

The role of plant anatomy in invasion ecology

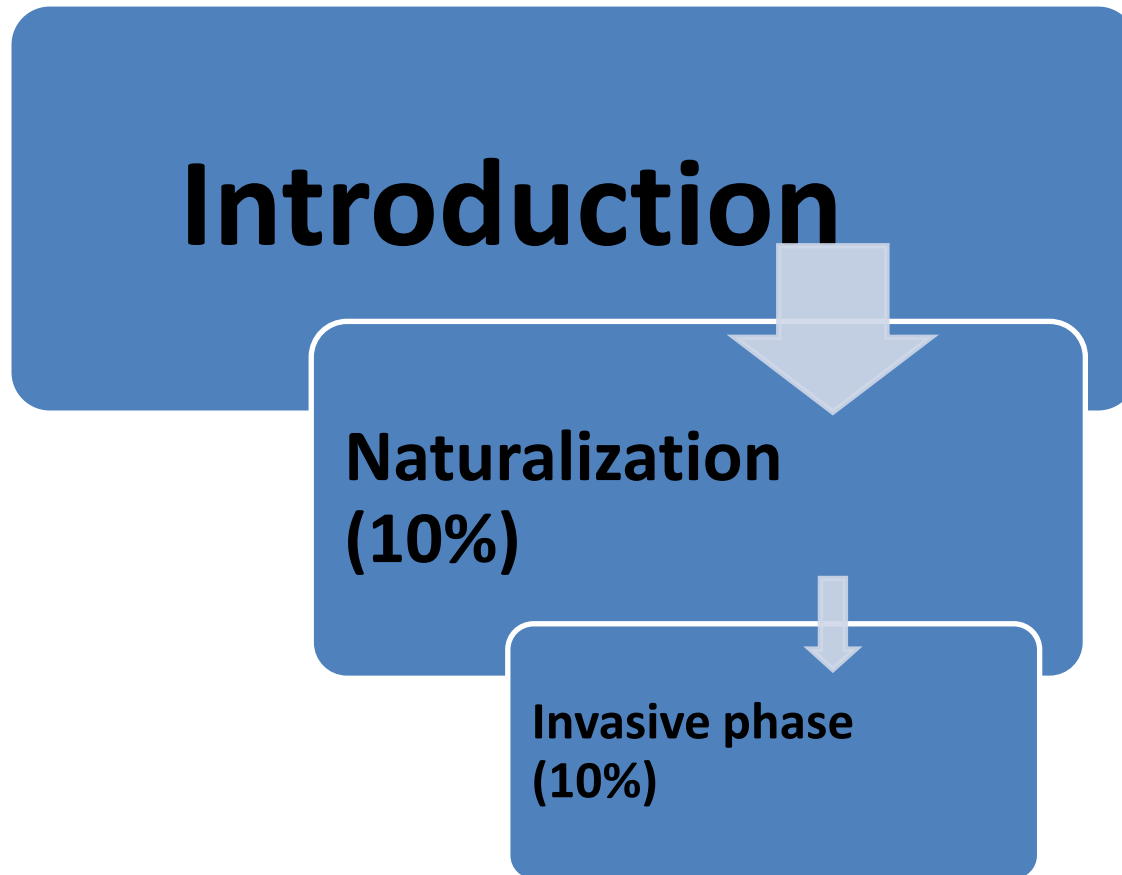
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PhD Candidate



Republic of Botswana

The invasion process: the tens rule



(Richardson *et al* 2000; Williamson and Fitter 1996)

Effects of invasive species

“On a global basis...the two great destroyers of biodiversity are, first habitat destruction and, second, invasion by exotic species” - E.O Wilson



What is it about the 1% of introduced plants that make them invasive?

Dolichandra unguis-cati (L.) Lohmann
(syn. *Macfadyena unguis-cati* (L.) Gentry)

