

Fire and plant invasions, the cases of *Hakea sericea* and *Acacia dealbata* in Portugal

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The problem

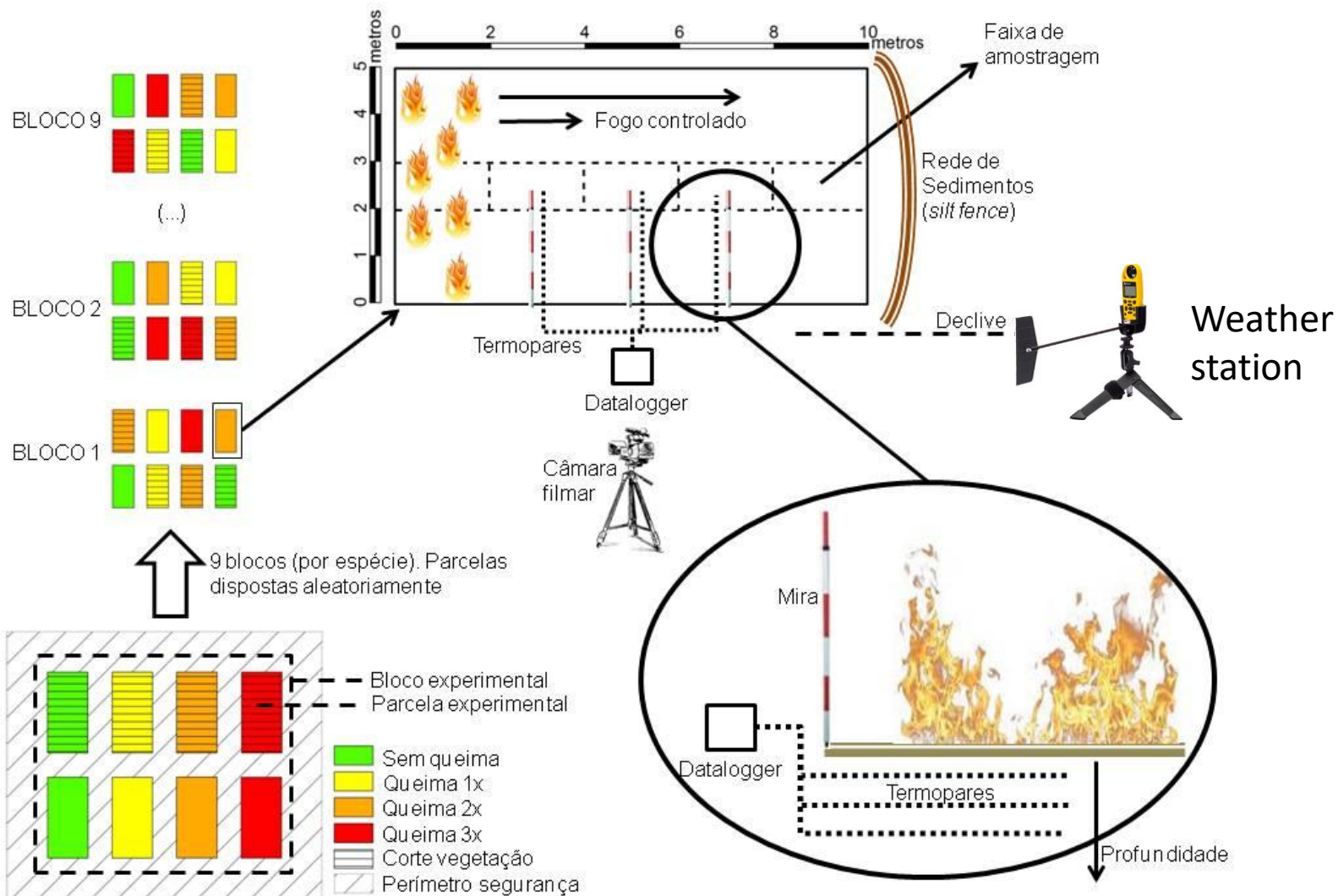
- Portugal is an invasion-prone country, given its mild climate, the current fire regime and the introduction of many fire-adapted alien plant species
- These conditions are leading to a widespread expansion of totally novel ecosystems, still poorly studied and understood
- This is the case of areas dominated by two problematic species brought from Australia:
 - *Acacia dealbata* – Silver Wattle
 - *Hakea sericea* – Silky hakea

- Therefore, the use of fire as a fuel management tool may aggravate the problem of plant invasions
- Yet, proper management through an informed use of fire, may:
 - At least, minimize the risk of expanding the invasive plants, using an appropriate prescription;
 - If properly used, it may even contribute to locally eliminate the invasive plant species.

However

- Currently we don't know how to set a prescription envisaging the achievement of such goals;
- The existing guides on prescribed burning for portuguese conditions:
 - Have the sole goal of managing fuels for fire hazard mitigation
 - Did not consider the risk of plant invasions

- The Aliens & Flames project comprises several tasks dedicated to:
 - **Characterize the fuel properties** associated with the two alien plant species
 - Apply different types of **slash and burn treatments** in experimental plots
 - **Monitor the effects** of these treatments on the seed bank and on the individual plants
 - Produce a **guide of best practices** to deal with these fire adapted plant species



