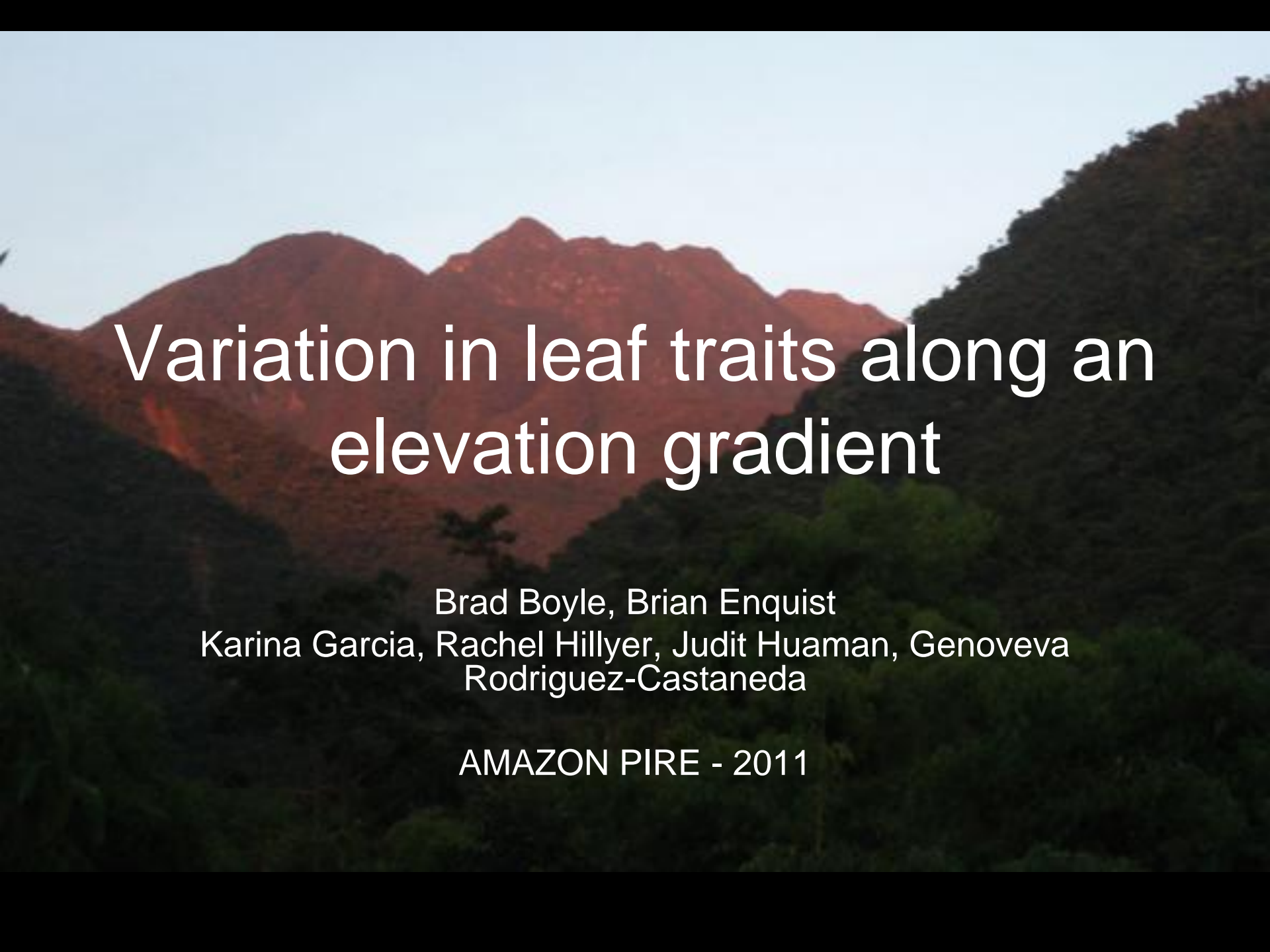




These ain't no
coca leaves but
they've got
teeth

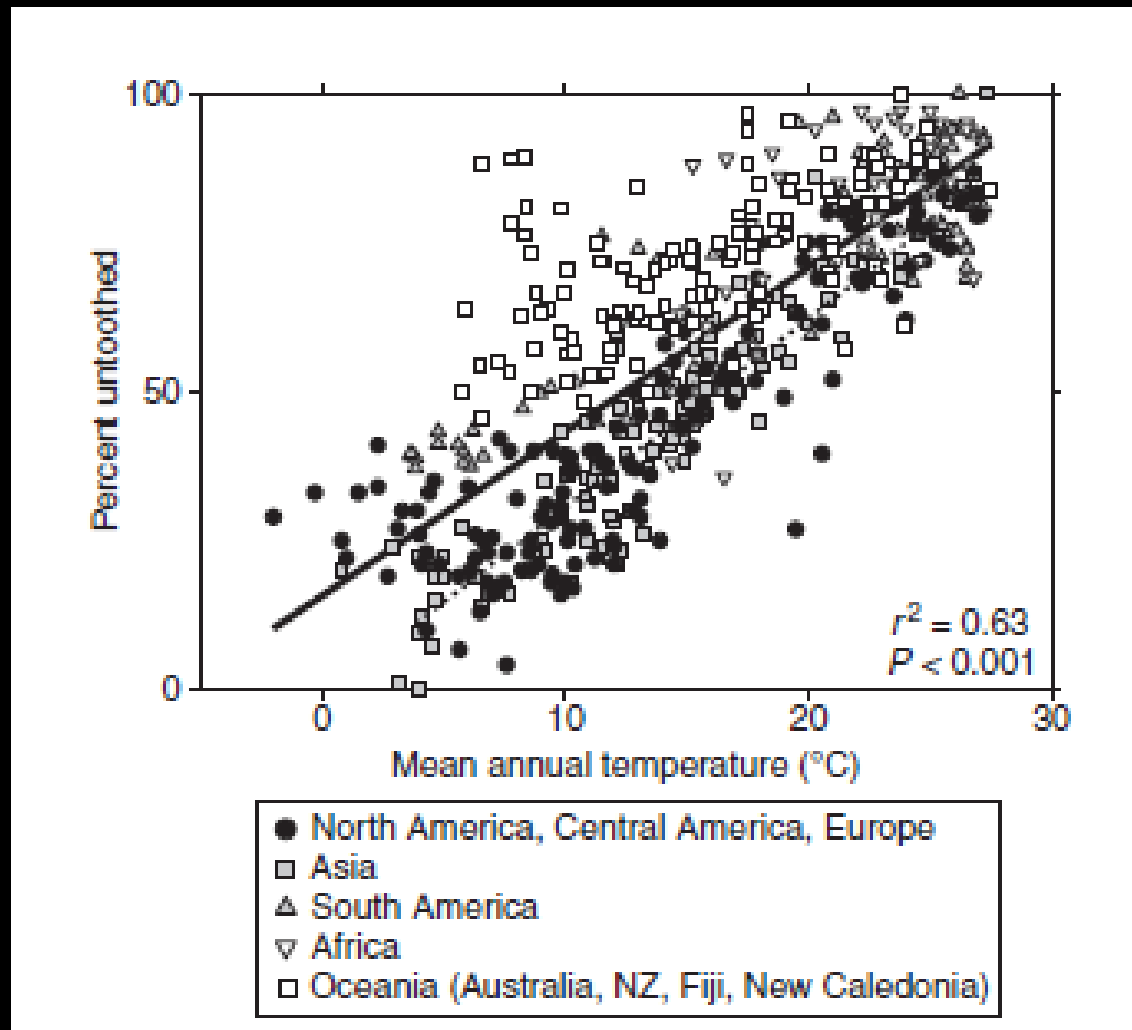


Variation in leaf traits along an elevation gradient

