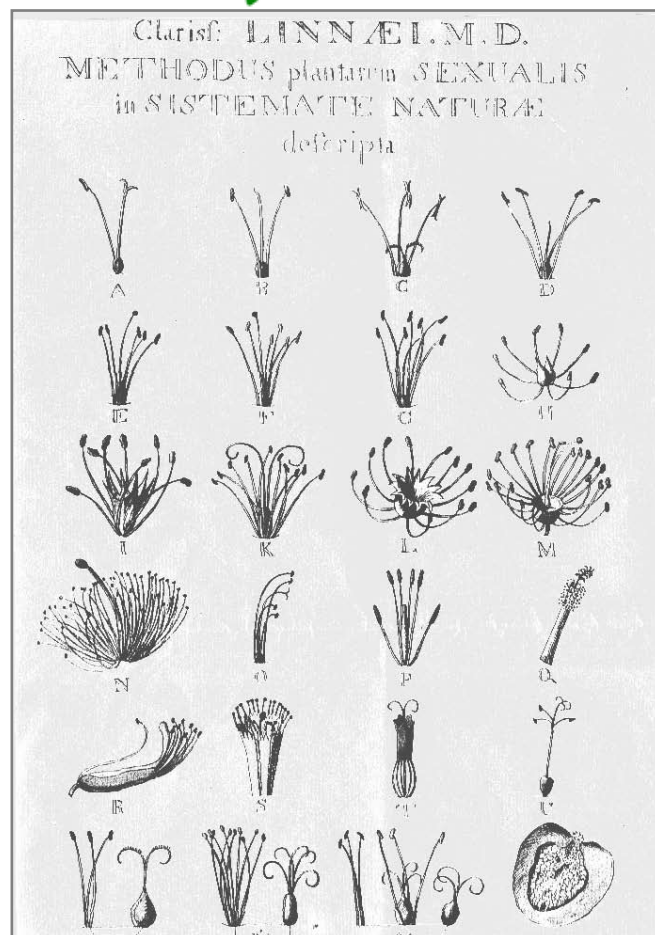


ASBS

*Australian
Systematic
Botany
Society*



Newsletter

No. 130 March 2007

Price: \$5.00

ISSN 1034-1218

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Loose inclusions with this issue

- Nominations for positions on ASBS Council

Publication dates of previous issue
Austral.Syst.Bot.Soc.Nsltr 129 (December 2006 issue)

Hardcopy: 9th February 2007; ASBS Web site: 12th February 2007

From the President

In March 2005, a letter was sent to the then Federal Minister for the Environment and Heritage, Senator the Hon. Ian Campbell, to solicit his support for a scheme to enhance the funding base for the Australian Biological Resources Study to enable more research grants and post-graduate scholarships to be awarded per annum (*Austral. Syst. Bot. Soc. Nsltr* 122: 3–4). The letter was co-signed by Mark Harvey (then President of the Society of Australian Systematic Biologists), Ian Naumann (then President of the Australian Entomological Society), Stephen Hopper (then President of the Australian Systematic Botany Society) and Andy Austin (Director of the Centre for Evolutionary Biology and Biodiversity, University of Adelaide). The letter was copied to ABRS and used within the Department of Environment and Heritage to garner support for an application to the Federal Government to increase the funding base for ABRS. Face-to-face meetings were held with various ministers and assistant ministers, as well as a phone hook-up between the presidents, the Chair of the ABRS Advisory Committee and the then Assistant Minister for the Environment and Heritage, Mr Greg Hunt.

Whilst the push for additional funds for ABRS received a sympathetic hearing, the latest cabinet reshuffle has meant that the department has a new Minister, the Hon. Malcolm Turnbull. It now seems opportune to acquaint Mr Turnbull with our arguments, as that knowledge has likely not passed to him from the previous minister. The following is a transcript of the letter sent.

Dear Minister

Re: Australian Biological Resources Study

The task of identifying, naming and understanding the Australian biota is an immense and important one that is currently suffering from a significant skills shortage. We believe this shortage, without government intervention, will become serious to the point where it will jeopardise the conservation of Australia's biological diversity and key areas of several natural resource industries. We strongly believe that the solution to this impending crisis is best tackled through an enhanced training program and additional research funding to the Australian Biological Resources Study that will expedite the next generation of scientific expertise in this area and the delivery of taxonomic names and their associated biological information.

The science of taxonomy and systematics are interrelated biological disciplines. Taxonomy is the process of naming and describing new species. Systematics is the science of determining how these species are related to each other, where they occur in the

landscape (i.e. their distribution) and, to some extent, their ecology. It is a modern science, informed by molecular analyses and careful study of organisms in the field and in museum and herbarium collections, enabling rapid and predictive biological diagnostic work to be undertaken when needed by industry, public health, water resource organisations, quarantine, Landcare, marine science and conservation.

Australia's Biodiversity

Nearly 500,000 species are thought to exist in Australia, of which only a small fraction are currently named. The following table outlines our current estimates of the extent of most of the biota.

Importance of Taxonomic/Systematic Research

There are numerous examples of enormous increases in previously unknown species that represent significant biological challenges. The discovery of 300 new species of Australian gum trees (eucalypts) in the last 20 years shows that even large organisms are still being found. The discovery of large numbers of insects and other invertebrate animals living in underground caverns and water bodies in arid central Australia has astounded the biological community. This so-called 'stygofauna' (organisms living in underground water) includes whole groups of blind beetles and small crustaceans that were completely unknown only a few years ago. Many of these species have very small natural distributions. The discovery of stygofauna in areas of resource exploration and mining development has triggered a response from State and Federal agencies to ensure that no species is likely to become extinct as a result of any mining or related activity. In a similar way, the documentation of the Australian biota and the development of a sound taxonomic knowledge base are of critical importance to identifying insect pests in agriculture, species that can contaminate food exports, identifying our marine resources, and recognising biosecurity threats to our continent. Taxonomic information is also crucial in understanding the processes that govern the sustainable use of Australia's water resources, including the numerous microorganisms that live in our waterways and deliver crucial ecosystem services.

Essentially, all these areas form key components of the Australian Government's National Research Priority area - An Environmentally Sustainable Australia.

We believe that the increasing skills shortage and diminished research capacity in taxonomy can be solved at relatively modest cost by implementing or enhancing three programs.

1. New ABRS Postdoctoral Fellowship Scheme.

This would be a new initiative modelled on the Australian Research Council postdoctoral

Table 1. The table included in the letter to the Minister on diversity and extent of taxonomic knowledge of Australia's major biotic groups

	% Described	% Undescribed	Estimated # Spp.
Terrestrial Vertebrates	98	2	2,500
Vascular Plants	70	30	25,000
Marine Invertebrates	30	70	80,000
Terrestrial Arthropods	25	75	255,000
Other Terrestrial Invertebrates	15	85	60,000
Fungi	15	85	50,000
Total			472,500

scheme. It would fund two Fellows per year for a period of three years, selected on the basis of excellence. Each Fellowship would be awarded \$90,000 (salary, on-costs and research funding) to pursue taxonomic research within a university or government research laboratory. These early career researchers would represent the next wave of systematist scientists ready to fill the skills shortage
TOTAL COST \$600,000 per annum.

2. *Expanded ABRIS PhD Scholarship program.* The ABRIS currently funds only one new PhD scholarship per year, each of which runs for three years, at a total cost of approximately \$85,000 per year. This program should be immediately expanded to fund two additional PhD students per year. These students would be based at universities around the country and sometimes affiliated with other key research organisations (e.g. State herbaria, museums, CSIRO).
TOTAL ADDITIONAL COST: \$200,000 per annum.

3. *Enhanced ABRIS Research Grants Scheme.* The ABRIS Research Grants Scheme currently distributes \$1,875,000 towards the study of the systematics of the Australian biota. Some 30 projects are funded each year on the basis of excellence and relevance to ABRIS and National Research Priorities. Although this scheme has received slight increases over the last few years the current level of funding is significantly less than 12–14 years ago, even though the cost of doing this research has increased on average by more than 70%. An enhanced scheme should see a doubling of available funds.
TOTAL ADDITIONAL COST: \$1.9 million per annum.

To effectively develop and administer the above schemes, they should be phased in over three years so that the additional funding would build up from \$1.25 million in Year 1 to \$2.7 million in Year 3.

The provision of the above training opportunities for postgraduates and early career researchers would significantly address the skills shortage that is so clearly evident in this area of biology. The requested additional funds are, in reality, modest, but would have an enormous effect on the capacity of the nation to deliver

on government policy and national need. However, without such increases, it is clear that the current limited administered funds for ABRIS will soon start to fail in delivering on its core role as the provider of high-quality knowledge on the taxonomy of the Australian biota.

We thank you for your interest in this matter, and we request that you meet with a small group of us to discuss this matter further.

On behalf of the 2,600 members of our scientific societies/organisations,

The letter was co-signed by Chris Lambkin, President of the Society of Australian Systematic Biologists, Jonathan Majer, President of the Australian Entomological Society, Peter Fairweather, President of the Ecological Society of Australia and myself of behalf of the Australian Systematic Botany Society. The letter was also signed by Bob Hill, Convenor of the ARC Environmental Future's Network and Andy Austin, Director of the Australian Centre for Evolutionary Biology & Biodiversity. Copies of the letter were sent to Merylyn Sleigh, Chair of the Australian Biological Resources Study Advisory Committee and Cameron Slatyer, Director of the Australian Biological Resources Study.

We would like to think that we have a good chance to successfully promote our case to the new Minister (or his Assistant Minister), and lead to an increase in the funding base for an organisation that has delivered much good to environmental science over the past 25 years, but is struggling due to the lack of any real increases in funding since the early 1990s. I'll keep you posted on any developments.

John Clarkson

ASBS Inc. business

New members

Council is pleased to welcome the following new members for 2007 to the Society:

- Miss Melita Baum, School of Botany & Zoology, Australian National University, Canberra, A.C.T.
- Prof. David Cantrill, Royal Botanic Gardens, Melbourne, Vic.
- Mr Matthew Donnon, Environmental Biology, University of Adelaide, S.A.
- Mr Andrew Ford, CSIRO Sustainable Ecosystems, Atherton, Qld.
- Ms Margaret Heslewood, National Herbarium of N.S.W., Sydney.
- Mrs Helen Jolley, Royal Botanic Gardens, Melbourne, Vic.
- Bronwen Keighery, Department of Environment and Conservation, Perth, W.A.
- Dr Pina Milne, Royal Botanic Gardens, Melbourne, Vic.
- Mr David Warmington, Flecker Botanic

Gardens, Edge Hill, Qld.

- Mr Trevor Wilson, School of Biological Sciences, University of Sydney, N.S.W.

Hansjörg Eichler Research Fund Committee report

A bumper crop of ten applications was received for the current (March 2007) round. On behalf of the Eichler Committee I am pleased to announce the successful March 2007 grantees:

- Margaret Heslewood (RBG Sydney/Univ. Adelaide). Phylogeography and bio-geography of genera in the family Cunoniaceae in Australasia (\$2000).
- Jacinta Burke (Univ. Melb.) Systematics and taxonomy of Subtribe Dendrobiinae (\$2000).
- Melita Baum (ANU) Variation within the monotypic genus *Howittia* using morphological and molecular data (\$1000).
- Trisha Downing (Univ. Melb.) Investigating genetic and morphological variability in

the holly grevillea, *Grevillea aquifolium* (Proteaceae) (\$1000).

This round attracted an extremely competitive field of ten applications and choosing the winners was tough. We wish the successful applicants the best of luck with their projects

That so many applications were received in this round is very encouraging in light of the total of five applications that were received in the previous two rounds combined. It is unclear at this stage what is behind the sudden increase in interest. The propaganda was unchanged from previous rounds: there was no media blitz or product placement or celebrity testimonials. It is possible that the increase in the maximum value of grants from \$1000 to \$2000 is a factor, yet this was so for the previous two rounds as well. Perhaps the much-lamented decline in numbers of taxonomy students has been reversed – could it really be true? Whatever the reasons, the Eichler committee has an uncommonly arduous task ahead in reviewing this round. On a less positive note, several applications could not be accepted because they failed to meet the submission rules. It

pains me to reject applications for being one day late but rules are rules and must be applied fairly and consistently. After all, I like to think one of the most important roles of the Eichler grants is in providing an effective training opportunity in grant application writing. If rules are applied flexibly here we would be doing our students a disservice by rewarding lax standards which would be mercilessly punished in the real world of research grant writing.

The closing dates for applications remain March 14 and September 14 each year. Reports by Claire Marks and Tony Roberts, Eichler recipients in 2005, follow in this issue. As always, the expertise and enthusiasm of the Eichler committee (Barbara Briggs, Rod Henderson, Betsy Jackes, Tom May, Chris Quinn) in reviewing grant proposals is greatly appreciated.

Application guidelines and form are available from the Society's website (www.anbg.gov.au/asbs).

Darren Crayn
Chair

Australian Systematic Botany Society Inc.

**Notice of Annual Conference
Darwin, 24th–28th September 2007**

- two days of seminars: papers invited on taxonomic botany and flora conservation
- two days of workshops
- one day field trip

Website to be advised by email to members.
Contact: dale.dixon@nt.gov.au

**Notice of Annual General Meeting
Darwin, Monday 24th September 2007**

In accordance with Section 25 of the Society's Rules notice is hereby given that the Annual General Meeting of the Australian Systematic Botany Society Inc. will be held on Monday 24th September 2007 at Cazaly's, Palmerston (the same venue as the ASBS Conference), commencing at 5.00 pm.

The purpose of the meeting is to:

- confirm the minutes of the AGM held on 14th November 2006,
- receive reports from Council,
- receive and consider the statement of accounts for the 2006 financial year and
- to declare results of the vote for membership of Council.

Nominations for Council office

Please see notice included with this Newsletter.

Reminder on payment of annual Membership Fees

Your 2007 membership fees were due at the beginning of this calendar year.

Under the Rules of the Society you cannot hold office, nor do you have the right to vote, if you are unfinancial.

Refer to the envelope containing this issue of the Newsletter for what you owe.

Eichler Research Fund reports

Evolution of *Nicotiana* L. (Solanaceae) in Australia

Claire Marks

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Introduction

Nicotiana contains 86 species worldwide, including commercial tobacco and its progenitors. The genus also includes 26 native Australian taxa, all in section *Suaveolentes*, which also contains South Pacific and one African taxa. I am studying the morphology of all taxa, and making new field collections, to investigate relationships, taxonomy, biogeography and evolutionary history within this group. My results will be compared to published molecular DNA analysis. All Australian and related taxa are being surveyed for chromosome numbers, which are known to be variable within the group.

There have been a number of revisions of the section since the publication of the first Australian species, *Nicotiana suaveolens* Lehm., in 1818 (Wheeler 1935; Goodspeed 1954; Burbidge 1960; Horton 1981). David Symon (AD) has published and described four new species since the last revision as well as identifying several possible new species requiring further investigation. Australian *Nicotiana* are still relatively poorly collected and known. One of the main barriers to understanding has been their distribution throughout arid central Australia and their ephemeral habit (Fig. 1).

Molecular phylogenies have been successful at placing the genus *Nicotiana* within its family context, including identifying the Australian endemic tribe Anthocercidae (including *Cyphanthera*, *Duboisia*, *Anthocercis* and *Symonanthus*) as the sister group to the genus *Nicotiana* (Olmstead, Sweere et al. 1999; Garcia and Olmstead 2003). Molecular data also show that *Nicotiana* is monophyletic, and that within it the Australian section *Suaveolentes* is also monophyletic (Aoki and Ito 2000; Chase, Knapp et al. 2003; Clarkson, Knapp et al. 2004). However, these studies have failed to resolve relationships within the section *Suaveolentes* with any degree of statistical support. DNA sequences of the *nhF* and *matK* chloroplast genes, other chloroplast loci (*trnL* intron, *trnL-F* spacer and *trnS-G* spacer), and internal transcribed spacer (ITS) regions of nuclear ribosomal DNA, have all been found to be too similar between species to illuminate relationships among them. The fact that the Australian species of *Nicotiana* are so genetically similar suggests that they may have radiated and differentiated fairly recently or

alternatively that they are a more ancient group that has undergone little genetic change.

Project aims

The primary aims of my PhD project are to confirm terminal taxa (species and subspecies) and to create a morphological phylogeny of *Nicotiana* section *Suaveolentes*. I aim to discover new morphological characters for this analysis to create the phylogeny. Methods used include:

1. Growing all taxa from seed in the glasshouse to discover new seedling and juvenile characters, and to allow comparison of adult characters from plants grown under the same conditions.
2. Electron Microscopy (SEM) of seeds and trichomes.
3. Cytology – chromosome counts of all species. Chromosome numbers in the section are known to be variable with $n=16, 18, 19, 20, 21, 22, 23$,



Fig. 1. *Nicotiana velutina* H.-M. Wheeler growing in red sand at Bundooma, Old Ghan Railway track, Northern Territory.

- 24, and the whole section is of amphidiploid origin (Chase, Knapp et al. 2003).
4. Field work to collect rare and poorly known taxa so that they can be included in the growth trial, SEM and cytology.
 5. Study of herbarium specimens.

Field work

In October 2005 I undertook field work in the Northern Territory and South Australia assisted by the Eichler Research Fund. I am very pleased to report that I was successful in finding *Nicotiana truncata* Symon, which is only found in the Gibber desert between Coober Pedy and Oodnadatta, SA. I feared that my trip may have been too long since rain after I unsuccessfully scoured every dry creek line that crossed the road for what felt like several hundred kilometres. However, plants were eventually found a few hundred metres from the type locality at Fish Hole Creek. This small population along the roadside was the only one I found.

I was also able to find *Nicotiana burbridgeae* Symon at Witjira National Park, SA, on the edge of the Simpson Desert. Many thanks to Denise Noack, University of Adelaide, for directions to a known population (Fig. 2), which prevented what could have been days of fruitless searching across the vast plains. The plants were starting to senesce but had lots of seed and just a few flowers left.

Fig. 2. The author collecting *Nicotiana burbridgeae* Symon at Witjira National Park, South Australia. (The *Nicotiana* plants are in the left foreground).



Having located these two key species, I then focused on finding as many as possible of the six other *Nicotiana* species found in the vicinity of Alice Springs. I found many plants growing on red sand dunes along the Old Ghan Railway line, in what seemed to me as very difficult conditions (Fig. 1). Needless to say, they looked quite different from those I had been growing in the glasshouse. Many thanks to the Rangers at Watarrka National Park who guided me to an amazing population of *Nicotiana gossei* Domin growing in a spring-fed creek. David Albrecht at the Alice Springs Herbarium was also very helpful in explaining the ecological niches of species that I had not been able to deduce from the literature, and for suggesting collection sites that were much more likely to have plants than the sites noted from herbarium records.

Overall the trip was very successful and I returned with presses at least as full as I anticipated. Collecting in central Australia was an amazing experience and I was certainly impressed with the desert plants and landscapes, despite other adventures such as heatstroke and getting bogged in sand.

Other work

I have successfully used my field collections, as well as seed from seed banks, to grow plants for morphological analysis. Scanning Electron Microscopy (SEM) of trichomes (Fig. 3) has been particularly interesting and several new hair types have been identified. Surveying all taxa for hair types using preserved plant material is still underway. SEM of seeds has also been useful; however, seed size, shape and to a lesser degree ornamentation have been found to vary within species as well as between species.

A number of flower characters have been measured and analysed phenetically to determine terminal taxa. When I first started this project I was convinced that many species were impossible to tell apart, and very difficult to key out. My current understanding is that many species are very similar, but separable, although there are few clear cut vegetative characters. I am still investigating flower size and shape.

I was fortunate to be able to attend the VI International Solanaceae Conference in Madison Wisconsin in July 2006, and afterwards to be able to visit the New York Botanic Garden. I also spent some time working at Kew and the Natural History Museum, London, using their collections to sort out some taxonomic problems, particularly involving the three South Pacific taxa.