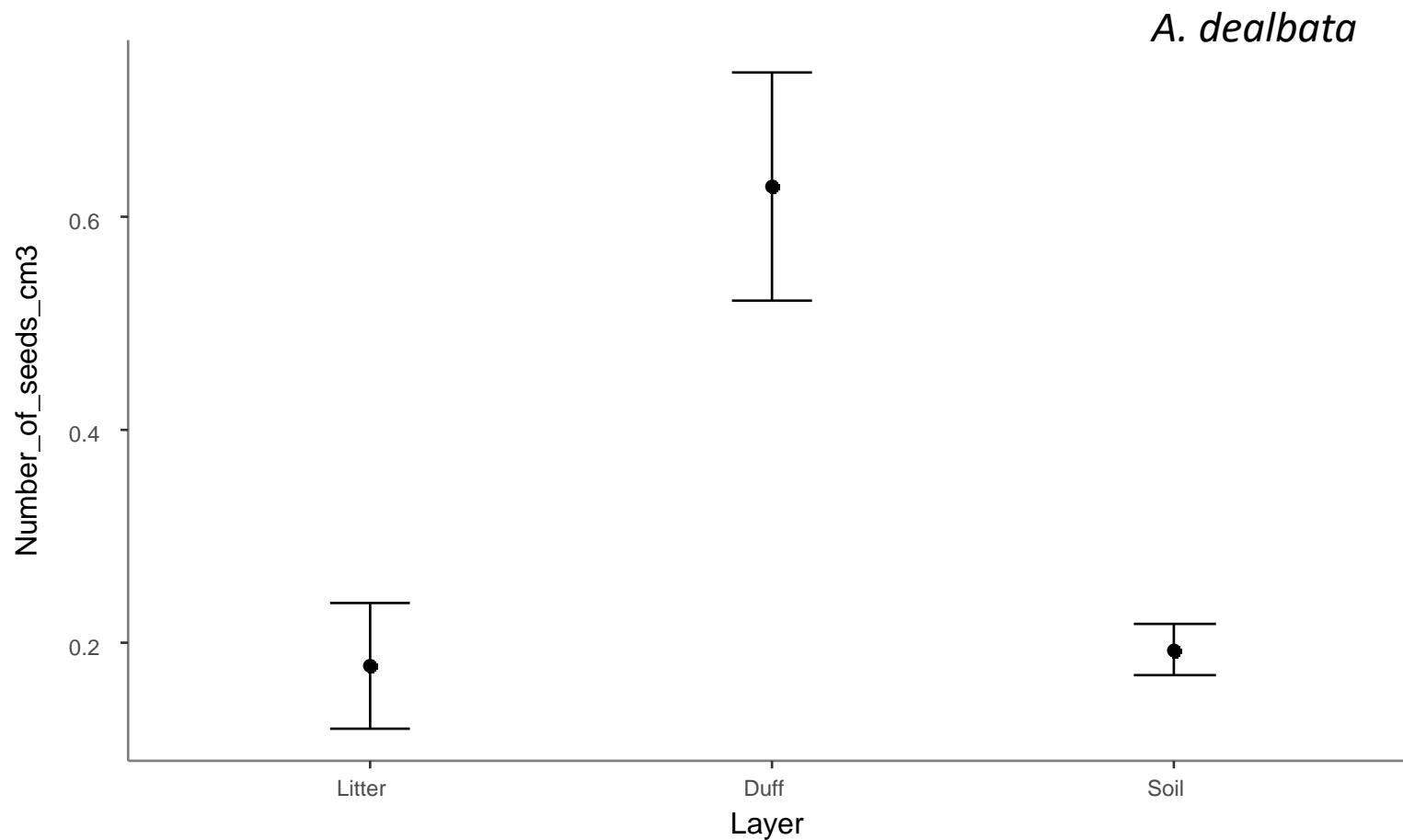


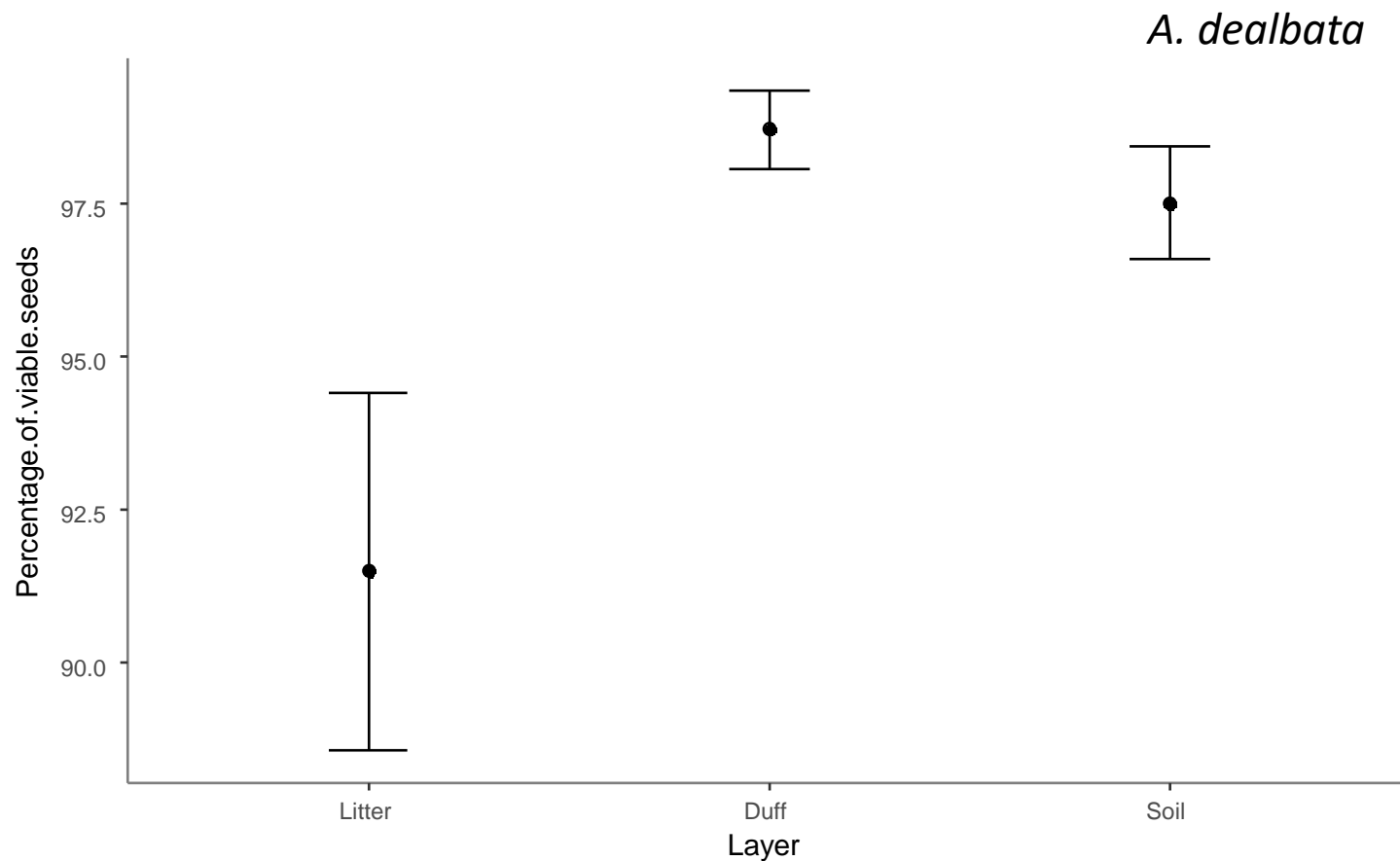
Hakea sericea

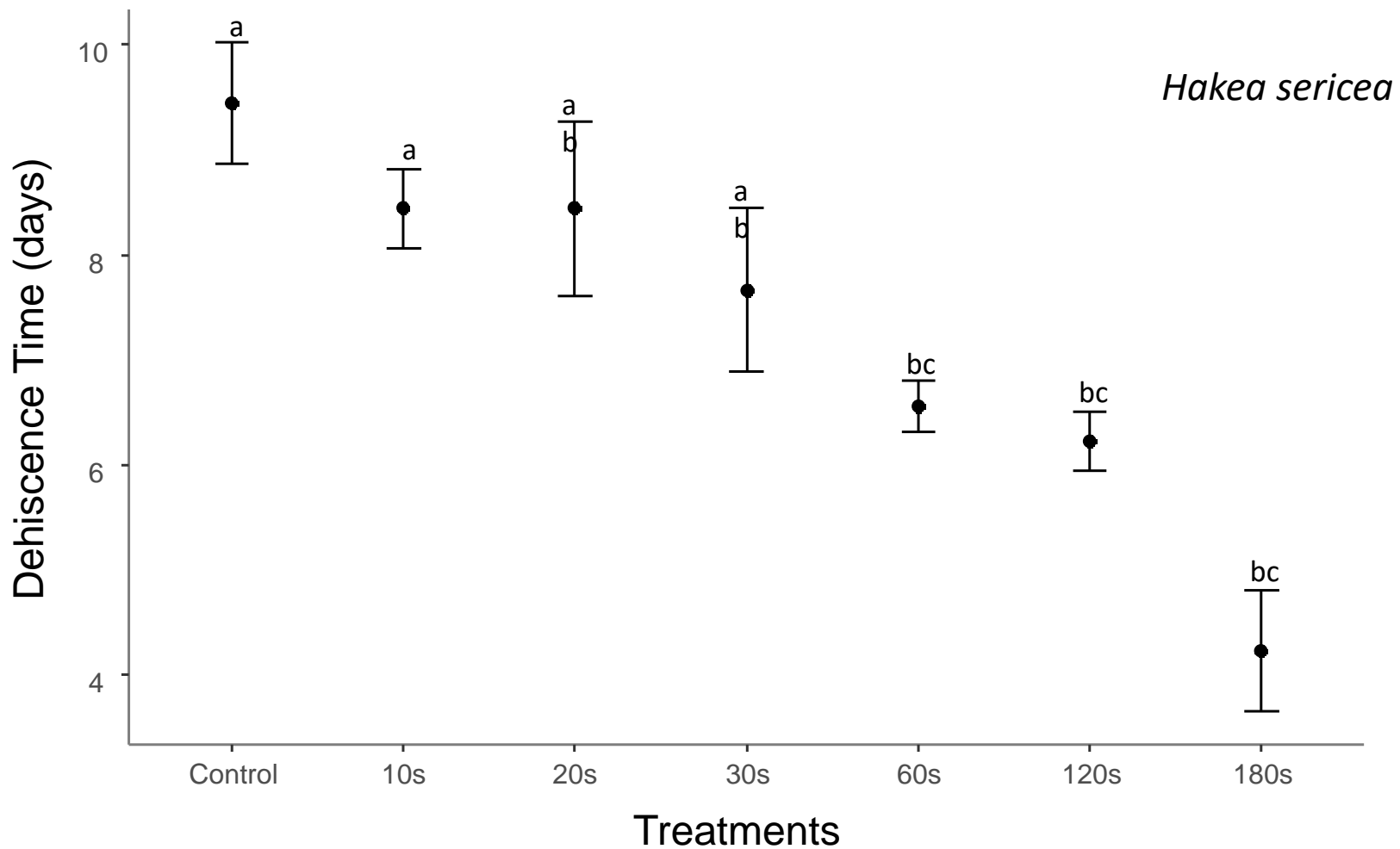