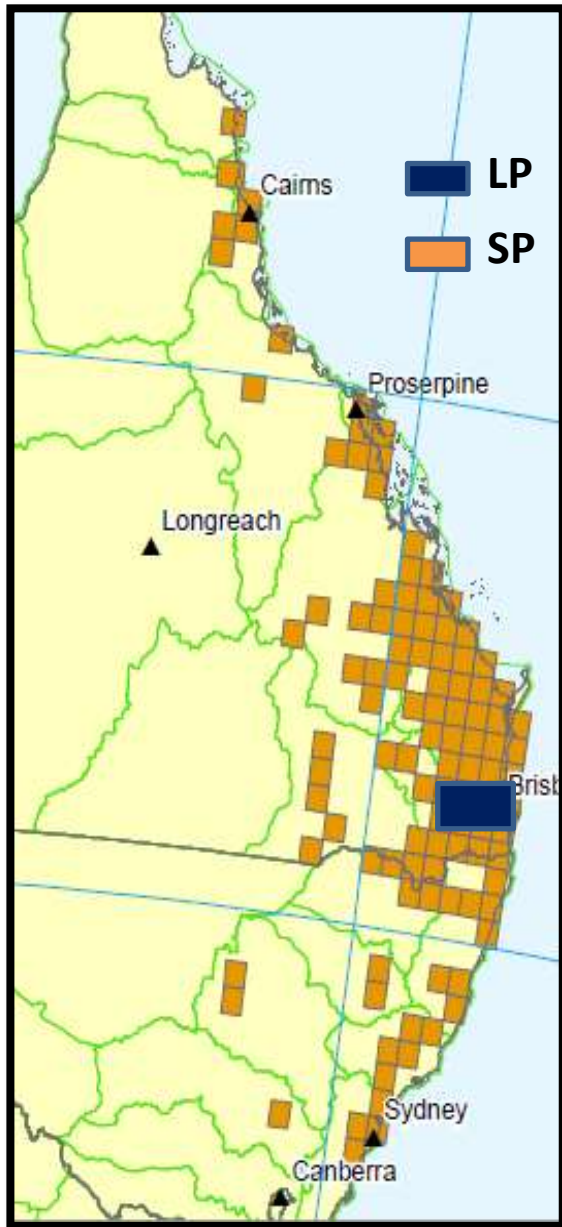
Family Bignoniaceae



A major environmental weed in Australia



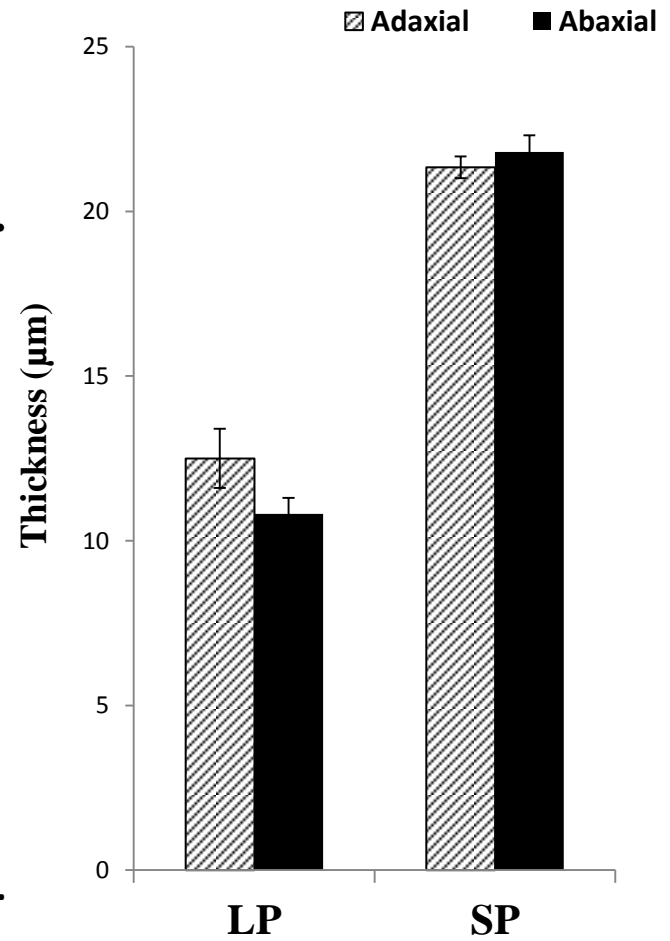
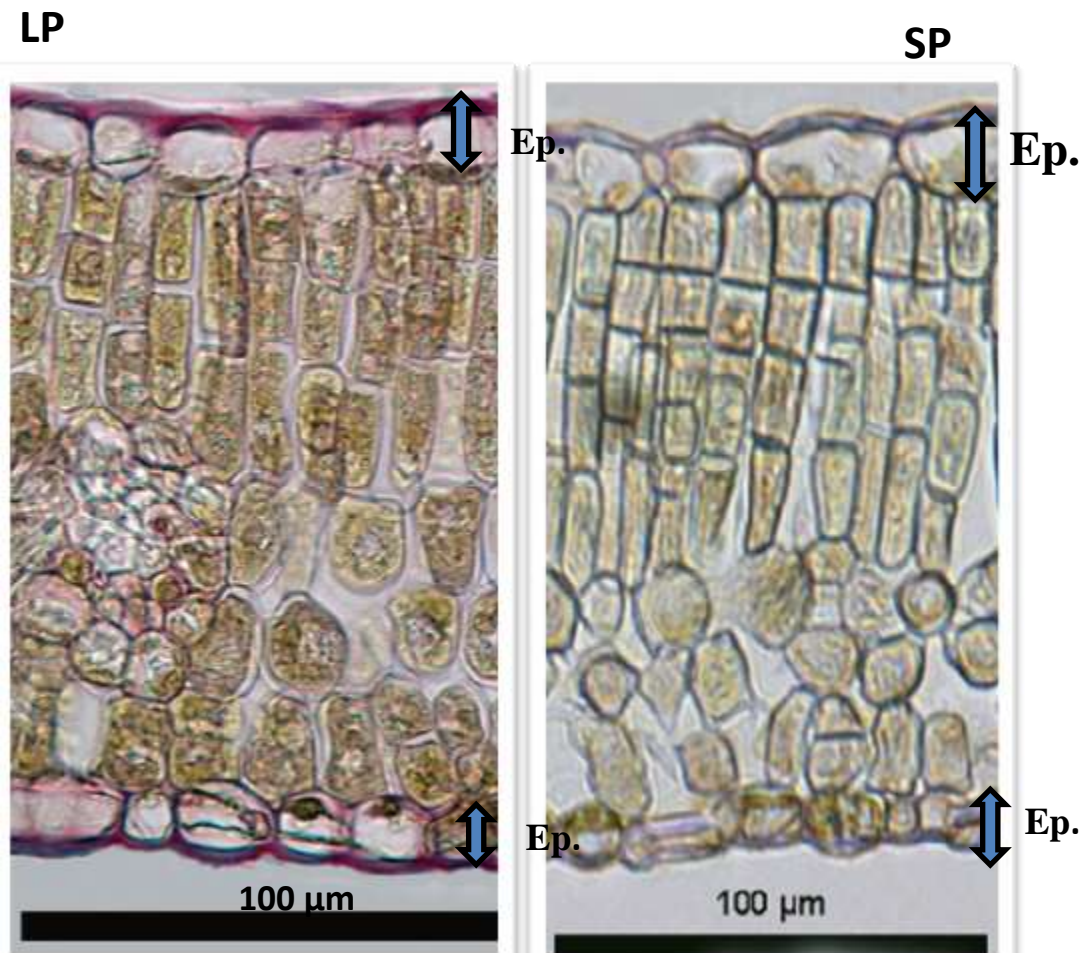
Long pod & Short pod in Australia