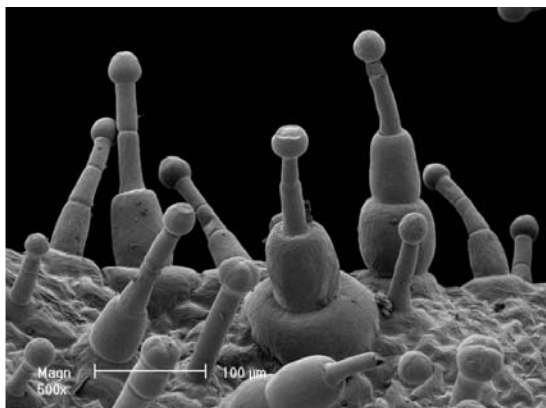


Fig. 3. *Nicotiana burbridgeae* Symon glandular trichomes from the lower leaf surface (SEM image).

I started working on chromosome counts late last year and met with some difficulties in preparing root tip squashes. However Associate Professor Brian Murray, University of Auckland, recently ran a workshop in Melbourne on chromosome techniques and I hope to have much better success in the near future. My morphological work also continues but is not ready to report as yet.

Acknowledgements

I would like to sincerely thank the Australian Systematic Botany Foundation for awarding me the Eichler Research Award that made my field work possible. Thanks also to the Australian Biological Resources Study (ABRS), School of Botany and the University of Melbourne whose travel grants also allowed me to attend

the Solanaceae Conference and visit overseas herbaria last year. Many thanks to my supervisors Professor Pauline Ladiges and Dr Éd Newbigin for all their help and support.

References

- Aoki, S. and M. Ito (2000). Molecular phylogeny of *Nicotiana* (Solanaceae) based on the nucleotide sequence of the *matK* gene. *Plant Biology* 2: 316-324.
- Burbridge, N. T. (1960). The Australian species of *Nicotiana* L. (Solanaceae). *Australian Journal of Botany* 8: 342-378.
- Chase, M. W., S. Knapp, et al. (2003). Molecular Systematics, GISH and the origin of hybrid taxa in *Nicotiana* (Solanaceae). *Annals of Botany* 92: 107-127.
- Clarkson, J. J., S. Knapp, et al. (2004). Phylogenetic relationships in *Nicotiana* (Solanaceae) inferred from multiple plastid DNA regions. *Molecular Phylogenetics and Evolution* 33: 75-90.
- Garcia, V. F. and R. G. Olmstead (2003). Phylogenetics of the tribe Anthocercideae (Solanaceae) based on *ndhF* and *trnL/F* sequence data. *Systematic Botany* 28(3): 609-615.
- Goodspeed, T. H. (1954). *The Genus Nicotiana: Origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics*. Waltham, Mass., Chronica Botanica Company.
- Horton, P. (1981). A taxonomic revision of *Nicotiana* (Solanaceae) in Australia. *Journal of the Adelaide Botanic Gardens* 3: 1-56.
- Olmstead, R. G., J. A. Sweere, et al. (1999). Phylogeny and provisional classification of the Solanaceae based on chloroplast DNA. *Solanaceae IV*. M. Nee, D. E. Symon, R. N. Lester and J. P. Jessop. London, Royal Botanic Gardens, Kew.
- Wheeler, H.-M. (1935). Studies in *Nicotiana* II. A taxonomic survey of the Australasian species. *University of California Publications in Botany* 18(4): 45-68.

An investigation into the molecular phylogenetics of *Jedda multicaulis* (Thymelaeaceae)

Tony Roberts

James Cook University, Cairns

This project explores the phylogenetic position of *Jedda multicaulis* within the Thymelaeaceae using molecular techniques.

Background

Jedda multicaulis J. Clarkson is a shrub endemic to the tropical savanna of Cape York Peninsula. When he first described it in 1986, Clarkson erected the new genus *Jedda*, in the family Thymelaeaceae to accommodate it. *Jedda* was placed in the subtribe *Linostomatinae* Domke, suggesting an affinity with *Lophostoma*, *Enkleia* and *Linostoma* (Clarkson 1986). There are no other Australian endemics in the subtribe. The genus *Lophostoma* contains four species, all found in northern tropical South America, *Linostoma* contains six species which occur from India to New Guinea and the three species

of *Enkleia* occur from the Andaman Islands through South East Asia and Malesia (Mabberley 1997). According to Clarkson (1986) the genera *Linostoma* and *Jedda* are difficult to separate on floral morphology alone, but he regarded the traditionally narrow generic limits within the Thymelaeaceae justified the erection of the new genus (Clarkson 1986).

The latest revision of the Thymelaeaceae (Herber 2003) reflects recent investigations into the phylogeny of the family, which have included the use of molecular, morphological, anatomical, biochemical and fossil data. *Jedda*, *Lophostoma*, *Enkleia* and *Linostoma* were again placed together in the *Linostoma* group of the tribe Daphneae, sub family Thymelaeoideae, along with the tropical African genera *Dicranolepis*,

Synaptolepis and *Craterosiphon*. A review of the literature failed to reveal the use of any molecular data to support the placement of *Jedda multicaulis* in this group. Pollen morphology (Herber 2002) supports the placement of *Jedda* in the subfamily Thymelaeoideae.

Aims

This study attempted to determine firstly if Herber's (2003) placement of *Jedda multicaulis* in the *Linostoma* group is supported by a phylogenetic analysis of molecular data, and secondly to assess its monotypic generic status.

This investigation is part of a larger research project currently being undertaken toward the degree, Master of Science (MSc). The title of the research is "An investigation into the causes of rarity of an environmentally hardy, savanna plant: *Jedda multicaulis*". The project investigates the apparent paradox of natural rarity combined with environmental hardiness by investigating the taxonomic, geographical, ecological and evolutionary parameters of *Jedda multicaulis*, a species that is currently listed as 'vulnerable'.

Methods

rbcL sequences were initially selected to investigate *Jedda*'s phylogenetic position within the Thymelaeaceae because they had been successfully used by van der Bank et al. (2002) to explore the phylogenetic relationships of the African and Australian genera of Thymelaeaceae (excluding *Jedda*). Additionally, the authors used the *rbcL* sequences of 27 genera within the Thymelaeaceae, which they lodged with GenBank allowing them to be used in this investigation, significantly reducing the cost of obtaining the required data. Three members of the *Linostoma* group were sequenced in that study, *Synaptolepis alternifolia*, *Craterosiphon scandens* and *Enkleia siamensis*.

The DNA of ten species from five of the six genera placed in the *Linostoma* group with *Jedda* by Herber (2003) were procured from the RBG Kew DNA Bank. This avenue was chosen in an effort to expedite the research and maximise the effectiveness of the allocated project budget.

DNA was extracted from fresh leaf material of *Jedda multicaulis*, and the *rbcL* gene was amplified and sequenced.

rbcL amplification of the DNA of specimens procured from the RBG Kew DNA Bank however proved difficult. An attempt at PCR amplification of the entire *rbcL* gene failed to produce any useable product. A second attempt after amplification using GenomiPhi (a whole genome amplification kit that uses bacteriophage Phi29 DNA polymerase from GE Healthcare) also failed. A third attempt was made to amplify

the *rbcL* gene in two overlapping pieces. Success was achieved for only three specimens, *Linostoma pauciflorum*, *L. persimile* and *Dicranolepis grandiflora*, and only the first half of the *rbcL* gene from those species could be sequenced.

As a preliminary check, the resultant sequences were compared to sequences in the GenBank database using Basic Local Alignment Search Tool (BLAST) (National Center for Biotechnology Information). The results indicated that the sequences of *L. pauciflorum* and *D. grandiflora* were most similar to sequences of other members of the *Linostoma* group of the tribe Daphneae, sub family Thymelaeoideae. The sequence of *L. persimile* was most similar to sequences of members of the Fabaceae.

The amplification and sequencing of the *rbcL* gene of *L. persimile* was repeated from scratch, to minimise the chance that the result was caused by local contamination. The result was the same.

A preliminary analysis of the *rbcL* sequences of *Jedda multicaulis*, *Linostoma pauciflorum*, *Dicranolepis grandiflora* and those of van der Bank et al. (2002) using parsimony and Bayesian methods indicated moderate support (BS>75%; PP> 0.95) for a clade comprising *Jedda multicaulis*, *Synaptolepis alternifolia*, *Craterosiphon scandens* and *Enkleia siamensis* with *Linostoma pauciflorum* and *Dicranolepis grandiflora* forming a weakly supported sister clade. These results lend support to Herber's (2003) classification and placement of *Jedda multicaulis* in the *Linostoma* group.

Future

The failure of most of the RBG Kew DNA Bank specimens to amplify may have been the result of degraded DNA extracted from dried herbarium specimens. The next step in this study is to attempt to acquire fresh vegetative material of species within the six genera placed in the *Linostoma* group by Herber (2003) in an attempt to obtain useable DNA, and thus complete *rbcL* sequences. Other regions will subsequently be sequenced to better assess *Jedda*'s monotypic status. The extraction, amplification and sequencing of fresh specimens should pose fewer difficulties than the RBG Kew DNA Bank specimens based on the success experienced with the fresh vegetative material of *Jedda multicaulis*.

Acknowledgments

I would like to thank the Australian Systematic Botany Society for financial support provided through the Hansjörg Eichler Scientific Research Fund. The funding permitted me to explore the various techniques used in molecular phylogenetic research and has provided me with a sound base on which to continue my investigation. I would also like to thank my supervisors, Prof. Paul

Gadek and John Clarkson, for their invaluable guidance.

References

- Clarkson, J.R. (1986) *Jedda*, a new genus of Thymelaeaceae (subtribe *Linostomatinae*) from Australia, *Austrobaileya* 2, 203-210.
- Herber, B.E. (2002) Pollen morphology of the Thymelaeaceae in relation to its taxonomy, *Plant Systematics & Evolution* 232, 107-121.
- Herber, B.E. (2003) Thymelaeaceae, In *Flowering plants: dicotyledons: Malvales, Capparales and non-betain*

- Caryophyllales*, Vol. 5 (Eds Kubitzki, K. and Bayer, C.). Springer-Verlag, Hamburg, pp. 373-396.
- Mabberley, D.J. (1997) *The plant-book: a portable dictionary of the vascular plants*. Cambridge University Press, Cambridge.
- Van der Bank, M., Fay, M.F. and Chase, M.W. (2002) Molecular phylogenetics of Thymelaeaceae with particular reference to African and Australian genera, *Taxon* 51, 329-339.
- National Center for Biotechnology Information. Basic Local Alignment Search Tool (BLAST). www.ncbi.nlm.nih.gov/BLAST/

Articles

Life Science Identifiers (LSIDs) in the global and Australasian biodiversity communities

Kevin Thiele

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Information and database managers from the combined Australasian herbarium and museum community met in Canberra in April (see p. 16), to consider and respond to a recommendation from the Global Biodiversity Information Facility (GBIF) and Biodiversity Information Standards (TDWG) organizations that all major Australian biological collections adopt and deploy Life Science Identifiers (LSIDs). The recommendation was endorsed by the group, and all institutions have been urged to support LSIDs and develop implementation plans and strategies for their deployment. The purpose of this article is to explain what on earth this is all about, by providing a background on LSIDs and their significance.

The World Wide Web revolutionized the way in which we broadcast and access digital information. The next revolution will come from new technologies that allow us to synthesize, manage and integrate the web's vast quantities of information – the so-called semantic web. These technologies will evolve the Web from an electronic notice board into a truly connected, dynamic and flexible knowledge collaboration.

Globally Unique Identifiers (GUIDs) are a critical building block in this new revolution. One type of GUID – Life Science Identifiers (LSIDs) – have been chosen as an agreed standard in the global biodiversity community, supported internationally by GBIF and TDWG. LSIDs are decentralized, collaborative and free. Individual institutions - the custodians of data - manage the deployment of LSIDs for their own shareable data assets rather than relying on a centralized issuing authority. This provides LSIDs with much-needed flexibility in the fast-evolving web. The risks of implementing LSIDs are considered to be low, and the risks of not implementing them high.

So what are LSIDs? They are small, lightweight, globally unique digital tags that can be attached to any digital object. Objects that carry an LSID can be uniquely identified and attributed, even when the object is shared, merged into other objects, or moved from its local context. Three properties of LSIDs contribute to their flexibility and utility.

Think global, then everything's local

Databases use unique identifiers to manage records. For example, specimen records in a specimen database are often identified using accession numbers, and names databases generally assign nameIDs or other numbers for each name. The uniqueness of the identifier allows a record to be unambiguously identified – clearly important in managing, using and maintaining the data.

However, identifiers are almost always local to the particular database in which they are assigned. If data from two or more databases are combined in some way, it is likely that uniqueness of the combined identifiers will no longer be guaranteed. It may then no longer be possible to unambiguously refer to any given record, and all records will need to be cumbersome renumbered after which many broken processes and links will need to be fixed.

Imagine if every database record in every database in the world had an identifier that could be guaranteed to be globally unique. Then when two databases are merged or share data it would be immediately possible to use the newly accessible records with no possibility of identity clashes or ambiguity.

LSIDs provide just such a way of tagging records in databases with globally unique identifiers. An LSID is a string of text of the form `urn:lsid:authority:namespace:identifier`

An example would be: urn:lsid:herbarium.PERTH.lsid.org.au:specimen: 02344759

If the authority (herbarium.PERTH.lsid.org.au) is a unique address, and the authority can guarantee that the record 02344759 in its specimen table is unique, then the LSID is globally unique and can identify that record and that record only.

Further, LSIDs may be applied not only to records in databases but to any type of digital object that may at some time be shared. LSIDs in exactly the same form can be applied to specimen records, names, descriptions, characters and character states, documents, images, spreadsheets, phylogenies – to any digital object of any kind.

Applying LSIDs to objects is cost-free, and LSIDs are assigned by custodians of data with no requirement for a centralized issuing authority. For these reasons, LSIDs have been adopted by the international biodiversity community as the principal system of globally unique identifiers for use in the life sciences domain. LSIDs are seen as an enabling technology for the next generation of web applications, processes and operations.

Have calling card, will travel

LSIDs are more than just unique identifiers for records and other digital objects. They also act as calling-home cards for the objects they are attached to. This means that objects with LSIDs can never get lost on the web, and can always be ascribed back to their custodian or owner using simple protocols for communication.

Consider a database (the client) which aggregates records from several source databases. The owner of the client database may need to query the source databases at intervals for updates to their records. To do this the client would need to maintain systems for identifying each record in its source database, and for querying each source database for the updates. The updating would almost certainly be a cumbersome and expensive operation.

If, however, the records carry LSIDs and the source databases establish simple resolving services, a straightforward mechanism for updates can be established. Part of an LSID is the address (e.g. herbarium.PERTH.lsid.org.au) of the authority which maintains the resolving service of the source database. Free web tools are available which will accept an LSID and find from this address the source's LSID resolver. The tool sends the LSID as a query to the source, which recovers from it the pointer to the original record in its database (e.g. specimen:02344759). The resolving service then returns information about the original record in a standard format. The returned information will normally include essential data about the record, and this can

be used by the client to update its copy of the record.

If all records carry LSIDs, one process attached to the client's database can be used to update records from all sources, and one process at the client databases can be used to supply updates for all clients. Substantial time and cost savings are available at both ends using LSID technology.

Carry meaning, not just data

Over time, the ability of LSIDs to recover information about digital objects from their custodians will establish the true power of LSIDs, and play a part in the evolution of the World Wide Web into the Semantic Web – a flexible and intelligent web of knowledge. This is because the information returned when the LSID of a digital object is queried can be made meaningful to machines as well as humans.

Consider, as an example, Google Images. When this was new a few years ago it was considered pretty cool. But it is simply an early and somewhat primitive example of a data aggregator which suffers from the lack of LSIDs.

Google Images is powered by web robots which trawl the web for image objects embedded in web pages. When an image is found, the robot returns to Google a thumbnail of the image and an extract of the html page text that surrounds it. From this text, Google Images makes a guess at the meaning of the image – is it an image of Copacabana Beach or of a funnel-web spider? The thumbnail image, a link to the original image and the inferred meaning is then databased ready for querying. The weak link is the inference part – these days any query using Google Images will return some images that correctly match the query but many that are simply wrong – a funnel-web spider image returned from a query about Copacabana Beach is ample evidence of a failed inference.

As, however, images are progressively tagged with LSIDs it will become possible to build vastly more accurate inference engines. If the funnel-web spider image is tagged with an LSID it will be possible to directly query the original custodian of the image to ask for information about it. The query will return tagged, machine-readable, information using standard and well-structured formats. One tag may say "This image is of an organism" while another may say "The name of the organism is *Atrax robustus*". Immediately, an inference engine like Google Images will be able to identify the image much more accurately, because it has real information from the custodian of the image rather than simply the context of the image on its page.

A system of LSIDs becomes more powerful still when LSIDs point to other LSIDs. For example, if the name of the funnel-web spider changes, inference will become more difficult, as it will be hard for a machine to determine that the name has changed and what it has changed to. In the above example, however, if the "name" tag of the funnel-web spider image said "the name of this organism can be found at `urn:lsid:museum.NSW.lsid.org.au:name:117858` then the current name can be retrieved by the same process, through a query to another authority. In this way, whenever the name changes, the image will be automatically referred to its correct name rather than to an out-of-date name.

Simple examples like these show the power that LSIDs are bringing to the World Wide Web. The global biodiversity community has a real and immediate need for LSID technology; indeed, the

success of initiatives such as the Atlas of Living Australia and the ePedia of Life depend on LSIDs being used extensively by our community's information systems. It's likely, further, that the next generation will use LSIDs in reasoning and inference engines to create information structures that can hardly be imagined today.

All Australian herbaria have been asked to implement LSIDs as quickly as possible with available resources. Early benefits expected to flow include more effective management of specimen records between herbaria, better handling of taxon names and concepts, and more (and more flexible) electronic floras and identification keys. You may not see the LSIDs in the background, but they may soon be everywhere.

Web ref.: <http://wiki.tdwg.org/twiki/bin/view/GUID/LSID>

Environment (and agriculture) the big loser in closure of CRCs

Rachel McFadyen & Jenny Barker
CRC for Australian Weed Management

¹Climate change is now firmly on Australia's political agenda, and among its predicted environmental impacts scientists warn of a fresh invasion of pest plants and animals and more intense and frequent bushfires. Yet against this backdrop of increasing environmental change and uncertainty, two of Australia's Cooperative Research Centres (CRCs) – the CRC for Australian Weed Management (Weeds CRC) and the Tropical Savannas CRC – are set to close in 2008 and the future of the Bushfire CRC is uncertain. Their closure follows the wind-up in 2006 of the CRC for the Great Barrier Reef World Heritage Area, CRC for Coastal Zone, Estuary and Waterway Management and the CRC for Tropical Rainforest Ecology and Management. The Weeds and Tropical Savannas CRCs recently failed in their bids for a third, seven year term largely because they could not meet the CRC Programme's strict commercialisation criterion.

The Australian Government announced a change in focus for the CRC Programme in 2004, restating its objective as 'enhancing economic growth through user-driven, co-operative public-private research centres that achieve high rates of commercialisation.' In other words, the CRC Programme placed greater emphasis on direct commercialisation processes such as spin-off companies and licensing products, a condition

difficult for 'public good' CRCs to meet. In the wake of the decision not to renew the Tropical Savannas and Weeds CRCs, the CEO of the Bushfire CRC, Kevin O'Loughlin stated his concern that the CRC will fail to meet the tough new commercialisation criterion when it bids for its second term in 2008 (*Canberra Times* 6/1/07). Such is his concern that O'Loughlin has foreshadowed the possibility of foregoing the lengthy rebid process to concentrate efforts on establishing a permanent national research institute in fire ecology and forest research funded by universities and state governments.