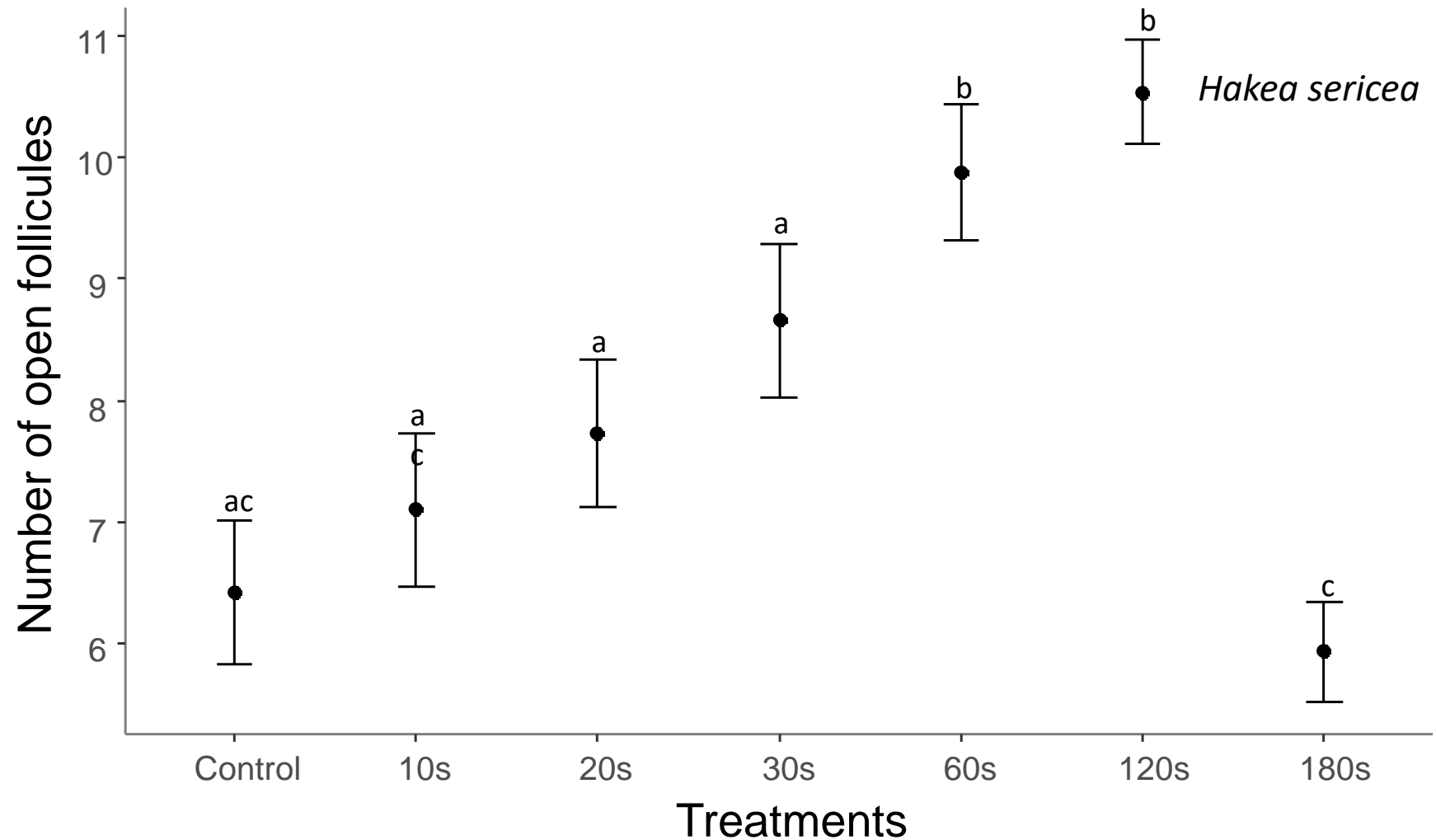
Acacia dealbata

Preliminary results on fire ecology and fire effects

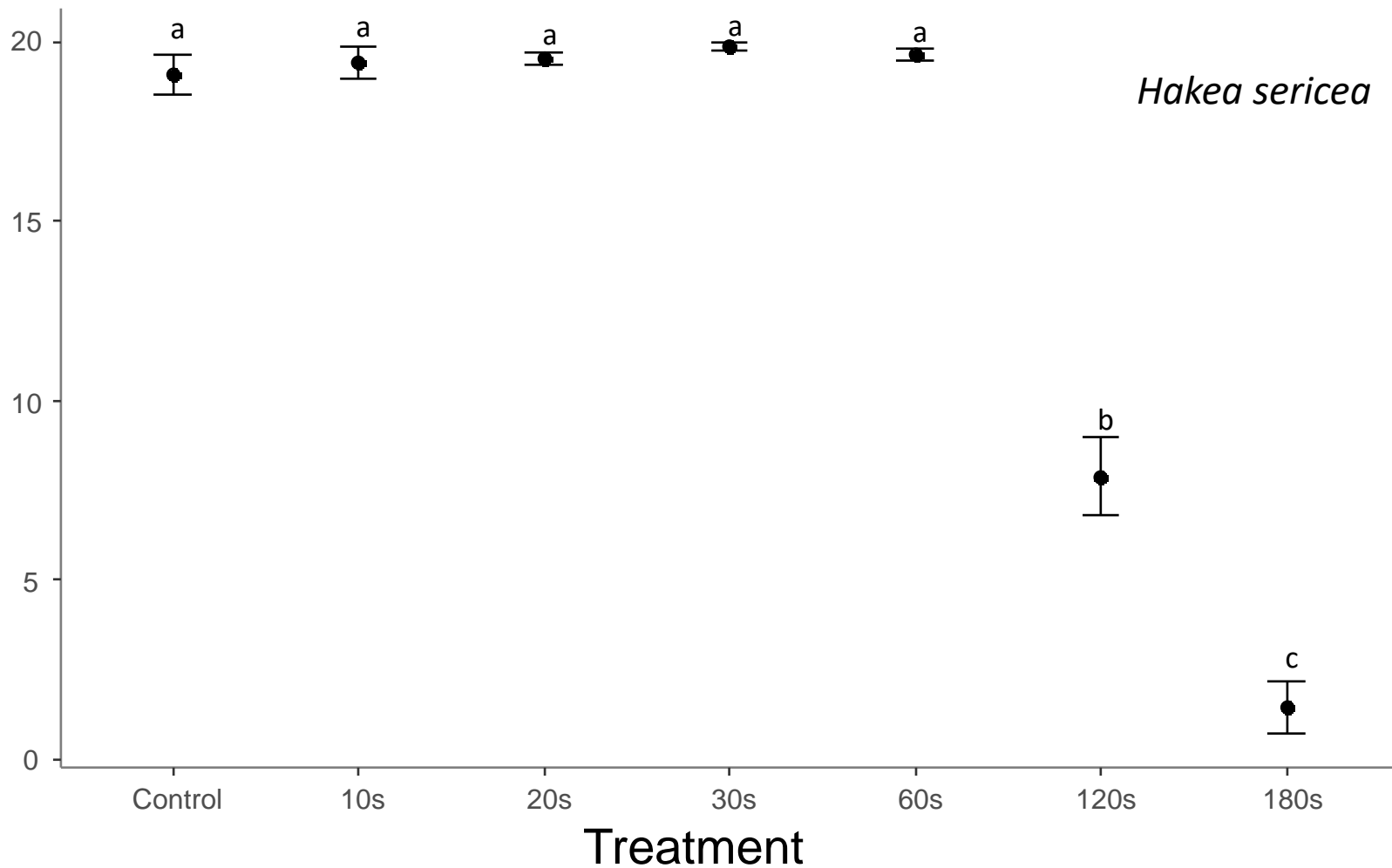








