



Savanna Science Network Meeting 2025



The interplay between fire and microhabitat cover drives seed predation in savanna and gallery forests in Brazil

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Differential effects of FIRE

Tropical forests

Poor resilience to disturbance by fire

Vegetative reproduction isn't common

High tree canopy cover; Long recover



V Moryama/Greenpeace

Tropical savannas

High resilience to disturbance by fire

Vegetative reproduction is common

High herb cover; Fast recover



William Hoffmann

**Fire sensitive forests along watercourses immersed
in the Cerrado pyrophytic savana matrix**



© Alex Costa

Fire and foraging behavior of seed predators

- Fire in tropical forest negatively affects ants and ant seed removal (e.g. Paolucci et al. 2017 *Oecologia*)



- Fire in savana increases seed removal by ants (e.g. Parr et al. 2007; Alcolea et al. 2021)



Alex Wild

Plant cover x foraging behavior of seed predators



Predation risk affected by vegetation cover = rodents avoid foraging in less covered spots (e.g. O'Dowd & Hay 1980)

Questions

Is the effect of fire on seed removal similar between savannas and gallery forests in the Brazilian Cerrado?

Does fire has a differential impact on seed removal by ants and vertebrates?

Is the effect mediated by plant cover?

Three pairs of gallery forests impacted by wildfires and controls in Southeastern Brazil



