

INTRODUCTION

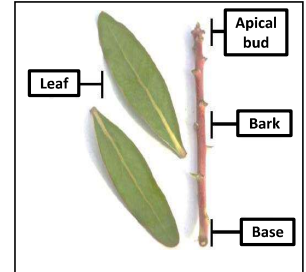
Peroxidases are enzymes implicated in many physiological processes in the plants life cycle, including rooting. Diverse researches have highlighted the importance of changes occurred in the peroxidase activity during the successive phases of the rooting process. However, these enzymes play another important role in rooting, since their activity in cuttings can be used as biochemical marker to determine their ability to form roots. This would allow the selection of plants easy-to-root as plant material for vegetative propagation. Stem cutting is the main propagation method for members of the Proteaceae family, but many of them root with difficulty, especially the *Protea* genus, in which the cuttings may take 5-6 months to root.

MATERIAL AND METHODS

Enzyme and specific activities have been measured in 4 different zones of the cuttings (apical bud, leaf, base of the cutting and bark from the middle zone of the cutting) from species and cultivars of *Leucospermum* (*L. cordifolium*, *L. patersonii*, *L. 'California Sunshine'*, *L. 'Flame Spike'*, *L. 'Succession I'*, *L. 'Vlam'*) and *Protea* (*P. magnifica*, *P. obtusifolia*, *P. 'Cardinal'*, *P. 'Pink Ice'*, *P. 'Susara'* y *P. 'Sylvia'*) genera.

Measurements were made by spectrophotometry using guaiacol and o-dianisidine as substrates.

Protein concentrations were determined by Bradford assay (Bradford, 1976) using globulin as standard.

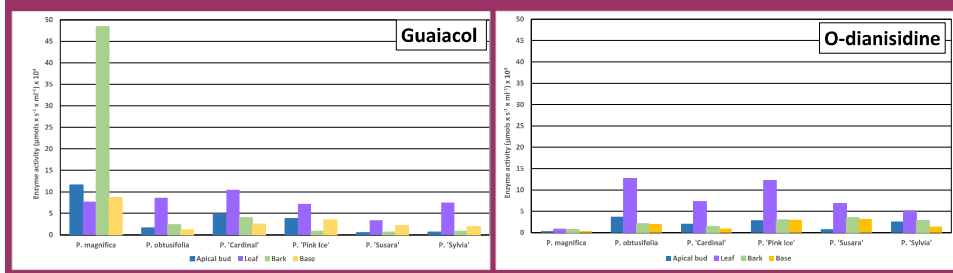


RESULTS

PROTEA



Enzyme activity (EA)



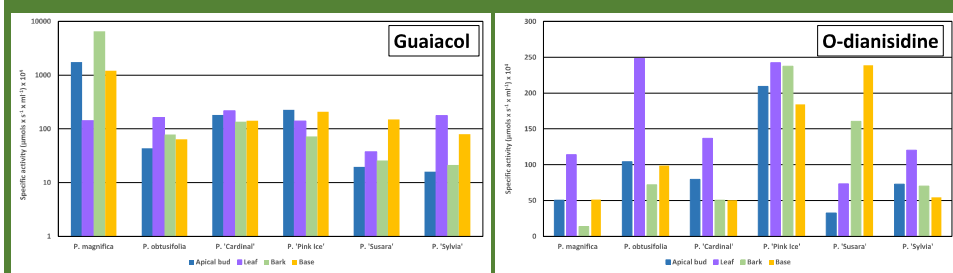
Higher EA (Guaiacol)

- *P. 'Cardinal'*, *P. obtusifolia*, *P. 'Pink Ice'*, *P. 'Sylvia'*, *P. 'Susara'* → LEAF
- *P. magnifica* → BARK

Higher EA (O-dianisidine)

- *P. obtusifolia*, *P. 'Pink Ice'*, *P. 'Cardinal'*, *P. 'Susara'*, *P. 'Sylvia'* → LEAF
- *P. magnifica* → LEAF and BARK

Specific activity (SA)



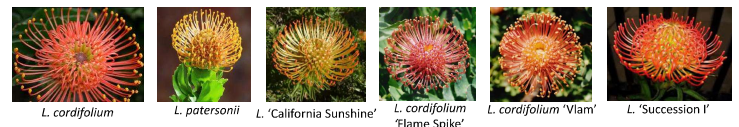
Higher EA (Guaiacol)

- *P. 'Pink Ice'* → APICAL BUD
- *P. 'Cardinal'*, *P. obtusifolia*, *P. 'Sylvia'* → LEAF
- *P. magnifica* → BARK
- *P. 'Susara'* → BASE

Higher EA (O-dianisidine)

- *P. obtusifolia*, *P. 'Pink Ice'*, *P. 'Cardinal'*, *P. 'Sylvia'*, *P. magnifica* → LEAF
- *P. 'Susara'* → BASE

LEUCOSPERMUM



ADDITIONAL ASSAYS

1. Increase in oxidizing substrate concentrations (H_2O_2): 2.0 μ l-6.0 μ l
2. Increase in the amount of enzyme extract up to 300 μ l
3. Mixtures of enzyme extracts of *Leucospermum* with leaf extract of *Protea obtusifolia* (guaiacol) in varying proportions (50/50, 40/60, 20/80 and 10/90).

NEGATIVE VALUES = WITHOUT ACTIVITY

- Enzymatic activity had negative values in the mixtures with 50% *Leucospermum* extract and 50% *P. obtusifolia* extract.
- Increase in enzymatic activity by decreasing the percentage of *Leucospermum* extract in the mixture and increasing the percentage of *P. obtusifolia*.

NEGATIVE VALUES WERE OBTAINED FOR ENZYME AND SPECIFIC ACTIVITY IN ALL SPECIES AND CULTIVARS



WITHOUT ACTIVITY

CONCLUSIONS

Measures obtained with both substrates confirmed the existence of a relation between the peroxidase activity and the ability of cuttings to root. Species and cultivars of the difficult-to-root *Protea* genus showed high peroxidase activity whereas the species and cultivars of the easy-to-root *Leucospermum* genus showed a nil enzymatic activity.