Number of Viable Seeds

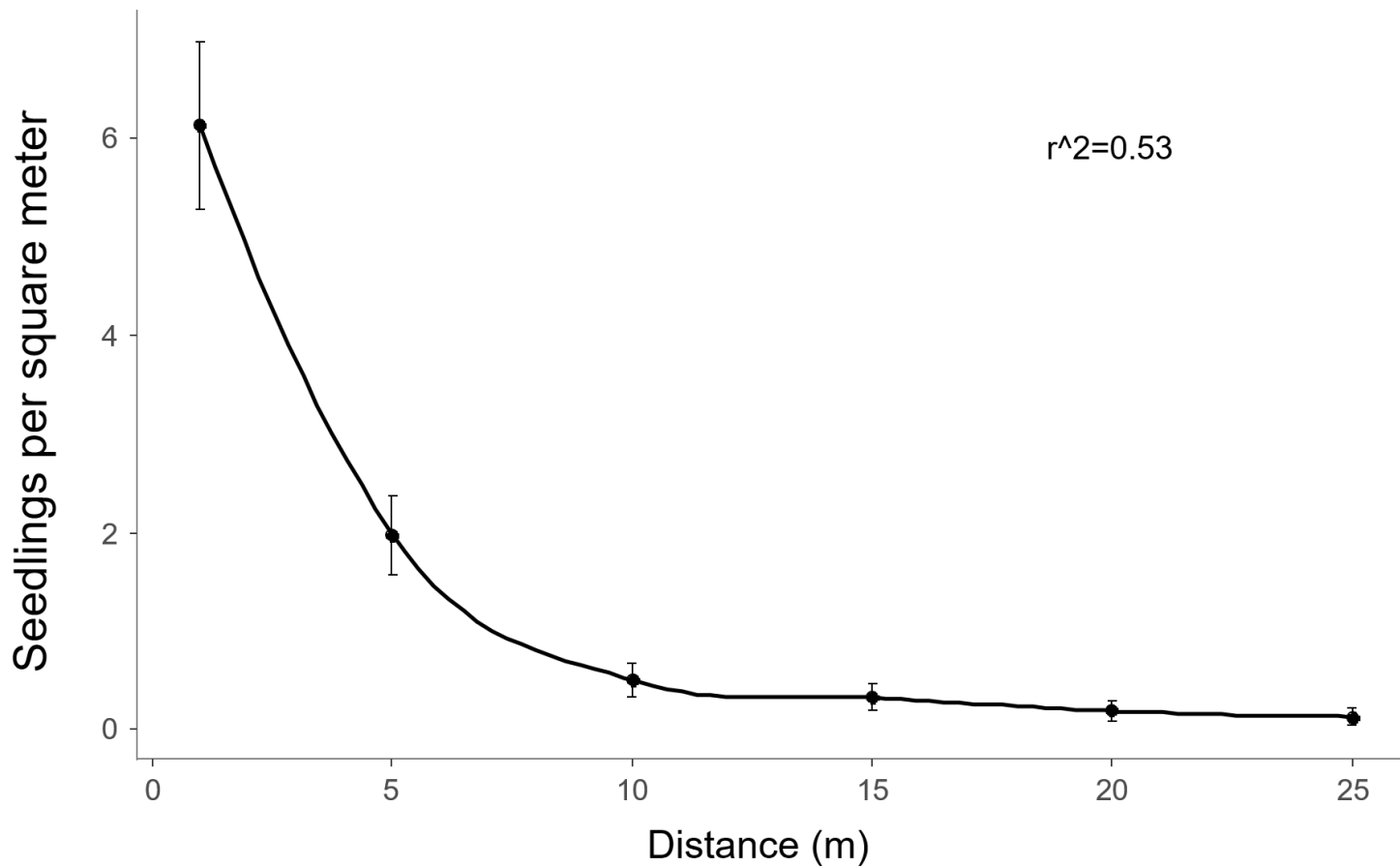




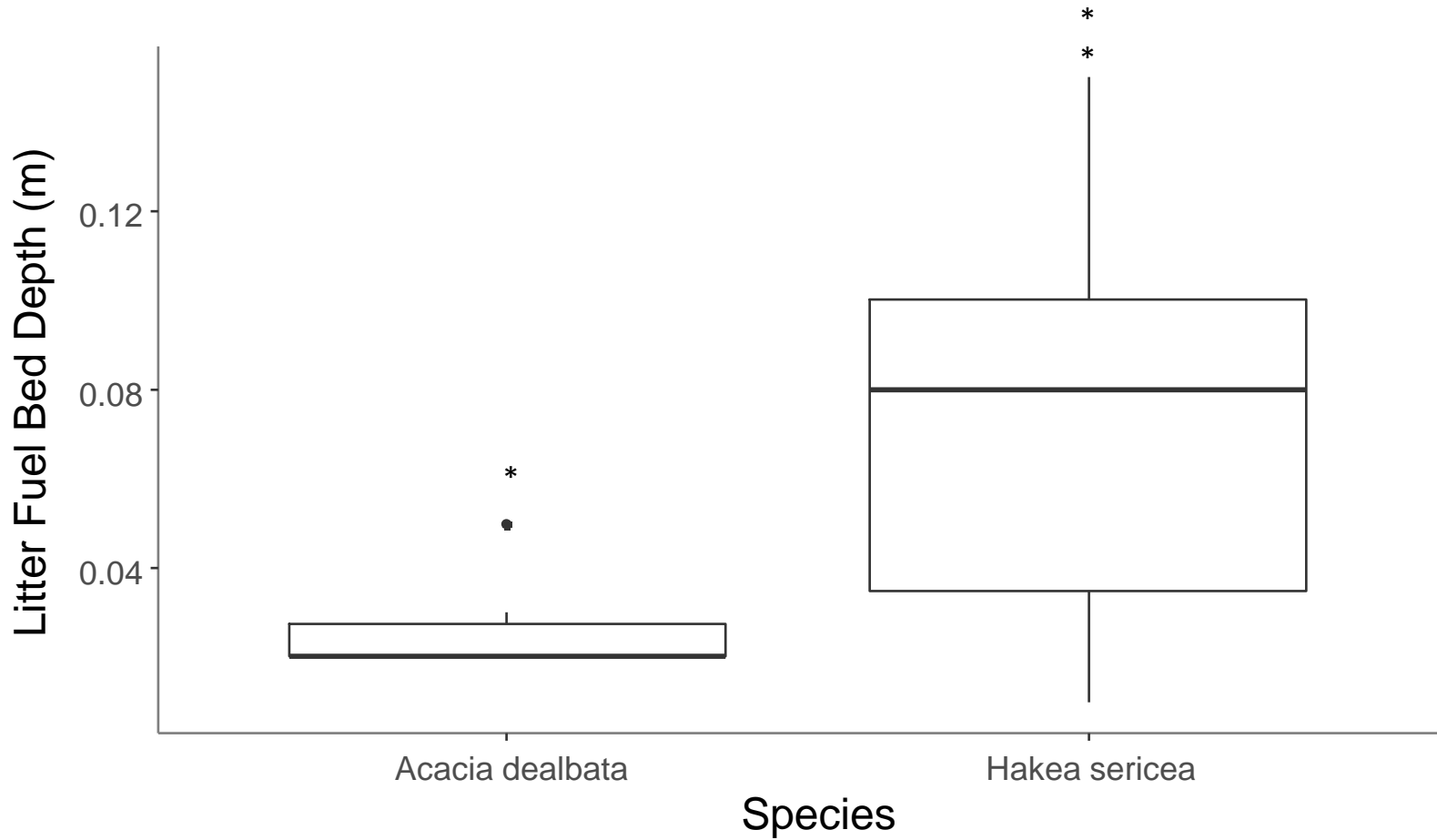
ALIENS & FLAMES