Two burned savannas and controls



Seed species

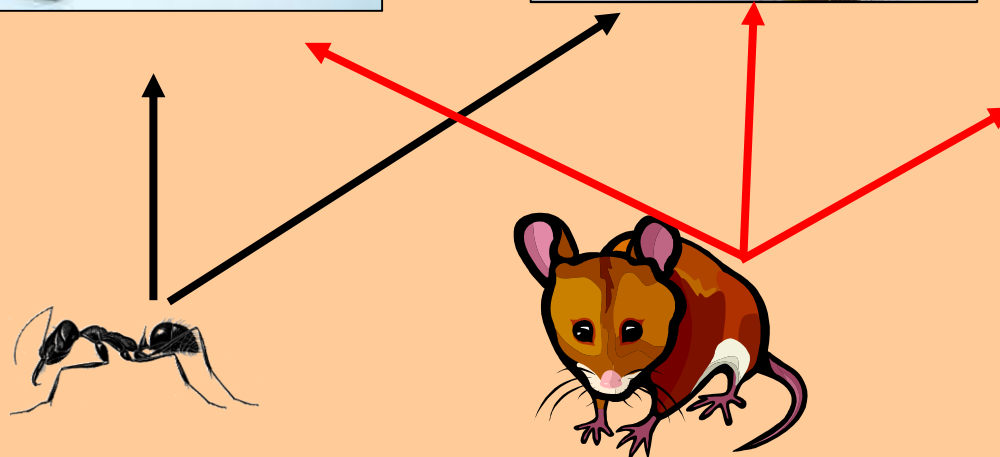
Small, highly palatable Sunflower



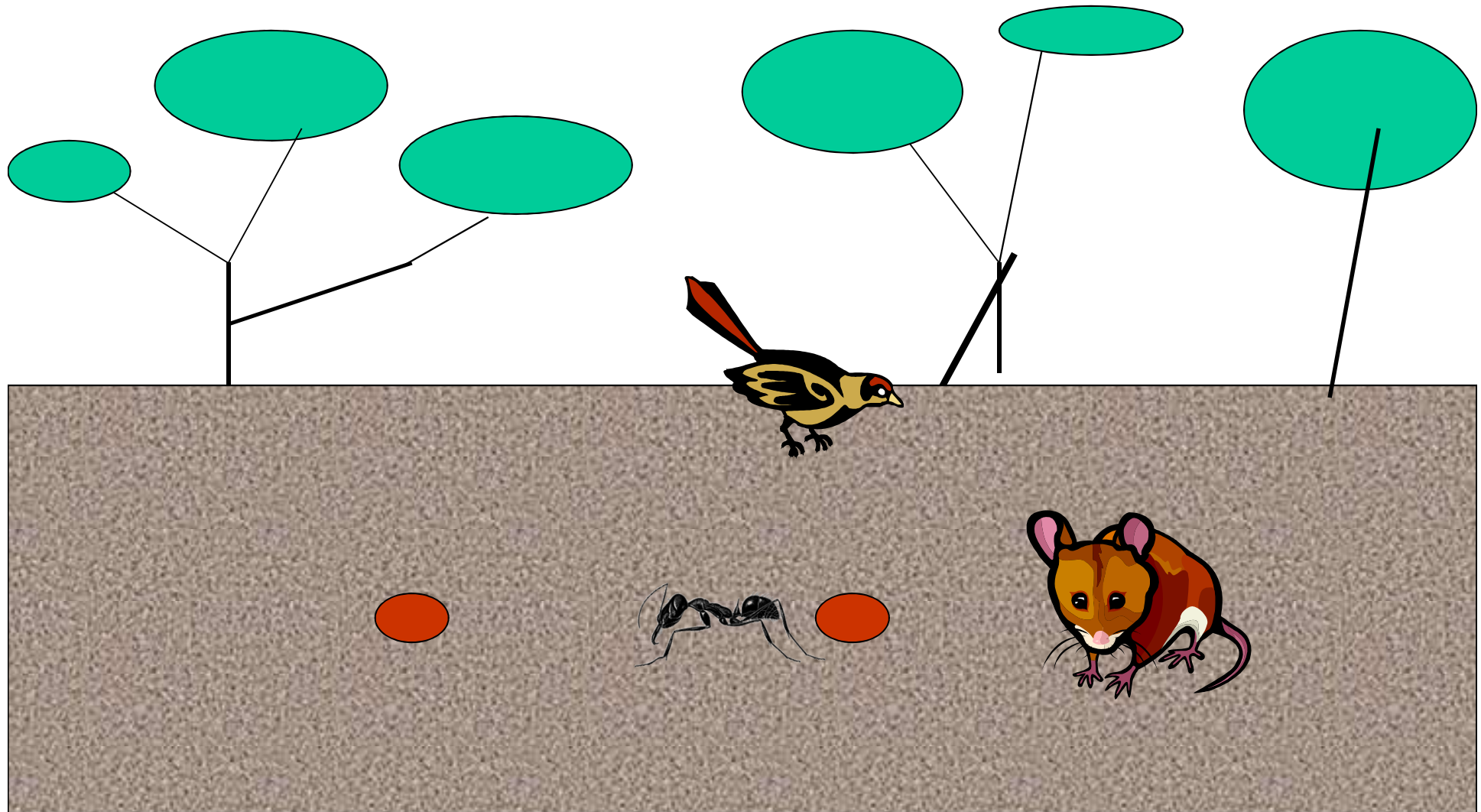
Small, less palatable (alkaloids) *Solanum*