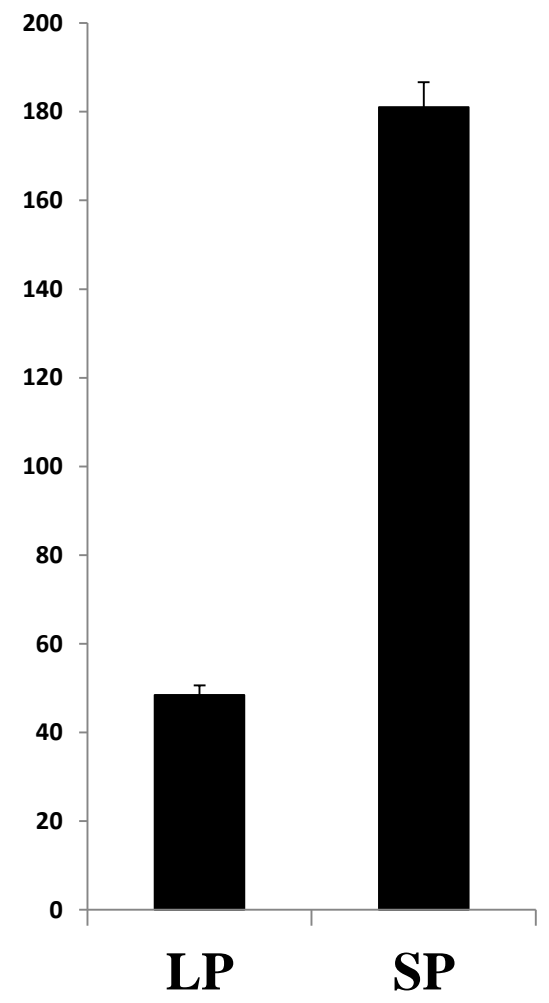
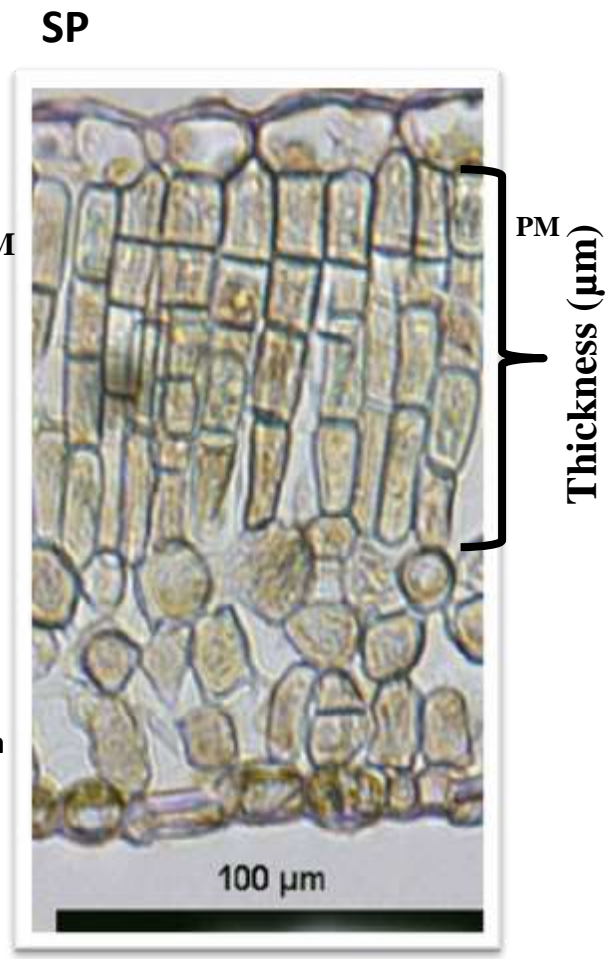
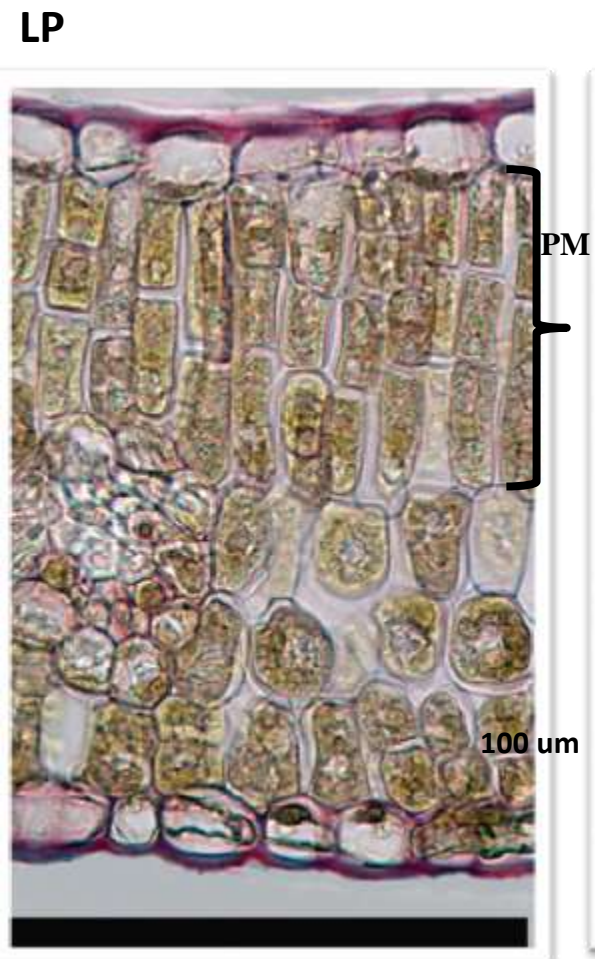
↑
SP

