Filming Foraging Folivores

Effect of PSMs & plant spatial arrangement on brushtail possums

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Plant chemistry

- 1^{o}: fibre, nitrogen
- 2^{o}: PSMs - oils
  phenolics
  FPCs
  waxes

Physiological & Behavioural Responses to PSMs

Metabolic & detoxification pathways

Avoid

Variety →

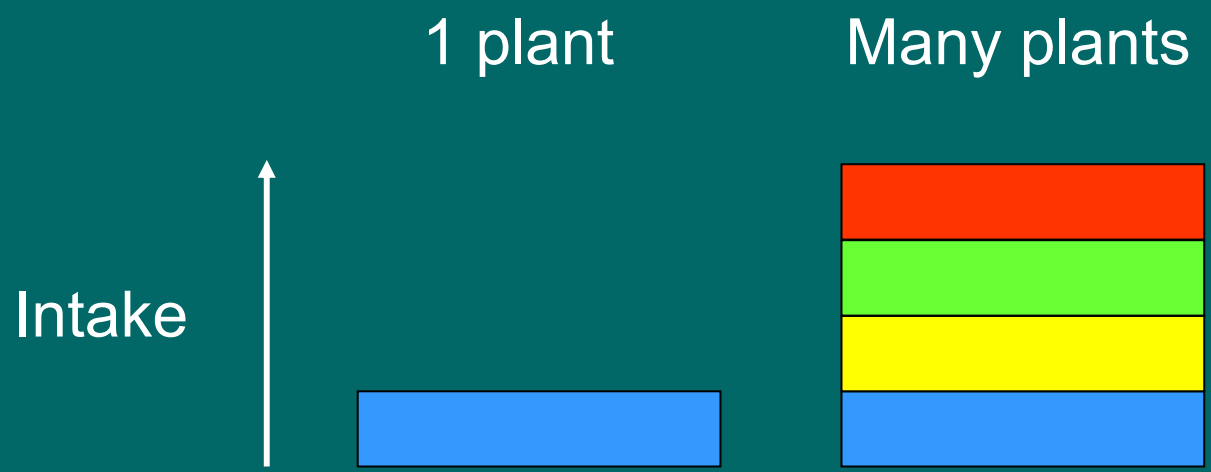
Specialise →

↑ energy & nutrients

↓ PSM costs

Research focus

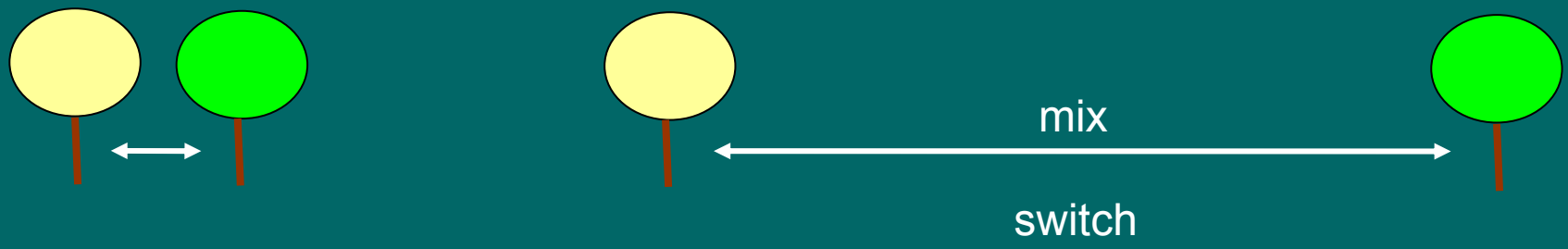
- Generalist herbivore: variety → low [PSM]