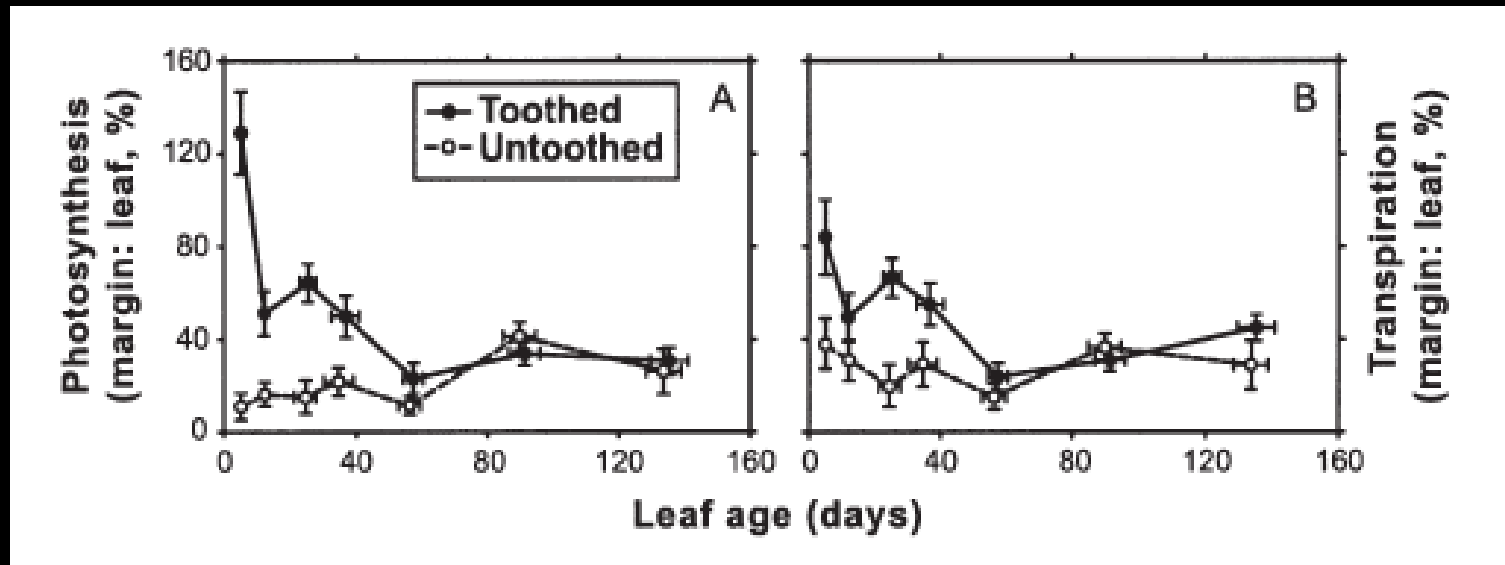
Brad Boyle, Brian Enquist
Karina Garcia, Rachel Hillyer, Judit Huaman, Genoveva
Rodriguez-Castaneda