↑
LP

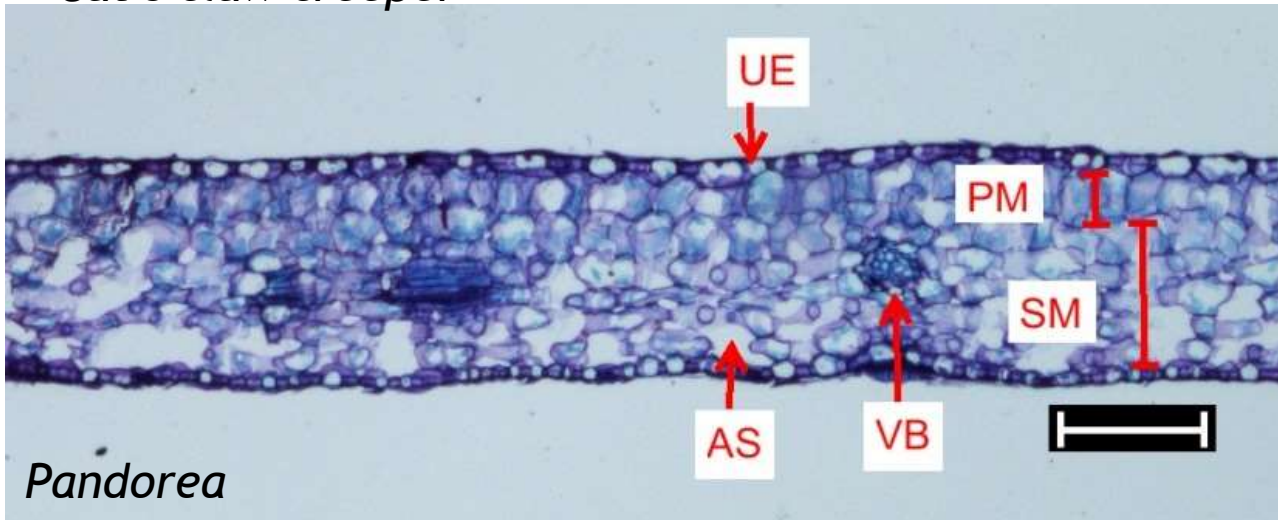
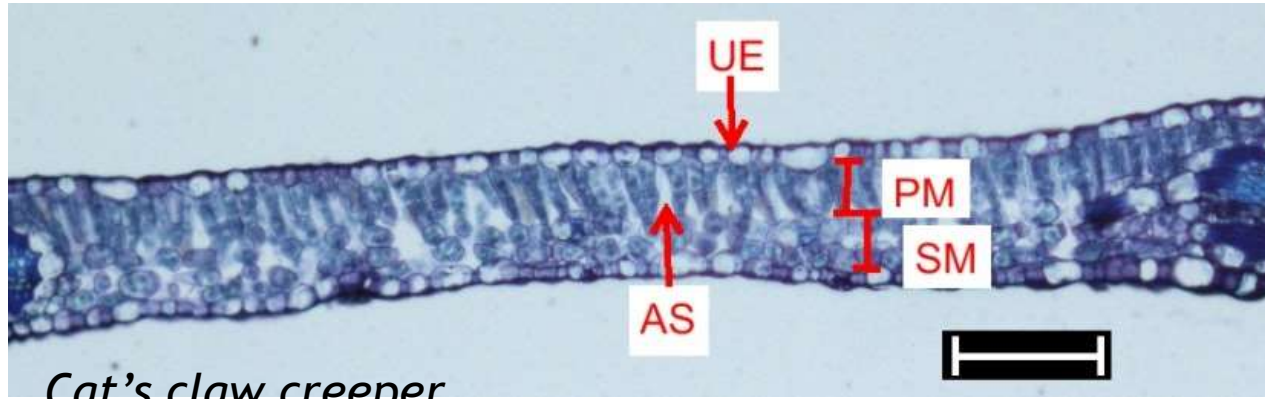
Epidermal thickness



Palisade mesophyll



Eco-physiological Performance & Plasticity



Invasive taxa: thinner leaves ($P < 0.05$)

CCC vs *Pandorea*: more palisade mesophyll ($P < 0.001$).