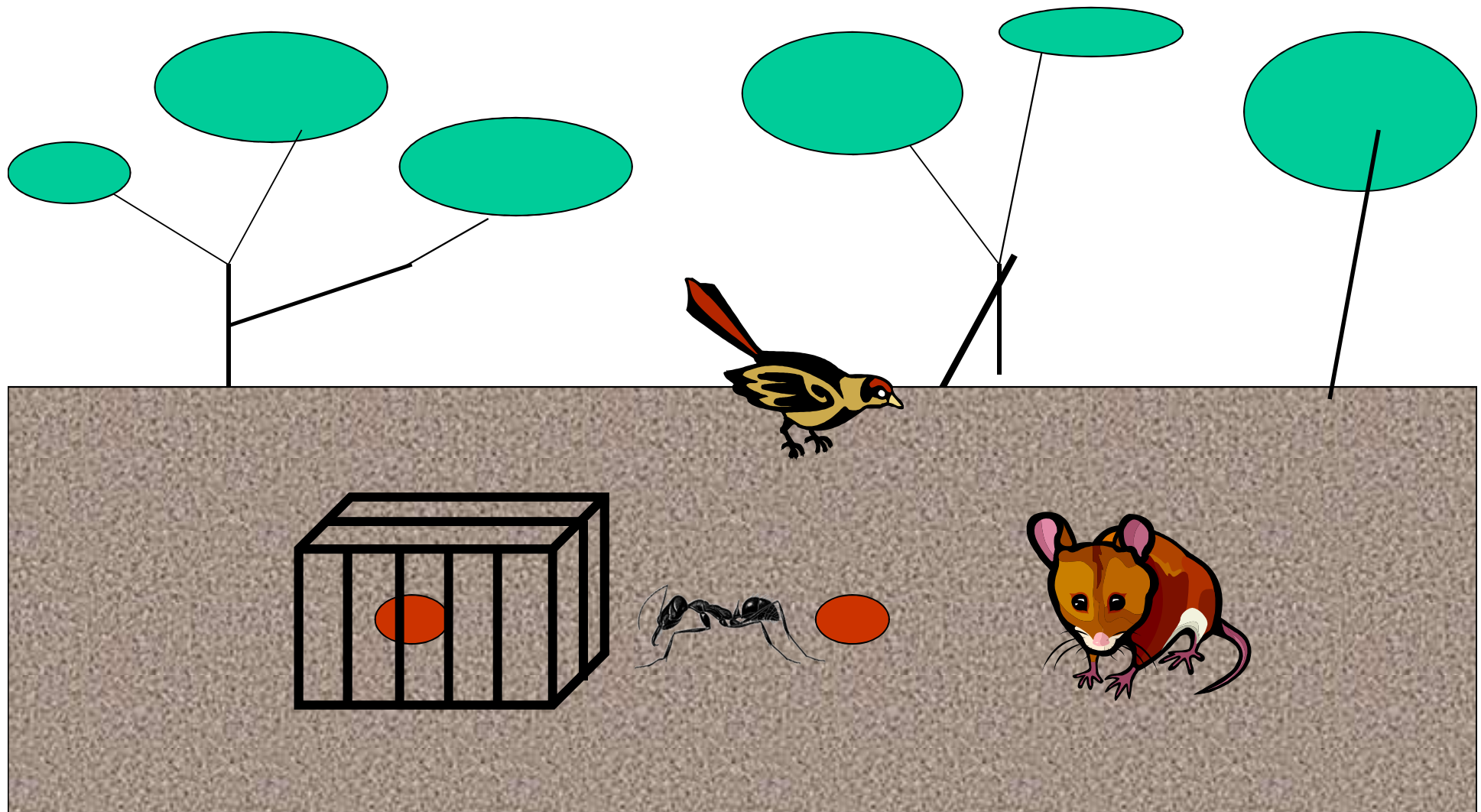
Large *Syagrus* Palm
High handling constraint