AMAZON PIRE - 2011

Teeth Decrease with Temperature



Peppe et al 2001



Leaves with teeth maximize carbon gain early in the season
 (when temperature is limited but water and nutrients are not)

Questions

- Does the temperate pattern of leaf teeth increasing with elevation hold true in the tropics?
- When phylogeny is considered does any pattern in the raw data still hold true?

		Raw Data	
		Significant	Not Significant
Independent Contrasts	Significant	Relationship between trait and environment	Weak signal that strengthens when phylogeny is added
	Non Significant	No relationship (possibly clade level filtering)	No relationship

Collecting...



Processing...



More
processing...



Processing...



SP1600
HB-KBC-4064-23

Even more processing...



Processing...



SP1500
246-L1

Still processing...

Leaf Traits Measured

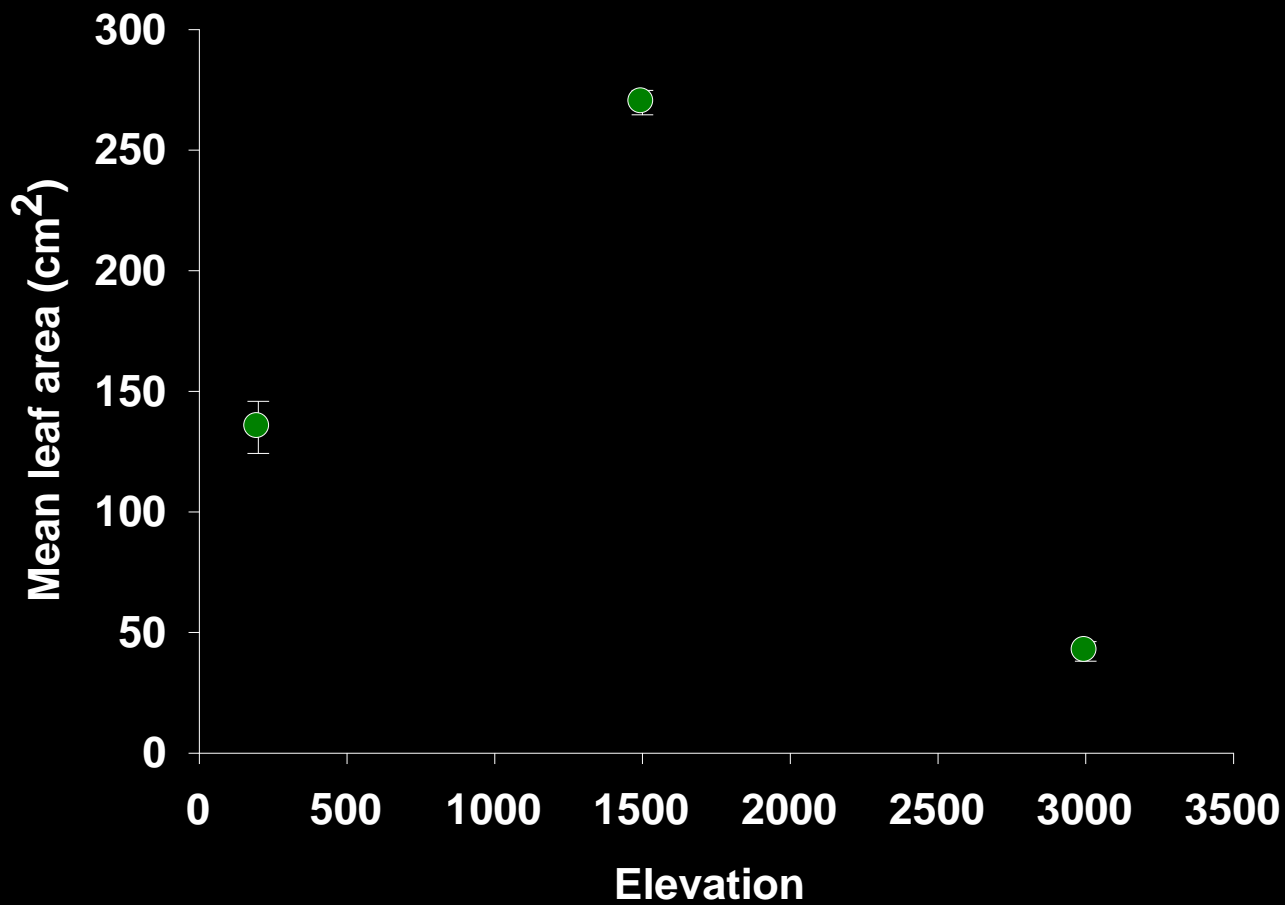
- Total blade area
- Number of teeth
- Tooth area
- Leaf thickness
- Traits to be measured
 - Specific leaf area (SLA)
 - N, P, C content
 - Isotopes (C, N)