The closure of these CRCs is not just a blow to the environment. The Weeds and Tropical Savannas CRCs also conduct important research for Australia's broadacre and grazing industries. And Australia's agricultural industries have suffered a further setback with the CRC for Innovative Dairy Products also failing to secure a new term in the latest round of funding. The Productivity Commission, the Australian Government body that reports on science and innovation, has been critical of the CRC Programme's move towards commercialisation and away from 'public good' research. In a report (Productivity Commission 2007) released in March 2007, the Commission recommended that:

The original objectives of the program — the translation of research outputs into economic, social and environmental benefits — should be reinstated. This is likely to produce greater community benefits than focusing public support on the commercialisation of industrial research.

¹ This article is modified from an item originally requested by the Australian Network for Plant Conservation published in *Australasian Plant Conservation* 15(4).
Rachel McFadyen is CEO of the CRC for Australian Weed Management.

Unfortunately, these findings have probably come too late to resurrect the failed CRCs and they must look to alternative funding sources to survive beyond their current term.

Weeds CRC achievements

With the impending closure of the Weeds CRC in little more than 12 months, it is fitting to look back at some of its achievements and initiatives, particularly in the environment sector.

The Weeds CRC has:

- *National partnerships* Established partnerships with key environmental research organisations including Adelaide University, CSIRO Entomology, Qld Department of Natural Resources & Water, CSIRO Plant Industry, CSIRO Sustainable Ecosystems, SA Department of Water, Land & Biodiversity Conservation, NT Dept of Infrastructure, Planning & Environment, University of New England and the University of Queensland.
- *Nationwide expertise*. Developed a world-class, nationwide network of researchers including internationally recognised leaders in weed management.
- *National Weeds Advisory Group*. Representation on the National Weeds Advisory Group which advises the Australian Government on weeds research and development.
- *Biosecurity*. Exposed a loophole in Australia's quarantine laws that would allow the importation of 125,000 plant species into Australia – amongst them 4000 known weeds – without any screening (Spafford et al. 2004). The Weeds CRC worked with Biosecurity Australia and the loophole was finally closed late last year.
- *Weed Spotters*. Detected new weeds through the establishment and training of a network of individuals with botanical expertise. To date, about 200 Weed Spotters have been trained and over 700 specimens have been submitted to the Queensland Herbarium.
- *Early Warning System*. An arrangement with Australian herbaria to develop an early warning system to alert weed managers to the first indication of plant spread in a region/state. The system will integrate with data from Australia's Virtual Herbarium.
- *Weed risk assessment*. Developed decision-support tools for managing new weed incursions and strengthened weed risk assessment systems used in Australia.
- *Biodiversity*. Produced the first report in Australia that quantifies the impact of alien plants on Australian biodiversity (Coutts-Smith and Downey 2006). The New South Wales-based report found that invasive plants are the biggest threat to the survival of native species after land clearing. The Weeds CRC is also reviewing the impact of weeds on threatened and endangered species and ecosystems nationally.
- *Indigenous lands*. Worked closely with the Australian Quarantine and Inspection Service in a project to raise weed awareness on indigenous lands in Northern Territory and Cape York, Qld, employing two Aboriginal Liaison Officers to help coastal communities identify and respond to potential invasive plants.
- *Environmental weed management*. Packaged and delivered a range of weed management information, working with the Commonwealth Department of Environment and Heritage to produce management guides for the Weeds of National Significance and Alert List for Environmental Weeds, as well as an Introductory Weed Management Manual. The Weeds CRC has also produced a series of Best Practice Management Guides for key environmental weeds. A further eight new management guides are in production and will be available before the Weeds CRC's closure.
- *Reducing chemical reliance*. Researched and promoted integrated weed management tactics in the environmental and agricultural sectors to reduce costs, lessen chemical reliance and avoid herbicide resistance.
- *Biocontrol*. Contributed to the successful release of biological control agents such as blackberry, bridal creeper and mimosa and conducted world-leading research into the science of biocontrol, with the results published in international scientific journals. The Weeds CRC also reviewed over a century of biological control in Australia, finding clear evidence of its cost-effectiveness in weed management (Page and Lacey 2006).
- *Nursery/landscape industries*. Worked with the nursery/landscape industry and gardening media to inform them of the damage caused by invasive garden plants and the existence of state and federal laws regulating the sale and distribution of noxious weeds.
- *Bushland Friendly Gardens*. Helped Australians choose environmentally friendly plants for parks and gardens through its Bushland Friendly Gardens website.
- *School programs*. Led the national development of Weed Warriors, an education and awareness program that introduces school students to weed science. The Weeds CRC also developed Lord of the Weeds, a national competition for high school students to design a weed management strategy for their school or local area. Teaching resources and activities aimed at raising weed awareness amongst upper primary school students are available through the Weeds CRC's Ghastly Guests initiative.
- *VET sector*. Prepared and delivered a range of resources needed by the Vocational Education and Training (VET) sector for competency based training in weed related areas.
- *Media campaigns*. Raised community awareness via regular media releases and

through established relationships with key journalists. Recent environmental press releases include 'Make your garden waterwise – but don't plant weeds!', 'Garden plant threat to native species', 'Weeds a catchment priority' and 'Prepare for climate change invaders'.

New national weeds centre proposed

The Weeds CRC has been invited by the Australian Government to submit an alternative model for a new national weeds organisation. Major partners in the Weeds CRC have expressed their willingness to remain engaged and are backing the proposed new Centre. If the proposal is successful, the Australian Centre for Weed Research will enable core collaborative research and delivery capacity to continue in the long term. If it fails, Australia will be without a national organisation to coordinate weed research and to package and deliver these results across the full range of private and public land use, including park managers, bushcare and landcare groups, local government, regional Natural Resource Management (NRM) bodies and

farmers. Furthermore, many of the Weeds CRC's initiatives and the momentum and skills it has built up over the last 12 years will be lost. The proposal for the new centre is available on the Weeds CRC website (Web ref. 1) and is currently before the Australian Government.

References

- Canberra Times 6/1/07 'Threat to bushfire research'.
Coutts-Smith, A. and Downey, P. (2006) Impact of weeds on threatened biodiversity in New South Wales. *CRC for Australian Weed Management. Technical Series 11*. www.weeds.crc.org.au/publications/technical_series.html
Page, A.R. and Lacey, K.L (2006) Economic impact assessment of Australian weed biological control. *CRC for Australian Weed Management. Technical Series 10*.
Productivity Commission. (March 2007) *Public Support for Science and Innovation* (Research Report). Australian Government.
Spafford Jacob, H., Randall, R. and Lloyd, S. (2004) *Front door wide open to weeds: an examination of the weed species permitted for import without weed risk assessment*. WWF Australia, Sydney.
Web ref. 1. www.weeds.crc.org.au/main/weeds_crc_to_end.html

Database of Robert Brown's Australian Botanical Specimens available online in FloraBase

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During my term as ABLO in 1998–99 I spent many days at the British Museum of Natural History (BM) photographing material and retrieving literature requests from various departmental libraries. On one of these occasions I had the good fortune to meet David Moore, a long-time associate of the BM. He was busily capturing data from Robert Brown sheets into a small laptop – and so began a discussion on the Brown collections and the merits of databasing.

The then upcoming bicentenary of the Flinder's expedition, on which Robert Brown made several thousand biological and geological collections, served to reinforce David's determination to make as much of the valuable information he had collected available widely.

To this end we arranged with the management of the BM's Botany Department for David's database to be made available on the Western Australian Herbarium's web server. The work to do this was completed in time for the bicentenary *Investigator 200* symposium held in Albany in December 2001 (see Wege et al. 2005), which also saw the launch of 'Nature's Investigator: The Diary of Robert Brown in Australia' (Vallance et al. 2001).

As readers will know, Brown often used temporary manuscript names for his gatherings because the

plants he collected were new and unpublished. Correlation of these manuscript names with the published names is aided by the database, but it also has much value in listing taxa by genus, family, locality or state. The database on the website has a simple structure, containing just five fields. More detail is available in Chapman et al. (2001). The five fields are:

1. *Bennett Number*: Assigned in the mid 1870s when Robert Brown's collection of dried Australian plants dating from 1801–05 was first catalogued at the BM.
2. *Last Determined Name*: The most recent determination on the sheet in the BM.
3. *Family*: The family name is that under which the BM herbarium was arranged in the nineteenth century following the move from the British Museum at Bloomsbury. The order today is a modification of that used by Bentham and Hooker (1862–83).
4. *State*: The is the present-day Australian State.
5. *Label data*: This field contains an unedited transcription of Brown's original label data of specimens in his herbarium. It contains the manuscript name which the plant was given on collection as well as any other manuscript names; some basic ecological data, e.g. "... In paludosis ad radices collium Bay I ora australis Nova Hollandia Jany 11 1802 desc ..."; and Flinders's original chart nomenclature where

appropriate, e.g. "Island y2" [= Astells Island, Northern Territory] and the few geographical names that were published in 1801–05. It should be remembered that this field is, for the most part, a transcription and contains Brown's 18th century abbreviations and spellings.

The website presents all the detailed collection label details available in the database (see also Groves & Moore 1986). However, these data represent the state of knowledge on Brown's plant collections in mid-2001 and are almost certainly incomplete.

David Moore continues to update the database at the BM and has made some structural changes to the database subsequently. The aim has been to allow the data in the website to be updated regularly, however, impediments remain. Not the least is devising a simple system to capture any new determinations applied to the Brown sheets either at the BM itself or when specimens return from loan. The ABLO may have some role in effecting this; or perhaps in maintaining the database directly in coming years.

Ultimately, I expect the BM's Botany Department will database all their collections and then all the

currently available data in the Brown database will be housed, maintained and accessed there. In the interim, the Western Australian Herbarium has now formally added the Brown database to its FloraBase web site (Web ref. 1), providing a service to the Australian botanical taxonomic community.

References

- Chapman, A.R., Moore, D.T., Rees, R.G. & Groves, E.W. (2001). Robert Brown's Australian Botanical Specimens, 1801–1805 at the BM. Western Australian Herbarium: <http://florabase.dec.wa.gov.au/brown/>
- Groves, E.W. & Moore, D.T. (1986). Preparation of a first listing of the plants collected in Australia by Robert Brown (1773–1858) during the Flinders voyage of 1801–1805. *Australian Systematic Botany Society Newsletter* 49 (December 1986).
- Vallance, T.G., Moore, D.T. & Groves, E.W. (2001). *Nature's investigator: the diary of Robert Brown in Australia, 1801–1805*. ABRS, Canberra.
- Web ref. 1. <http://florabase.dec.wa.gov.au/brown/>
- Wege, J., George, A.S., Gathe, J., Lemson, K., & Napier, K. (2005). *Matthew Flinders and his scientific gentlemen: the expedition of HMS Investigator to Australia, 1801–05*. Western Australian Museum, Welshpool.

Deaths

Ed Cross (1977–2007)

Australian plant systematists have become aware over the last couple of weeks that Ed lost his battle with cancer on Good Friday 6th April. He was widely recognised as one of our rising young stars. Ed, who began his studies in systematics at the University of New South Wales, was based at the Australian National Herbarium. He was an Eichler Award recipient in 1998.

An obituary is anticipated in a coming issue of the Newsletter.

South Australian butterfly expert Robert Hilson Fisher OAM (1923–2007)

Bob Fisher was an Honorary Research Associate in the Entomology Section of the SA Museum for 20 years. During this time he reorganised the butterfly collection and incorporated his own collection of butterflies. He was author of *Butterflies of South Australia* (Fisher 1978), a Handbooks Committee of South Australia publication now out of print. His extensive collection of photographs of Australian butterflies is held by the Museum. The plants on which the butterflies feed were also collected for this study. These 300 collections are held in the State Herbarium of South Australia. They were made between 1964 and 1987, the earlier ones with R.V.

Southcott and John Womersley. Many of them bear the annotation "Larval food plant of ...".

A profile can be seen on the Butterfly Conservation South Australia site (Web ref. 1).

References

- Fisher, R. H. (1978). *Butterflies of South Australia*. (Government Printer, Adelaide).
- Web ref. 1. http://users.chariot.net.au/~bcsa/Profiles_1.htm

New Zealand phycologist and botanical artist Nancy Adams (1926–2007)

Murray Parsons has informed us that:

The phycologist and wonderful botanical artist Nancy Adams died last night, 26 March 2007. She was in Huntleigh which is a rest home in Karori, Wellington. Nancy who has been ill for some time would have been 81 on 19 May 2007.

Obituaries can be found on the websites of the *New Zealand Herald* (Web ref. 1) and on the *NZ Plant conservation Network* (Web ref. 2)

References

- Web ref. 1. www.nzherald.co.nz/author/story.cfm?a_id=65&objectid=10431737
- Web ref. 2. www.nzpcn.org.nz/news_events/news01.asp?newsid=150

News

News from the Western Australian Herbarium

Two pieces of good news from PERTH – we will have a new building at last, and we have a number of new botanist appointments. If good things come in threes, maybe we should vote for world peace for the third.

The announcement in late March that the Biodiversity Science Centre will go ahead brings to a successful conclusion several years of planning work by many people, and provides a welcome relief after several months of recent uncertainty while Treasury deliberated the final approval and staff at PERTH held their collective breath.

The Centre is the first stage of a consolidation of the Department of Environment and Conservation's Science Division staff and functions into one location. Currently we are scattered over three main sites – the Herbarium in South Perth, the conservation and genetics groups in Kensington, and the biodiversity survey branch at Woodvale. This lack of geographic focus has made collaboration somewhat difficult in the past. All these groups will start to come together in the new building, with final co-location to follow in a second stage.

Around half of the new building will comprise the new PERTH Herbarium. The architects have visited several other new herbaria in Australia and overseas to learn from others' experiences, and have worked closely with PERTH staff to develop a facility that looks fantastic compared with our current grossly overcrowded building. No more boxes of specimens stacked on top of each other on the compactuses, or ever-spreading constellation of demountables and shipping containers to handle overflow specimens and staff (at least for a few years until the cycle starts again). The collection halls in the new building will be climate-controlled at 17°C and low humidity for insect control, so maybe our recent Easter fumigation – the whole methyl bromide thing – will be our last. And the ground floor will have a delightful open-space including a large atrium, cafeteria, exhibition areas and public-access Reference Herbarium.

As anyone who has tried moving a herbarium will attest, the next few years will see regular planning meetings and much work as we put together a strategy for effecting the move with a minimum of angst and down-time. Any advice and stories of success (and heartbreak) from others will be most welcome during this time.

Our other news as noted above are a couple of appointments. Michael Moody is joining us from

Indiana University, to take up a joint position shared between DEC and the University of Western Australia. Michael has experience in the systematics and ecology of aquatic plants, particularly Haloragaceae, and has worked with a number of Australian botanists for several years. He brings much-needed molecular phylogenetic skills to our group. While based at the Herbarium, Michael will also take on teaching Jenny Chappill's systematics courses at UWA, as well as supervising students and research. John Huisman has accepted a joint position shared between DEC and Murdoch University. It's great to have John as a formal part of the Herbarium after many years of close association with us while supported by ABRS and other short-term contracts. John will curate our growing phycological collections, continue his basic taxonomic research into Western Australia's rich marine flora, and help develop a marine survey capacity in DEC to match our existing terrestrial survey group. Marine survey is shaping up as a major issue in Western Australia, with the continued development of massive onshore and offshore natural gas and other developments, particularly in the phycologically poorly-known Kimberley region.

The closer linkage between DEC and the universities through joint appointments like this is a welcome, and we hope a fruitful, development.

So – world peace? – to be announced.

Kevin Thiele

And from Canberra

From a recent visit to Canberra we report the following:

- Randy Bayer has left to take up a post in the United States
- David Jones is winding his work up for a planned retirement later this year
- Lyn Craven and Helen Hewson are having battles with serious illnesses. We wish them well.

AM for Wal Whalley

Dr Ralph Derwyn (Wal) Whalley of the University of New England, previously Associate Professor of Botany, now Honorary Research Fellow in Botany, was awarded an AM (Member in the General Division of Order of Australia) in the Australia Day Honours list for services to conservation and the environment, particularly through research into Australian native grasses and the promotion of their use for pasture, lawn and revegetation of degraded natural landscapes.

Jeremy Bruhl

Life Science Identifiers: a computing workshop of global significance

Apologies for the stack of acronyms. Computing is full of them, and they proliferate in pace with new organisations and developments.

Kevin Thiele in this issue (p. 8) has given an account of the globally unique identifier (GUID) for biodiversity data, the Life Science Identifier (LSID).

Canberra was the location on April 1–3 for a workshop charged with investigating the value of LSIDs for Australian biosystematics institutions and requirements for their implementation.

The Global Biodiversity Information Facility (GBIF), based in Europe, funded the workshop, organised by Greg Whitbread, Convener of CHAH's Herbarium Information Systems Committee (HISCOM). GBIF and its associated data standards group TDWG (the Taxonomic Databases Working Group) saw developments of such systems as the Australia's Virtual Herbarium as a potential test-bed and proofing facility for global IT developments.

The outcomes of the workshop (Web ref. 1; Thiele p. 8) were:

- the roadmap for implementation;
- the technical aspects of the implementation in an Australian context;
- an executive summary to utilise when seeking support for implementation.

Attending the workshop were two representatives of GBIF, Lee Belbin and Ricardo Pereira of the TDWG Infrastructure Project, many members of HISCOM and of the parallel Museum's group OZCAM, the developers of ABIF (the Australian node of GBIF hosted by ABRS), a member of the South Australian Partnership for Advanced Computing, and a number of observers. New Zealand HISCOM members, Kevin Richards and Aaron Wilton, were able to relate their experiences with implementation of LSIDs at the Allan Herbarium (CHR).

By the end of the workshop participants were convinced of the value of LSIDs to their individual information systems and federated national systems such as the AVH and the Atlas of Living Australia (Barker 2007) as well as global systems. Kevin Thiele's account gives an excellent rendition of the benefits. It was agreed that HISCOM and OZCAM should seek support from CHAH and CHAFC and their individual institutional heads to install LSIDs in their data records of specimens, names, taxon concepts and taxon factsheets in the first instance.

References

- Barker W.R. Funding for an Atlas of Living Australia. *Austral. Syst. Bot. Soc. Nsltr* 129: 15–16.
- Web ref. 1. *Meeting Minutes -- An LSID Policy for the Australasian Biodiversity Federation.*
At <http://wiki.tdwg.org/twiki/bin/view/GUID/AbfLsidMeetingMinutes>

Bill Barker

Miscellanea

Honouring 300 years since Linnaeus's birth

Want to honour Linnaeus? His actual birthday was 13th May 1778. We've played a part with a special illustration on the front cover (see p. 38).

Want to learn more about Linnaeus?

An internet-based course is being offered for part time study from September 2007 to January 2008. All teaching is in English and all lectures and teaching are done through the internet. The last date for applications is April 15 but there is an indication that late applications may be considered if there are still vacancies on the course after the regular admission procedure.

www.ibg.uu.se/linnaeus/Internet/index.html

Food for thought

Three papers of interest:

- Bean, A. (2007). A new system for determining which plant species are indigenous to Australia. *Australian Systematic Botany* 20; 1–43.
- Daws, M.I., Hall, J., Flynn, S. & Pritchard, H.W. (2007). Do invasive species have bigger seeds? Evidence from intra- and inter-specific comparisons. *South African J. Botany* 73: 138–143.
- Pillon, Y. & Chase, M.W. Taxonomic exaggeration and its effect on orchid conservation. *Conservation Biology* 21: 263–5 (2007).

Those bumblebees again

An ABC news story (Web ref. 1). Andrew Hingston from the University of Tasmania has studied the effect of the bumblebee invasion on the spread of South African *Agapanthus* in bush surrounding Hobart.