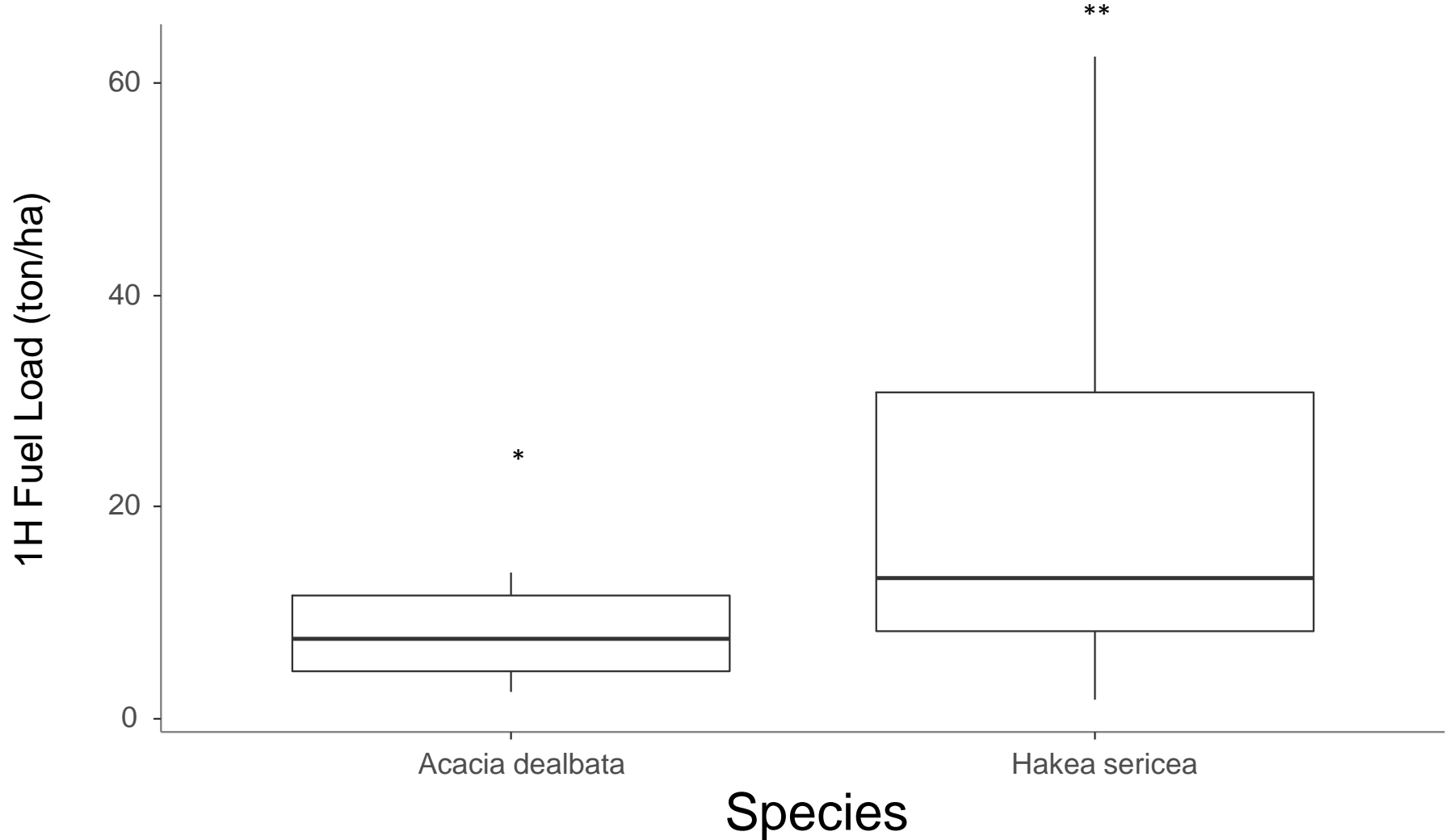


Hakea sericea



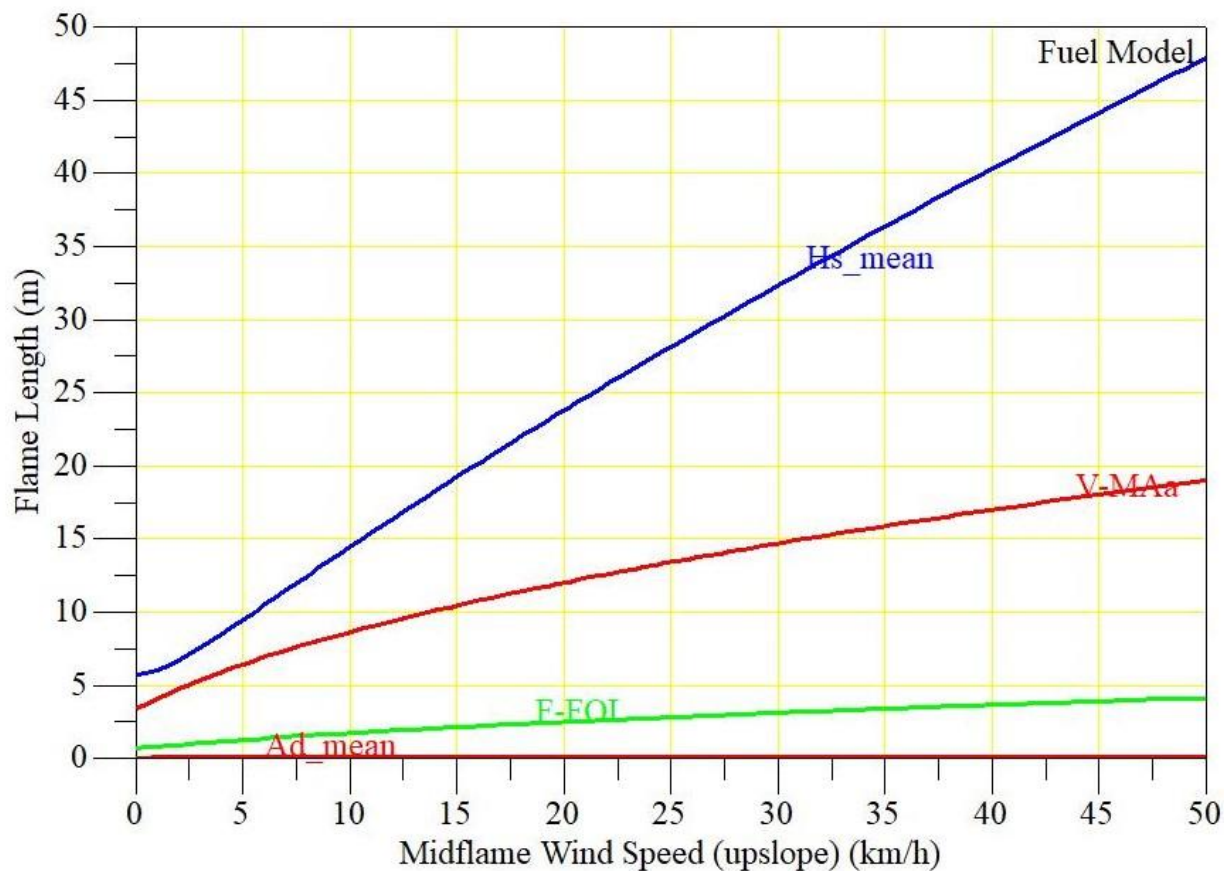
Fuel characteristics and potential fire behavior





	<i>A. dealbata</i>	Broadleaf forest	<i>H. sericea</i>	Tall shrubland
1-h load (ton/ha)	7.59±1.25*	2.67	17.85±5.15	9.50
10-h load	2.10±0.53	1.27	0.04±0.04*	2.50
100-h load	0.00	0.69	0.00	0.00
Live woody load	0.00	1.16	27.32±7.43	14.50
Herbaceous load	0.00	0.00	0.00	0.00
Fuel depth (m)	0.02±0.00*	0.15	1.69±0.33	1.05