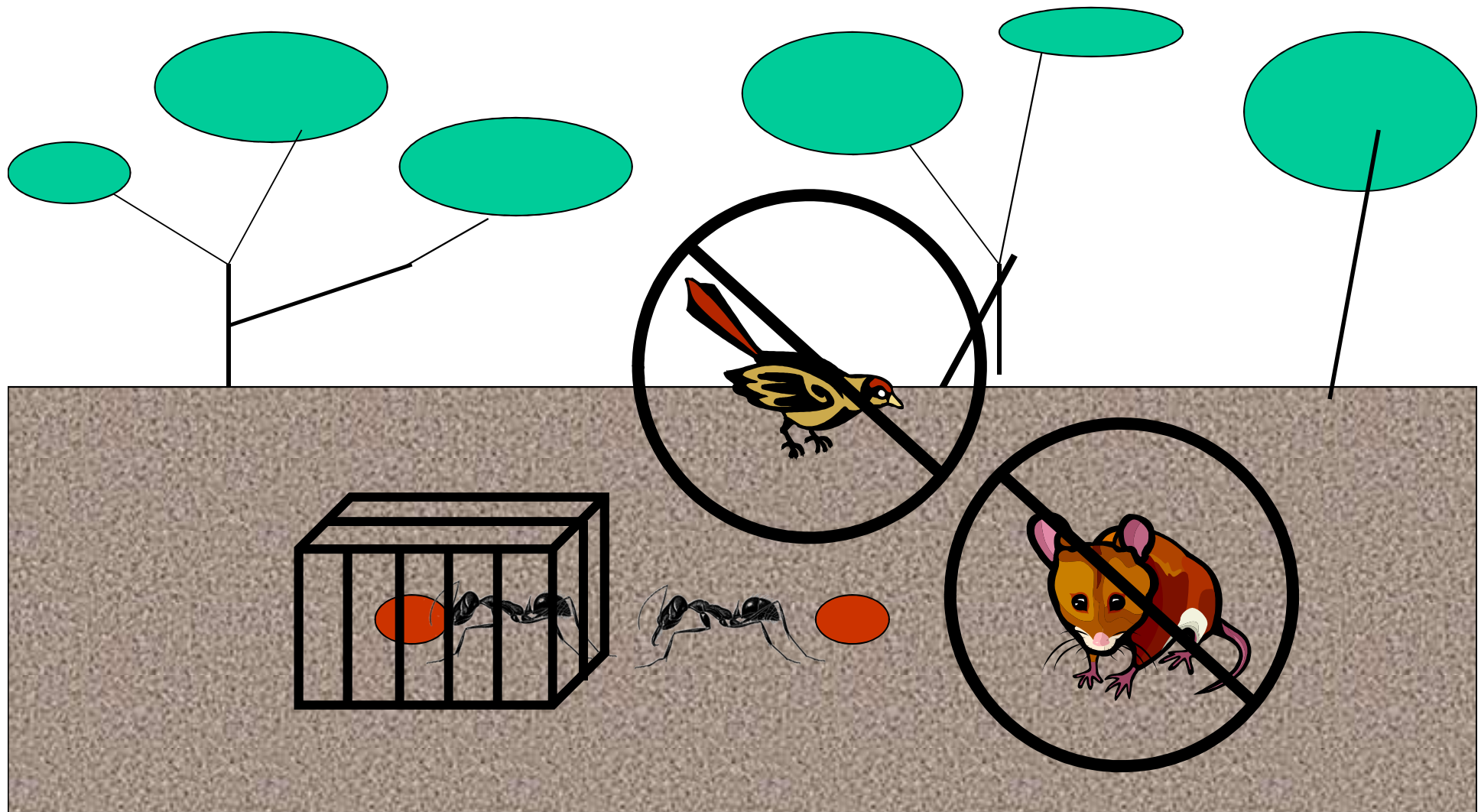
Selective exclosure removal experiments to measure the removal of seeds by ants and vertebrates