His research shows bumblebees are major pollinators of *Agapanthus* and may be increasing the plant's seed set since they contact the reproductive organs of the flowers more often than do honeybees and they carry more *Agapanthus* pollen grains on their bodies than do honeybees.

Web ref. 1: www.abc.net.au/news/newsitems/200701/s1829006.htm

What you have to do to raise money for science: the new look Bob Hill

You may not recognise a newly shorn Bob Hill next time you see him. He sacrificed his diagnostic pony tail for the Brain Foundation.

www.sciences.adelaide.edu.au/ponytail/

A plea for employment of more systematists

Again a little out of date but the article by Richard Rowe in *The Australian* on Jan 17th 2007 *Wanted: more biodetectives* is the sort of item we need to see more of

<http://theaustralian.news.com.au/story/0,20867,21069793-12332,00.html>

Margaret Flockton Award Exhibition 2007

Red Box Gallery, Mrs Macquaries Road, Royal Botanic Gardens, Sydney

The Exhibition is open from 10am to 4pm Monday to Friday until the 15th June. This free exhibition showcases the winner and selected entries for this prestigious botanical illustration award and selected works are for sale.

www.rbgsyd.nsw.gov.au/conservation_research/herbarium_and_services/botanical_illustration/margaret_flockton_award

Australian *Solanum* species a weed in London

The news is a bit old now, but an Australian *Solanum* species was reported on the BBC News (Web ref. 1) as a weed in Westminster in London in July 2006. The Natural History Museum identified the plant as the kangaroo apple, *Solanum laciniatum* Ait. You can see a little more about it on the Natural History Museum site (Web ref. 2).

Web ref. 1: <http://news.bbc.co.uk/1/hi/england/london/5194188.stm>

Web ref. 2: www.nhm.ac.uk/about-us/news/2006/july/news_9061.html

Simplifying systematics – why didn't we think of this?

SALTDeck is a set of 50 individual species identification cards; it aims to take the guesswork out of saltland plant species identification and selection. It can be downloaded from the Australian Government, Land & Water site at Web ref. 1.

The following is taken from their press release (Web ref. 2)

While several excellent plant identification guides currently exist, they are not aggregated into any sort of management 'kit' for identifying the particular species that grow on saline land ...

In addition, almost all identification aids until now have been very 'botanical' in nature and focus on the fine detail that is often required to differentiate closely-related species. SALTDeck is different. It recognises that if microscopes and text books are required to differentiate between species then farmers and advisors probably won't bother! For example there are several samphire species but SALTDeck has just one card for samphire to provide farmers and advisors with the essential information about this plant and its role in – and value to – a more productive saltland pasture system.

References

Web ref. 1: www.lwa.gov.au/products_list.asp

Web ref. 2: www.landwaterwool.gov.au/news.asp?news=50

2007 Science and Innovation Awards

These awards are for 18–35-year olds in Agriculture, Fisheries and Forestry. Winners will receive up to \$10,000 to undertake their project that will benefit themselves and their industry. Closing date is 15th June 2007.

www.daffa.gov.au/brs/science-awards

Australian Museum Eureka Prizes for 2007

Nominations are called for the Australian Museum Eureka Prizes for outstanding science. Presented annually by the Australian Museum, the prizes reward excellence in the fields of:

- research and innovation
- science leadership
- school science
- science journalism and communication.

Entries close on 4th May 2007.

www.australianmuseum.net.au/eureka/

Want to nominate your favourite nursery for its weed awareness?

The Council of Australasian Weed Societies offers you the chance to nominate your local "Weed-Wise" nursery for an award. For further information go to the CAWS website and click on Awards. Closing date: May 1st 2007.

<http://home.vicnet.net.au/~weedss/>

Conference report

5th International Southern Connection Conference University of Adelaide, 21st–25th January 2007

David Cantrill¹, Amy Hahs² and Dan Murphy¹

¹National Herbarium of Victoria, Royal Botanic Gardens Melbourne

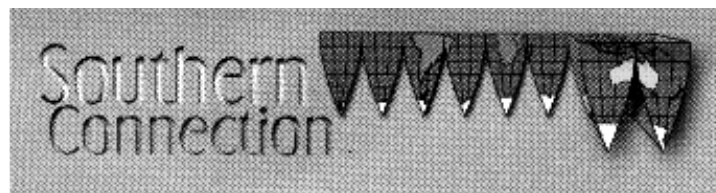
²Australian Centre for Urban Ecology, Royal Botanic Gardens Melbourne

The fifth meeting of the Southern Connection was as noticeable for the focus on New Zealand as it was by the absence of delegates from key regions such as Africa. Previous meetings have had a good representation of participants from other southern continents, along with those from the Northern Hemisphere that are interested in southern lands. It was therefore somewhat disappointing that this meeting did not attract the full range of delegates from regions that form the southern connection. Despite this the meeting was well attended with over 200 delegates from 10 countries, and talks that covered a wide range of topics grouped around eight key symposia. The symposia ranged from southern urban ecosystems to invasive species, quaternary palaeoclimates to megafaunal extinctions, and some fascinating areas such as subterranean communities. The diversity of topics available is one of the great attractions to this meeting for it allows participants to be exposed to a range of research approaches and topics outside their own subdiscipline. It is through this sort of cross fertilization that new research directions can be developed.

The meeting started with a lively session in the symposium entitled “Goodbye Gondwana”, a symposium that dominated the meeting with 5 of the 24 sessions being devoted to this subject. The dichotomy between dispersal versus vicariance in biogeography has dogged debate on the origin of austral biotas. Recent advances and uncritical use of data (biological and geological) has seen resurgence in dispersalist arguments such as recent papers by McGlone entitled “Goodbye Gondwana” (*Journal of Biogeography* 32 (5): 739–740) and Trewick *et al* “Hello New Zealand” (*Journal of Biogeography* 34: 1–6). The contention is that as New Zealand was submerged in the Oligocene the flora and fauna must be the result of recent immigration since re-emergence in the Miocene. This is purportedly supported by molecular dating that shows the age of clades in New Zealand is younger than the time of

continental fragmentation (80 Ma) indicating they must be dispersed. The nature of the debate and the contrasting use of data was best highlighted by two juxtaposed talks on geological history of the New Zealand region. Craw asserted that the Oligocene record is equivocal, poorly dated, and with all localities having evidence for marine submergence. This was perfectly contradicted by Daphne Lee who pointed out that extensive sequence of coal bearing and non marine sediments of Oligocene age occurred over the New Zealand landmass pointing to emergent land in Oligocene times. This was just one of the many polarized debates that surround the argument. The talk by Ladiges and Cantrill highlighted the need to explain the patterns seen but also that a strong understanding of the geology is required. At the end I was uncertain as to where Gondwana had gone as there still seemed to be ample evidence that Gondwana was alive, and that parts of eastern Gondwana (ie New Zealand, New Caledonia) had not drowned in the Oligocene but were alive and well.

One fascinating session was on the stygofaunas of the calcrete aquifers in Western Australia and artesian springs of the Great Artesian Basin. The onset of aridity seemingly forced a number of organisms to colonize unique environments, such as pore spaces in the aquifers, or left organisms stranded in wet environments such as springs in the Great Artesian Basin. The ability of life to adapt to a changing world was a key message but the evolutionary history of these taxa and the phylogeographic relationships between regions was also interesting. Although a separate session, the stygofauna topic nicely linked to the symposium on the above ground biota presented in “Aridification of the Four Southern Continents”, which focused mainly on the Australian arid zone, but did provide a broader snapshot of the arid biota in the southern hemisphere. Unfortunately, there were few arid-zone plant examples, perhaps highlighting an area requiring further research. As issues of



contemporary climate change draw increasing attention, arid zone biotas have the potential to provide rich sources of evidence for examining biotic responses to climatic fluctuations. Plant taxa have the potential to provide excellent examples to test hypotheses at a variety of different timescales. In talks by herpetologists, Melville and Shoo, these different evolutionary timescales, underlying the patterns of evolution in the arid zone biome, were well illustrated. Congruence of patterns between different taxa provides compelling evidence for general mechanisms affecting biotas and may allow the ability to track the timing of the development of aridity across the southern hemisphere. A somewhat controversial talk by Norman *et al.* suggested the possibility that many of the older (basal) lineages of Australian birds are from the arid zone, which raises the possibility of pre-adaptation in arid lineages. However, in general the symposium highlighted how little is currently known about the timing of the onset of aridity, and the later biotic responses during Pleistocene climatic oscillations.

Environmental change in deep time has clearly influenced the present day biota and understanding these processes is central to any integrated knowledge of the origins of the Austral Biota. Two further symposia added to this deeper time perspective: "Quaternary Palaeoclimates" and "Megafaunal Extinctions". The latter dealt with the record of extinction and decline in the megafauna of New Zealand (Moas), New Caledonia, and Australia (Diprotodontidae), the latter being combined with a picture of the changes in vegetation. The role of man in these changes was discussed. The Quaternary Climate session was a much larger event with numerous pollen diagrams. It is clear that although we have a good understanding of broad patterns of change in climate and vegetation, that detailed work is required to examine the history of processes such as El Niño Southern Oscillation (ENSO) a pattern that drives short term climate variability in Australia and South America.

The symposium on "Southern Urban Ecosystems" was chaired by Glenn Stewart, from Lincoln University, New Zealand. It started off with an overview of the historic and future trends in urban ecology methods by Maria Igantieva and Colin Meurk, followed by four different examples of the methods being used to investigate populations of plants and animals in urban areas across Australia and New Zealand. One of the recurrent themes was the importance of social components in influencing the ecological patterns observed within urban areas, with Glenn Stewart highlighting the role of garden management decisions on the composition of lawn and urban

woodland biotopes and Matt Beaty presenting a framework for integrating social-ecological systems to better understand the relationship between urban landscape heterogeneity and biodiversity in Sydney. The other recurrent theme was the importance of spatial context, with Jenni Garden demonstrating the importance of landscape context on the composition of reptile and mammal species within remnant fragments and Amy Haas demonstrating how quantitative measures of urbanisation can be used to investigate changes in plant species richness within urban areas. The talks demonstrated the breadth of urban ecological research being undertaken in Australian and New Zealand cities, and highlighted the similarities and differences between research being undertaken in the northern and southern hemispheres.

The session on invasive species focused largely on the role that environmental modifications by plants played in the invasion process. The session started with an overview of this topic by José Facelli, and this theme was revisited by several of the subsequent speakers. The session did not produce any specific generalisations, highlighting that there is still a large area of ecological understanding that would benefit from increased research attention. Based on the presentations at the symposium, there is evidence that the interactions between native plants, exotic plants and the local soil conditions are complex and depend on the species involved as well as the ecological process of interest. This idea was well illustrated by Ramiro Bustamante's work in Chile, who found that regeneration of two native trees in Central Chile was increased or decreased by the presence of two exotic tree species, depending on whether the germination requirements of the native species were met. Several of the talks during this session focused on the role of *Buddleja davidii* on the successional processes of the floodplains in New Zealand, and also the patterns of spread for *Pinus radiata*, and the consequences of *Pinus* invasions on native ecosystems in the southern hemisphere. The session concluded with the results of a nine year study examining the effects of *Hieracium* spp. suppression on the vegetation of New Zealand's modified tussock grasslands. The talks demonstrated that studies of invasive species provide interesting opportunities for enhancing our knowledge of general plant community processes. Research into invasive species also has the additional benefit of lending itself to manipulation experiments, and our improved understanding of the processes of invasion will provide opportunities for more specific mediation and control efforts to reduce the effects of invasive species.

For the systematic botanist there was much to offer throughout the meeting but the meeting also

included a symposium devoted to Systematics in southern hemisphere plant groups. A tour de force was the paper presented by Hervé Sauquet (Royal Botanic Gardens, Sydney and soon to be Royal Botanic Gardens Kew) on the Proteaceae, and new approaches to scoring character states that enable exploration of character evolution within the Proteaceae. Here observational data is recorded into a database which then has masks overlaid to reduce information to manageable character suites. By recording the data in this way it is easy to change the masks without having to rescore the data set enabling multiple hypotheses to be examined for phylogenetic signal. This approach signals a way forward for reintegrating morphology into phylogenetic analyses. Ulf Swenson presented new analyses of Australasian (largely Australian and New Caledonian) Sapotaceae that illustrated some of the problems with the traditional taxonomic approaches in this family. Other groups presented included phylogenetic and biogeographic studies in the Annonaceae, *Acacia*, and Asteraceae. The session was rounded out with an elegant study on the *Elaeocarpus* by Maurizio Rossetto where

the life history characteristics were used to interpret population genetic structure explaining the distribution of two co-occurring rainforest trees. This type of phylogeographic study is widespread amongst animal researchers but has been rarely applied to plants. It is a powerful method to predict and understand patterns of plant distribution.

One thing that is emerging from many studies is the importance of being able to integrate the record of life and climate into our studies. The use of fossils for calibrating phylogenetic trees and in understanding the evolution of southern biotas was one common theme that ran through a number of the sessions in this meeting.

We would recommend future meetings of the Southern Connection to all those people interested in southern hemisphere biology. The diversity of topics presented offered great opportunities to broaden one's horizons outside the small areas of research that we are usually engaged in.

ABRS report

Change of email and WWW addresses for ABRS

The Department of Environment and Heritage, of which ABRS is a part, has changed its name to the Department of the Environment and Water Resources, using the acronym DEW because there is already a DEWR (the Department of Employment and Workplace Relations).

Our email addresses have changed to the form: firstname.lastname@environment.gov.au.

Our website is now found at: www.environment.gov.au/biodiversity/abrs/

Emails addressed to people using the old address of deh.gov.au continue to be forwarded, but I do not know how long this will last. The older address ea.gov.au is no longer used, and emails sent to it will disappear without a warning message being returned.

Advisory Committee

As I write this the Advisory Committee is meeting to discuss the grant applications for 2007–2008. Applicants can expect to hear the results some time after the Federal Budget is brought down in May. The number of applications for botanical projects was disappointingly low and I urge you all to consider applying next year.

Staffing

Amy Jarrott, part of the Graduate program for DEW, is working with us until May, with special responsibility for creating a poster celebrating the Tercentenary of Linnaeus' birth in 1707.

David Levy, who was working on ABIF (the Australian Biodiversity Information Facility), has also found another position, but we welcome back Rob Beardow to work on the Australian Faunal Directory (AFD) upgrade.

Publications

Flora of Australia volume 2 - Winteraceae to Platanaceae. Published on 28 Feb. 2007. B5, xviii + 486 p, hardcover \$140, softcover \$120.

Algae of Australia - Introduction. Published on 1 March 2007. 250 x 176 mm, 744 p, hardcover \$180.

Both books are available from CSIRO publishing.

Algae of Australia: Batrachospermales, Thoreaales, Oedogoniales and Zygnemaceae (Entwisle, Skinner, Lewis & Foard) .

This book is in press and we expect it to be published in April. It also will be available from CSIRO publishing.

Annette Wilson
Editor - Flora of Australia

ABLO report

Winter has been a non-event this season with temperatures averaging double figures in January and only two days of snow. Living as close as I do to the gardens I was able to visit that muffled and white world rather early, and delighted in skimming the paths knowing my footsteps were the first to christen the snow with human tread. Despite warnings to the contrary, my Melbournian origins have stood me in good stead and the brief chilly days have been mere blips on the horizon. The days are now lengthening appreciably, and the gardens an unseemly riot of bulbous activity. The *Galanthus* have finished, the daffodil walk a slash of yellow between the Orangery and the Palm House, the hyacinths are making a play for the tourists attention and ever so quietly the bluebells are emerging to steal the show. Victoria Gate is overtaken by the colourful, creeping carpet of cultivars of *Crocus vernus* - a curious phenomenon dressing the ground in mauve, purple and a shocking, brilliant white, all eerily stalking the commercial outlets of Kew. And in between this horticultural mayhem, the ducks and geese waddle with unconcerned aplomb.

Despite the absence of real bone-cracking chill, London again found itself littered with outdoor skating rinks at Christmas. Both Kew and the Natural History Museum provided these entertainments for the public, and it was indeed an unusual sight to behold as I wandered about the gardens or visited the BM.

But I digress, England has experienced the fourth warmest Winter since 1659, and on the plus side has also enjoyed an overall increase in rainfall with the southeast in particular, experiencing a 20% increase on last year ... and this deeply Australian ABLO still finds walking in the rain one of the greatest and most delicious of novelties. Things are certainly looking up for Spring and Summer.

And on to the news ...

Kew's new mission statement

The process in developing a new mission statement for Kew involved predictably, workshops and 'drafting' group meetings, but culminated in an internet survey of staff, 'Friends' and other stakeholders in order to canvass for opinion and ideas. By February, it was agreed that the new mission statement would be:

To inspire and deliver science-based plant conservation worldwide, enhancing the quality of life.

Berlin

Towards the end of November I was fortunate enough to visit Berlin in order to attend the launch of the third and final volume of the Mueller

Correspondence Project – *Regardsfully Yours* – at the Australian Embassy. Whilst in Berlin, I was also able to take care of a few requests and so had the privilege of working in the herbarium of the Botanical Gardens and Museum at Berlin-Dahlem. One of the requests required me to find type materials of a number of grass genera. I was dubious as to the prospect of success, as I was aware of the devastation the gardens and herbarium had suffered during WWII and thought like so many others, that the collection had been completely destroyed. Happily, I was able to provide some relevant information and resolve some aspects of the quest for grass types, but also during that process was made aware of just how much had survived the fire bombing, especially the types. Shortly after the war a report was commissioned by the Allies, and this enumerated a number of the groups in which the types had been saved (Alston 1946). Alston reported that about 400,000 sheets in 1100 boxes and 20,000 books were saved or acquired subsequently and eventually evacuated to Bleicherode in Thuringia. The fern collection, part of the palms, ascomycetes and fungi imperfecta, plus random vascular families survived the fire-bombing, but for details of what actually survived, see Sleumer (1948). I would recommend this to all who work on groups known to have type material at B. I think most of us assume that the types no longer survive at B, but as I have found, this may not necessarily be the case.

Construction at Kew

I neglected to mention in my last report that the foundation stone for the Shirley Sherwood Gallery has been laid and work proceeds apace, being expected to be completed for the anticipated opening in Spring 2008. The new gallery is located adjacent to the Marianne North Gallery, and will offer Kew the opportunity to display some of its precious collection of botanical art and illustrations as well as items from the world-renown Shirley Sherwood collection of contemporary botanical art. I however, continue to find solace in the works of Marianne North and her gallery, which displays some rather comforting images of the Black Spur, and the mighty cathedral forest of *Eucalyptus regnans* just above Fernshaw in the central highlands of Victoria. Of course much of her other Australian work I also appreciate and consider quietly beautiful ... Monies are being gathered at present to renovate the gallery, but as yet, no dates have been set.

The Australian section in the rock garden is slowly being reconstructed, but despite best endeavours

of the staff, the work has yet to be completed. Two of Kew's horticultural staff, Annette Dalton and Joanne Everson, are hoping to obtain funding for a plant collecting recce timed for later in the year, with the official collecting trip scheduled for the Summer of 2007–08. The newly renovated areas will display and highlight the sub-alpine flora of Australia's south east.

After much delay, the 'sod' has finally been turned for the new herbarium and library extension. This will be the fifth extension for the current herbarium building, the first having been constructed under the aegis of Sir Joseph Hooker in 1876–77 (Wing C) after much wrangling with royal and parliamentary opposition. The second was built in 1902 (Wing B), the third in 1932 (Wing A) and the most recent, Wing D, in 1968. The site is a four-year-old boy's dream sporting as it does, diggers, backhoes, mini-cranes and pile-drivers and so many steel girders that BHP-Billiton should consider a takeover. So powerful has been the work on foundations that the ABLO office in Hunter House has been shaking with the pile driver's effort.

Loans

Just a quick note for those of you dealing with herbarium to K, new AQIS Import Conditions (ICON) have been launched (11th March 2007).

