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INTRODUCTION

Further knowledge of members of the Proteaceae family at cyto-histological level is valuable to improve cultivation conditions and develop new cultivars and propagation strategies. These plants originate in dry zones, with high insolation and nutrient-poor soil, so they usually have scleromorphic features that protect them from ultraviolet radiation and water loss.

The present study aims to describe the anatomical organization and ultrastructure of leaves and stems of three cultivars of *Leucadendron* R.Br. (*L. discolor green*, *L. 'Safari Goldstrike'* and *L. 'Inca Gold'*) and three cultivars of *Leucospermum* R.Br. (*L. 'High Gold'*, *L. 'Spider'* and *L. 'Succession II'*).



MATERIAL AND METHODS

Samples: leaves and stems were collected from plants cultivated in private and experimental fields located at 564-612 m a.s.l. in northern Tenerife (Canary Islands, Spain).

LM: samples were fixed in FAA and embedded in Paraplast plus. Transversal sections (20 μm) were stained with Safranin-Fast Green (Johansen 1940).

TEM: samples were fixed in 3% glutaraldehyde and postfixed in OsO₄, both in PB, embedded in Spurr's resin (Spurr 1969). Semithin sections were stained with toluidine blue. Ultrathin sections were stained with uranyl acetate and lead citrate, then viewed and photographed in a JEOL JEM 1010 electron microscope (SEGAI-ULL).

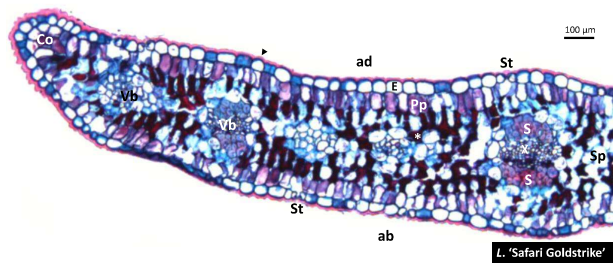
SEM: samples were fixed in 2.5% glutaraldehyde in PB, dehydrated in graded ethanol series and HMDS, silver coated and photographed in a ZEISS EVO 15 scanning electron microscope (SEGAI-ULL).

RESULTS

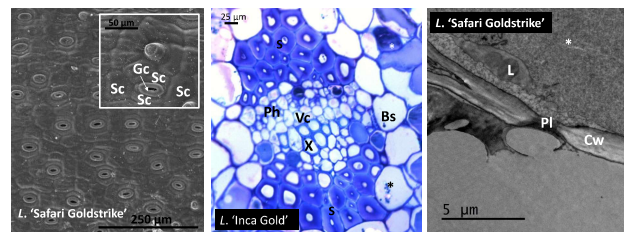
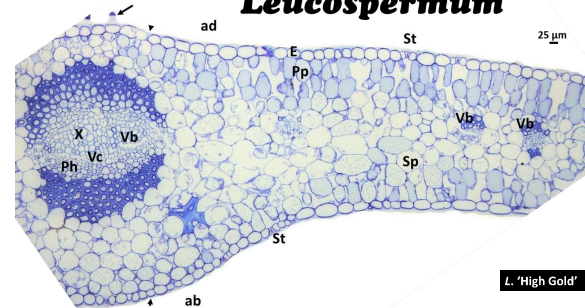
Leucadendron

LEAF

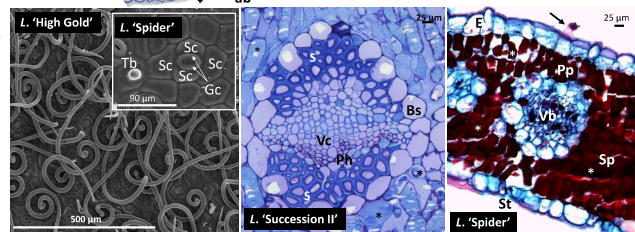
Leucospermum



- Simple epidermis (E)
- Thick cuticle (head arrow)
- Anphistomatic
- Reniform and paracytic stomata (St)
- Simple trichomes (arrow)
- Palisade parenchyma (Pp) with phenolic deposits (*)
- Spongy parenchyma (Sp) with phenolic deposits only in 'High Gold' and 'Succession II'
- Collateral vascular bundles (Vb) with the phloem (Ph) on the abaxial side of the xylem (X)
- Perivascular sclerenchyma (S)