Native vs. Exotic Vines

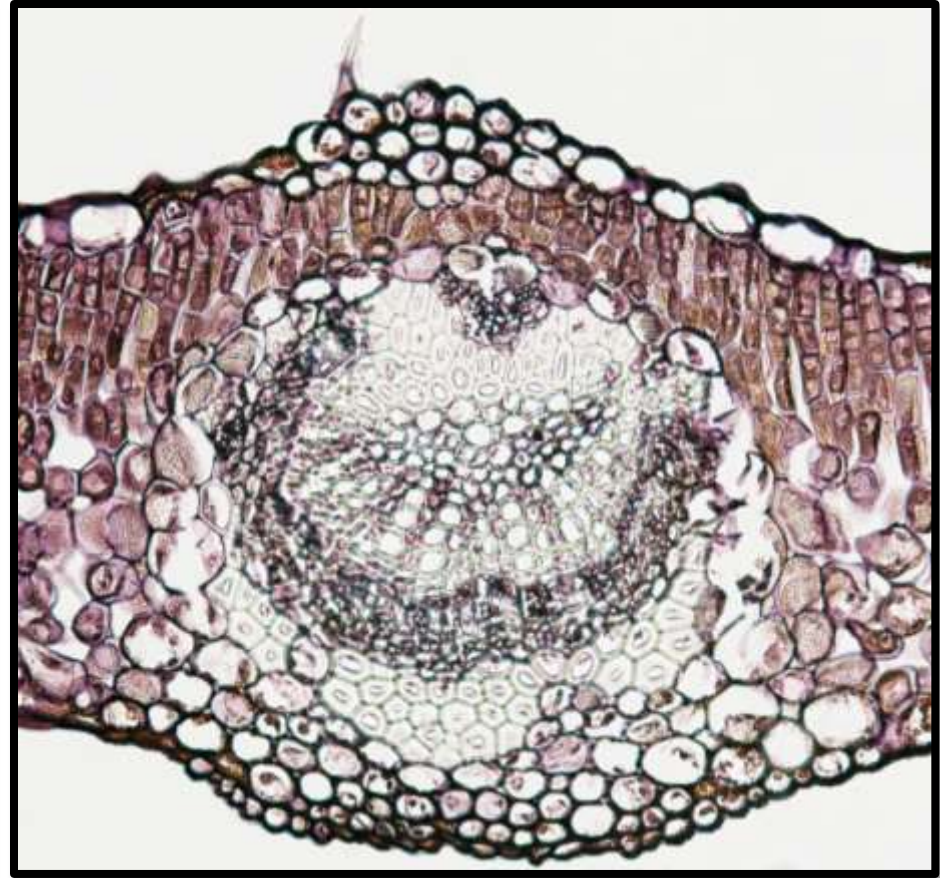
Osunkoya *et al.* 2014

Trichomes

LP

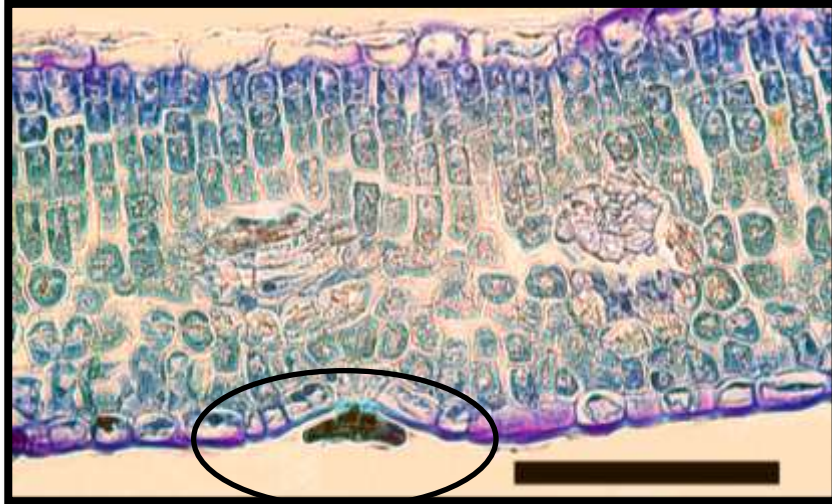