Visits, Visitors' Exhibits and Seminars

There has been only one scientific visit during this Winter ABLO term. Gavin Duley visited K to review the Australian *Xerochrysum* in preparation of his Honours year with Jeremy Bruhl at the University of New England, Armidale. Although the scientific visits have been few in number, quite a number of others have visited Kew for herbarium and garden tours.

On 7th December, the Linnean Society hosted the launch of the Linnean Tercentenary marking a year celebrating of the birth of Carl Linnaeus. It presages twelve months of conferences, meetings and seminars, each dealing with the various aspects of his contribution to natural history. The Society's meeting room had been refurbished, but was not adequate to hold all those who attended the celebrations. The meeting overflowed with a large number of delegates viewing the occasion via cable link in the library. Drinks followed and a number of 'Linnean' initiatives' were displayed in the Society's other rooms. One of the more exciting of these initiatives is Charlie Jarvis's *Order out of Chaos* due out this May. This exhaustingly comprehensive catalogue lists each Linnaean name including place and date of publication, information about the type specimen and place of typification, and the current name, all of which are tidily supported with explanatory notes.

Earlier that day I attended the 8th Young Systematist's Forum at the Natural History Museum. There were 11 talks and these ranged across the plant world featuring a phylogeny of the Juncaginaceae, elements of the Fabales, Myrtales, and also included red algae (*Acrochaetium*), and 'taxonomic escapades' of *Macromitrium*. Although botany outnumbered the zoological presentations, the Mexican black spiny tailed iguana as well as marine crocodylians represented Zoological endeavours, and a single presentation discussing the functional reproductive morphology of longhorn beetles represented entomological studies. The day was great and the standard of presentation high. All in all, the seventh day of December was a very good day indeed.

Housekeeping and email difficulties

Since the commencement of my term as ABLO, email difficulties at Kew have increased and seriously disrupted ABLO email correspondence. So great have been the difficulties experienced by the organization at large, that a new server was commissioned in December. Unfortunately, this has not been the cure to all ills as it was hoped. Problems persist, and during March the server was again reloaded. If any of you have tried to contact me electronically and not heard from me, please persist or use conventional mail options or fax facilities. The ABLO website should now reflect the new contact numbers.

I also ask those of you who require information on taxa and collections to provide the ABLO with full protologue details and synonymy with your initial request. I have found as have other ABLOs before me, that when requests come in which are fully documented, they are quick and easy to service. I have wasted a great deal of time completing the required research before I get to look in the cupboards. Also, Annette Wilson has kindly taken the time to update the ABLO website with the current protocols for library requests. I would ask you to refresh your memories about these protocols – this would also save me a lot of time in servicing the library requests.

Displays at Kew – Kew Magazine and the Tropical Display

Since the beginning of February, a selection of photographic work commissioned for Kew Magazine has been on display in the Nash Conservatory. The photographs have been taken by commissioned photographers as well as Kew staff, and the breadth of images represented range from whimsical images of sleeping dormice at Wakehurst Place, to the iconic *Amorphophallus titanum*, as well as glorious images of rather far-flung and remote localities known to Kew's plant hunters, botanists and ecologists. It's fabulous and

you can catch a glimpse of these stunning images in Kew's web pages (Web ref. 1):

The Princess of Wales Conservatory has been host to a tropical extravaganza this Winter. The emphasis of this year's display has been Kew's work in the tropics with rainforest being the background for tropical flowers and orchids. It was certainly impressive.

Mycological news

Good news to report for the mycological spirit collection. It has taken Mark Powell, a volunteer, nine months to restore the collection (c. 1200 specimens), which involved cleaning storage jars and topping up the fluid to ensure that all parts of the fungus are submerged. Some of the oldest material dates back to 1886. Even better, Mark has data-based these collections so ensuring the information is more readily accessible to other mycologists. However, although the Mycological herbarium is now stored in the Wolfson Wing of the Jodrell, the spirit collection is housed in the Herbarium spirit collection. This environmentally

controlled storage facility will keep the collections between 12 – 16°C., and should ensure longevity for the newly restored materials.

New publications

To complete this report I would like to make a plug for the recently revised *Flowering Plant Families of the World* (ISBN: 978-1-84246-165-5). It currently retails for £27 and covers 506 flowering plant families with fully revised text, taking into account the new relationships between plants revealed by DNA studies. Dick Brummit has made great improvements on the quality of the maps as well as, of course, the text.

References

- Alston, A.H.G. (1946) Taxonomic botany and botanical collections in Germany. p 4. *BIOS Final Report No. 152, Item No. 22*, British Intelligence Objectives Subcommittee: London, H.M. Stationery Office.
- Sleumer, H. (1948) The Botanical Gardens and Museum at Berlin-Dahlem. *Kew Bulletin*, 4:172-175.
- Web ref. 1. www.kew.org/kewmagazine/exhibition/themes/index.html

Book reviews

Identification of Eucalypts in south-eastern Australia made easier

Review by Marco Duretto
Tasmanian Herbarium

Field Guide to Eucalypts: Volume 1 South-eastern Australia. 3rd Edition. By M.I.H. Brooker & D.A. Kleinig. 2006. Bloomings Books: Melbourne. 356 pp. hard cover. ISBN 1 876473 52 5 (v 1). \$129.95

&

Eucalypts of Victoria and Tasmania. By D. Nicolle. 2006. Bloomings Books: Melbourne. 310 pp. soft cover: flexibind. ISBN 1 876473 60 6. \$49.95

Publishers website: www.bloomings.com.au

In 2006 Bloomings Books published two new identification guides for the Eucalypts in south-eastern Australia.

Brooker & Kleinig's is the 3rd edition [and apparently fully revised and updated!] of the first volume of an existing series covering virtually all species of *Eucalyptus* and *Corymbia* found in Australia. Volume 1 covers south-eastern Australia (New South Wales less the north-west, Victoria, south-east South Australia and Tasmania). The volume describes c. 300 species and includes maps and over 1500 colour photographs. The flier boldly states that 'This book provides the world's

most authoritative reference for anyone interested in trees ...'

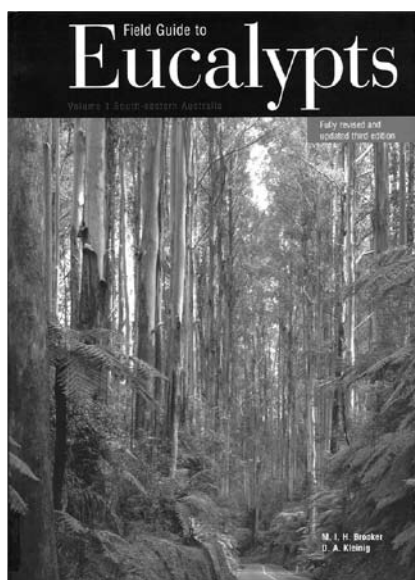
Nicolle's is the first publication of an account of the Victorian and Tasmanian Eucalypts (*Angophora*, *Corymbia* & *Eucalyptus*) following his 1997 account of South Australian Eucalypts. It includes almost 600 colour photographs, accurate maps and descriptions of 141 species (40% of these endemic to the area).

The two texts overlap in areas covered, though the area covered by Brooker & Kleinig is substantially larger, and both have descriptions, distribution maps, information on classification, keys, key characters etc. Excellent (usually) colour photographs illustrate habit, and key features of most taxa covered in both books. They differ, apart from the precise area covered, in the amount and type of information they offer.

Brooker & Kleinig provide an excellent overview of characters used in the identification and classification of the Eucalypts. They discuss variation in the size of the plants, bark types, phases of the leaves, and the types of inflorescence, buds, flower, fruit, seeds etc. The descriptions are accompanied by useful photographs and line

drawings. These proved useful when using the keys. Both books provide glossaries.

I have to admit that I am not very good at identifying eucalypts as anyone who has asked me to collect species for them can attest to. Will the 'Isla Gorge fiasco' ever be forgotten? This is said so that the reader will look at my comments

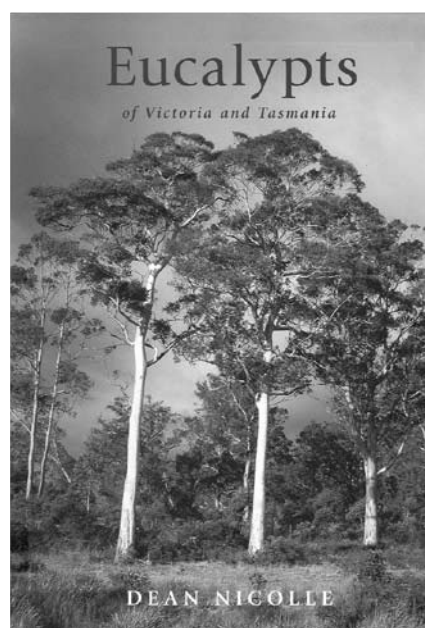


regarding the keys with a pinch of chaff. The keys are easy to use and the names I got when keying out several specimens matched what the material was said to be. When using keys to Eucalypts it quickly becomes apparent how many organs, and these often in varying degrees of maturity, that you need to identify most taxa. It also makes you acutely aware of how inadequate most herbarium specimens are: that is, most are single branches with next to no notes. Invariably bark is not included or discussed etc, and the person lodging the specimen does not include both fruit, buds or juvenile foliage. To identify anything both alternatives at a couplet regularly need to be checked. An ideal group for an interactive key (see Centre for Plant Biodiversity Research 2006).

Both books use indented keys, which do work well with larger groups and are probably less prone to editorial errors. Brooker & Kleinig provide keys for each State, which is more manageable for the user. They also add the page number where the species is found in the text. Nicolle's account would have benefited greatly from doing the same and/or by numbering the species. When species are not in alphabetical order, as in both books, then it is onerous to have to go to the index to find where a species is in the book. Often in large and difficult groups, such as the Eucalypts,

a quick check of descriptions, photographs, maps etc is required to help the user make a decision at a couplet. This can occur on a regular basis with Eucalypts as the organs required for an easy identification are invariably not all present.

The circumscription of *Eucalyptus* has been the subject of quite a lot of research by many research groups over the last few years. Brooker & Kleinig provide a much abridged outline of the taxonomic history of *Eucalyptus* though they omit to mention much of the recent work [last 10–15 years] published on *Angophora*, *Corymbia* and *Eucalyptus* (see review by West, 2006). Nicolle does not provide any detailed taxonomic history of the genera though does say he 'generally' and 'mostly' follows Brooker (2000). Brooker (2000) delegates both *Angophora* and *Corymbia* to subgenera of *Eucalyptus* though Nicolle treats them as separate genera. A few sentences explaining this sort of departure from the classification published by Brooker (2000) would be of assistance to the reader.



I have to admit I was disappointed that neither book referred to, and/or directed the reader to, some of the exciting research that has recently occurred in Eucalypt systematics. A few lines and references would have sufficed. This information is particularly important in Eucalypts as it is one of the few groups where the problems of changing classifications has been noted by the mainstream media and has affected a wide variety of professions and non-professionals outside systematic botany. It also indicates to the reader that what is in the text is not the only classification

currently in use and so could reduce some of the confusion and angst that often surrounds Eucalypt systematics.

The issue boils down to whether to recognise *Corymbia* and *Angophora* as distinct genera (as in Nicolle) or to delegate them to subgenera of *Eucalyptus* (as in Brooker & Kleinig). The fact that each of these texts adopt a different circumscription of *Eucalyptus* illustrates that different points of view are presently being discussed.

Brooker & Kleinig indicate, of *Corymbia*:

We have retained the name *Eucalyptus* for them in conformity with the earlier edition of [the] Field Guide.

I must admit that I find this line a bit of a 'cop out'. The value of new [and, as stated on the dust cover, fully revised and updated!] editions is to include and/or discuss new developments in a particular field. The taxa in this volume are in phyletic order and so the species widely accepted to be of the genus *Corymbia* [in Brooker & Kleinig under subgenera *Blakella* and *Corymbia*] are placed at the beginning of the species accounts. There is no reason why these could not be under the genus *Corymbia* instead – users will have no trouble interpreting this. If the authors do not agree with the separation of *Corymbia* from *Eucalyptus* then why not just be a bold and say so. It is for the good for all, professionals and non-professionals alike, to see that there are differences of opinion. In fact, the differences of opinion in the taxonomy of Eucalypts over the last few decades has generated some very interesting and useful debates in systematic circles. It is unfortunate that *Angophora* is omitted from Brooker & Kleinig's account altogether as the senior author does include it under *Eucalyptus* in his recent classification of *Eucalyptus* (Brooker 2000).

Both Brooker & Kleinig and Nicolle place species in some sort of phyletic sequence keeping closely related taxa together. This is highly commended and is useful for the user as closely related taxa can be compared easily and adds interest when reading about specific taxa. Both include information about how species are classified in the genera by listing subgeneric taxa. In accounts of large genera I find the addition of this sort of formal classification extremely useful and it does add much to any account. Neither account summarizes the classification in one place, which is a shame.

Nicolle includes a single line indicating what subgenus, section and series a species is classified in though he does omit subsections and subseries. He provides no additional information on these taxa.

Brooker & Kleinig provide some information on the key characters (apomorphies?, meaning of the name?) of some of the subgeneric taxa but are inconsistent. A page is dedicated to each of the subgenera where some text describing some characters of the taxon and usually a photograph of a leaf is presented. The amount of information varies greatly. For the subgenera *Blakella*, *Corymbia* and *Eudesmia*, for example, only the meaning of the name is described. For the subgenera *Symphyomyrtus* and *Eucalyptus* more information is provided. A consistent approach to these pages would be useful, that is, the product and a general understanding of the classification of *Eucalyptus* would be greatly enhanced if the same information were provided for each of the subgenera. It would have added no extra pages to include the species number, distribution, a map, and a brief description of all the subgenera. As it stands some of the pages are virtually empty. Under *Symphyomyrtus* similar pages are included for the sections but with similar inconsistencies. Under subgenus *Corymbia* the sections have distributional data only but this information is lacking elsewhere. On page 239 there is an account for what appears to be series *Rhodoxylon* but without a heading. It looks like an afterthought or a work in progress: what have I missed?

Both books list species with their authorities though Nicolle, under the heading of 'Authority', also includes the place of publication, typification details and some synonyms, and these with their authorities and places of publication. Nicolle is commended for including obvious synonymies, especially in *Angophora* and *Corymbia*, thus indicating to the reader that alternative classifications, some of which are recent, do exist. Brooker & Kleinig provide very few synonyms and these seem to indicate recent changes in their circumscription of taxa.

Brooker & Kleinig provide descriptions and distributional data for each species or subspecies. Diagnostic characters are in bold which is extremely useful for a quick check. Each species or subspecies has a distribution map, a photograph of its habit as well as close-ups of bark, fruits, flower buds, and sometimes other features. Some of the photographs are looking a little tired, possibly because we are so familiar with the format, but they do provide the information needed. The descriptions vary in content significantly and some are, as with *E. angulosa* and *E. psammitica*, worryingly brief. For these species only how they differ from a related taxon is described, and so they can not be easily compared with other taxa. The same brief descriptions are used for non-typical subspecific taxa. It would be more appropriate to describe the same characters for each taxon of the same rank throughout which allows easy comparison.

Flowering times are listed for only a few taxa and bizarrely recorded as 'unknown' for some taxa such as *E. malacoxylon* and *E. psammitica*. These species are some of those that have only very brief descriptions based on how they differ from other species. Curiously, in both cases the species they are compared to are some of the many species that have no 'Flowering Time' headings. Another case of an inconsistent approach to the presentation of data.

Nicolle presents significantly more information under a number of headings that cover the meaning of the epithets, good descriptions, distribution and habitat, cultivation and uses, as well as extra notes. Also included are distribution maps and photographs of the plant habit, flower buds, fruit and sometime juvenile foliage, bark and other useful features. Each taxon has two pages. I expected to see more photographs of the juvenile foliage and bark, as these are so important in determining species. The quality of photographs, especially of the fruit and buds, is generally high. Here the descriptions are directly comparable. Nicolle also provides information of where the habit shots were taken, which is good, though he should keep better notes: I suspect *E. coccifera* was photographed on Mt Wellington and not Mt William.

One thing that did annoy me with both books, and to some this would be trivial, is that when there are subspecies then a description of the species is not provided. That is descriptions are provided for the subspecific taxa only. No comparison of the species with other species is allowed and so the subspecific taxa are treated as if they are the same rank as species.

Brooker & Kleinig sometimes confuse subspecies a little more by not keeping all subspecies together. For example, *E. lacrimans* is listed within the subspecies of *E. pauciflora* and its description covers a number of subspecies of *E. pauciflora*. All very confusing but I am sure they know what they are talking about.

You do have to admire Brooker & Kleinig for producing an identification guide to an incredibly diverse group, and across an entire continent. All this information, photographs and expertise synthesised into a single work: a remarkable achievement. I can not agree with the line on the flier that it is the 'most authoritative reference for anyone interested in trees' and I do believe some serious work is required to standardise the accounts given. That aside, the fact that it is in its 3rd edition and selling remarkably well (earlier additions have sold over 10,000 copies!) is a testament to its suitability for the end user. The three volumes of the series are a manageable size and can easily be taken into the field.

Nicolle's book is lovely and easy to use inside or in the field. I am sure it will become an essential reference for everyone in Victoria or Tasmania or just interested in Australian plants and/or Eucalypts. I am very pleased to have a copy of it and I am sure I will be using it regularly.

Some would wonder if two more identification guides for Eucalypts in south-eastern Australia is getting excessive with the large number of other guides and various state floras available. This is especially apparent as two book reviews in the last issue of the *ASBS Newsletter* dealt with the third edition of *Euclid* (Centre for Plant Biodiversity Research 2006; reviewed by Clarkson 2006) and also the *Forest Trees of Australia* (Boland *et al.* 2006; reviewed by Harden 2006). Both guides were produced by CSIRO Publishing.

Eucalypts can be a very difficult group to identify and as far as I am concerned any help can't hurt. The areas covered by both books are dominated by Eucalypts and contain significant diversity. In addition, there are numerous documented hybrids, clines, etc. confusing specialists and non-specialists alike. There are also a significant number of Eucalypt systematists in the area. Having greater than one source of information (or 10 or 12) is invaluable. So in all honesty, the more guides the merrier.

Identification guides on such an economically important group that is known by most professional and non-professionals helps to get a simple message across to the wider community. The message is that Australia is a mega-diverse country with many rare and restricted species. Wouldn't it be lovely if a large number of guides were produced on other groups as well ...

References

- Boland, D.J., Brooker, M.I.H., Chippendale, G.M., Hall, N., Hyland, B.P.M., Johnstone, R.D., Kleinig, D.A., McDonald, M.W. & Turner, J.D. (2006). *Forest Trees of Australia* 5th edition. (CSIRO Publishing: Melbourne).
- Brooker, M.I.H. (2000). A new classification of the genus *Eucalyptus* L'Her. (Myrtaceae). *Australian Systematic Botany* 13: 79–148.
- Centre for Plant Biodiversity Research (2006). *EUCLID Eucalypts of Australia* 3rd edition. (CSIRO Publishing: Melbourne).
- Clarkson, J. (2006). A third edition of Australia's *Eucalyptus* Identification tool. *Australian Systematic Botany Society Newsletter* 129: 25–27.
- Harden, G (2006). A fifth Edition of the classic *Forest Trees of Australia*. *Australian Systematic Botany Society Newsletter* 129: 27–29.
- Nicolle, D. (1997). *Eucalypts of South Australia*. (D. Nicolle: Adelaide).
- West, J. (2006). Evolutionary relationships in *Eucalyptus sens. lat.* – a synopsis. In Centre for Plant Biodiversity Research. *EUCLID Eucalypts of Australia* 3rd edition. (CSIRO Publishing: Melbourne).