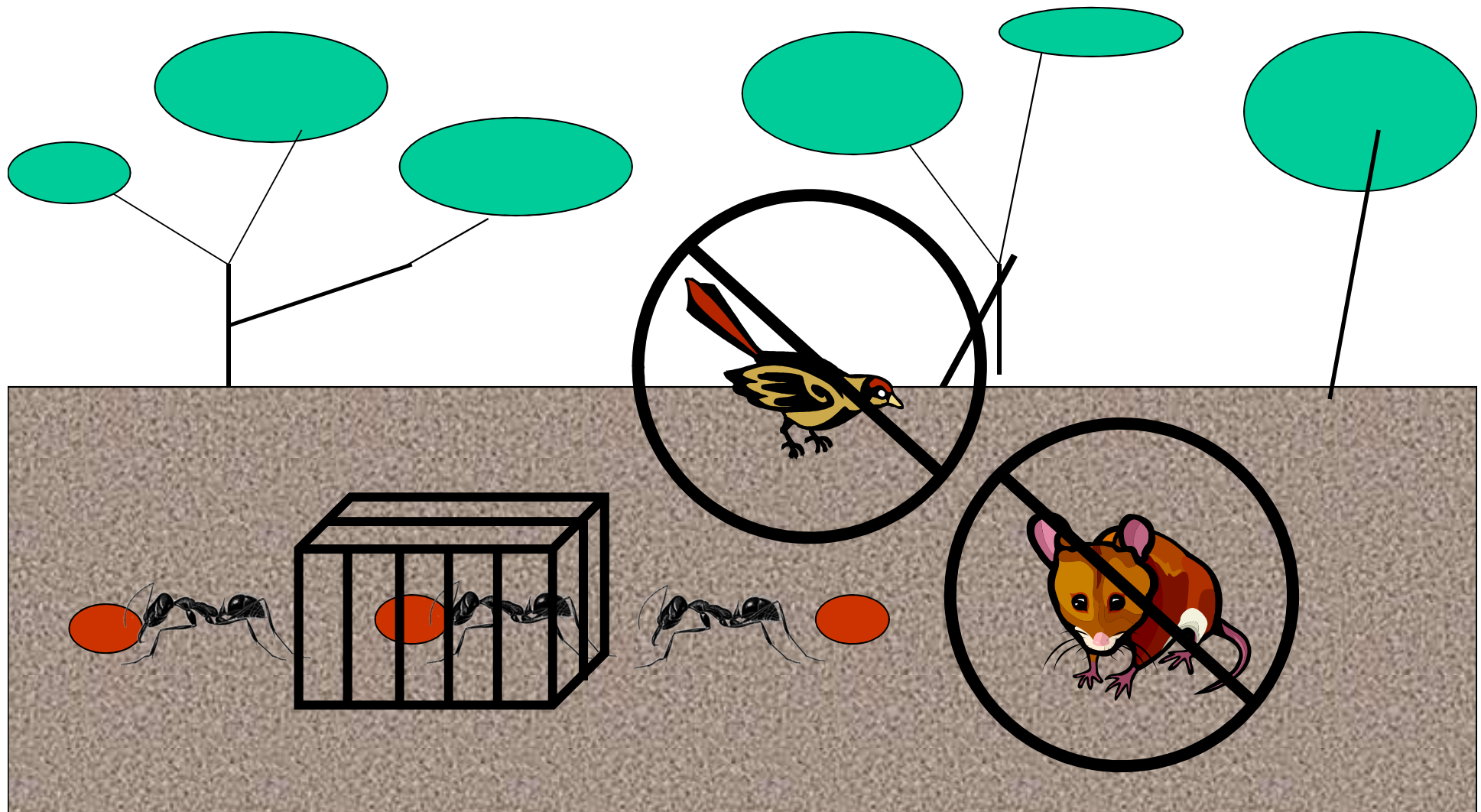
Selective exclosure removal experiments to measure the removal of seeds by ants and vertebrates