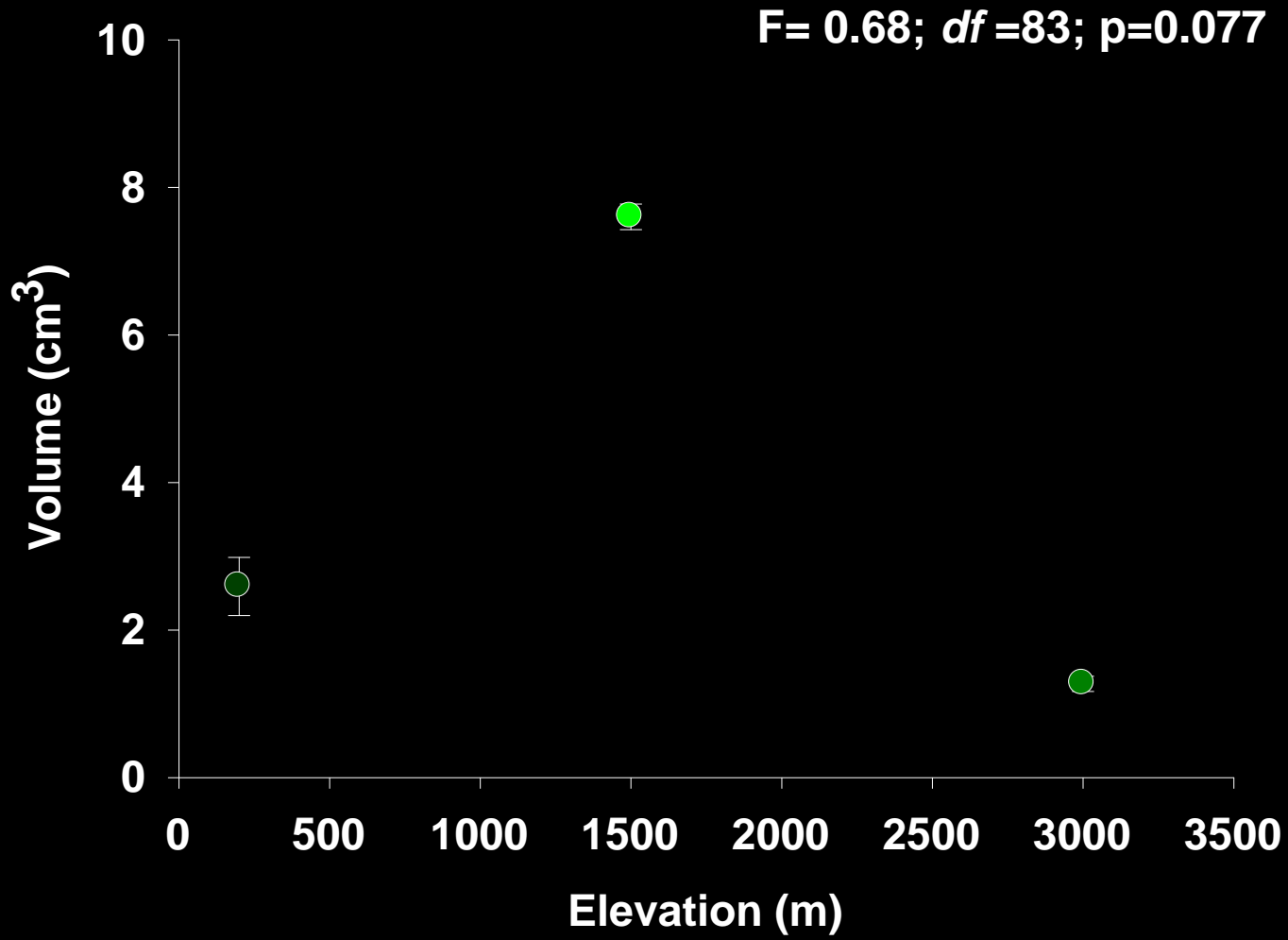
Site	Number Species	Number Species Analyzed	Number Species w/teeth
Wayqecha	48	31	13
San Pedro	95	26	5
Tambopata	81	29	5

