b</sup>
<b><i>A. tenuispina</i></b>	<b>Shrub</b>	<b>91.70±1.7<sup>a</sup></b>
<i>A. tortilis</i>	Tree	5.70±1.7 <sup>b</sup>
<i>Z. mucronata</i>	Tree	1.10±1.7 <sup>b</sup>

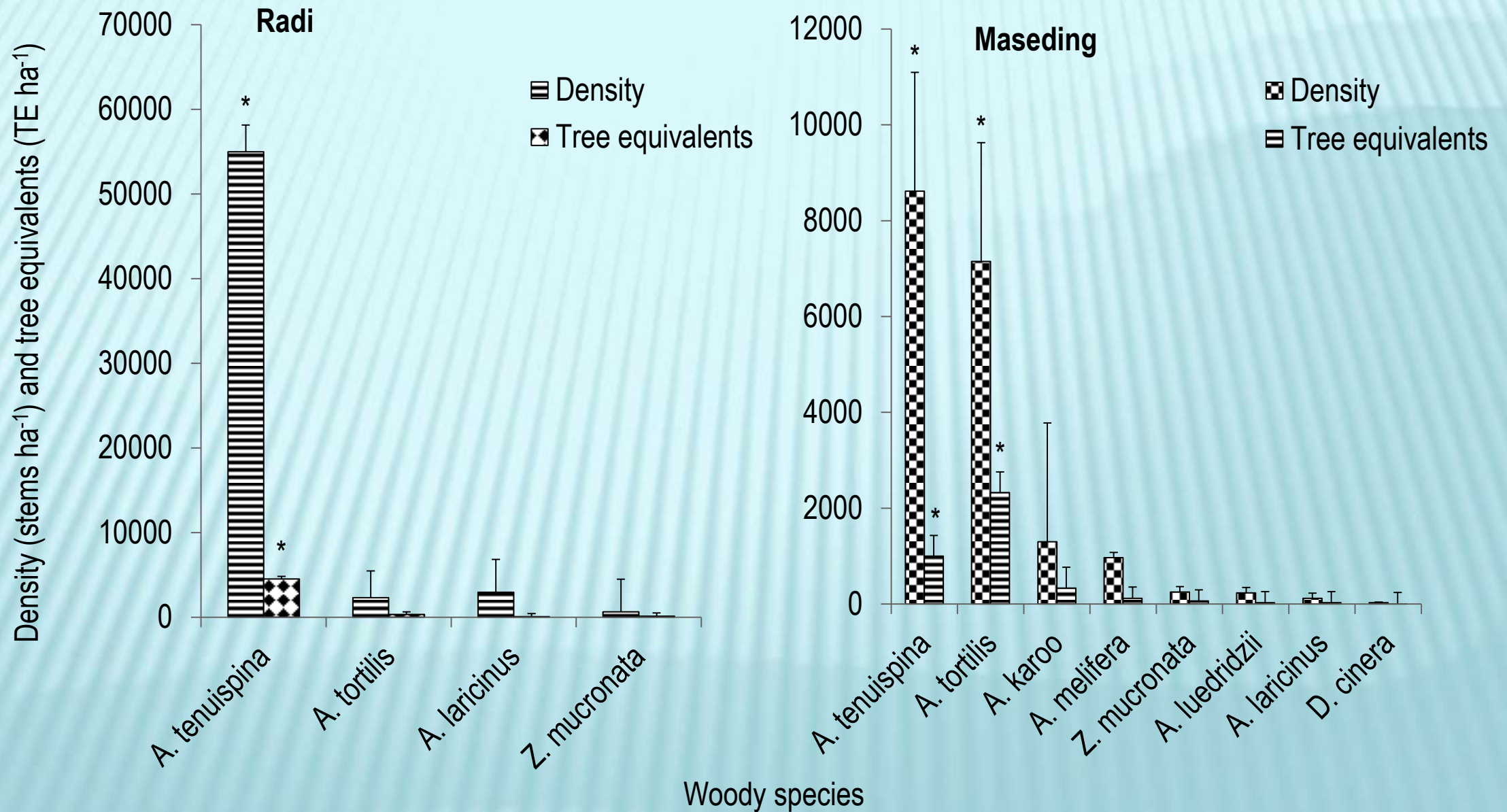
**Table 2:** Mean species frequencies at Maseding