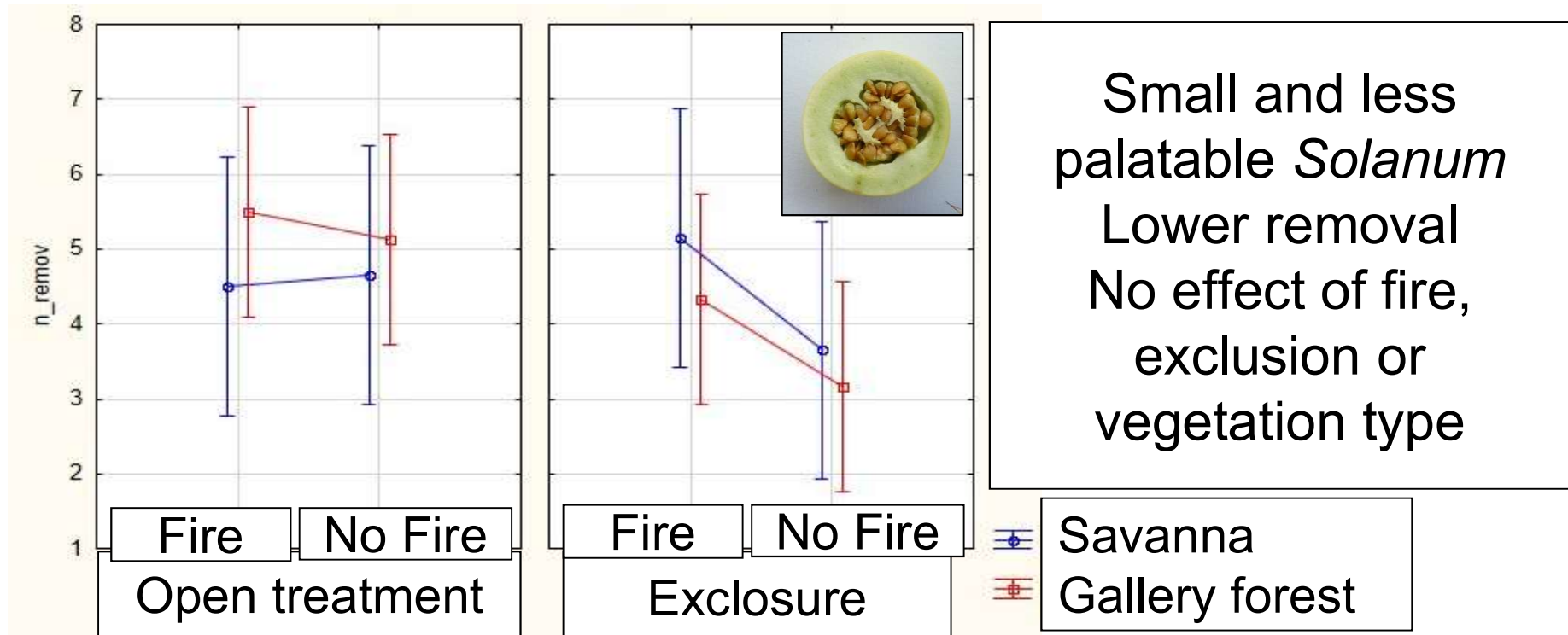
Selective exclosure removal experiments to measure the removal of seeds by ants and vertebrates

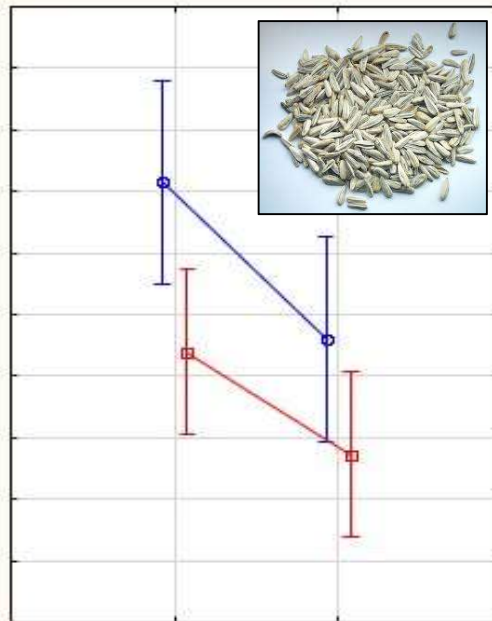
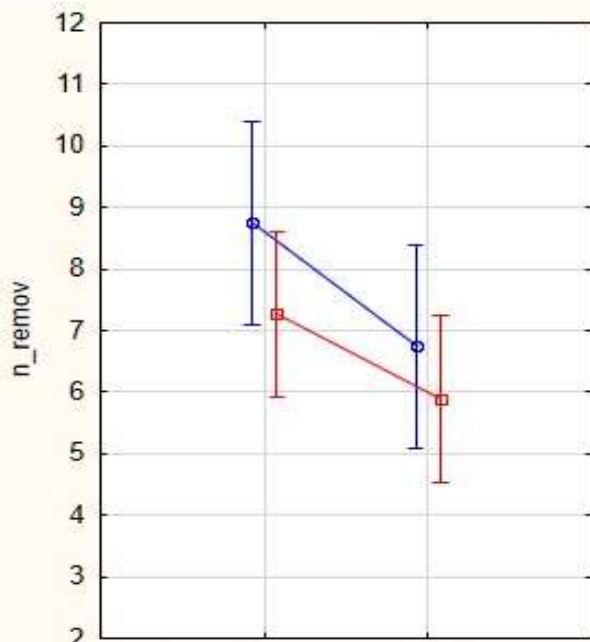


Selective exclosure removal experiments to measure the removal of seeds by ants and vertebrates