A new South Australian Grass flora

Review by Bryan Simon

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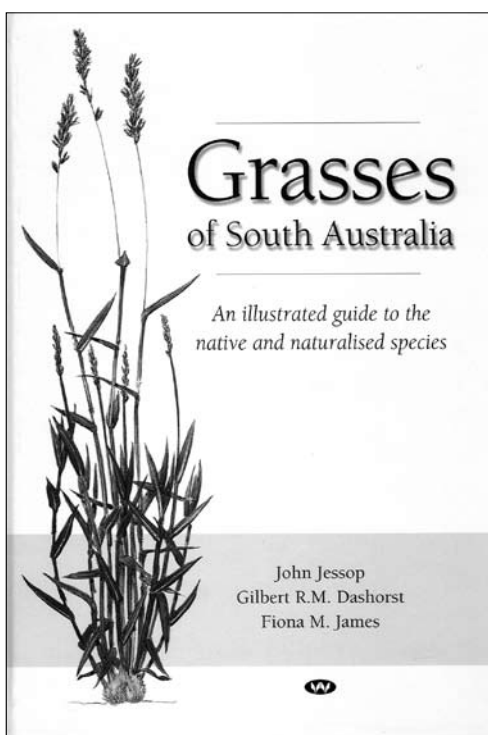
Grasses of South Australia. By John Jessop.
Illustrated by Gilbert R.M. Dashorst &
Fiona M. James. 2006.
Wakefield Press, South Australia, b&w
illustrations and colour plates, hard cover
554 pp. Price A\$49.95, plus \$10 postage
within Australia.

Of all the Australian states, South Australia, with the four editions of its flora, stands alone as the state with more published editions of its flora than any other state. The publication of this book has taken the level of knowledge of grasses for this state to a new level of professionalism in terms of data, quantity and quality of illustrations and ecological information.

The impetus for the project stemmed from a proposal from members of the Native Grass Resources Group of South Australia and their desire to expand the grass treatment in the 4th edition of the *Flora of South Australia* (Jessop & Toelken 1986) into a more definitive treatment. South Australia is well known for its enthusiastic and mostly amateur agrostologists and is the only Australian state that has a publication (*Native Grass South Australia*) dedicated to its native grasses; hopefully this trend will expand to other states with richer grass floras than South Australia. The interest in the South Australian grass flora has resulted in an increase in the search for and collection of specimens in the 20 years since the last published edition of the flora (Jessop & Toelken 1986); this, together with corrections to classification and nomenclature, has resulted in a 36% increase in grass species for South Australia in that time. Further changes to grass classifications and resulting name changes are likely as a result of current work in grass phylogeny and classification worldwide.

John Jessop has been the moving force, editor and main author for a number of noteworthy

Australian botanical publications (Black 1978, Dashorst & Jessop 1990, Jessop 1981, Jessop & Toelken 1986, Jessop 1993). His interest in grasses commenced on his move to Adelaide in 1974 and he has a very good understanding of the intricacies of this family, which to a large extent is avoided by most botanists. However, his editorial skills and dedication to getting large publications started, managed, written and completed are well known, as manifested by the cited publications above. Unfortunately this characteristic of tenacity and single-mindedness to accomplish such publications, particularly floras and handbooks, is becoming a rarity these days as current tertiary level taxonomic training becomes depleted, both in Australia and overseas, at a time when biodiversity monitoring needs more people like John Jessop to document it.



Of particular note in this book are the very appealing full-page illustrations of Gilbert Dashorst and quarter-page illustrations of Fiona James and a few of Dashorst's. All parts of all the 426 species of

South Australian grass are illustrated, with every genus having one full-page illustration and the remaining species and/or varieties, where more than one, a quarter-page illustration. Although it appears to have been an editorial decision to represent the drawings in this way, perhaps some of the genera with many species could have benefited from having more than one full-page illustration. Furthermore the depiction of the habit of each grass in a silhouette form is in my view not a good idea and blurs the detail that could have been better shown in a non-silhouetted habit drawing. Regarding the decision not to attach scales to the drawings, I feel this is regrettable as it would have been beneficial to have the scales strategically placed next to the illustrations, especially when comparing full-page drawings with quarter plate ones for related species; this

would not have involved a cross checking to measurements in the descriptions.

In addition to the black and white illustrations of all species are 20 colour plates, each one representing a grass tribe. While these are of very good quality as works of botanical art, in my opinion they do not add much more information to that provided in the black and white drawings. I feel maybe some colour photos of habit, such as those as depicted in the *Flora of Australia* grass volumes, may have been a better option as a contrast to the black and white illustrations. However these are only what I regard as could be small points of improvement to a collection of the best complete set of grass illustrations that has been published for an Australian State, and should set the standard for other Australian States to follow.

The main body of the book is arranged in what appears to be a phylogenetic sequence that is followed in contemporary books on grasses. However while the genera are grouped into tribes there is no mention of the subfamily rank where the tribes are placed. There is general consensus among current workers as to the subfamilial composition of the grass family (GPWG 2001), although refinements are continually being made to the more unknown parts of the family (Sanchez-Ken & Clark 2007). A short mention of the classification of South Australian grasses under their subfamilies, similar to that in *AusGrass* (Sharp & Simon 2002) would not have been out of place.

The ecological notes are more complete than usually found in a work of this nature. This is a reflection of the field experience of numerous people in South Australia. In addition to the information provide by people listed in the introduction as those having good field experience, there is another ecological section (BS), summarising spreadsheets from the Biological Survey of South Australia. Distribution maps are excluded, probably a good idea in terms of the space they would have occupied, and that on-the-fly maps can be readily obtained through the Australian Virtual Herbarium (Web ref. 1). The glossary is very well put together and illustrated and appears to cover all the descriptive terms used in the book. The map showing the botanical regions of South Australia has the necessary regions shown as well as the artistic creation by Gilbert Dashorst, with a parchment-like appearance and a dolphin and whale thrown in for light relief.

Following the trend of some other Australian grass books (Tohill & Hacker 1983, Wheeler, Jacobs and Whalley 2002) genera are first keyed out in a number of informal groups, which are illustrated, to assist in the identification process.

The fact that these groups cut across the formal classification of the family is a reflection that contemporary classifications often depends more on cryptic characters that are not mirrored by overall morphology. Under the family description a figure of about 10,000 species is mentioned as the number of species of grasses worldwide. This number is a commonly cited figure that has been around for more than 50 years (Hubbard 1954); a more correct estimate for present times would bring the figure up to about 12,500 from the current data contained in *GrassWorld* (Simon 2007).

The general layout and typesetting of the text is well done, with little wasted space and the effective use of bold type. I could find few typographic errors; the only two that I noticed were the caption of Fig. 58 has not been placed in italics and there was an outdated spelling for the caption of Fig. 238 for the species *Monachather paradoxus*. The taxonomic treatments that are followed are mostly that of *AusGrass* (Sharp & Simon 2002), one notable exception being the adherence to Webster's placement of *Paspalidium* with *Setaria* (Webster 1995). To my knowledge this nomenclatural transfer has not been followed in other parts of Australia, and is taken up in this book rather surprisingly, especially as the author states that the combination of *Paspalidium* with *Setaria* by Webster "is followed here although its level of acceptance in Australia has yet to be gauged." Both genera belong to the bristle clade of the tribe Paniceae, along with 22 other genera (Kellogg, Penly & Doust 2007). Preliminary indications are that both *Paspalidium* and *Setaria*, as presently constituted, are polyphyletic. More investigation needs to be done before new nomenclatural labels can be assigned to the groupings resulting from this early work.

I was pleased to see that a mistake in *AusGrass* was picked up in the account of *Eriochloa* at the top of page 451 and the authors are quite correct to notice a contradiction between information in the *AusGrass* dichotomous key to and the description of *Eriochloa australiensis* in relation to spikelet length. The *AusGrass* key has the spikelets as 6–9.4 mm long, whereas the description has the length as 5–15 mm long. This is due to the data source for the descriptions being different from that of the key, although most were checked against each other. This was one that slipped through the net, with the correct figure being 6–9.4. This allows for specimens with spikelets 9.5 to 15 mm long, being accommodated within *Eriochloa longiflora*, not recognized in this book.

Overall this is one of the finest grass books of a particular geographic region that has appeared in recent times and should serve as a benchmark

for similar publications for other regions. The dedication and patience of the authors in commencing, writing and completing such a fine publication is to be highly commended.

References

- Black, J.M., revised & edited by John. P. Jessop (1978). Flora of South Australia, Part 1, 3rd edn. Lycopodiaceae – Orchidaceae. Government Printer, South Australia.
- Dashorst, Gilbert R.M. & Dashorst, John, P. *Plants of the Adelaide Plains and Hills*. Kangaroo Press.
- GPWG (Grass Phylogeny Working Group) (2001). Phylogeny and subfamilial classification of the grasses (Poaceae). *Annals of the Missouri Botanical Garden* 88: 373-457.
- Jessop, J.P. (ed.). (1993). *A List of the Vascular Plants of South Australia* (Edition IV). The Botanic Gardens of Adelaide and State Herbarium.
- Jessop, J.P. (ed). (1981). *Flora of Central Australia*. The Australian Systematic Botany Society; Reed.
- Jessop, J.P. & Toelken, H.R. (1986). *Flora of South Australia, Parts I- IV. Alismataceae-Orchidaceae*. South Australia Government Printer, Adelaide.
- Kellogg, E.A., Penly, A., Doust, A. (2007, in press). *Phylogenetic relationships in the Setaria/Pennisetum clade (Panicoideae)* in Columbus, J.T., Friar, E.A., Porter, M.A., Prince, L.M. and Simpson, M.G. (eds). *Monocots: Comparative Biology and Evolution* (Poales). Rancho Santa Anna Botanic Garden.
- Hubbard (1954). *Grasses*. Penguin.
- Sanchez-Ken, G.J. & Clark, L.G. (2007, in press) *Phylogenetic relationships within the Centothecoideae + Panicoideae clade*. in Columbus, J.T., Friar, E.A., Porter, M.A., Prince, L.M. and Simpson, M.G. (eds). *Monocots: Comparative Biology and Evolution* (Poales). Rancho Santa Anna Botanic Garden.
- Tohill, J.C. & Hacker, J.B. (1983). *The Grasses of Southern Queensland*. University of Queensland Press.
- Webster, R.D. (1995). Nomenclatural changes in *Setaria* and *Paspalidium* (Poaceae: Paniceae). *Sida* 16: 439-446.
- Wheeler, D.J.B., Jacobs, S.W.L. & Whalley, R.D.B. (2002). *Grasses of New South Wales. Third Edition*. University of New England
- Sharp, D. & Simon, B.K. (2002). *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (Australian Biological Resources Study, Canberra and Environmental Protection Authority Queensland. CSIRO Publishing.
- Simon, B.K. (2007, in press). GrassWorld - interactive key and information system of world grasses. *Kew Bulletin* Web ref. 1. www.chah.gov.au/avh/

Tasmania's rich botanical history

Review by Robyn Barker
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Janet Somerville's Botanical History of Tasmania 1642–1820. Foreword by Winifred Curtis. Edited by Brad Potts, Gintaras Kantvilas and Jean Jarman. 2006. University of Tasmania and Tasmanian Museum & Art Gallery. 233 pp. \$45 plus postage and handling. ISBN 1 86295 342 2 . Order form downloadable at <http://fcms.its.utas.edu.au/scieng/plantsci/>

Centenaries are good for increasing an interest in history. The ASBS 1988 bicentennial symposium in Melbourne led to an extremely valuable collection of botanical history papers still much used today (Short 1990) and the present tercentenary of the birth of Linnaeus (Web refs. 1, 2) is leading to further exposure of Linnaeus, even though we have only recently celebrated 250 years since the publication of his major botanical work *Species Plantarum* in 1753.

Certainly there is a lot more information around since the bicentenary of the Flinders and Baudin voyages and it would appear that it may have been the tercentenary of Tasman's visit to Tasmania (1942) that precipitated Janet Somerville's interest in the early botanical history of Tasmania; Winifred Curtis describes in her foreword their mapping between 1942 and 1946 of salt-marshes in the area where Tasman landed and the identification by Somerville of Boomer Creek salt-marsh on the shores of Blackman

Bay as Tasman's landing place. This conclusion was arrived at by comparison with Tasman's description of the locality and the list of plants given in his journal.

Centenaries aside, the origins of this project lie in a different era; Janet Somerville's major research was conducted at the University of Tasmania between 1958 and the year of her death, 1969. A copy of her manuscript work was found in the papers of the late Professor William Jackson and has been reproduced along with a foreword written 20 years ago by another doyen of Tasmanian botany, Winifred Curtis. Much of the freely available material we take for granted today would have only been available to Somerville through either visits to libraries in other states or through interlibrary loans or by painstaking trawls through Government records. While the sources quoted may not have changed many of them are now much more freely available on the web or as facsimile editions. Indeed, as the editors acknowledge, some of the work reproduced here has to some extent been superseded by, amongst others, the Duyker (2003) publication on Labillardière and the Vallance et al. (2001) publication on Robert Brown. But even here there are interpretations that are not found in these more modern treatments e.g. for Labillardière's visit to the island his comments are reported chronologically and plants mentioned in his diary are given by name making them much

easier for botanists to search than the Duyker essay on the topic. The editors have brought botanical names up to date in the extensive footnotes.

In a state with a much earlier European contact than most Australian states, this account is extremely useful in bringing together botanical information from these early primary sources. Somerville has concentrated on botanical information and observations within the journals and woven these into background accounts of the voyages. She clearly had an interest in the possible introduction of plants to Tasmania by early visitors such as du Fresne (1772), Furneaux (1773), Cook (1777), Bligh (1788 and 1792), D'Entrecasteaux (1792–93) and Baudin (1802–03). At the end of the treatment of each of the visitors there is a brief discussion of the role they may have played in the introduction of alien plants to Tasmania and there is a whole section on the ports and refreshment stations which might have been the source of any introductions. Overwhelmingly the answer seems to be that there were no species introduced and naturalised by these early visitors, a conclusion which could possibly be challenged by others.

The book also provides a background for another area where there is presently considerable interest in and argument: the first established "garden" by the French in the now delightfully known Pigsties Bay area. Debate continues on this matter but here there are a number of photographs of the disputed area placed in the context of the activities of the naturalists on board the *Recherche* and *Esperance* in 1792 and 1793.

Browsing the contents of the volume I was reminded that in his relatively short life-time Matthew Flinders (1774–1814) paid at least 3 visits to the island; when reading of his exploits on the *Investigator* one forgets just how familiar with the area he must have already been.

The editors have done a remarkable job in bringing this volume up to date and it must have

involved considerable research on their parts. It is they who have compiled the references and they who have assembled 58 present day black and white photographs of sites visited by these early expeditions and 19 maps from various early sources. They have brought plant names up to date and they have supplied an index to these; it is unfortunate that they did not also supply an index to people since this would have been extremely useful. The only comment with

which I could find fault was the Editor's Note (p. 190) where it gives the impression that Brown's (1810) *Prodromus* was extremely well received on publication, which of course it was not. That only the first part of the *Prodromus* was ever published was precisely because it was not viewed with any interest at this time and it was left to time to reveal just how valuable a publication it was – in the meantime many of the species described by Brown remained as manuscript names ready for his unpublished second volume. Incidentally Tasmanians should now be able to compile a list of plants collected from Tasmania by Robert Brown by accessing the Brown database (see p. 12 or Web ref. 3).



This volume might also now allow, through the work of the editors, the development of historical trails and markers celebrating the activities of these early naturalists. Finding such information on my one brief trip to Tasmania a few years ago was not easy and it seems a shame that information about these early activities is not more readily available to the casual tourist.

Just one word of warning – the review copy supplied has not been stapled effectively and the first few pages have already escaped the staple but the glue is still holding them in.

If you have to deal with older herbarium specimens collected from Tasmania this modest book will be extremely helpful as a first stop in interpretation of collecting localities, but buy it too for a one-stop coverage of the topic up to 1820 or to read before your next visit.

References

Duyker, E. & M. (ed). (2003). *Citizen Labillardière: a naturalist's life in revolution and exploration*. (Miegunyah Press, Melbourne).

Short, P.S. (ed.) (1990). *History of systematic botany in Australasia*. (Australian Systematic Botany Society, Canberra)

Vallance, T.G., Moore, D.M. & Groves, E.W. (2001). *Nature's Investigator: The diary of Robert Brown in Australia 1801-1805*. (ABRS, Canberra).

Web ref. 1: www.linnaeus2007.se/

Web ref. 2: www.acay.com.au/~linnsoc/LinnTercConf/Linn%20Tercentenary%20Conference.htm

Web ref. 3: <http://florabase.calm.wa.gov.au/brown/search>

An illustrated history of Adelaide Botanic Garden

Review by Tony Orchard

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***Seeds of Change. An Illustrated History of Adelaide Botanic Garden.* By Richard Aitken. Bloomings Books, 2006. 224 pp., Page size 280 x 215 mm. RRP \$49.94. ISBN 9780646461373.**

This is the most ambitious and significant book ever produced on a botanic garden in Australia.

So goes the publisher's blurb. And, when the obligatory pinch of salt has been applied, this statement is probably not too far from reality: this is indeed a well-produced and attractive book. The jacket features a picture of the flower of *Victoria amazonica*, taken from Louis Van Houtte's *Flore des Serres et des Jardins de l'Europe* (1850–51), and the saga of the giant amazon water lily occupies a prominent place in this history. So imagine my surprise when visiting the Adelaide Botanic Garden recently, to find the *Victoria amazonica* pool cruelly exposed to the elements in the middle of a building site. Gone was the 1868 Victoria House (see photo on p. 83 of this book) built especially to house it. The house to replace it is discussed on the last two pages of the book, with an illustration of the new house on p. 198. But I should not have been surprised: the history of the Adelaide Botanic Garden is one of constant change and renewal, hence the title of this book, and let's face it, the old house was getting a wee bit creaky.

The idea of a botanic garden for Adelaide was proposed in England even while the colony was being planned. Thomas Allen was appointed 'Gardener and Ground-workman' to Governor Hindmarsh, and accompanied him on the initial voyage of the *Buffalo*. William Light's 1836 plan for the new settlement at Adelaide envisaged formal streets on a grid plan, but surrounded by wide parklands. Within these parklands were several Government Reserves, including a Botanic Garden.

This initial Botanic Garden was situated on what has been described as low-lying boggy ground on the banks of (almost on an island of) the Torrens River, north-west of the city square mile, in an area that is still parkland, just east of Thebarton. For the first 2–3 years this area was apparently farmed by Allen, who grew melons and other vegetables in abundance, and sold them in the city.

Shortly after Governor Gawler replaced Governor Hindmarsh in 1838, a new appointment of Government Botanist was made: John Bailey, who had qualifications as a horticulturist gained through working at the famous London nursery of Loddiges & Son. One of his sons, Frederick Manson Bailey later became Government Botanist in Brisbane, and his grandson, John Frederick Bailey also became Queensland Government Botanist before moving to Adelaide in 1917 as Director of the Botanic Garden. At about this time (c. 1839) the Botanic Garden was moved to a new situation north-east of Adelaide, on a site straddling the River Torrens, just east of the present zoo. The new gardens consisted largely of beds of ornamentals and some economic plants, but, unfortunately for Bailey, he had arrived at a time when the colony was almost bankrupt. Bailey's salary became a small gratuity, and by 1841 his appointment was terminated by agreement. He went on to become a pioneer of the South Australian nursery trade.