Species Correlation Table

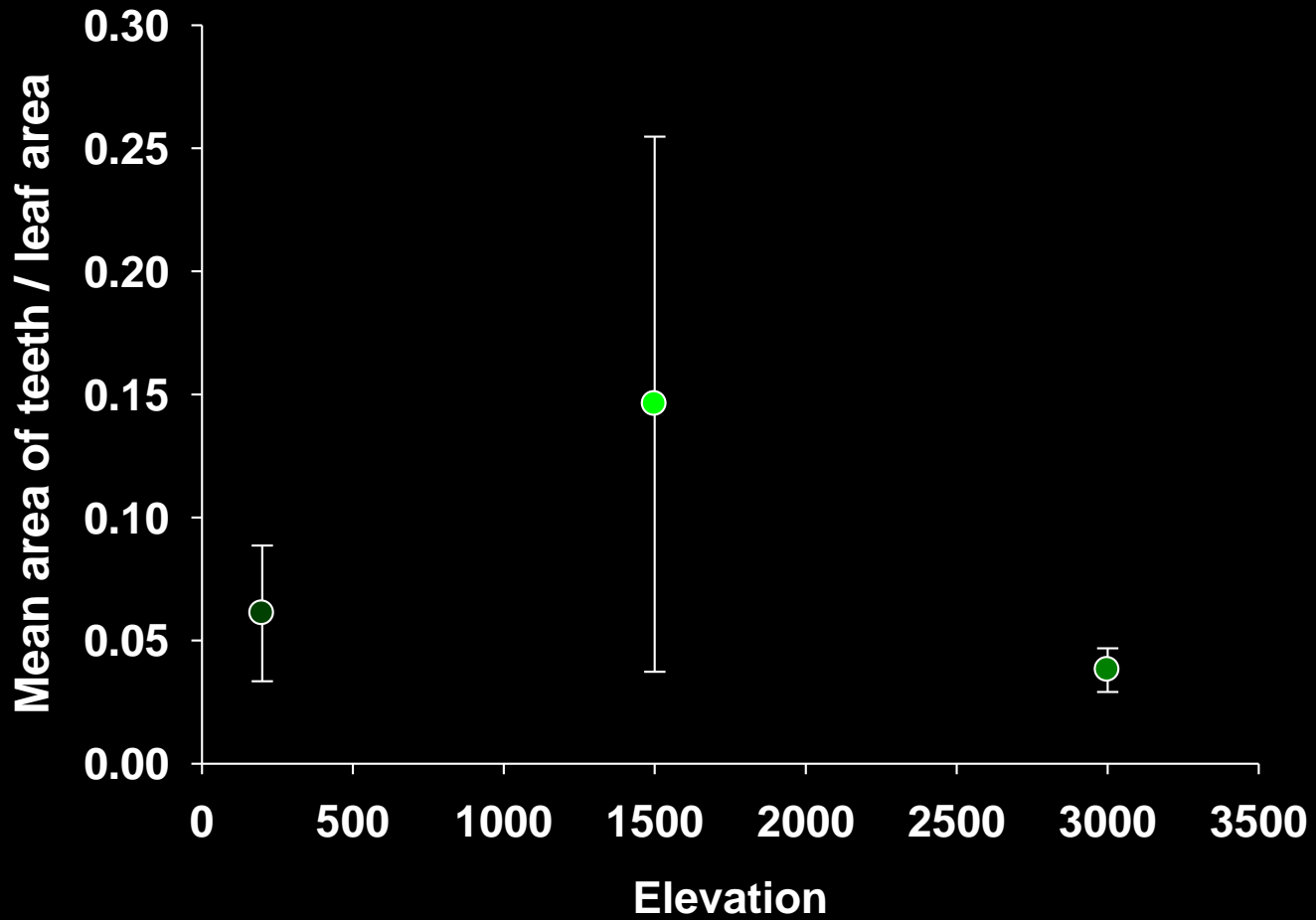
	Volume	Blade area	Leaf thickness	Tooth area	Num teeth
Elevation	-0.489	-0.6916	0.1776	-0.1764	0.3701
Volume		0.8597	0.4662	0.1578	-0.3489
Blade area			0.0317	0.2325	-0.4665
Leaf thickness				-0.0183	0.0819
Tooth Area					-.0153

