



*fostering research into
the biology and cultivation
of the Australian flora*

Newsletter

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New Series

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President's Message

This year's round of applications for grants featured a large number of good proposals, thirteen in total, nearly all in areas the Foundation is able to support. There were requests for grants to support work on the conservation of Australian plants, on their physiology, reproduction and ecology; requests for studies on the influence of fire and on the role of mycorrhizae in their growth.

After a long discussion, including consideration of the Foundation's financial resources, five applicants were asked for full proposals. These will be sent to the Scientific Research Committee for their approval, and then the Council will meet in August to make final decisions.

Details of projects supported in past years, and the results of completed projects can be found on the Australian Flora Foundation's website www.aff.org.au. I wish to express my gratitude to all members of the Foundation who have made this work possible.

Peter Goodwin
President

Thanks to donors

The Council of the Australian Flora Foundation would like to sincerely thank the following people and organizations who this year have made donations to the Research Fund:

A. Ashford, P. Cameron, I. Cox, P. Esdale, M. Esson, F. Gleason, P. Goodwin, A. and J. Hall, M. Johnstone, E. King, G. Kirby, P. Lightfoot, G. Long, P. McGee, M. Reed, W. Reed, J. Scown, A. Segal, D. Snape, A. Taji, P. Urbonas, A. Wheeler, APS Kaduna SA, APS Newcastle NSW, APS South Australian Region, APS Sutherland NSW, APS Wangaratta Vic, SGAP Mackay Qld.

The Foundation would not be able to carry out its research objectives without the support of donors and benefactors. Donations for research of \$2 and over are tax deductible.

Summaries of Final Reports

Each year the Australian Flora Foundation funds a number of grants for research into the biology and cultivation of the Australian flora. While the grants are not usually large, they are often vital in enabling such projects to be undertaken. Many of the projects are conducted by honours or postgraduate students, hopefully stimulating their interest in research into Australia's flora. This work is only made possible by the generous support of donors and benefactors.

Presented here are brief summaries of completed projects. Full reports of these and other projects can be accessed on the Foundation's website www.aff.org.au

Developing a technique for obtaining colour accurate photographs of Australian native flowers

Michael Eckert email Michael@eckert.com

This project was funded by the Ian Potter Foundation via the Australian Flora Foundation

The colour within a photographic print depends heavily on the illumination at the scene (sunny day, cloudy day, morning, evening, flash, etc.), the colour accuracy of the film, and the colour accuracy of the print. Because of the combination of these factors, it is usual for photographs to exhibit large colour shifts from the original flower, both in hue and saturation. At best, red flowers remain red, blue flowers vary between blue and purple, and yellow flowers vary between yellow and orange. The primary objective and achievement of this project was to develop and validate a technique to obtain colour accurate digital photographs of Australian native flowers and foliage in the field.

Examples of the photographs can be found by going to the AFF website (www.aff.org.au) then to 'Results and reports', then to 'Summaries', then to '02/03', and clicking on the Eckert summary. The summary provides a link to 82 colour accurate photographs from 17 genera. The images are scaled down versions of the originals.

Germination, Establishment and Mycorrhizal Synthesis in the Epacrid *Woollsia pungens*

Anne E Ashford & John H Palmer

School of Biological, Earth and Environmental Sciences, The University of New South Wales

The objective of this project was to study factors controlling germination, seedling establishment and mycorrhiza formation in epacrids under controlled conditions. *Woollsia pungens* (Cav.) F. Muell. was chosen for specific study (i) because of its importance as a component of native bushland and (ii) the species has horticultural potential

The project was subdivided into the two distinct aims:

(i) To determine what factors control germination and seedling establishment in *Woollsia pungens* and to establish a procedure for routine germination, and

(ii) To determine the factors necessary for the establishment of a mycorrhizal relationship in *W. pungens* under axenic conditions and study the development of this relationship.

Seeds of known provenance of *Woolfsia pungens* were collected from a large population growing in the Georges River National Park on two different years and subjected to germination trials, with emergence of the radicle as the measure of successful germination. No dormancy was apparent and we found no specific effects of photoperiod, light intensity, temperature or smoke on percentage germination. We have found that *W. pungens* has a distinct juvenile stage and that there is a transition from this to the adult stage when the seedlings are 12-18 months old. This transition is accompanied by a change in leaf shape. Calcium hypochlorite was found to be an effective surface sterilizing agent for the seed and an axenic culture system was established to grow seedlings and inoculate them with an appropriate mycorrhiza-forming fungus and follow whether mycorrhizal synthesis had occurred and whether it had been beneficial to plant growth. Using this system we inoculated boxes containing seedlings with the endophyte MG60 that had been isolated from *Woolfsia pungens* in the wild. We found that plants in boxes that had been inoculated with MG60 developed mycorrhizas. Plants in the boxes that had been inoculated were more vigorous than those in boxes that had not.

Horticultural Potential of an endangered species, the Freycinet Wax Flower

Ms Natalie Papworth & Dr Alan MacFadyen, Royal Tasmanian Botanical Gardens, Mr Alan Gray, Tasmanian Herbarium, Dr Anthony Koutoulis and Ms Aina Price, School of Plant Sciences, University of Tasmania, Dr Andrew Rozefelds, Tasmanian Museum and Art Gallery.

Surveys undertaken on the Freycinet Peninsula found over 100 plants of the critically endangered Freycinet Wax Flower (*Philothea freyciana*). All plants are restricted to the Hazards, and a single plant is also known from nearby Cape Tourville. The Freycinet Wax Flower is restricted to skeletal soils derived from granitic rocks, and it often occurs in runnels and in vertical crack lines in the granitic terrain. The Freycinet Wax Flower is likely to be slow growing, although both young and mature plants were located, which indicates recruitment is occurring in the wild.

As the species is critically endangered a number of propagation techniques were attempted, including seed, tissue culturing and standard vegetation propagation, to establish an ex situ population. Standard nursery vegetative propagation methods were found to be the most effective, and as a result the Royal Tasmanian Botanical Gardens (RTBG) now holds 70 cutting-produced plants in pots from various genotypes. The project has successfully established an ex situ collection of this critically endangered species at the RTBG.

Tissue culture techniques have successfully resulted in shoot proliferation, but we have been unable to induce root initiation in explants to date. If we can successfully overcome this challenge it will become possible to explore the horticultural potential of this attractive species.

The Scientific Research Committee

The Foundation's Scientific Research Committee is an accredited panel of scientists that approves all projects to be funded from the Foundation's Research Fund. Its members assess the scientific merit and technical feasibility of research proposals. The final decision on which projects are funded rests with the Council. Members of the Scientific Research Committee serve in a voluntary capacity.

Current members are:

(Chair) Professor Richard Williams (*University of Queensland*)
Dr Trevor P. Whiffen (*LaTrobe University*)
Professor Betsy Jackes (*James Cook University*)
Dr Peter McGee (*Sydney University*)
Dr Kingsley Dixon (*Kings Park & Botanic Gardens, WA*)

The Australian Flora Foundation is a not-for-profit organization with the sole objective of fostering scientific research into Australia's flora.

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