For a few years the site was leased, until, in 1855, George Francis, a London-born botanist, was appointed Superintendent of a new Botanic Garden situated near the corner of Frome Road and North Terrace, in "40 acres of the Police Paddock", on a site very closely matching its present one. Among the first purchases were a set of ornate semicircular gates at the North Terrace end, leading into a main north-south main path. Both of these features still survive essentially unchanged. Francis designed elaborate arabesque parterres near the main gate, and planted *Araucarias* which still dominate several parts of the garden. Francis was Superintendent for only 10 years (1855–65), but in that time he laid out the backbone of the garden and established many of its major features. One of his triumphs was a large domed conservatory on the western side, sadly later demolished as the hospital expanded. He planned the series of lakes formed from a small creek on the site, and began buying plants, both exotic and native. The gardens were opened to the public in 1857, and soon became very popular. By 1860 reticulated water was available, and fountains joined other attractions, such as aviaries.

Worn out, Francis resigned in 1865, and died 4 days later. His replacement was Richard Schomburgk, a German immigrant. Schomburgk took on his new responsibilities with vigour, one of his first plantings being the avenue of Moreton Bay figs near North Lodge. Shortly afterwards cages were built either side of this avenue, to house a menagerie that at one time included Bengal tigers, bears and "plebeian wombats, opossums and wild dogs". Schomburgk expanded Francis' flower beds, adopting the latest "ribbon or Mosaic style". Many of his designs were based on German sources, in books which he had brought with him from Europe. Schomburgk's regard for books and learning led him to establish a botanical library and herbarium for the Gardens, as well as laying out Class grounds and building a Museum of Economic Botany. He was also responsible for purchase and construction of the Palm House, now one of Adelaide's architectural treasures. However, perhaps his most famous work was the building of the Victoria House in 1868 to provide a suitable habitat for the *Victoria*

lily. Francis had first suggested cultivation of this horticultural prize in 1856, but it was left to Schomburgk to deliver it. Schomburgk had a particular attachment to the plant as it was his brother Robert who had collected the specimens and prepared illustrations for Lindley's description. In 1882, an area north of the Botanic Gardens was excised for a zoo, and the Botanic Gardens lost its animals and some land, but gained additional territory extending to the River Torrens, an area now forming Botanic Park.

When Schomburgk died in office in 1891, his replacement was Maurice Holtze, who had been in charge of the Port Darwin botanic garden. Like Francis, Holtze was unfortunate to arrive as the colony struck hard times, and his Directorship from 1891–1917 was marked by stringent financial circumstances. Nevertheless he managed to renovate many of the older plantings, removing over-mature trees and opening up new vistas. He continued to build the scientific base of the gardens, expanding the library that Francis and Schomburgk had started. One of

Holtze's strengths was in pome fruits, and he was successful in acquiring a block of land near Mylor to establish the Mylor Type Orchard of fruit trees.

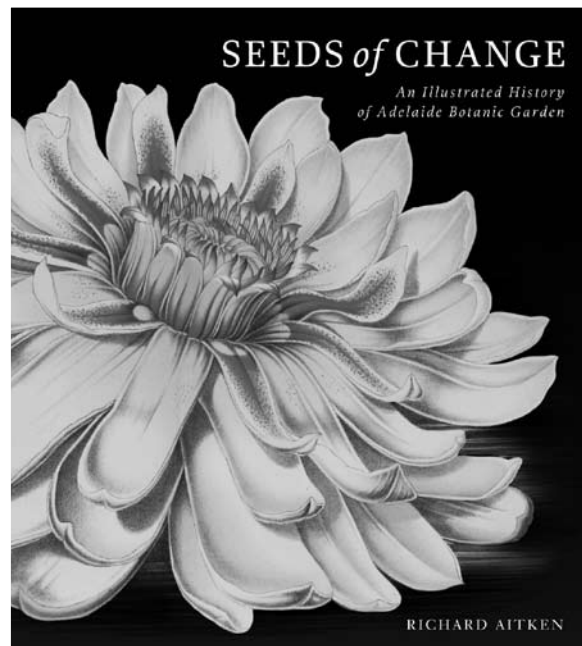
Upon Holtze's retirement the Directorship passed to John Frederick Bailey, (Queensland's government botanist) in the period 1917–32, and then to Harold Greaves (1932–48). Greaves Directorship saw the penultimate expansion of the Botanic Gardens. In 1908–09 the Muni-cipal

Tramways Trust had been given a large block of land between the Botanic Gardens and Frome road for a headquarters and depot. The former Lunatic Asylum on the corner of North Terrace and Frome Road had become an Infectious Diseases Hospital soon afterwards. In the late 1930s it was decided to expand the Adelaide Hospital, and a major land swap was orchestrated. The Gardens gained the old asylum site, but lost a strip of land on the western side to the Hospital. This strip included two of the Gardens iconic buildings, the

Director's residence and the domed conservatory. Greaves also lost most of the botanical library built up by Schomburgk and Holtze, when it was transferred to the Public Library.

In 1948 Noel Lothian was appointed Director, a position he was to hold until 1980. His achievements were substantial, and too numerous to enumerate here. He was responsible, among other things, for re-establishment of the herbarium as a major research institute, retrieving and expanding the botanical library, and instituting an agricultural and horticultural extension service. He revitalised plantings, introduced new landscaping ideas, and established satellite gardens at Wittunga and Mt Lofty.

Later Directors (Brian Morley, 1981–2000; Stephen Forbes since 2000) have continued the tradition of change, improvement and modernisation. The MTT depot was eventually added to the Gardens, and the distinctive tropical house provided new opportunities. On the debit side, the gardens lost a prime site by the ill-



advised construction of the Wine Museum, which resulted in demolition of the purpose-built State Herbarium.

This summary is all too long, but I hope serves to provide a sample of the intricate and fascinating history of one of the most beautiful botanic gardens in Australia. The author is an architect, curator and garden historian. He brought to the task an obvious wide knowledge of garden design and history which has resulted in a very detailed, erudite, but still eminently readable book. Throughout there is careful attention to the interweaving of politics, fashion, horticulture, finance and public support which form the real background of all such public institutions. He has captured the spirit of the times in the language he has used to describe events, although just occasionally he gets a little carried away. For example (caption on p. 95)

Schomburgk thoroughly refurbished the hothouses at Adelaide Botanic Garden, bringing new heat to their moist interiors, and greatly extending the offerings available for public gratification. Swelling spathes and

stalks unsheathed, inflorescences glistened and glowed, and blossoms enjoyed their moment of adulation until spent they sank gently to the stage awaiting their inevitable replacement by fresh young shoots and buds.

Such flights of fancy are rare, and in general the book is a joy to read. The publishers have done a magnificent job, using a very good quality paper and spacious layout, numerous well-reproduced historical photos, and excellent editing (I noted only a couple of very minor typos which it would be churlish to mention). The book is solidly case-bound, with a very substantial dust cover.

I thoroughly recommend this book to anyone with an interest in colonial history, garden history, garden design or horticulture in general, and even to those with an interest in the interplay between politics and public administration – nothing much there has changed in 150 years. The scientific side of the Adelaide Botanical Garden is acknowledged, but this was not the purpose of the book. It is all about the gardens, the plants, and those who planned and tended them. A bargain at the price.

Book notices

Books on Western Australian and global exploration

***Western Australian Exploration volume 1 1826–1835: The Letters, Reports & Journals of Exploration and Discovery in Western Australia.* Hesperian Press, Carlisle. 2005.**

The Western Australian Explorers' Diaries Project, incorporating the Historical Records of Western Australia, is an ambitious undertaking to locate and publish the surviving diaries etc. of early explorers and settlers in Western Australia. Most of these are various repositories in Perth. A group of interested people has set themselves to this task, and the first volume appeared in 2005. Transcribing and editing these papers is a massive task. Original spelling, punctuation and paragraphing are retained as far as possible, and sketches from the diaries are included. Explanatory footnotes are given. The contents list the 130 entries in vol. I in chronological order; they include some of botanical interest such as Charles Fraser, James Drummond, Thomas Braidwood Wilson, Alexander Collie, John Septimus Roe and Karl von Hügel. Appendices include biographical notes and a list of the modern scientific names of fauna that can be identified from the diaries. A similar interpretation of the flora, originally planned for volume I, will appear in volume II (the index contains entries for the plants as mentioned in the diaries).

Volumes in preparation include pre settlement, the period 1836–45, The Kimberley c. 1850–

1950, the Austin expedition of 1854–55 and the von Sommer expedition of 1847–48.

***Encyclopedia of Exploration.* By Raymond John Howgego. Hordern House, Potts Point**

Three volumes of this exceptional series have now been published. The first volume (published 2003) covers the period to 1800, the second (2004) 1800 to 1850, and the third (2006) 1850 to 1940 (The Oceans, Islands and Polar Regions). One more is in preparation. They provide 'a comprehensive guide to the history and literature of world exploration, travel and colonization' (cover blurb). Excerpts from two of a number of highly complimentary reviews sum them up: 'a marvellously rich, punctiliously researched, ambitiously wide-reaching reference work, unrivalled in accuracy and scope' (A. Manguel, *The Spectator*); 'it resembles less a book than a topographical feature, something so compelling that you cannot help looking at it, again and again, just to confirm that it is there' (F. Fleming, *The Times Literary Supplement*).

***The French Reconnaissance ...* By Frank Horner. Melbourne University Press. 1987.**

This has now been issued in French with the title *La Reconnaissance Française: L'Expédition Baudin en Australie (1801–1803)*. It has been translated by Martine Marin, president of Les Amis de Nicolas Baudin, and published by L'Harmattan, Paris (2006). It is useful in having

French text such as Baudin's journal in the original language and includes a list of the main publications since 1987 about relevant French and English voyages of the period (though not *The Encounter 1802* from the Art Gallery of South Australia).

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Australian exploration and taxonomic, popular and indigenous botany

***Voyages to the South Seas: In Search of Terres Australes.* By Danielle Clode.
The Miegunyah Press, 315pp, \$32.95**

For a review see Web ref. 1.

Web ref. 1. [www.theaustralian.news.com.au/
story/0,20867,21142638-5003900,00.html](http://www.theaustralian.news.com.au/story/0,20867,21142638-5003900,00.html)

***Beyond Capricorn.* By Peter Trickett.
Price: \$35.**

www.eaststreet.com.au/viewitem.php?b=28

Did the Portuguese beat the English to map the southern coastline? It is claimed by journalist Trickett that in the 1520s the Portuguese (Christopher de Mendonca) sailed past Fraser Island and into Botany Bay, around Wilson's Promontory, and as far as Kangaroo Island before returning to their base in Malacca via the North Island of New Zealand. The website above has details on how to obtain the book and a list of interviews that have already been conducted by the author.

***A Complete Guide to Native Orchids of Australia (Including the Island Territories).*
By David Jones.
New Holland. 2006 ISBN: 1877069124 .
AU\$75.00.**

David Jones' impressive new account of the Australian orchids, although presented in coffee table glossiness, is much more than that. Almost all of the 1300 taxa is illustrated with a superb colour photograph and each has a description, distribution, ecological notes, hints on recognition and conservation status and comments on hybridisation if applicable. Each genus has a line drawing of the main parts and the genera are grouped into alliances such as the Onion Orchid alliance and the Helmet Orchid alliance. For those who have not kept up with the major changes in the generic delimitation of orchids many of the familiar names no longer exist. There is no key and no synonymy cited for each species but you can usually find the old name cited in the index with its new equivalent. There are 496 pages packed into this solid hardback book.

***Hakeas of Western Australia. A field and identification guide.* By J.A. Young
Available from J. Young, PO Box 576, West Perth, WA 6872. Soft cover, 140 pp, 210 X 280 mm. Price \$20. plus handling costs \$8 (WA), \$12 (rest of Australia).
Tel. (08) 9242 2207.
jayoung50@westnet.com.au**

A field and identification guide to all Western Australian Hakeas. Each species with a line drawing and colour photographs, brief descriptive notes, distribution map and notes on uses and propagation. There is no key. Jennifer has previously published three small books on Hakea species to be found in different botanical regions of Western Australia.

***Sturt pea : a most splendid plant.* By David Symon & Manfred Jusaitis. Adelaide: Board of the Botanic Gardens & State Herbarium and Dept for Environment & Heritage. 2007.
www.fbga.asn.au/SturtPea07.htm**

This richly illustrated and attractively designed book covers many aspects of a plant that has captured the imagination of many. Included are the history of discovery, botanical nomenclature and taxonomy, cultivation, and the attainment of iconic status in our modern culture – in literature, art, trappings of commerce and tourist ephemera.

As well as the hard- and soft-cover editions available from book shops, there is a quarter leather-bound limited edition of 200 copies signed by the authors that is available from the Botanic Gardens of Adelaide.

***Eremophila and allied genera. A monograph of the Myoporaceae.* By R.J. Chinnock
Rosenberg Publishing, 2007. Hardcover
290 x 210 mm, 704 pages, 335 colour plates, 300 maps, 325 line drawings. ISBN
9781877058165, \$99.95.
[www.rosenbergpub.com.au/handleProduct.
asp?id=63&catid=7](http://www.rosenbergpub.com.au/handleProduct.asp?id=63&catid=7)**

The long-awaited testament to Bob Chinnock's decades of work on Myoporaceae in a massive work at an attractive price.

***Birrajakoo. Bush plants of Nyikina country, Western Australia.* Order form at
www.nyikinainc.com/Projects.html**

Nyikina people from Derby in Western Australia have decided to make resources that can be sold so that they can raise the funds to keep their language program going. Over the past few years they have collected photos and information about bush plants and now it is available on a CD.

Robyn and Bill Barker

From TAXACOM

Archives at <http://mailman.nhm.ku.edu/pipermail/taxacom/>

Taxacom celebrates 20 years

Taxacom celebrated 20 years of existence on 12th January 2007. Launched initially by Dr. Richard Zander, Taxacom began its existence on the night of January 12, 1987 as a dial-up BBS at the Buffalo Museum of Science (Buffalo, New York). It has been going long enough to have been examined sociologically by Dr. Christine Hine, University of Surrey (Web ref. 1).

Web ref. 1: <http://joni.soc.surrey.ac.uk/~scs1ch/taxacom.htm>

Message posted by James Beach.

Tools for checking nomenclature

Software now can be downloaded and used to check your botanical name against some of the more general requirements of the ICBN (not yet updated to the 2006 version of the code) (Web ref. 1).

Web ref. 1: www.kew.org/data/grassbase/icbn.html

Message posted by Kehan Harman

You can also try the *Nomenclatural Filter*. It has been published in various places – apparently for the first time by Jeffrey (1973). It can also be found as Figure 1 (and pages 14–15) in *Biology International* Special Issue No. 30 (1994) (Web ref. 2).

Jeffrey, C. 1973. *Biological Nomenclature*. London: Edward Arnold

Web ref. 2: <http://www.iubs.org/newiubs/products/bioint/BioInt%20PDF1/BI%20Special%20Issues/SPECIAL%20ISSUE%2030a.pdf>

Message posted by John McNeill.

Vienna Code - a caution

Should you be looking for the new Vienna Code on the web and come across the site where the web

version of the ICBN is being developed and being reviewed by the Editorial Committee (Web ref. 1) note the warning that it is still under construction and it is better to consult the hard copy.

Public release and announcement of the site will occur later in the year.

Web ref. 1: <http://www.ibot.sav.sk/karolx/kod/0000Viennatitle.htm>

Message posted by John McNeill

Croizat

For those interested in the history and philosophy of science an English version (*Suppression at the frontiers of evolutionary biology: Leon Croizat's case*) of Colacino & Grehan's (2003) paper can be accessed on the Web (Web ref. 1).

Colacino, C. & J.R. Grehan. (2003). Ostracismo alle frontiere della biologia evolutiva: il caso Léon Croizat. In: M.M. Capria (ed.) *Scienza e Democrazia*. (Liguori, Naples). pp. 195-220.

Web ref 1: www.sciencebuff.org/bibliography.php

Who uses biodiversity data and why?

A thread on *Who uses biodiversity data and why?* is archived through the November and December 2006 contributions. Arguments for whether one should work locally or globally were debated and when the subject started to wander there was finally a four-part response on behalf of GBIF addressing the following questions:

- Are primary data on species localities in fact used to make better global conservation policy and resource management choices?
- Are "global" primary species occurrence data useful for a "local" conservation policy or resource management choices?
- Why should so many people work so hard to achieve universal access to universal biodiversity data?

Websites of interest

Aquarium and pond plants of the world

Need to identify an aquatic plant used in the aquarium industry. Shaun L. Winterton's site is a good starting point. It includes those species regularly included on price lists of wholesalers or retailers of aquarium and pond plants world-wide. There is a Lucid key, fact sheets, lists of Federal (USA) noxious weeds, terrestrial plants used in aquaria and a glossary. The Lucid key opened quite happily on my computer which already has Lucid installed, but on another machine without it, nothing seemed to happen. Even so, you can

still browse the copiously illustrated generic fact sheets for information.

www.lucidcentral.org/keys/appw/html/opening_page.html

Another good site for aquatics is the University of Florida's Centre for Aquatic and Invasive Plants page with images of many plants as well as some teaching resources e.g. this information on our own *Melaleuca* species which has been a pest for many years.

In the past, some species were purposefully spread in order to "improve" our natural areas. For example, melaleuca tree were introduced to Florida from

Australia by spreading their seeds from airplanes over the Everglades. The idea was that the trees would suck up the water and make the Everglades better for human use. The plan resulted in millions of invasive melaleuca trees which are now known to be destructive to Florida's environment and animals. Melaleuca trees now are being removed at huge expense.

<http://plants.ifas.ufl.edu/>

The Botanical Art Society of Australia

The Botanical Art Society of Australia (BASA) has been formed to promote the development of botanical art nationwide and to bring together people who have a love of plants and of the botanical art form. Its website has lots of information for botanical artists including details of exhibitions and workshops (so far all in the eastern states of Australia) and examples of member's artwork. They produce a quarterly newsletter and membership details are given on their site. A week of intensive botanical art tuition, *Botanical Painting in Paradise*, was being undertaken in Fiji at the end of April.

www.botanicalartsocietyaustralia.com/

Australasian Quaternary Association

The Newcastle pollen images of Australian taxa by Feli Hopf, Peter Shimeld and Stuart Pearson from the School of Environmental and Life Sciences at the University of Newcastle, Australia can be accessed through this page. Added recently is a collection of pollen images from Southern Chile by Dr Simon Haberle and Prof Keith Bennett. Access to voucher information supporting each image was not immediately obvious.

www.aqua.org.au/AQUA/frames_res.html

Environmental Online Mapping Site for South Australia

Planning some field work in South Australia? Access to South Australian environmental information is available through *NatureMaps* via the web. The site provides an easy to use web mapping tool, enabling users to view, query, display and print data sets relating to the South Australian landscape and environment.

Information has been grouped based on themes and includes datasets relating to fauna and flora sites, vegetation, protected areas, fire, management and administrative boundaries, as well as base topographic and aerial photography.

www.naturemaps.sa.gov.au/

Australian Orchid Name Index

This is the list accessed by the Australian Orchid Genera key reviewed in *Newsletter* 128.

The *Australian Orchid Name Index* by Mark Clements and David Jones provides the currently accepted scientific names, together with their synonyms, of all Australian orchids including those in external territories. Extremely useful for checking censuses (state distributions and regions

are provided) and the placement of familiar species in the plethora of new genera in Orchidaceae. Or if you want hard copy you can also make use of David Jones copiously illustrated new work *A complete guide to Native Orchids of Australia (including the Island Territories)*, published by New Holland (see p. 33)

www.publish.csiro.au/samples/Orchid%20Key%20for%20web/html/AustralianOrchidNameIndex.pdf

U.S. interactive key web sites

There are two new American interactive key sites on the web utilising different software.

One is to Wetland Monocots of the United States on the United States Dept of Agriculture site (Web ref. 1) with grasses, legumes, gymnosperms and Ericaceae of the United States to follow in the next year. Grasses of Louisiana and Missouri are already on the site. This system uses SLIKS (Web ref. 2), free software requiring no installation. There were no problems using the on-line version of the keys available – identification is achieved by the user ticking characteristics from a long list of characters which best represent the material being identified.

