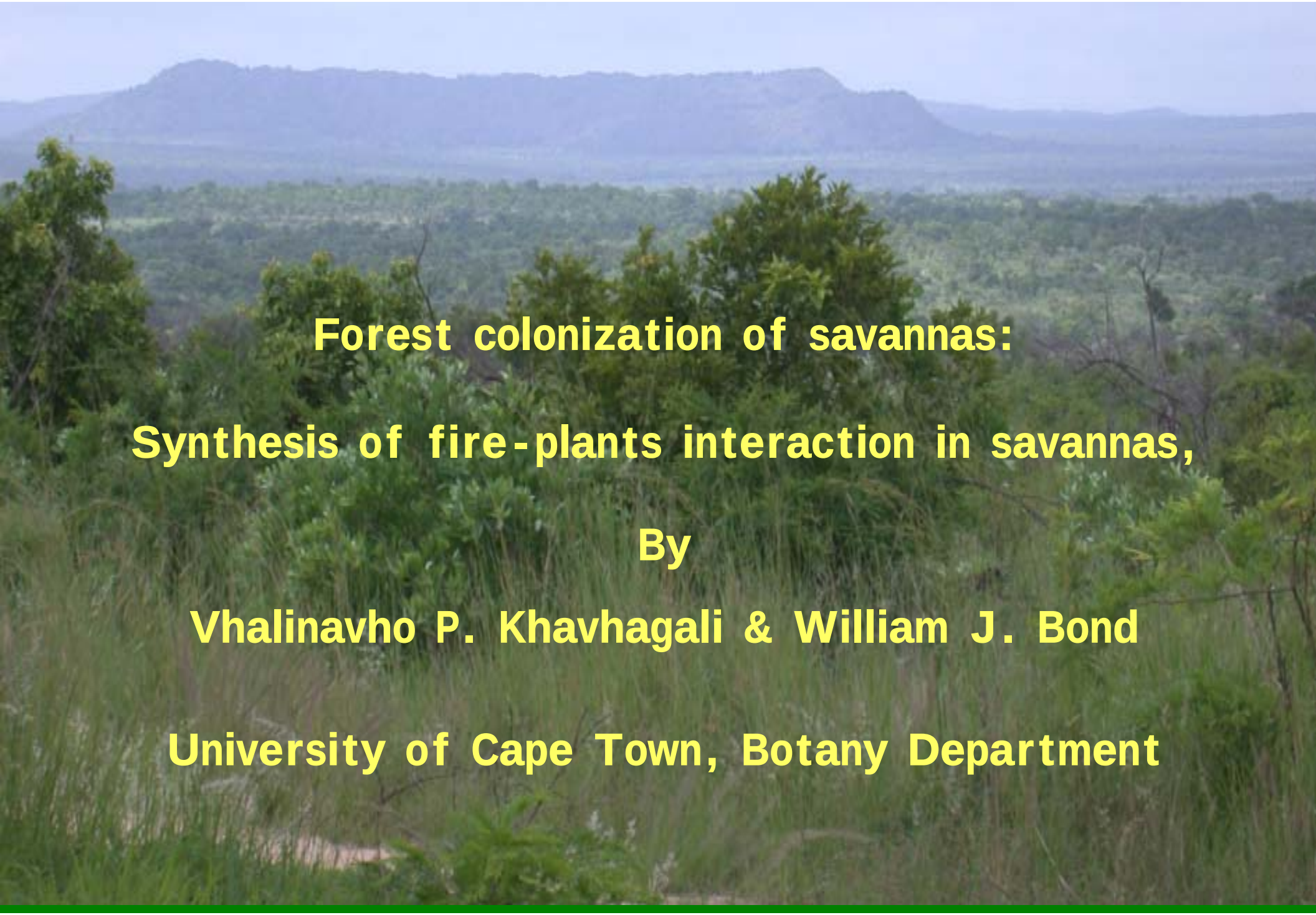

Forest colonization of savannas:

Synthesis of fire-plants interaction in savannas,

By

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Background

Increase in woody plants affects ecosystem biodiversity &

agricultural areas both in savannas and grasslands biomes,

Fire maintains the grassland and savannas structures

by limiting woody plants recruitment,

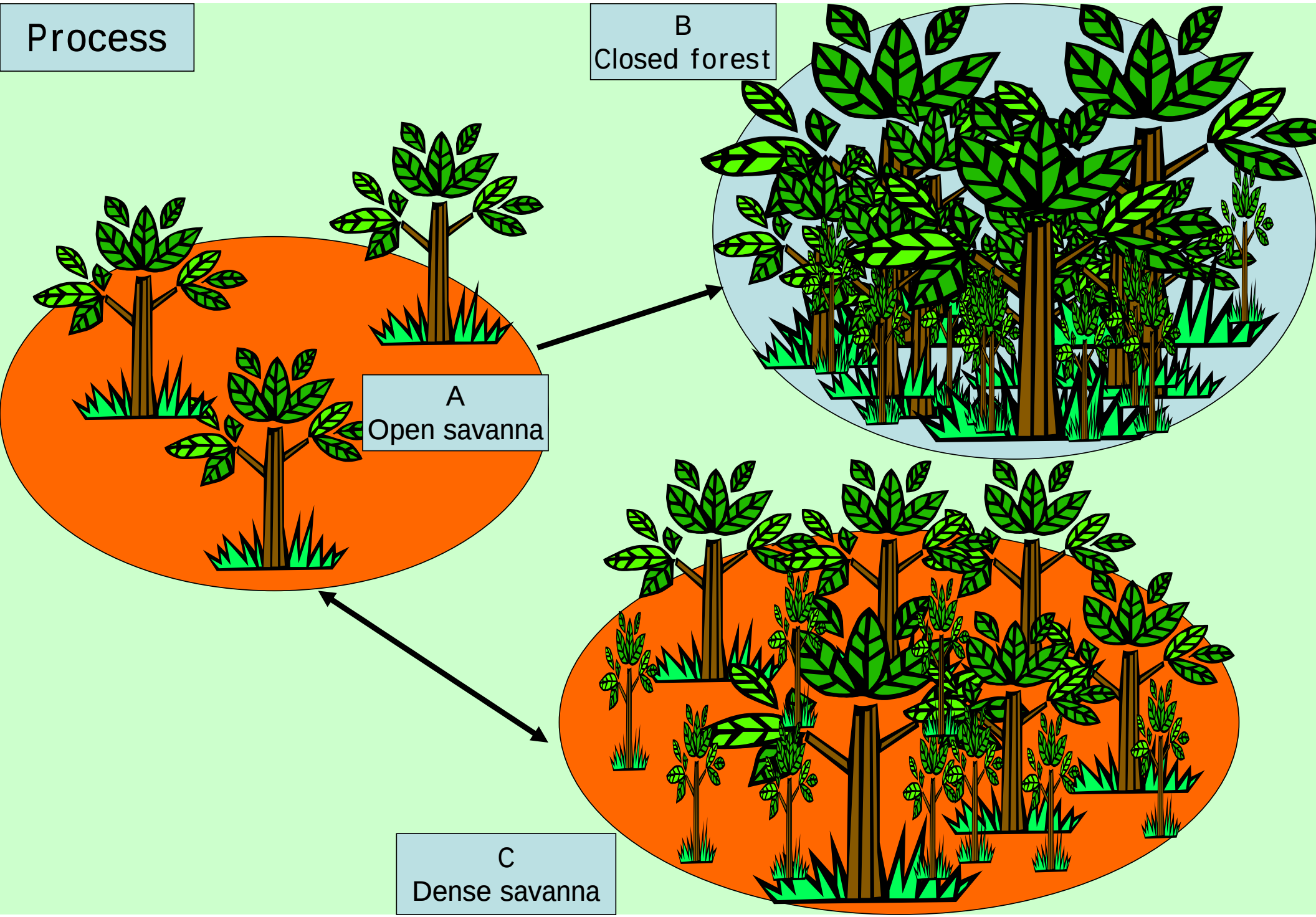
Woody species first appear in the shade of savanna trees (Nucleation),

but expansion beyond the canopy cover is rare and very slow.

Fire-plants, plants-moisture, plants-nutrients & plants-herbivory

& plant-nutrients/moisture-herbivore/fire interaction- not well understood,

Investigate influence of fire in woody vegetation using the EBPs in P/kop.


Process
B
Closed forest
A
Open savanna
C
Dense savanna

Questions

What is the impact of fire frequency on woody vegetation?
How does fire & plants interact to influence species composition?