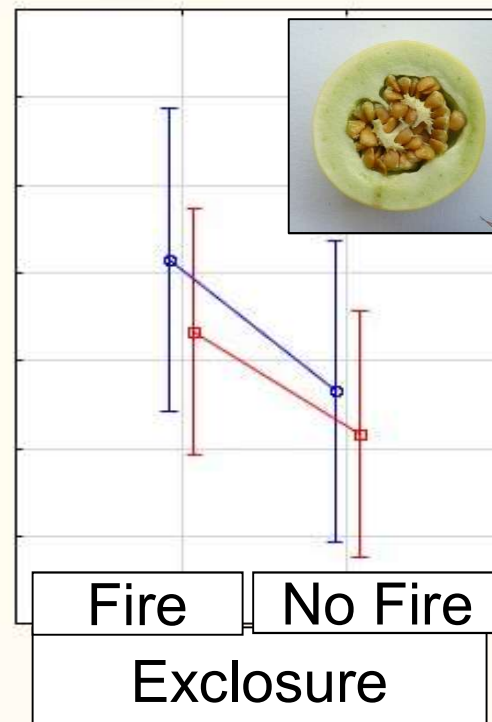
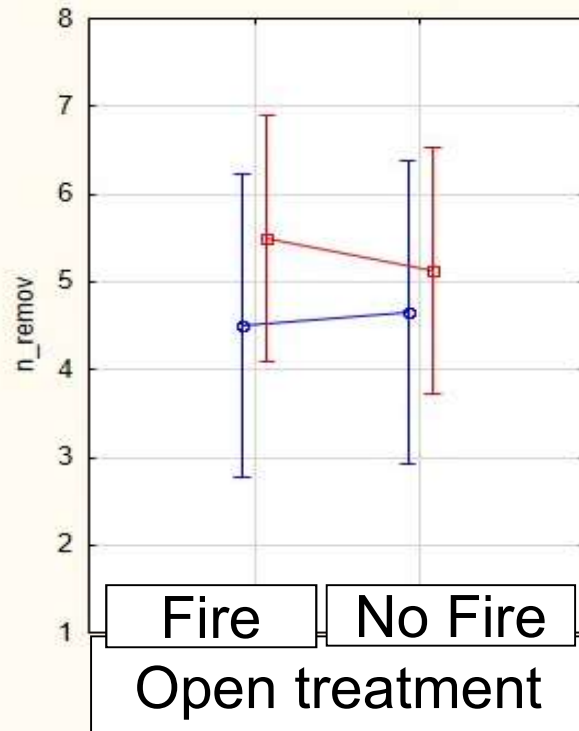