Foraging Costs…

- Alter: Plant spatial arrangement

  ∴ PSM distribution

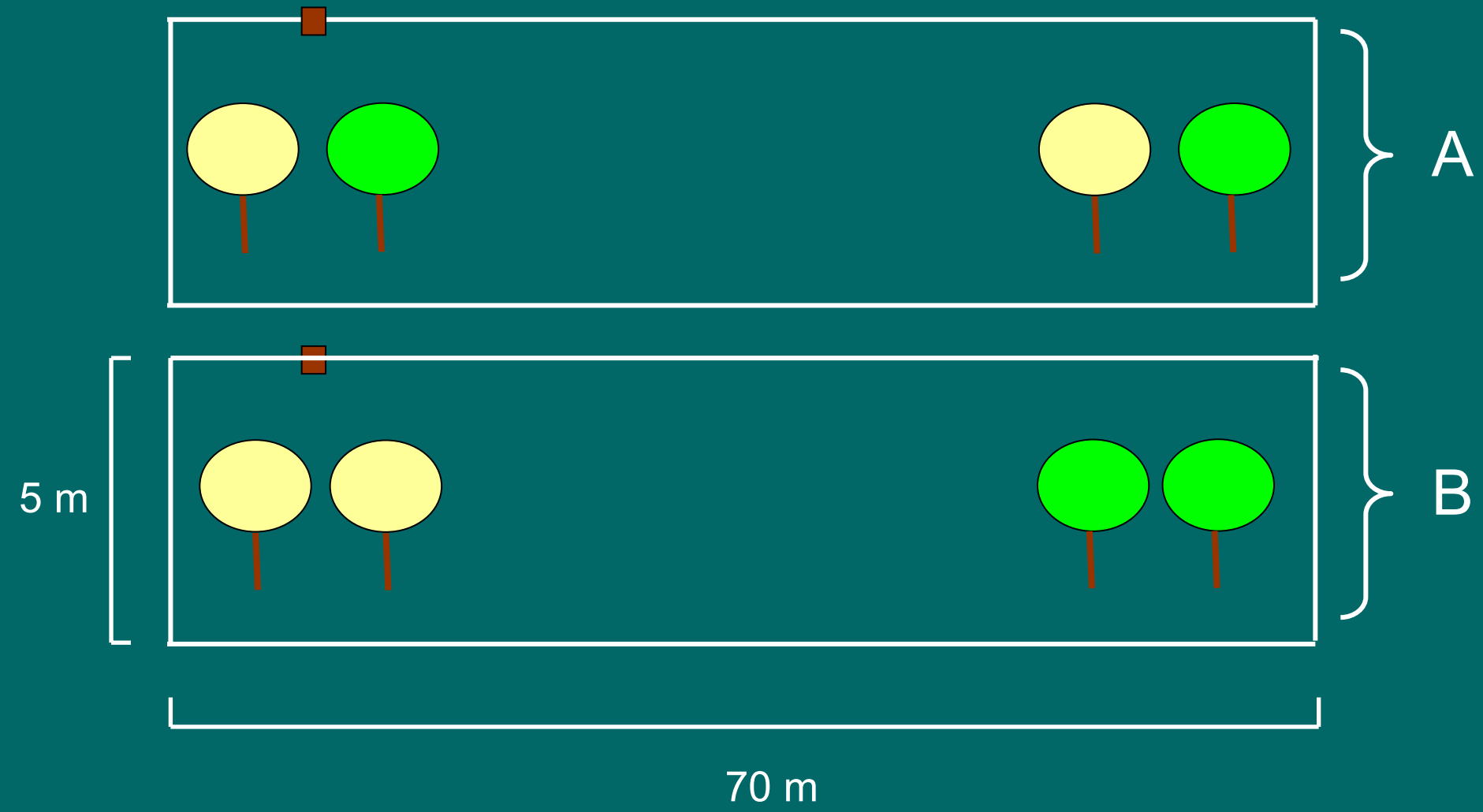


Does plant spatial arrangement affect foraging decisions?