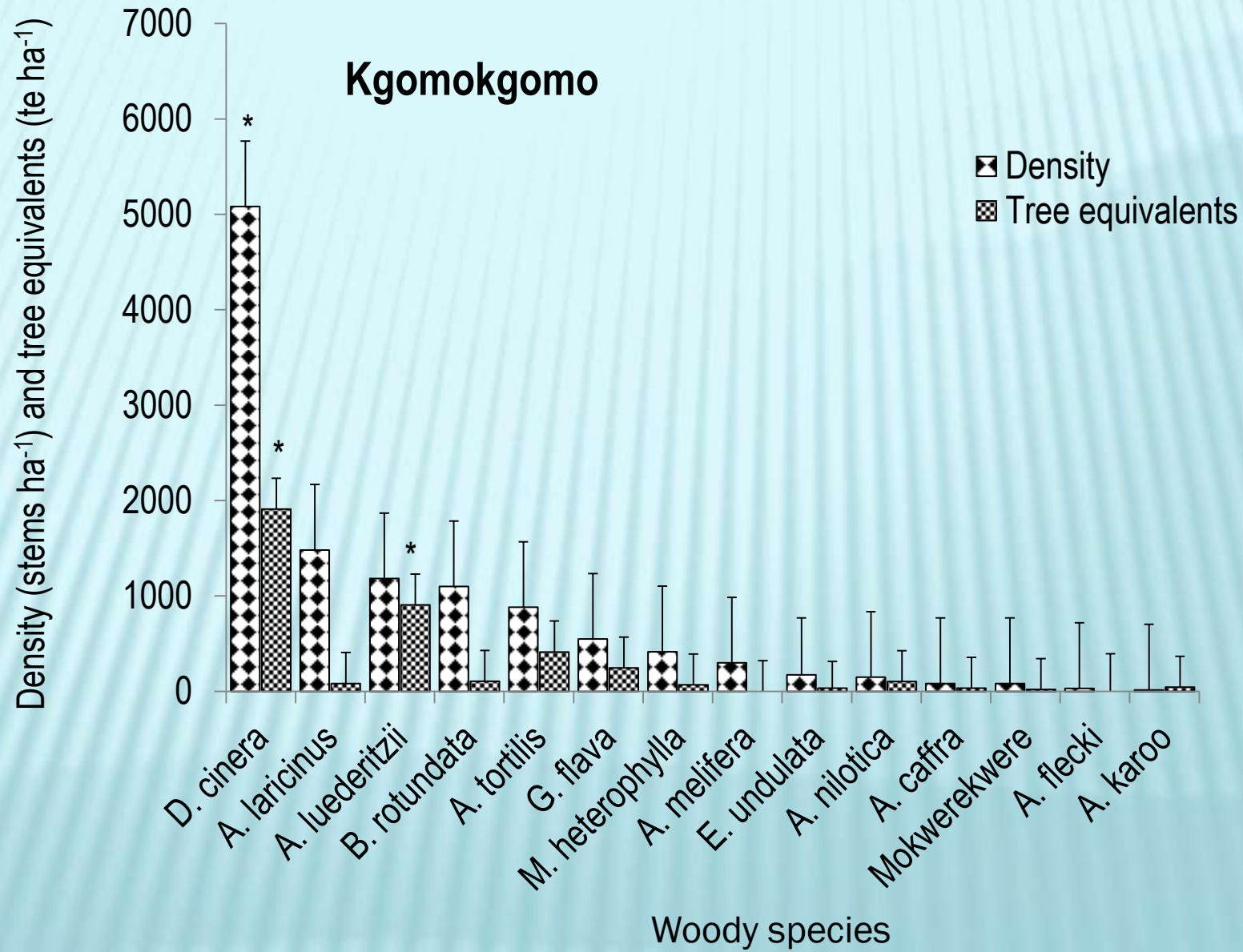
Species	Life form	Frequency (%)
<b><i>A. tortilis</i></b>	-	<b>61.83±10.8<sup>a</sup></b>
<b><i>A. tenuispina</i></b>	-	<b>24.83±10.8<sup>ab</sup></b>
<i>A. karoo</i>	Tree	7.03±10.8 <sup>b</sup>
<i>A. melifera</i>	Tree	3.43±10.8 <sup>b</sup>
<i>A. laricinus</i>	-	1.53±10.8 <sup>b</sup>
<i>A. luederitzii</i>	Tree	0.37±10.8 <sup>b</sup>
<i>D. cinera</i>	Tree	0.53±10.8 <sup>b</sup>
<i>Z. mucronata</i>	-	0.47±10.8 <sup>b</sup>

**Table 3:** Mean species frequencies at Kgomokgomo

<i>Species</i>	Life form	Frequency (%)
<i>A. caffra</i>	Tree	1.33±6.3 <sup>b</sup>
<i>A. fleckii</i>	Tree	0.43±6.3 <sup>b</sup>
<i>A. Karoo</i>	-	0.43±6.3 <sup>b</sup>
<i>A. laricinus</i>	-	5.70±6.3 <sup>b</sup>
<i>A. luederitzii</i>	-	8.17±6.3 <sup>b</sup>
<i>A. melifera</i>	-	7.50±6.3 <sup>b</sup>
<i>A. nilotica</i>	Tree	4.30±10.8 <sup>b</sup>
<b><i>A. tortilis</i></b>	-	<b>17.40±6.3<sup>ab</sup></b>
<i>B. rotundata</i>	Tree	6.30±6.3 <sup>b</sup>
<b><i>D. cinera</i></b>	-	<b>44.25±7.7<sup>a</sup></b>
<i>G. flava</i>	Shrub	1.90±6.3 <sup>b</sup>
<i>M. heterophylla</i>	Shrub	3.46±6.3 <sup>b</sup>
<i>C. imberba</i>	Shrub	1.56±6.3 <sup>b</sup>

# Woody density and tree equivalents





# Woody canopy area and volume

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- Radi: Canopy area and volume did not differ ( $p > 0.01$ ) amongst species
- Maseding: *Ziziphus mucronata* had a wider ( $p < 0.01$ ) canopy of 5.3 m<sup>2</sup> and greater volume of 4.2 m<sup>3</sup>.
- Kgomokgomo: *D. cinera* had wide canopy area of 2.7 m<sup>2</sup> and 2.4 m<sup>3</sup> volume



# CONCLUSION

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- Woody density and tree equivalents were beyond the threshold 2400 stems ha<sup>-1</sup> and 2500 TE ha<sup>1</sup>
- Debushing is recommended
- Caution must be taken for selection of method due to differences in dendromatric traits of each species