Highly variable results





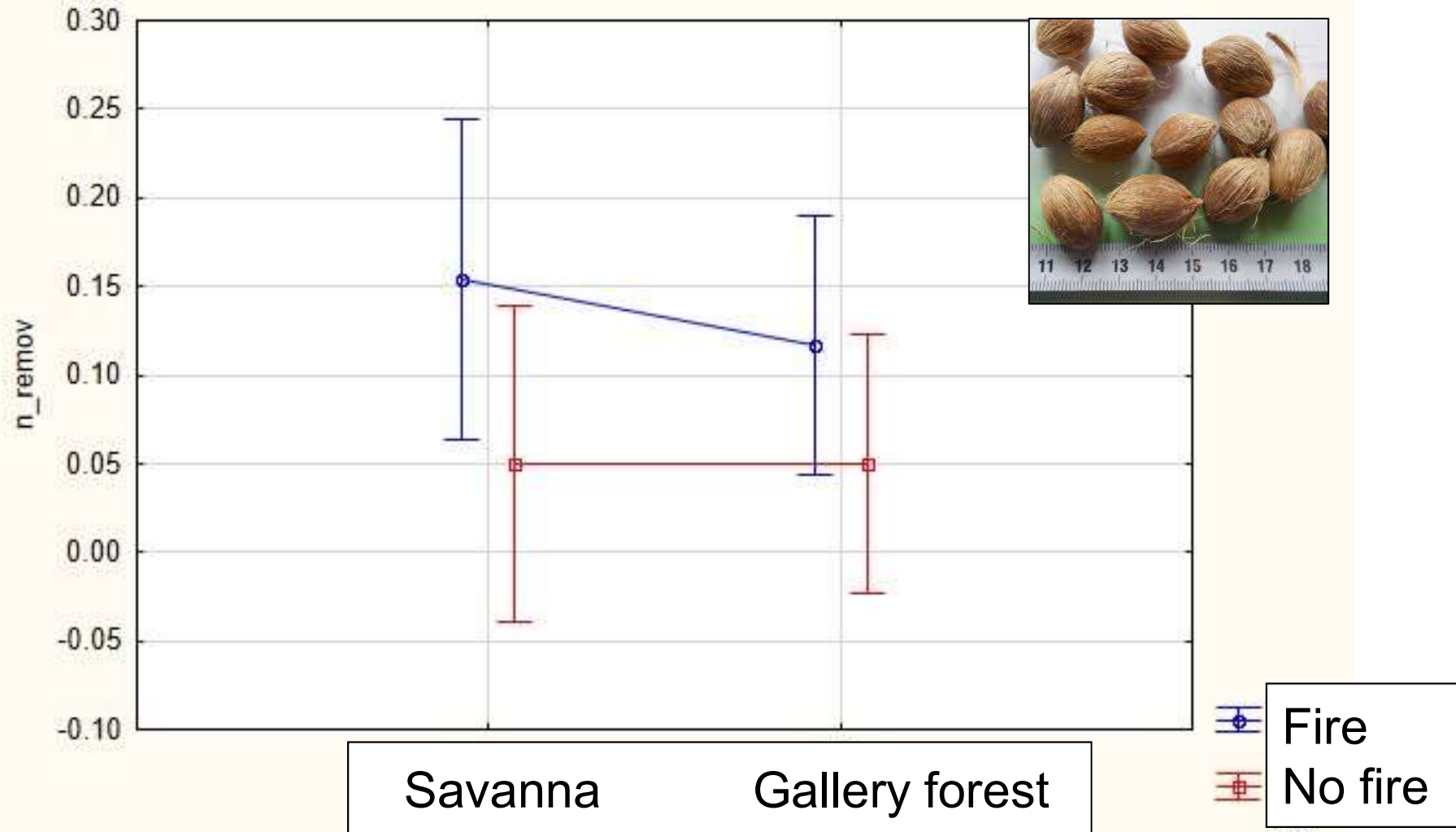
Small and palatable sunflower
 High seed removal
 Fire increased removal
 Removal was higher in savannas than forest (irrespective of fire)



Small and less palatable *Solanum*
 Lower removal
 No effect of fire, exclusion or vegetation type

—○— Savanna
 —□— Gallery forest

Large *Syagrus* palm; Low removal
No effect of fire or vegetation type



Influence of vegetation cover

Negative effect of cover on ant seed removal ($b = -0.59$) but low predictive power ($r^2 = 0.05$; $p < 0.001$) for sunflower only

No effect of cover on removal by ants or vertebrates for less palatable (*Solanum*) or large (*Syagrus*) seeds

Questions & Answers

Is the effect of fire on seed removal similar between savannas and gallery forests in the Brazilian Cerrado?

Yes, but only for less palatable/large seeds

Does fire has a differential impact on seed removal by ants and vertebrates?

Is the effect mediated by plant cover?

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Yes, but contingent on seed species and animal group

Implications

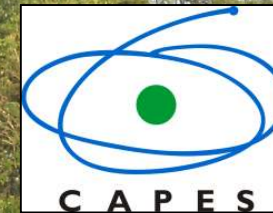
Plants whose seeds are preyed upon by vertebrates would benefit from fire to escape predation, while the opposite would be true for those removed by granivorous ants (e.g. small and palatable seeds)

Fire may create pulses of opportunities for certain plant species to recruit, while constraining others

Seed size and palatability probably matters, but more site and species replicates are worthwhile

Acknowledgments

Organizers of this meeting



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Thank you!