Methods

- 8 brushtail possums (*Trichosurus vulpecula*)
- 2 plant species: *E. globulus*
  E. tenuiramis
- 2 spatial treatments: mixed
  separate

Mixed vs Separate Plantings



Methods

- Variables
  - intake
  - distance

  } foraging efficiency

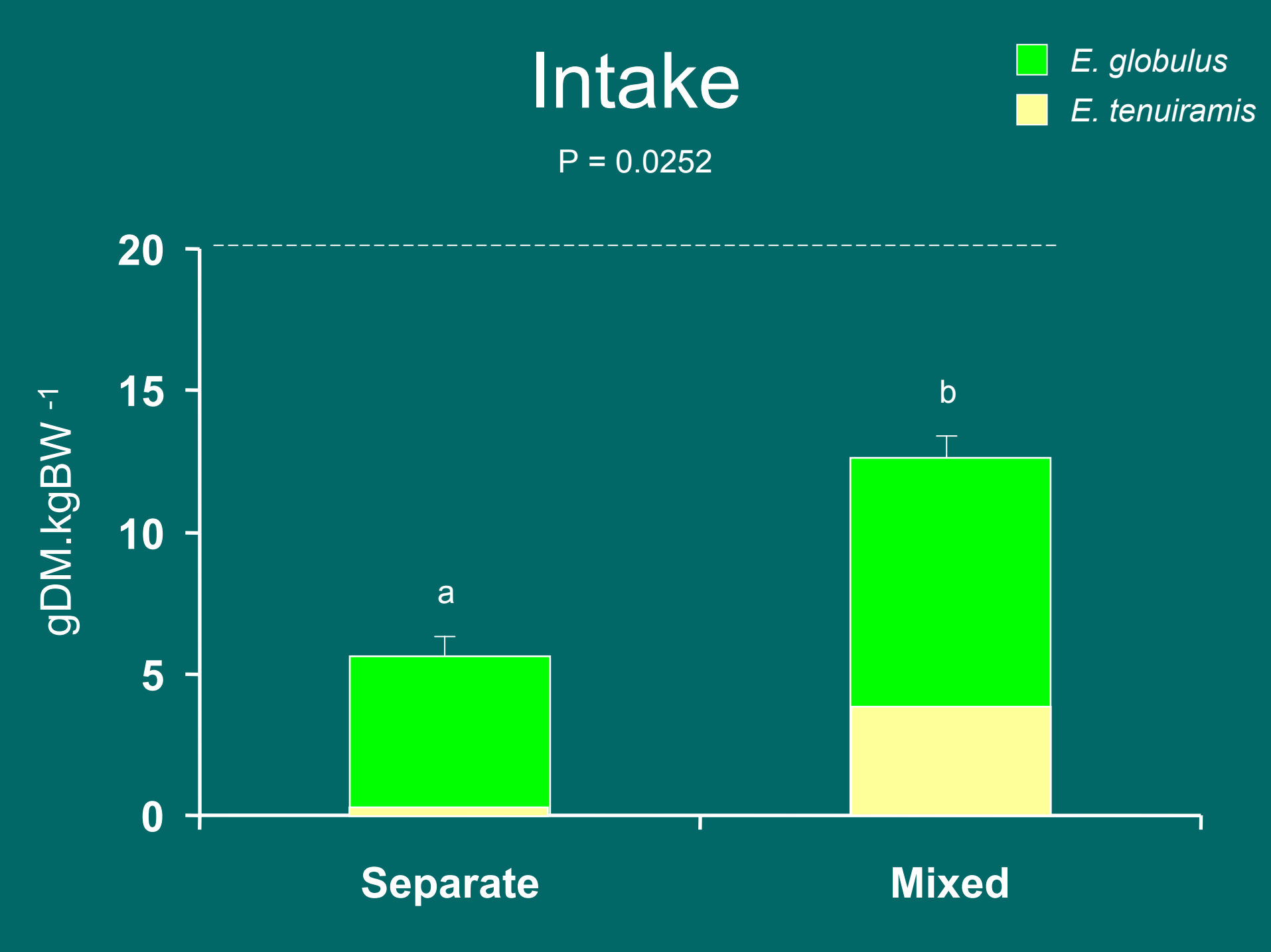
  - visits to each end

- ANOVAs

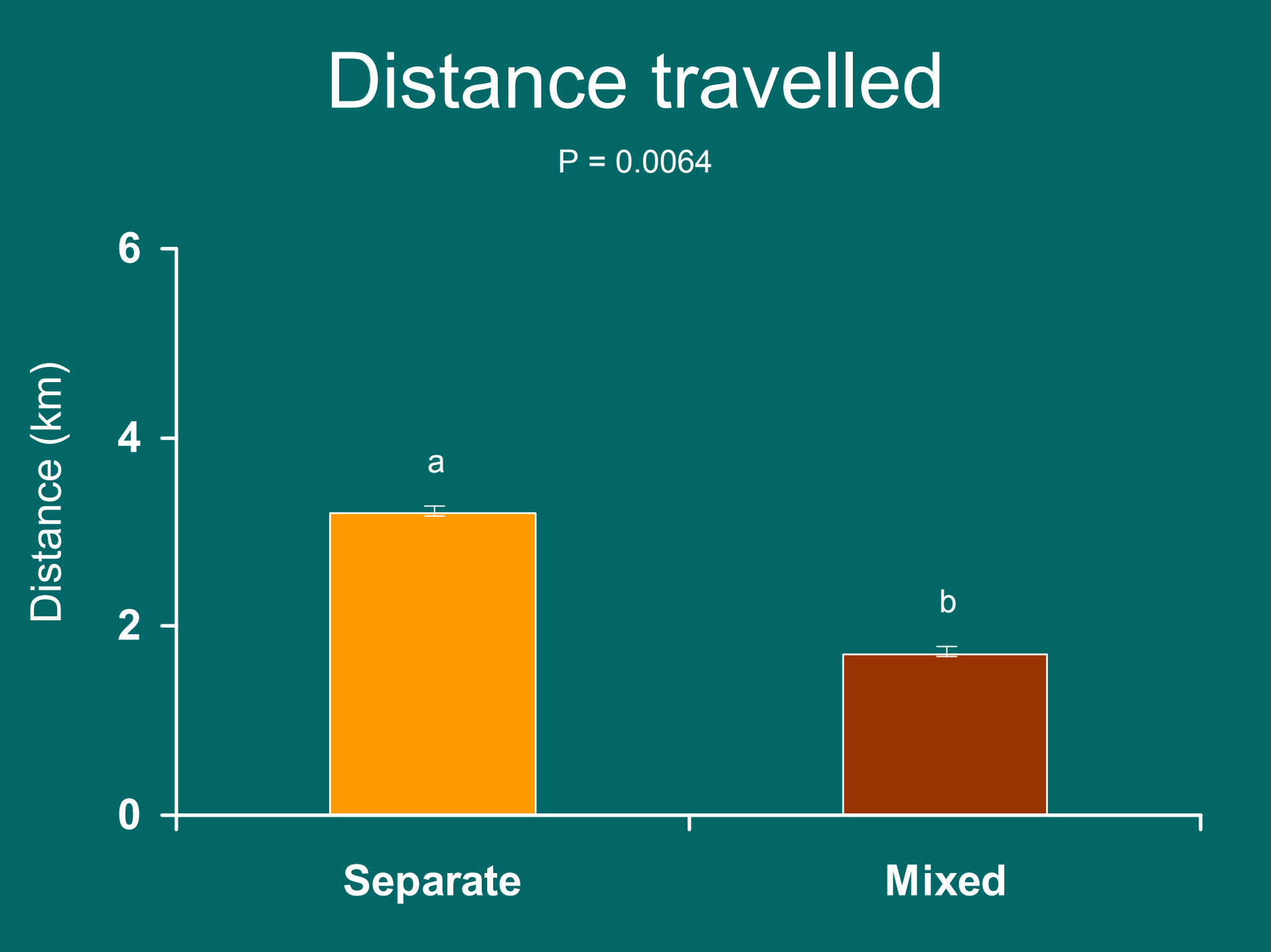