F= 1.742; *df* =84; p=0.191

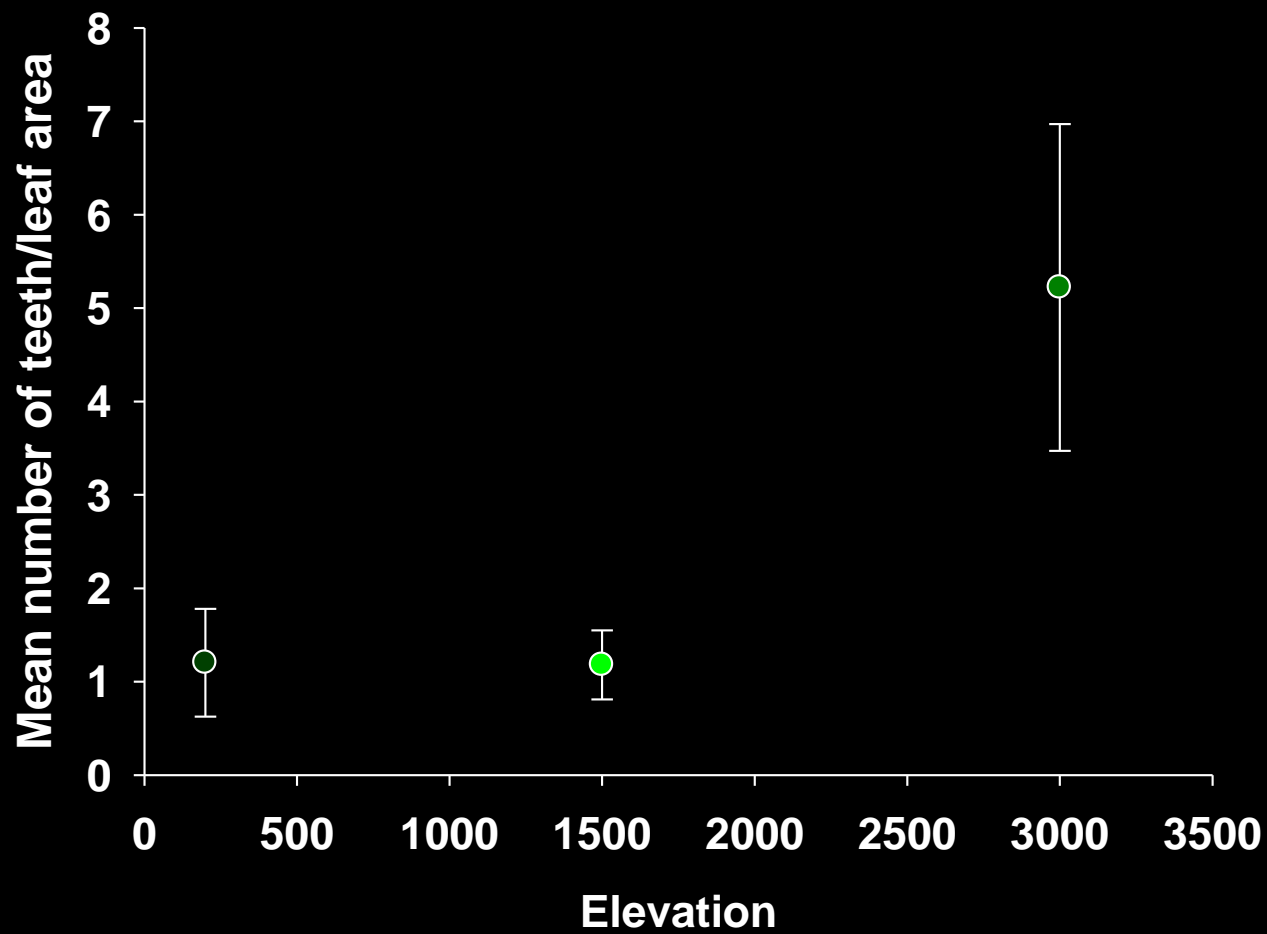




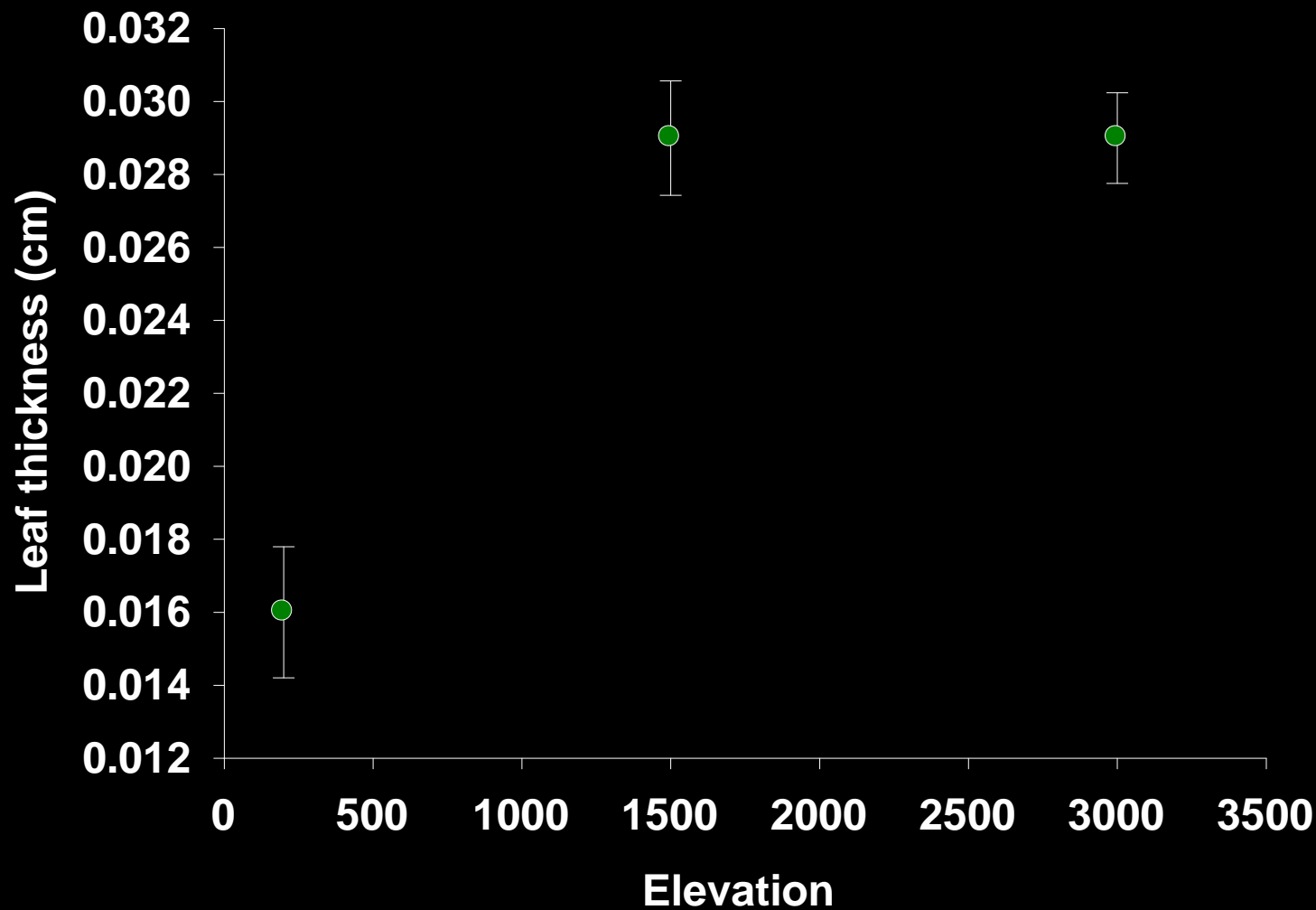
$F=0.67$; $df = 21$; $p= 0.42$

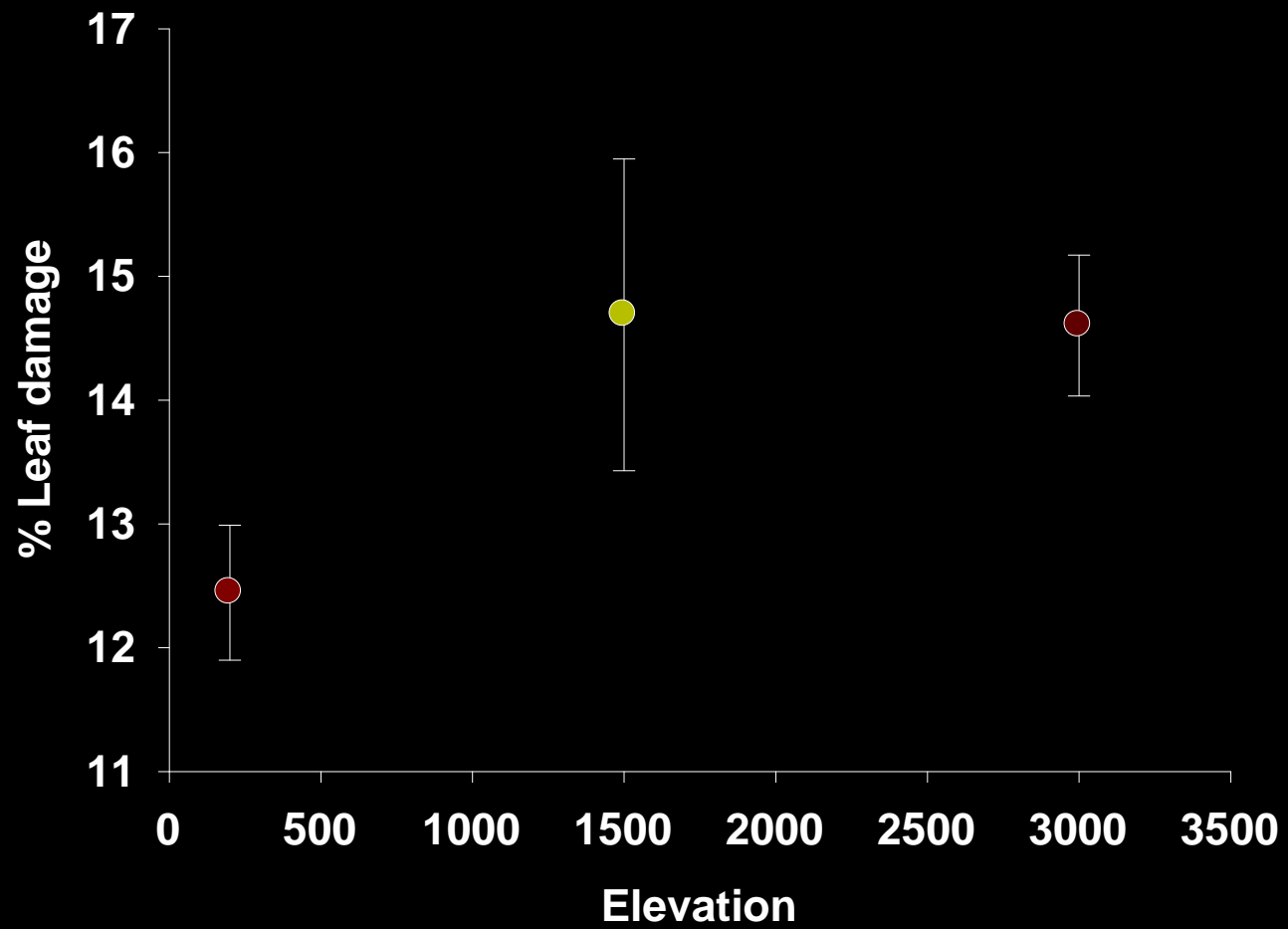


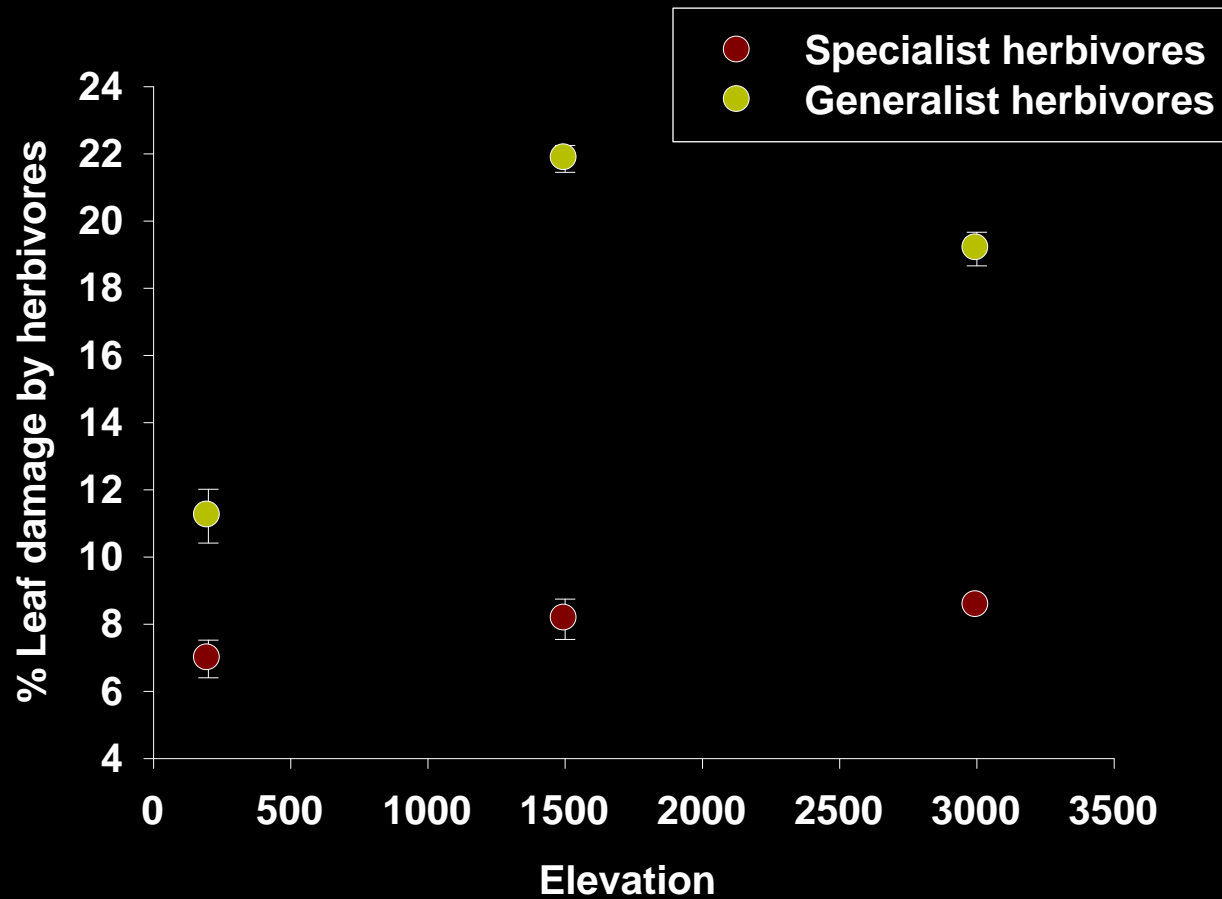
$F = 3.33; df = 21; p = 0.08$



F= 24.185; df =28; p <0.01







Summary

- All leaf traits were affected by the elevation gradient.
- Per species leaf traits were more variable at 1500m.
- At the community level, leaf area was lower at 3000m, but the leaves had higher number of teeth. Leaf thickness was lower at 200m.
- Damage by herbivores was on average 12-15%. Generalist herbivory increased with elevation and followed the pattern of leaf thickness.