For those who are interested in the software driving this site, Dallwitz has provided a list of comments, rebutted by Stinger, in the November 2006 Taxacom pages (Web ref. 3)

The other developing site is the Utah State University herbarium site where interactive keys have been made available for some grass and sedge genera (Web ref. 4). These keys have been built using either Lucid 3 or Phoenix (Web ref. 5) and they apparently work on both PCs and Macs. Java Virtual Machine (JVM) version 1.4.2 is required to run these keys and a link is provided for downloading this free software. Unfortunately my network-linked machine requires permission for such a downloading and I have yet to test the site.

Web ref. 1: http://npdc.usda.gov/technical/plantid_wetland_mono.html

Web ref. 2: <http://stingersplace.com/SLIKS>

Web ref. 3: <http://mailman.nhm.ku.edu/pipermail/taxacom/2006-November/subject.html>

Web ref. 4: <http://utc.usu.edu/keys/default.htm>

Web ref. 5: www.lucidcentral.org/

South African plants

The Biodiversity Explorer site on the Iziko: Museums of South Africa web page (Web. ref. 1) is the gateway to some fascinating information on natural history in South Africa. However for links to plants see Web ref. 2, 3.

Web. ref. 1: www.museums.org.za/bio/index.htm

Web. ref. 2: www.museums.org.za/bio/plants/angiospermae-alphab.htm

Web. ref. 3: www.plantzafrica.com/

Historical Australian periodical publications 1840–45

A digital library of Australian journals and newspapers that began publication between 1840 and 1845. Far too much to summarise here, but if you are interested in early accounts of topics in newspapers which are not readily accessible you might find them here. Titles include *The South Australian Magazine* (1841–43), *The Swan River news and Western Australian chronicle* (1844–49) and *The Port Phillip magazine* (1843). Philip Short drew my attention to this site by noting the

availability of *The Tasmanian journal of natural science, agriculture, statistics, &c.* in which there were items by J.D. Hooker on the Huon Pine, Leichhardt's lectures on the geology, botany, natural history, and capabilities of the country between Moreton Bay and Port Essington, Milligan on some fossil plants found near Hobart Town and Launceston, and items by Mitchell and Sturt on their expeditions. Many of the items are reprinted from other early newspapers.

<http://www.nla.gov.au/ferg/>

The war on weeds

Changes to Australia's Permitted Seeds List

Major changes to the list detailing those plant species whose seeds are allowed into Australia were referred to in an item on the Enviroweeds discussion group maintained by the CRC for Australian Weed Management. The list now targets individual species rather than genera and came into effect on 20 December 2006. Reproduced below are selected passages from the information given on the AQIS site (Web ref. 1) – highlighting is mine

Changes to the Quarantine Proclamation 1998 Schedule 5 section 63 – 'Permitted seeds list'

Effective from 20th December 2006, the *Quarantine Proclamation 1998* Schedule 5 section 63 – 'permitted seeds list' has been amended to reflect the results of Biosecurity Australia's review of the list of plant species that are permitted entry to Australia. The review involved replacing 2,913 genus-level listings that were on the permitted seeds list with the species within those genera that are already present in Australia. The revised Schedule 5 'permitted seeds list' now contains approximately 34,000 individual species listings.

The revised Schedule 5 'permitted seeds list' can be found on the ComLaw website [Web ref. 2].

ICON is currently being updated to reflect these changes. In the interim, until these changes are completed, importers are encouraged to check Schedule 5 to determine whether the species they wish to import are listed on the 'permitted seeds list'. **Any seed species listed on this Schedule may be imported without an Import Permit.**

Any species not listed on the Schedule are prohibited entry to Australia and will require assessing to determine their weed risk.

The removal of genus-level entries is not a permanent exclusion of species not currently included on the permitted seeds list. Importers can apply to AQIS Plant Programs to have a weed risk assessment on any plant species to determine its weed risk to Australia's agriculture and/or the environment. If the assessment concludes that the weed potential is low and there are no other quarantine concerns, the species will be added to the permitted seeds list.

If a species from within a previously permitted genus [see list at Web ref. 3] is not included on the revised list, and is later found to be present in Australia, it will be added to the permitted seeds list without the need for a formal Weed Risk Assessment.

I have not looked exhaustively at this list but I can see a number of areas of concern, particularly in light of the final paragraph highlighted above. Amongst the species whose seed is now allowed free entry into Australia are at least three species included in the Declared Plants list for Australia (Navie 2004) – *Rubus chloocladus* (= *R. anglocandicans*), *Peganum harmala* and *Oxalis pes-caprae*.

Physalis viscosa is not permitted entry but all *Physalis* species that are considered to have naturalised in Australia (Bean 2006) are now all given free entry. *Ruellia tweediana* (syn. *R. aff. malacosperma*) is not listed but on the basis of the final paragraph cited in bold above, would be added to the list without a formal Weed Risk Assessment. Yet this is a weed which is spreading in Queensland.

Opuntia and *Orobanche* species seeds continue not to be permitted entry into Australia, which is in line with the previous "permitted genera" list.

It seems that there might still be some fine-tuning needed.

References

- Bean, A. (2006). *Physalis* (Solanaceae) in Australia. *Austral. Syst. Bot. Soc. Nsltr* 127: 6–9.
- Navie, S. (2004). *Declared Plants of Australia: an identification and information system*. CD Rom. (Centre for Biological Information Technology, Queensland).
- Web ref. 1: www.aqis.gov.au/icon32/asp/ex_topiccontent.asp?TopicType=Quarantine+Alert&TopicID=17860
- Web ref. 2: [www.frli.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/51A908BB356E2A6CCA25724700824426/\\$file/0618884A061128Z.pdf](http://www.frli.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/51A908BB356E2A6CCA25724700824426/$file/0618884A061128Z.pdf)
- Web ref. 3: www.daff.gov.au/corporate_docs/publications/pdf/biosecurityaustralia/plant/2006/permittedgenera.pdf

Robyn Barker

From the Weeds CRC

Several recent press releases from the CRC for Australian Weed Management or their Enviroweeds discussion group are of interest. All press releases are available from their web site (Web ref. 1)

Weeds CRC to end in mid-2008

The Weeds CRC's application for a third, seven year term has been rejected (Web ref. 2) and the current Weeds CRC will finish in mid-2008. See p. 10 for further details

Prepare for climate change invaders

Australia should take urgent steps to prepare for fresh invasions of pests under climate change (web ref. 3). [A paper suggesting that quick-growing plants such as weeds may cope better with global warming than slower-growing plants has just been published in the *Proceedings of the National Academy of Sciences*. The paper by Weis, Franks and Sim is referred to on the University of California, Irvine site (Web ref. 4) – sourced from Enviroweeds mailing list 11th Jan. 2007]

Media release November 2006

Massive foreign takeover bid foiled

CEO of the Weeds Cooperative Research Centre, Dr Rachel McFadyen, said that the completion of the 'permitted seeds list review' by the Commonwealth agency Biosecurity Australia was a major breakthrough for biosecurity in this country (Web ref. 5). See also comments on p. 36.

Dr McFadyen also pointed to a new paper published in the US Proceedings of the National Academy of Sciences that holds up the Australian plant quarantine system as a model the US might consider adopting. The paper (Keller et al. 2007) reviewed the Australian system, noted that it had an accuracy of nearly 90%, and that it produced a real net economic benefit to Australia.

Media release 21 December 2006

Watering your lawn with sea-water

Concern was expressed over an item in *The Sydney Morning Herald* hailing the use of *Paspalum vaginatum*, a well known salt tolerant grass species, native to many tropical and subtropical coastal regions, including Australia. Developed in the United States, Sea Isle is a paspalum that its backers claim will be the most environmentally friendly turf grass of the 21st century. The original item is no longer freely available on the web but it is reproduced in its entirety at Web ref. 6.

From Enviroweeds 28th March 2007

Hybridising *Lomandra* species

Scott Watson of VicRoads expressed concern about introduced New South Wales forms of *Lomandra* being commonly planted in Melbourne instead of the local form – he has documented that hybrids now appear to be forming and that the emergence of intermediate plants has meant they have had to remove some recent plantings in conservation reserves. Such happenings are something that need to be borne in mind by the systematist of today.

From Enviroweeds 26th March 2007

A new way of getting rid of inaccessible weeds

Weeds – you can dig them up, spray them, cut them to pieces or burn them. Or you can shoot them!

An employee of the New Zealand Conservation Department is having great success shooting inaccessible pest plants on Mana Island using a paintball gun according to an article (Web ref. 7) in *The Dominion Post*, Tuesday, 6 March 2007.

From Enviroweeds March 2007

References

- Enviroweeds web server: <http://list.adelaide.edu.au/mailman/listinfo/enviroweeds.crcawm-v>
- Keller, R.P., Lodge, D.M. and Finnoff, D.C. (2007). Risk assessment for invasive species produces net bioeconomic benefits. *Proc. National Acad. Sciences U.S.A.* 104: 203-7; www.pnas.org/cgi/doi/10.1073/pnas.0605787104
- Web ref. 1: <http://www.weeds.crc.org.au/publications/media.html>
- Web ref. 2: http://www.weeds.crc.org.au/main/weeds_crc_to_end.html
- Web ref. 3: http://www.weeds.crc.org.au/documents/mr_climate%20change_081006.pdf
- Web ref. 4: http://www.today.uci.edu/news/release_detail.asp?key=1559
- Web ref. 5: www.weeds.crc.org.au/documents/mr_foreign%20takeover_211206.pdf
- Web ref. 6: www.droughtreliefguide.com.au/newsview/turf-with-your-surf-come-off-the-grass-1291
- Web ref. 7: www.stuff.co.nz/stuff/marlboroughexpress/3982842a10.html

Book reviewer wanted: *Flora of Australia* volume 2

We have a review copy of this available for anyone who wishes to volunteer to produce a review for the next issue of the newsletter.

Please contact the editors if you are interested.

Coming conferences

Tercentenary of the Birth of Carl Linnaeus. A festival of systematics and history!

25–27 June 2007, Sydney.

See notice in *Austral. Syst. Bot. Soc. Nsltr* 128, p. 42.

The conference is hosted by the Linnean Society of New South Wales with Botanic Gardens Trust and the University of Sydney.

Contact: Dr Elizabeth May
lizmay@bio.usyd.edu.au

Biodiversity Extinction Crisis Conference – A Pacific Response

10–12 July 2007, Sydney.

Inaugural regional conference by the Society for Conservation Biology, Australasia Section

There are five major themes:

- Regional Challenges (particular issues for the world)
- Managing threatening processes of universal importance
- Case studies of conservation in action, including biodiversity monitoring and assessment
- Conservation science and policy

- Conservation science and the community (non-government organisations, indigenous people)

Web site: www.biodiversity2007.com/

Society for Australian Systematic Biologists

3–7 December 2007, Brisbane.

The next Society of Australian Systematic Biologists Conference will be combined with the 8th Invertebrate Biodiversity & Conservation Conference and held in Brisbane at the Queensland Museum. See web site for further details.

Contact: Dr Christine Lambkin
Biodiversity Curator (Entomology)
Queensland Museum

Web site: www.ibcc2007.org/

The 4th International Conference: The Comparative Biology of the Monocotyledons & The 5th International Symposium: Grass Systematics and Evolution

11–15 August 2008, Copenhagen, Denmark.

The first circular is available.

Web site: www.monocots4.org

Requests for assistance

Material wanted: *Juncus pallidus* and allies

An amateur botanist in Britain, Mike Wilcox, is interested in receiving material of *Juncus pallidus*, *J. effusus* and *J. inflexus*. All three species (and hybrids between them) have apparently turned up in Britain. Mike is interested in the anatomy of the species and their hybrids. Herbarium specimens with enough culms that some could be removed for sections would be ideal.

If you have these species locally and could help out, please contact:

Mike Wilcox
32 Shawbridge St. Clitheroe, BB7 1LZ,
Lancashire, England
Michaelpw22@hotmail.com

Kevin Thiele

Chance to get your naturalised lavender species identified by the expert

Susyn Andrews (Consultant Horticultural Taxonomist), previously of Kew, and author of the book on Lavender (Andrews & Upson 2004) will be revisiting Adelaide to work in the Botanic Gardens Library between 22nd May and 4th June after speaking at a Lavender conference in Healesville. She has indicated that she will be happy to identify pressed specimens of naturalised *Lavandula* species during that time. If you have a problem species then forward you specimen to the State Herbarium of South Australia, clearly marked as *Lavandula* and for the attention of Susyn Andrews.

Reference

Andrews S & Upson, T. (2004). *The genus Lavandula*. (Royal Botanic Gardens, Kew).

The front cover illustration

The front cover of this issue celebrates the tercentenary of Linnaeus's birth (see p. 15). We feature Georg Dionysius Ehret's famous 1736 or 1737 depiction of Linnaeus's sexual system for classifying plants. This system assigned plants

to 24 classes based on reproductive structures, particularly the stamens. For a simplified explanation of the classes see Web ref. 1.

Web ref. 1. www.botany.utoronto.ca/courses/bot307/B_How/307b1Linn.html

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Contacting Major Australian Herbaria and Systematics Institutions

From outside Australia: add the country code 61 and omit the leading zero of the area code

AD tel: (08) 8222 9307 fax: (08) 8222 9353 www.flora.sa.gov.au	HO tel: (03) 6226 2635 fax: (03) 6226 7865 www.tmag.tas.gov.au/Herbarium/ Herbarium2.htm	MEL tel: (03) 9252 2300 fax: (03) 9252 2350 www.rbg.vic.gov.au/ biodiversity/	NSW tel: (02) 9231 8111 fax: (02) 9251 7231 www.rbg Syd.gov.au/conservation _research/herbarium_&_services
CANB tel: (02) 6246 5108 fax: (02) 6246 5249 www.anbg.gov.au/	BRI tel: (07) 3896 9321 fax: (07) 3896 9624 www.epa.qld.gov.au/nature_ conservation/plants/ queensland_herbarium	DNA tel: (08) 8999 4516 fax: (08) 8999 4527 www.nt.gov.au/pwcnt	PERTH tel: (08) 9334 0500 fax: (08) 9334 0515 http://science.calm.wa.gov.au/ herbarium/
QRS tel: (07) 4091 8800 fax: (07) 4091 8888	MBA tel: (07) 4048 4745/4743 fax: (07) 4092 3593	NT tel: (08) 8951 8791 fax: (08) 8951 8790	Australian University Herbaria Contact CHAH representative: Murray Henwood, University of Sydney
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These listings are published in each issue. Please inform the Editors of any change

ASBS Publications

History of Systematic Botany in Australia

Edited by P.S. Short. A4, case bound, 326pp. ASBS, 1990. \$10; plus \$10 p. & p.

For all those people interested in the 1988 ASBS symposium in Melbourne, here are the proceedings. It is a very nicely presented volume, containing 36 papers on: the botanical exploration of our region; the role of horticulturists, collectors and artists in the early documentation of the flora; the renowned (Mueller, Cunningham), and those whose contribution is sometimes overlooked (Buchanan, Wilhelmi).

Systematic Status of Large Flowering Plant Genera

Austral.Syst.Bot.Soc.Nsltr 53, edited by Helen Hewson. 1987. \$5 + \$1.10 postage.

This Newsletter issue includes the reports from the February 1986 Boden Conference on the "Systematic Status of Large Flowering Plant Genera". The reports cover: the genus concept; the role of cladistics in generic delimitation; geographic range and the genus concepts; the value of chemical characters, pollination syndromes, and breeding systems as generic determinants; and generic concepts in the Asteraceae, Chenopodiaceae, Epacridaceae, *Cassia*, *Acacia*, and *Eucalyptus*.

Australian Systematic Botany Society Newsletter

Back issues of the Newsletter are available from from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60-62, 66, 84, 89, 90, 99, 100 and 103. Here is the chance to complete your set. Cover prices are \$3.50 (Numbers 27-59, excluding Number 53) and \$5.00 (Number 53, and 60 onwards). Postage \$1.10 per issue, apart from \$1.75 for the Large Genera issue (Number 53).

Evolution of the Flora and Fauna of Arid Australia

Edited by W.R. Barker & P.J.M. Greenslade. Peacock Publications, ASBS & ANZAAS, 1982.
\$20 + \$8.50 postage.

This collection of more than 40 papers will interest all people concerned with Australia's dry inland, or the evolutionary history of its flora and fauna. It is of value to those studying both arid lands and evolution in general. Six sections cover: ecological and historical background; ecological and reproductive adaptations in plants; vertebrate animals; invertebrate animals; individual plant groups; and concluding remarks.

Also available from. Peacock Publications, 38 Sydenham Road, Norwood, SA 5069, Australia.
(To obtain this discounted price, post a photocopy of this page with remittance).

Ecology of the Southern Conifers (Now out of print)

Edited by Neal Enright and Robert Hill.

ASBS members: \$60 plus \$12 p&p non-members \$79.95.

Proceedings of a symposium at the ASBS conference in Hobart in 1993. Twenty-eight scholars from across the hemisphere examine the history and ecology of the southern conifers, and emphasise their importance in understanding the evolution and ecological dynamics of southern vegetation.

Postage rates: Those quoted apply only within Australia. Please e-mail for prices to other locations.

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AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

The *Australian Systematic Botany Society* is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the Society is to promote the study of plant systematics.

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may apply for membership by filling in a "Membership Application" form, available on the Society website, and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on January 1 each year.

The ASBS *annual membership subscription* is \$45(Aust.); full-time students \$25. Payment may be by credit card or by cheques made out to *Australian Systematic Botany Society Inc.*, and remitted to the Treasurer. All changes of address should be sent directly to the Treasurer as well.

The Newsletter

The *Newsletter* is sent quarterly to members and appears simultaneously on the ASBS Web site. It keeps members informed of Society events and news, and provides a vehicle for debate and discussion. In addition, original articles, notes and letters (not exceeding ten published pages in length) will be considered.

Citation: abbreviate as *Austral. Syst. Bot. Soc. Nsltr*

Contributions

Send to the Editors at the address given below. They *preferably* should be submitted as: (1) an MS-DOS file in the form of a text file (.txt extension), (2) an MS-Word.doc file, (3) a Rich-text-format or .rtf file in an email message or attachment or on an MS-DOS disk or CD-ROM. *Non-preferred* media such as handwritten or typescripts by letter or fax are acceptable, but may cause delay in publication in view of the extra workload involved.

Formatting of submitted copy. Please use Word in formatting indents, bullets, etc. in paragraphs and for tables. Do not format primitively with tabs, which change with the Normal style sheet. If embedding tables or references or other Objects from other software (Excel, bibliographic software, etc.) ensure that these are converted to Word tables or paragraphs. Letters in abbreviations of Australian States (SA, WA etc., but Vic.) and organisations (e.g. ASBS, ABRIS) should not be separated by full-stops, but initials should be (e.g. W.R. Smith, not WR Smith).

Images: their inclusion may depend on space being available. Improve scanned resolution if printing your image is pixellated at a width of at least 7 cm (up to a 15 cm full page). Contact the Editors for further clarification.

The *deadline* for contributions is the last day of February, May, August and November. All items incorporated in the *Newsletter* will be duly acknowledged. Any unsigned articles are attributable to the Editors.

Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the *Australian Systematic Botany Society Inc.* Newsletter items should not be reproduced without the permission of the author of the material.

Advertising

Advertising space is available for products or services of interest to ASBS members. The current fee is \$100 per full page, \$50 per half-page or less.

Flyers may be approved for inclusion in the envelope for products or services of interest to ASBS members. The current fee is \$100 per flyer, plus the cost of inserting them (usually roughly \$25-30). Flyers are not part of the *Newsletter* and do not appear with the *Newsletter* on the ASBS Web site.

A 20% discount applies for second and subsequent entries of the same advertisement. Advertisements from ASBS members are usually exempt from fees but not the insertion costs in the case of a flier. Contact the Newsletter Editors for further information.

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