e.g. Intake as a function of treatment

Hypotheses

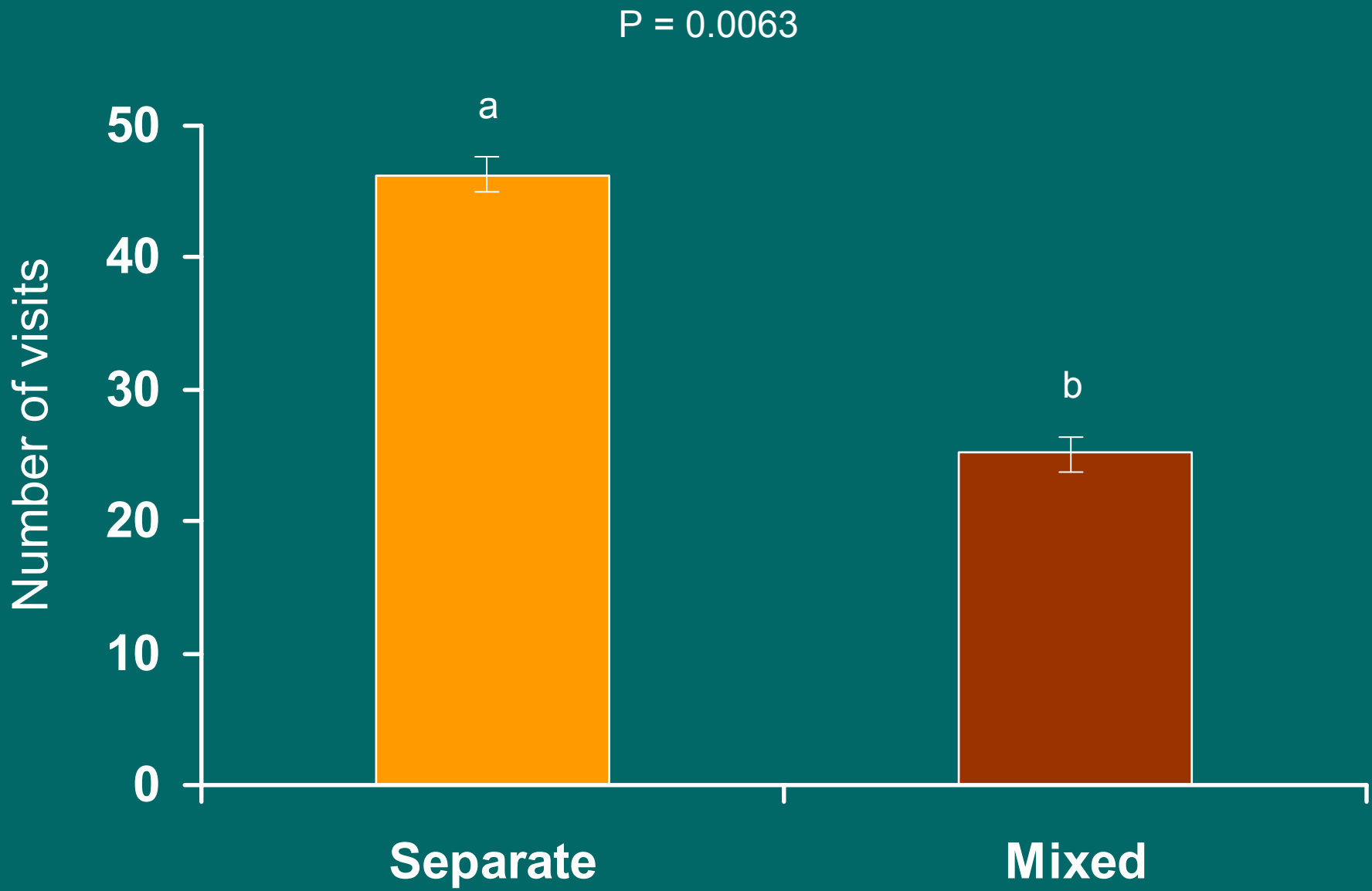
	Mixed	H1 Separate	H2 Separate
Intake	high	high	low
Distance	low	high	low
Foraging efficiency	high	medium	medium


