

Foreword

This special issue of *Functional Plant Biology* contains a selection of papers that represents the topics discussed at the 2nd meeting of plant ecophysiologicalists in Australia, ECOFIZZ 2005 'Ecological physiology of terrestrial and aquatic ecosystems: methods and current research'.

Over 40 plant scientists from Australia and overseas (Vietnam, France, USA, Germany) attended the conference held at The University of Queensland's Moreton Bay Research Station on North Stradbroke Island, 27 November–2 December 2005. ECOFIZZ 2005 was held concurrently with the annual conference of the Ecological Society of Australia in Brisbane, and several delegates participated in both meetings.

ECOFIZZ 2005 combined methods workshops and presentations of original research. In the mornings, attendees had the opportunity to gain hands-on experience in the setting of magnificent Stradbroke Island heathlands, woodlands and mangroves, to measure CO₂ fixation and fluorescence of leaves, sap flux in trees, soil respiration and water relations, and to set up a state-of-the-art field logging station.

The 30 presentations of the meeting, spanning the realms from landscape to molecule, highlighted the exciting ecophysiology research activities in Australia, including many new methods that are currently being developed to further this research. Similar to the first ECOFIZZ meeting (ECOFIZZ 2003 — Special Issue of *Functional Plant Biology* Volume 31, Issue 5, 2004), attendees saw an excellent selection of presentations. Of special mention were the ten high-quality presentations by early career researchers, and the 'Best Student Presentation Award' was presented to PhD students Le Buu Thach and Anna Richards from the University of Queensland, Andrea Leigh from the Australian National University, and recent PhD graduate Jane Wasley from the University of Wollongong.

A wide range of pertinent topics were discussed:

- (1) *Land use, greenhouse gas and carbon relations.* Greenhouse gas emissions and carbon sequestration potential were discussed in diverse plant communities including grassland, exotic and native tree plantations, and mangrove ecosystems.
- (2) *Nutrients.* Presentations focused on the nitrogen ecophysiology of wild and domesticated rainforest species including *Solanum*, *Ficus* and *Macadamia*, and wood density of *Eucalyptus* in relation to CO₂ enrichment and nutrition.
- (3) *Functional traits.* Topics in this session included investigations of leaf structure, plant growth parameters and architecture, and explored the hypothesis that rarity in plants can be explained by physiological profiles.
- (4) *Secondary compounds and scaling.* This session introduced leaf pigment analysis for fine-tuning remote sensing techniques, and FT-IR microspectroscopy for imaging of leaf compounds, and investigated secondary compounds including cyanogenic glycosides, terpenoids, other essential oils and metabolite profiles in rainforest and woodland trees.
- (5) *Water.* Speakers discussed water relations of Antarctic bryophytes, herbs, and native trees, to determine desiccation tolerance in the context of climate change, plant growth patterns, and tree water use at canopy and stand levels.
- (6) *Temperature.* Topics in this session included thermography as a tool to estimate leaf temperatures in sunlight, response of photosynthesis to high temperature, and the freezing physiology of subantarctic and alpine *Poa* species.
- (7) *Methods.* This session included comparison of methods estimating internal conductance of CO₂ movement in leaves, woody tissue CO₂ flux, and instrumentation for field research on plant and soil water relations.

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Overall, the meeting was a joyful event that allowed attendees to further their scientific knowledge, experience the island vegetation, and make good use of Stradbroke's surf beaches. As organisers, we were pleased to have had such a diverse audience attending, and look forward to ECOFIZZ 2007, which most likely will take place in Tasmania.



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