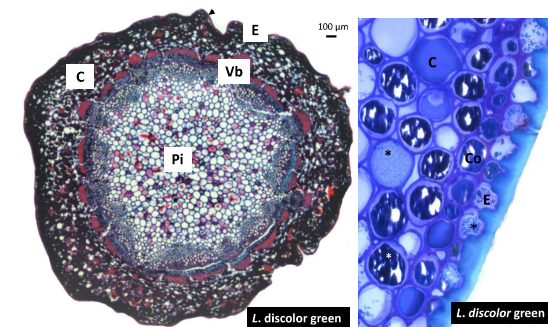
ab: abaxial, ad: adaxial, Bs: bundle sheath, Cw: cell wall, Gc: guard cell, Pl: plamodesmata, Sc: subsidiary cell.



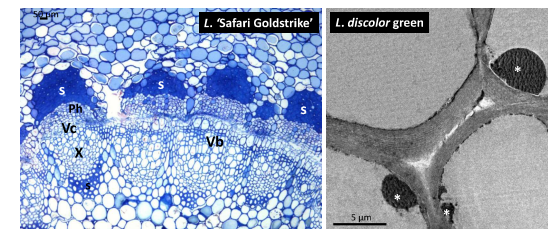
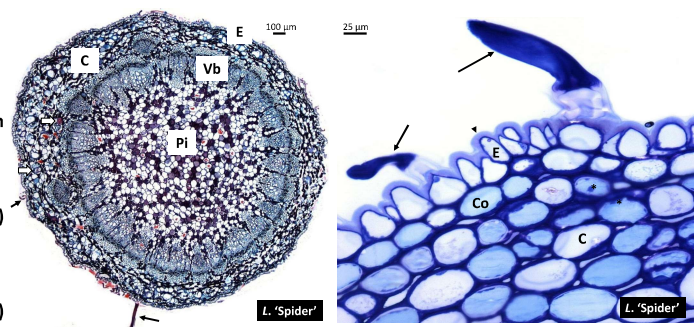
Leucadendron

STEM

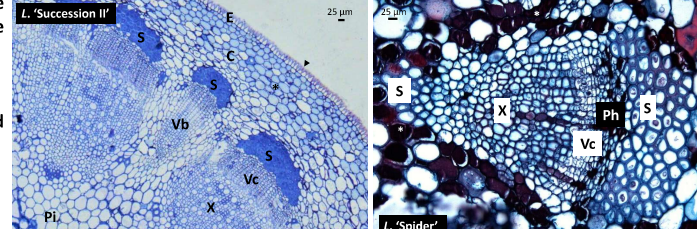
Leucospermum



- Concentric tissue arrangement
- Thick cuticle (head arrow)
- Simple epidermis (E) with papillary cells
- Simple trichomes (arrow)
- Subepidermal collenchyma (Co)
- Cortical parenchyma (C) presented phenolic deposits (*)
- Sclerenchyma (S) with highly thickened cell walls
- Collateral vascular bundles (Vb) with phloem (Ph) situated on the peripheral and xylem (X) on the inner side
- Perivascular sclerenchyma with thickened cell walls (S)
- Pith parenchyma (Pi) presented phenolic deposits (*)



Vc: vascular cambium



CONCLUSIONS

Both genera showed scleromorphic features on leaves and stems; thick cuticle, abundance of thrichomes and phenolic deposits in the cell lumen of the different foliar and caulinar tissues.