Intake
P = 0.0252
E. globulus
E. tenuiramis
gDM.kgBW -1
20
15
10
5
0
a
b
Separate
Mixed

Distance travelled



Visits to each end



Foraging efficiency

P = 0.0027

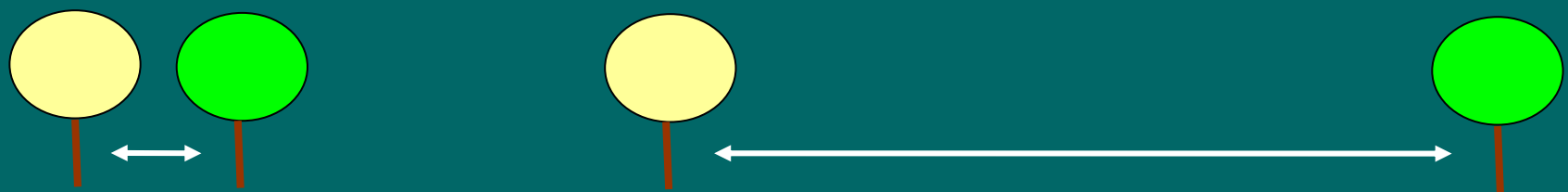
Separate	Mixed
$\frac{5.6\ gDM.kgBW^{-1}}{3.2\ km}$	$\frac{12.6\ gDM.kgBW^{-1}}{1.7\ km}$
$= 1.8\ gDM.kgBW^{-1}.km^{-1}$	$= 7.4\ gDM.kgBW^{-1}.km^{-1}$
	~ 4 x more efficient

Summary

	Mixed	H1 Separate	H2 Separate	Actual Separate
Intake	high	high	low	low
Distance	low	high	low	high
Foraging efficiency	high	medium	medium	low

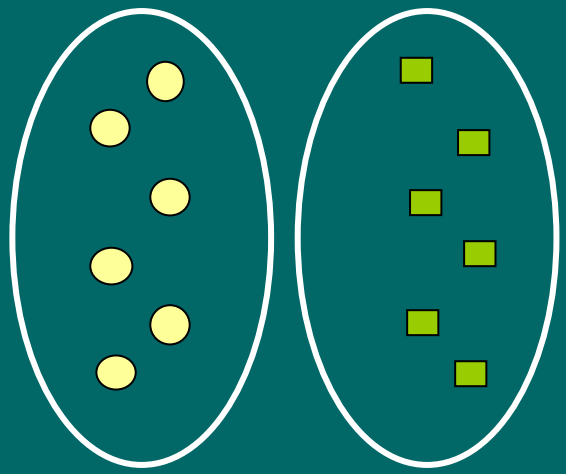
Conclusions

1. Brushtail possums altered foraging decisions in response to plant spatial arrangement…

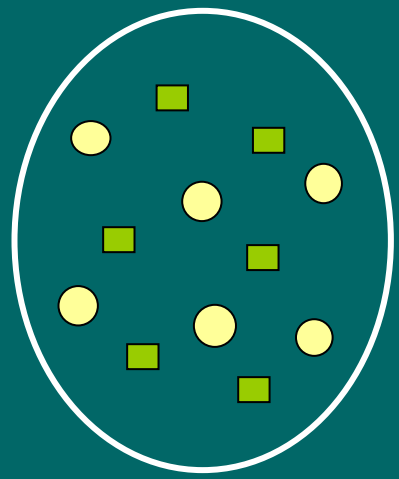


Implications

Spatial scale of plants important



Separate



Mixed

- ↑ distance travelled

⇒ ↑ foraging time

⇒ ↑ predation risk

⇒ ↑ energy expenditure

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Those possums who decided to stick around