SP

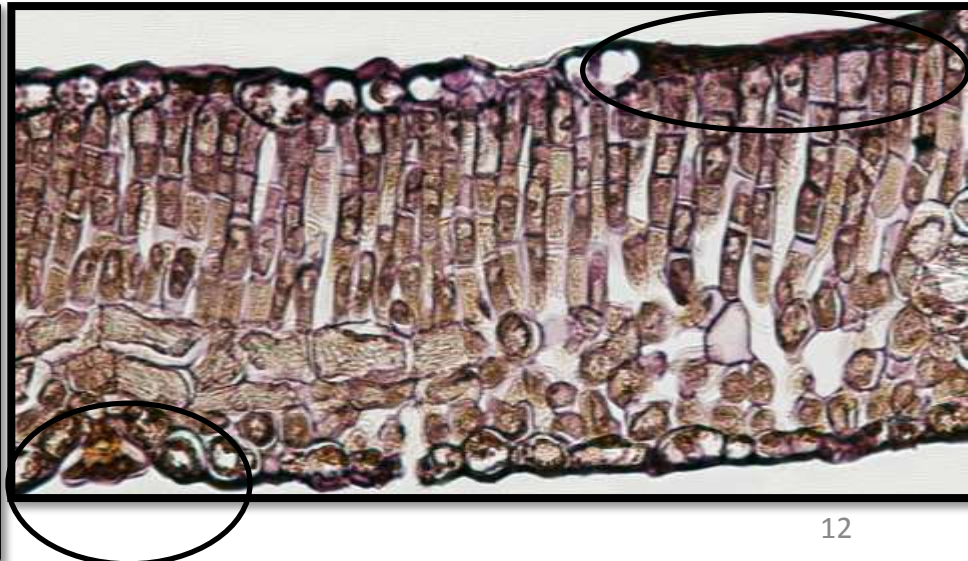
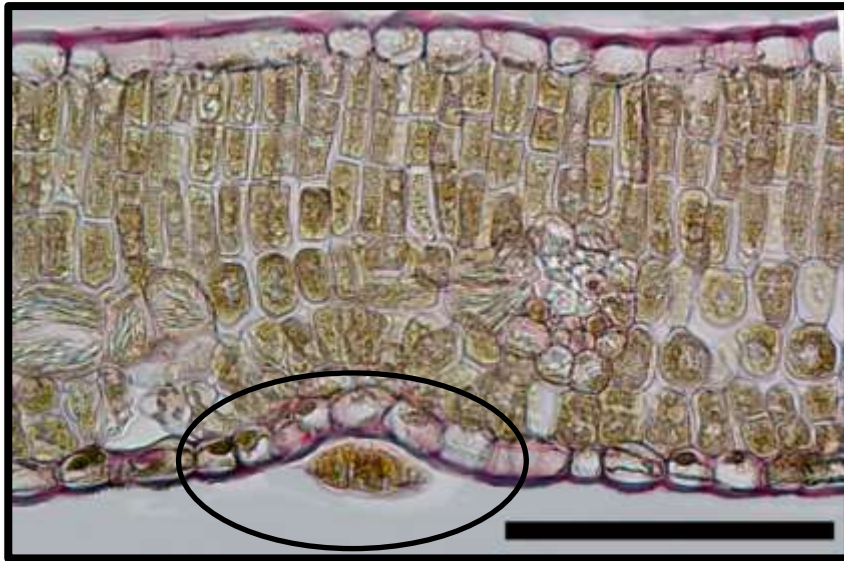
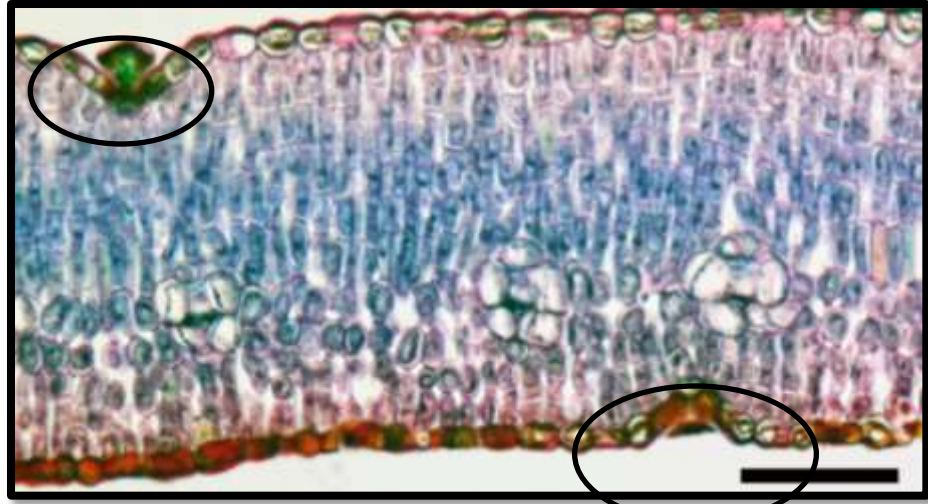