Predictions

Fire hypothesis- *Fire suppression, trees thickens up, and/or savannas >> by forests.*
Plants- *Savanna trees respond better to fire than forest trees.*
Canopy-*Canopy has positive effect on species composition & soil properties.*

Study site

Pretoriuskop- south-western region of the KNP, Average Annual rainfall =744 mm,
Broad-leaved deciduous woodland.

Methodology

Kambeni EBPs (Aug B1, B2 & B3 & the Gravel Pit = Control).
Sampled - under S. *birrea* & *T. sericea* and on the open habitat.
Soil samples : soil chemistry & soil moisture (5, 15, 25, 45cm)

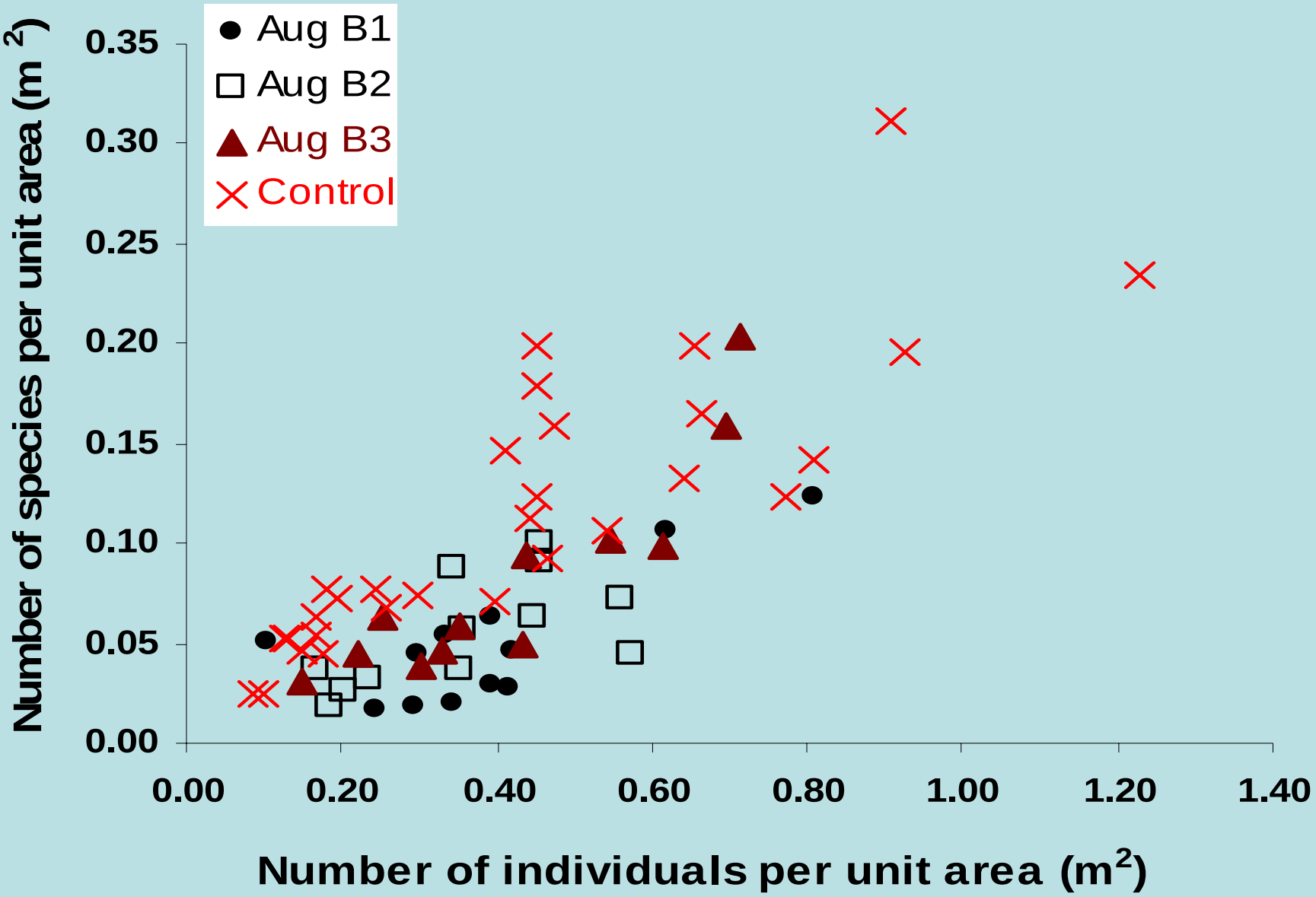
Sampling design

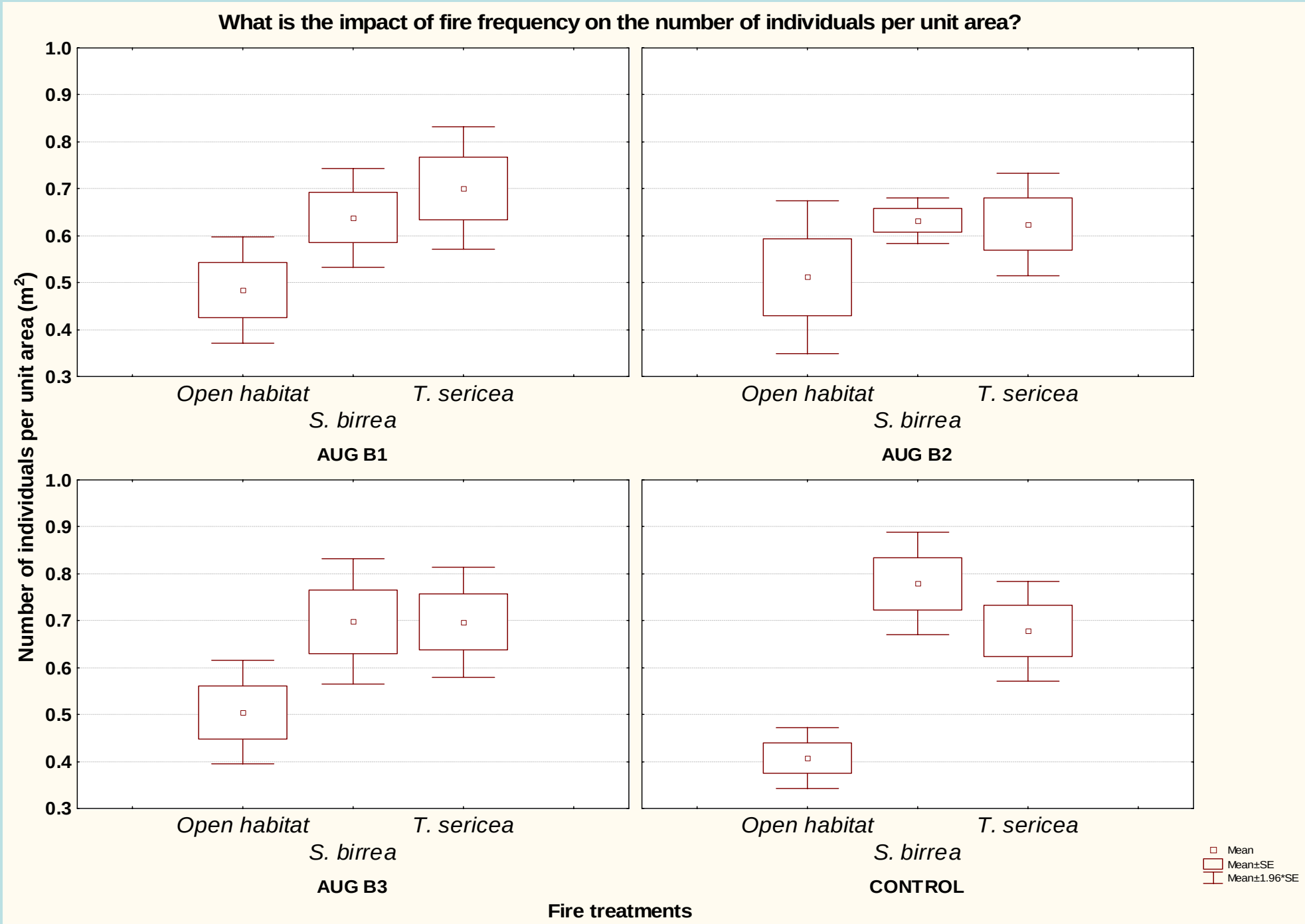
Open habitat

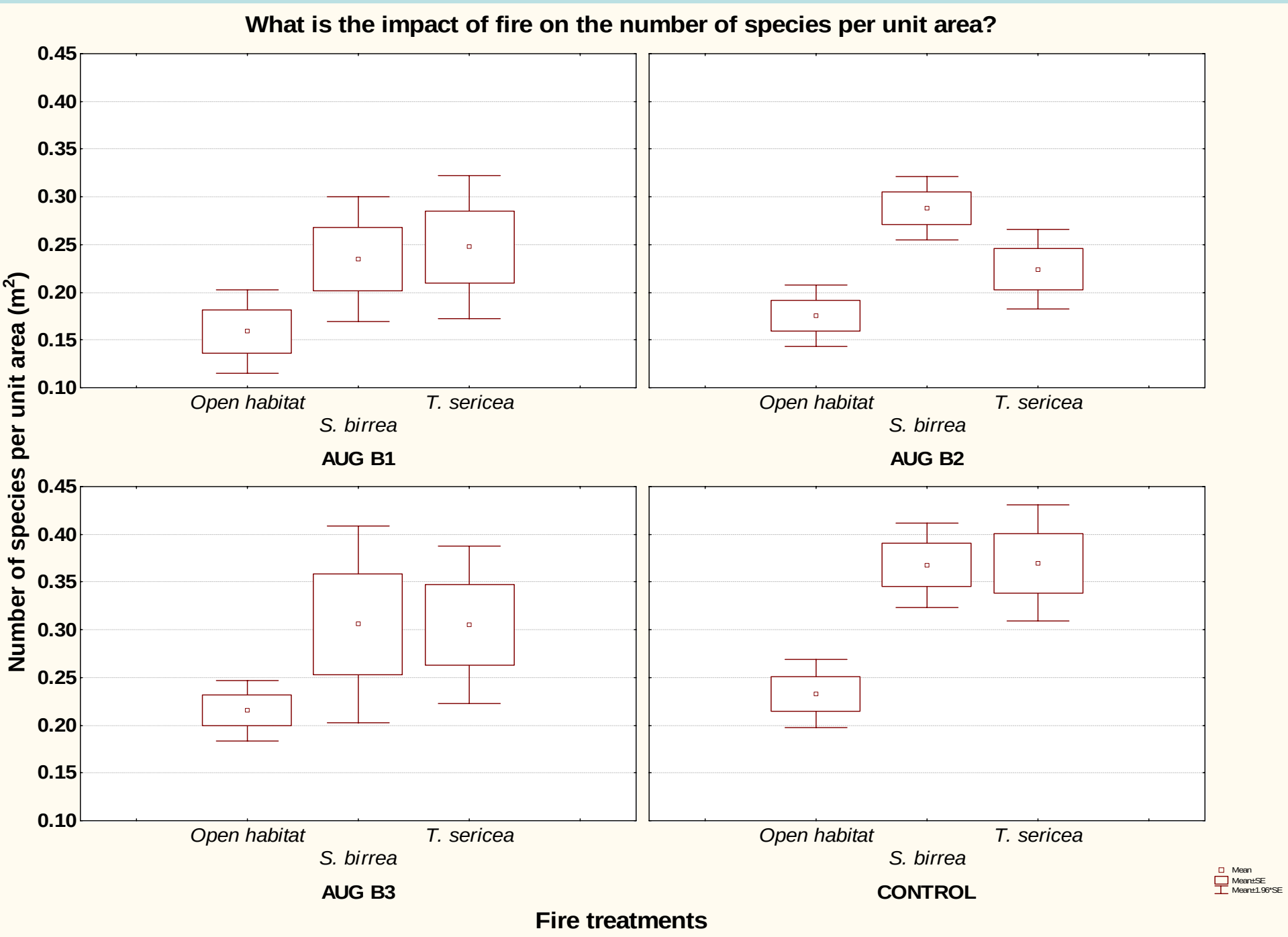
S. birrea

T. sericea

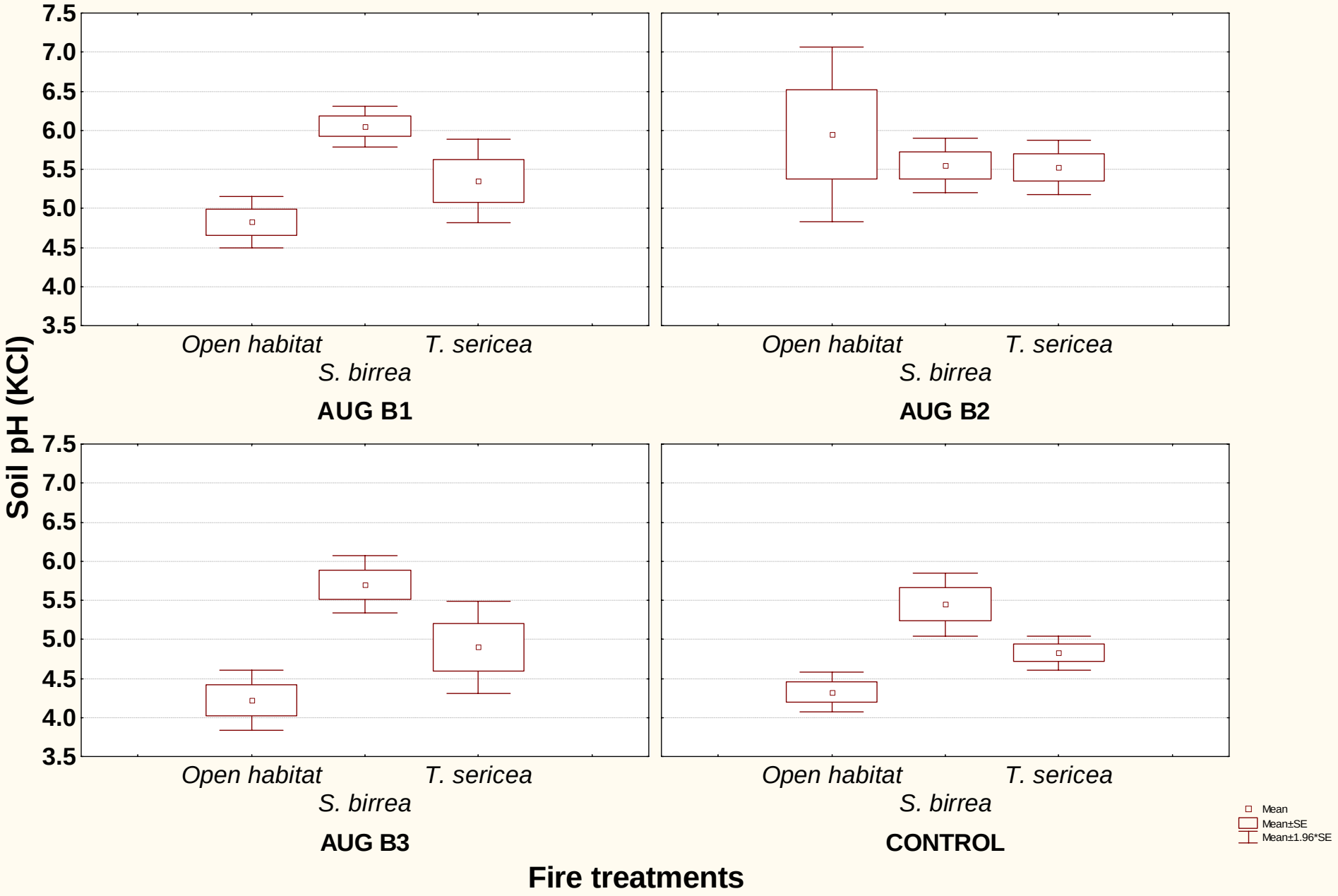
What is the impact of fire frequency on vegetation?




What is the impact of fire frequency on the number of individuals per unit area?
Number of individuals per unit area (m2)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
Open habitat
T. sericea
S. birrea
AUG B1
AUG B2
AUG B3
CONTROL
Fire treatments
Mean
Mean±SE
Mean±1.96*SE


What is the impact of fire on the number of species per unit area?
Number of species per unit area (m2)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
Open habitat
T. sericea
S. birrea
AUG B1
AUG B2
AUG B3
CONTROL
Fire treatments
Mean
Mean±SE
Mean±1.96*SE

What is the response of soil pH to fire frequency under different sampling sites?



Summary

- Fire alone did not lead to forest invasion (few new saplings in open sites, under Terminalia), but there was a shift to dense trees, and shift in species with no burn under Marula,

- Savanna trees had a positive impact by increasing resource availability (soil moisture, pH, Mg, C, Ca, OM & K) underneath their canopies & a negative impact by increasing woody plants that alters system functioning, soil nutrients, moisture and organic matter, resulting in biome shift & formation of thicket stands/forest patches,

- Fire exclusion/low fire frequency promotes recruitment of trees (Swaine et al, 1992) and high fire frequency led to open savannas (Tester, 1989; Shackleton & Scholes, 2000),

- Both fire and savanna trees has a complex interaction that shapes the function of the savanna ecosystem.

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Ndi a livhuwa