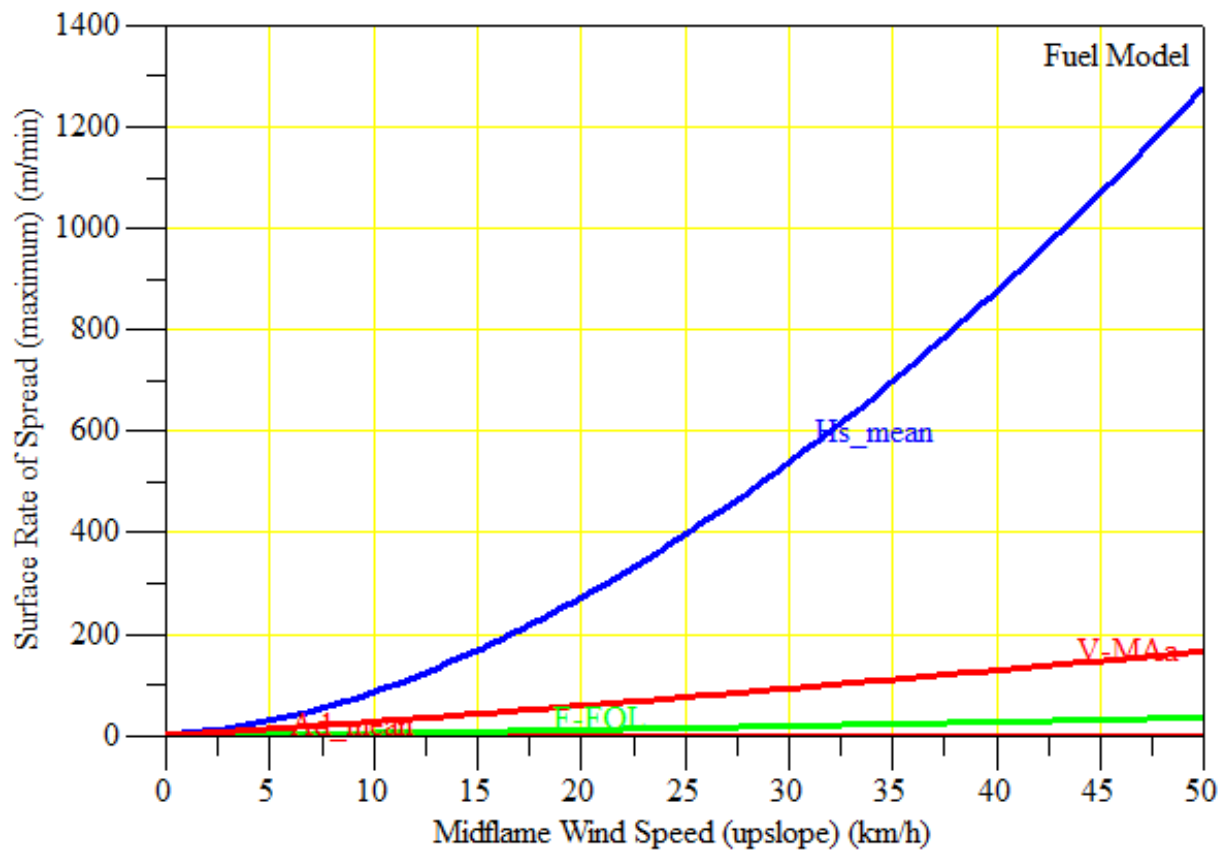
Simulated fire behavior



H. sericea

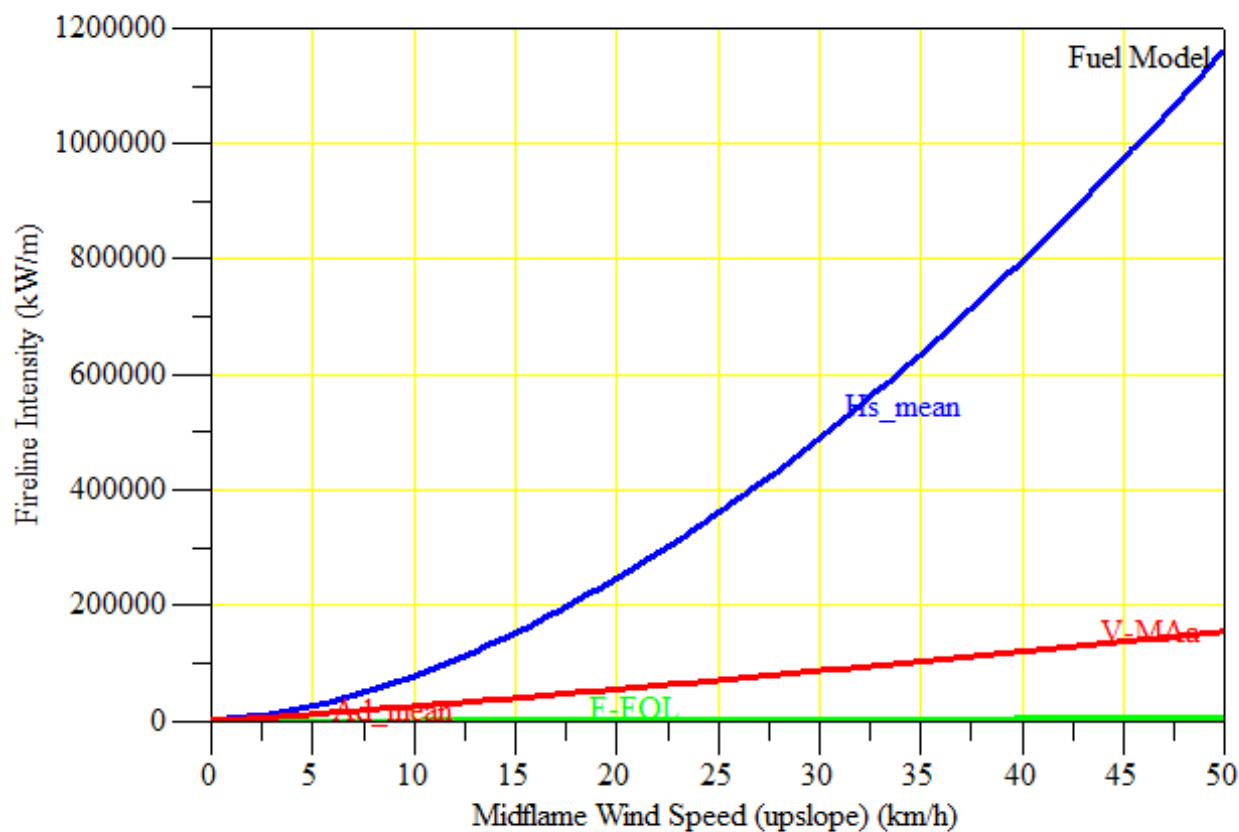
Tall shrubland

Broadleaf forest
A. dealbata



H. sericea

Tall shrubland
Broadleaf forest
A. dealbata



H. sericea

Tall shrubland
Broadleaf forest
A. dealbata

- Preliminary conclusions
 - As to fire effects, preliminary results point the possible need of long residence times in order to affect seed viability of *H. sericea*, and also *A. dealbata*.
 - Long residence times may even contribute to decrease dehiscence.
 - As to fire hazard, the two species present very different fuel characteristics and therefore distinct fire behavior potential.
 - In the case of *A. dealbata* preliminary results seem to indicate a low fire behavior potential in surface fires, given the highly compacted litter and the absence of other plants in the understory.
 - On the contrary, *H. sericea* seems to present a much higher fire hazard than typical mediterranean shrublands.



Thank you!