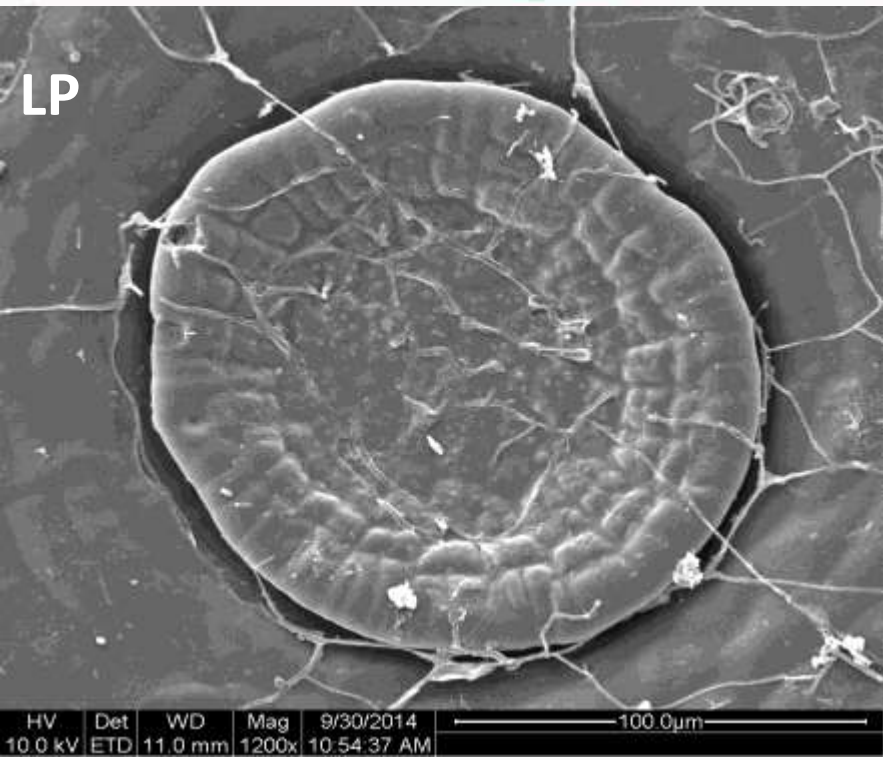
Glandular scales/EFN

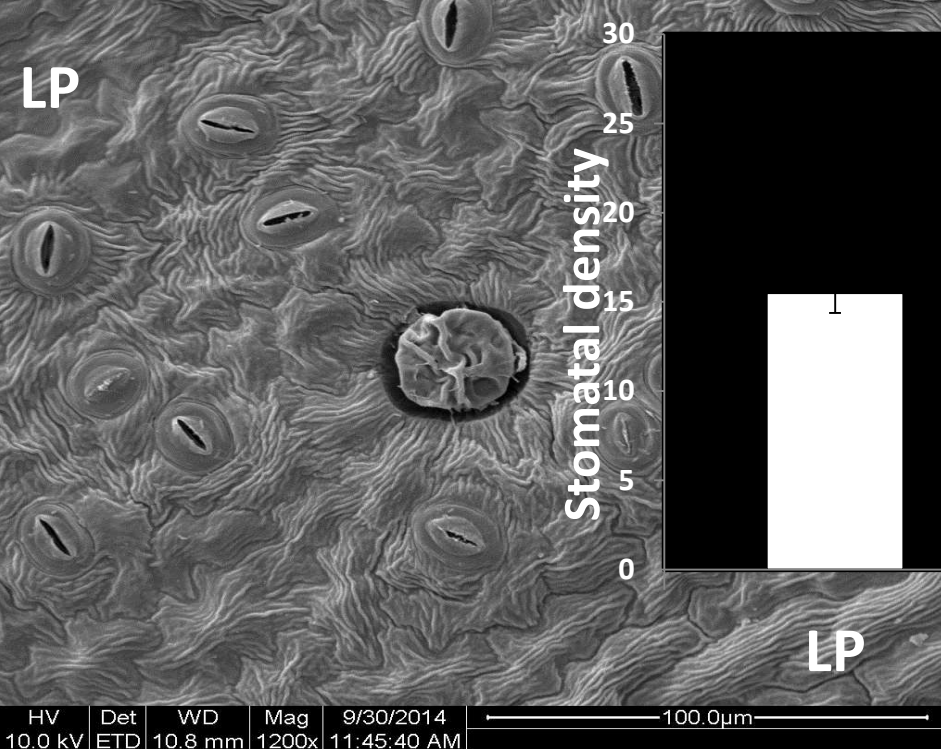
LP



SP

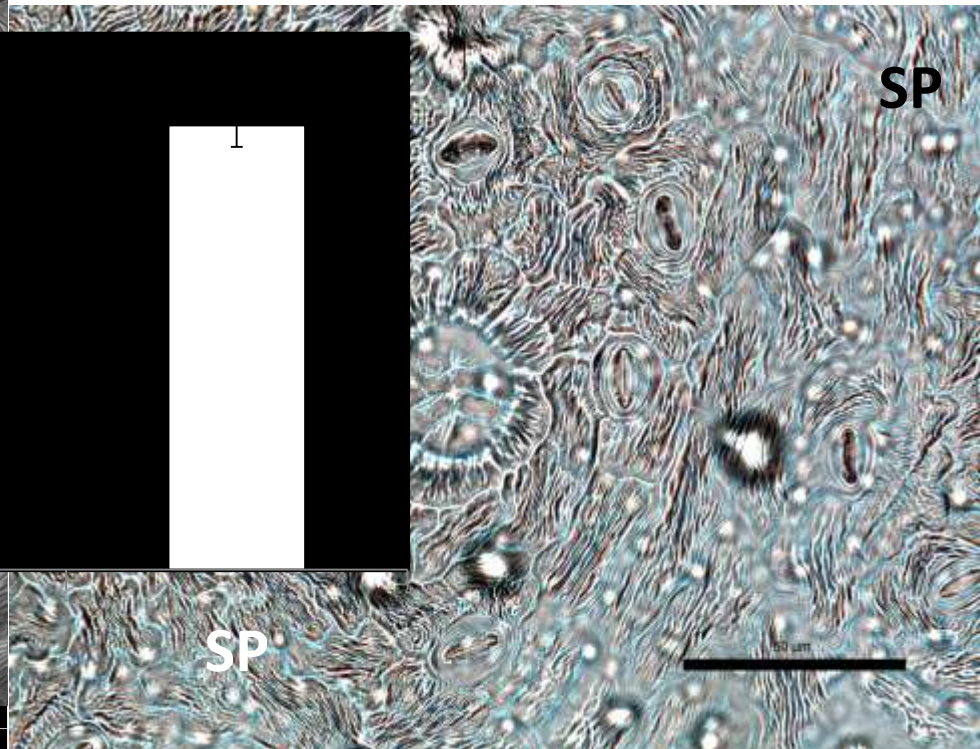
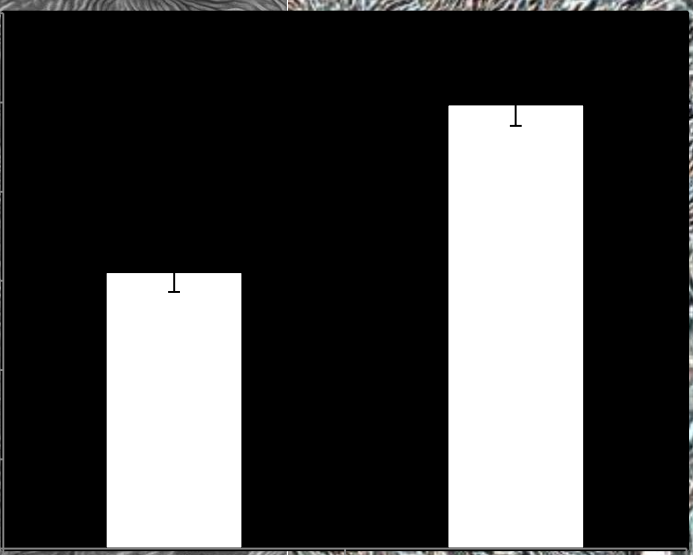






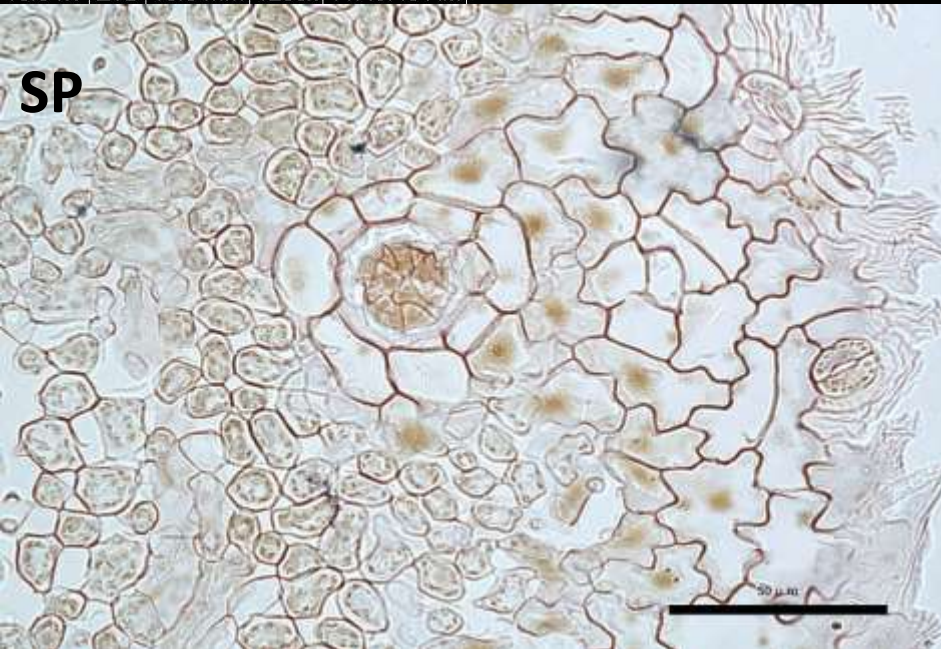
Stomatal density

30
25
20
15
10
5
0



HV 10.0 kV Det ETD WD 10.8 mm Mag 1200x 9/30/2014 11:45:40 AM

100.0 μm



Pictures by Cristina Latorre

Conclusion

- **There are marked differences between the anatomical structure of LP and SP**
- **EFNs are more common on the adaxial than abaxial surface and both are more frequent in SP than LP.**
- **Epidermal replica provides a rapid and inexpensive method for surveying the distribution and frequency of stoma & EFNs. Glandular structure is best observed using SEM and sectioning of paraffin-embedded material**
- **Anatomical variation observed between SP and LP may have taxonomic importance**

- Su

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- Te

- PS



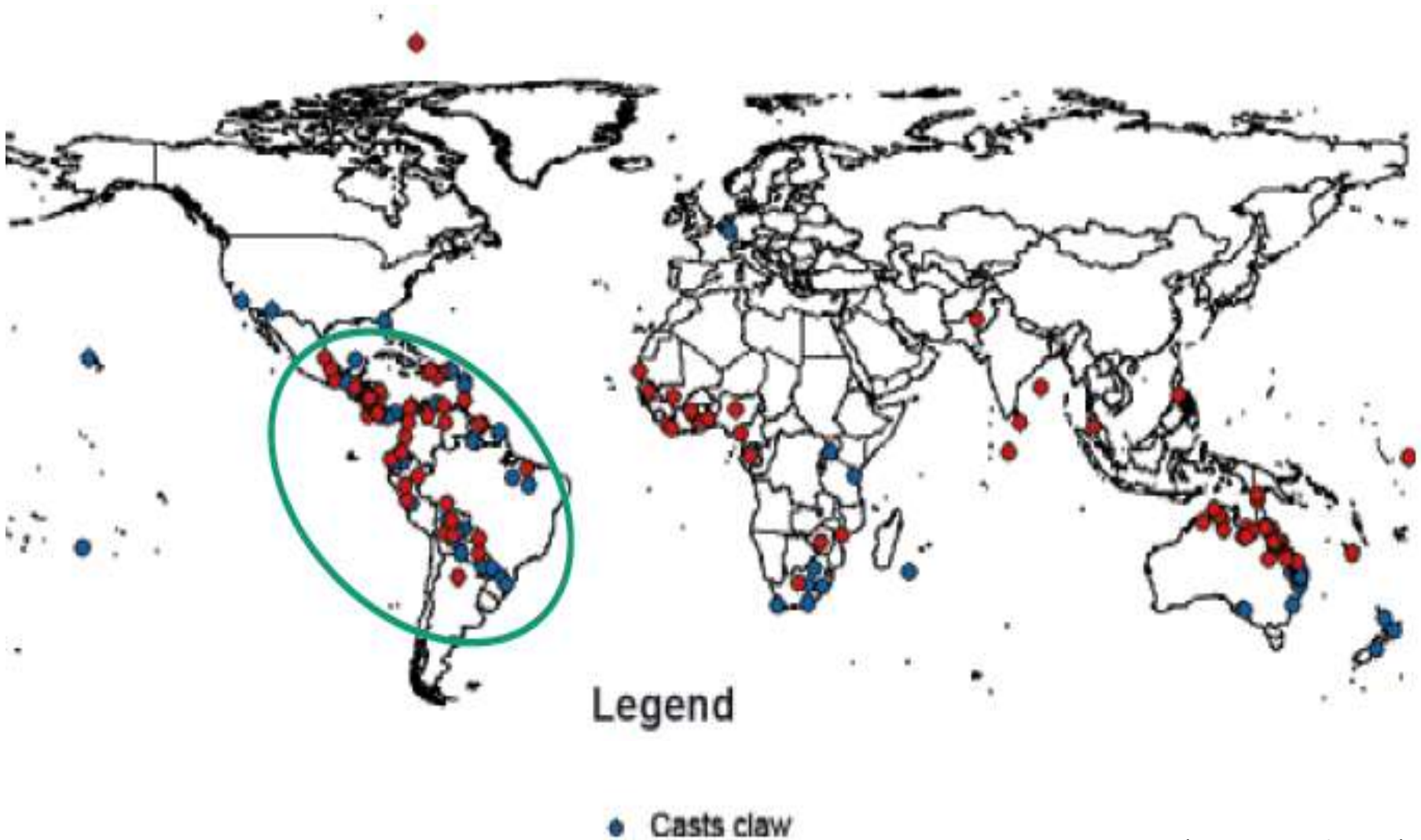
Thanks a lot!

HV	Det	WD	Mag	9/30/2014
10.0 kV	ETD	10.8 mm	1200x	11:45:40 AM

100.0µm



CCC distribution in the native and introduced range



(Prentis et al 2009)

CONTROL OF CCC

Leaf sucking tingid



Mechanical

Chemical

Biological control ✓

Leaf mining beetle



(Dhileepan et al 2007; King et al 2011)