

# Introduction

The Australian Biological Resources Study (ABRS) is a Program of Environment Australia. It was established in 1973 by the Commonwealth Government to support research and disseminate knowledge on the taxonomy of the flora and fauna of Australia.

ABRS promotes taxonomic and biogeographic studies of Australian biodiversity through two mechanisms:

- the Participatory Program, a unique research grants scheme which provides funds towards taxonomic and biogeographic research; and

- the Scientific and Communication Subprograms which publish major national series of flora and fauna books, electronic products and databases. ABRS also produces occasional publications on taxonomy, biogeography and closely related subjects.

In addition to the grants scheme and the publications, ABRS also offers information services and funding schemes.

Details of these programs and services are provided in this newsletter, and are also available on-line at

[www.ea.gov.au/biodiversity/abrs/](http://www.ea.gov.au/biodiversity/abrs/)

## Update on ABRS Activities

### ABRS Director's report

Ian Cresswell

The period since the last Biologue has been one of great change within ABRS. Our continued move to greater electronic publishing has been hastened, and we have continued to review and revise all our work to ensure we are delivering the best possible products in the most efficient manner. The May 2002 Federal budget required substantial savings to be made from many Commonwealth Departments. The net effect on ABRS was a reduction of \$500,000 in total budget, including the need for a significant reduction in running costs (of which by far the greatest component is salaries).

We have set a goal of achieving within 2 years 75% of our product being delivered via the internet. We have embarked on a process to ensure we get the balance right in both the content and style of delivery, and I look forward to significant input from all our 'stakeholders' as we continue to change how we do business. I am extremely proud of all the ABRS staff who have worked very hard to see 15 new publications brought out in the last 6 months. Over the same period the Australian Biodiversity Information Facility (ABIF), available information on fauna species (the Australian Faunal Directory) doubled from 20 per cent to 40 per cent of known taxa and now contains nearly 39,000 species (a list of all the new checklists available appears on page 17). Work also continued on development of the plant information in ABIF, with the continued population of the *What's its Name* website. We hope to launch the new ABIF-Flora website before the end of 2002.

The past 6 months have also been a time of rapid policy development in several areas of critical importance to ABRS, and we have been heavily involved in ensuring that the role of taxonomy, and in particular ABRS, is properly taken into account. The Federal Government concluded several major policy documents relating to biotechnology, access to genetic resources, and bioinformatics. ABRS provided input in order to promote the role of baseline species knowledge and correct nomenclature of all components of biodiversity.

The largest focus for ABRS this year will be increasing our web presence, both in terms of content, and also in a major upgrade to our existing website. All staff are currently working hard to plan the 'new-look' ABRS site, and I look forward to unveiling it in early 2003.

## Director's report (cont.)

ABRS has continued to play a key role in the implementation of Australia's Virtual Herbarium (AVH) and in the development of OZCAM (Online Zoological Collections of Australian Museums). The first phase of OZCAM will develop a web interface to link existing faunal databases for several key groups and provide a 'proof of concept' for a faunal data network.

ABRS has continued to make a significant contribution internationally. Several staff have served on, or provided advice to, international nomenclature committees, refereed journal articles, and participated in international projects. Our efforts are well regarded overseas, and our reputation is very high indeed. ABRS has also provided policy input on several issues for the Convention on Biological Diversity (CBD), and I was personally very pleased to see the Global Taxonomy Initiative (GTI) Programme of Work formally adopted by all countries at the Sixth Meeting of the Conference of the Parties to the CBD in April 2002.

Several staff, including myself, have participated in activities relating to the Global Biodiversity Information Facility (GBIF) and the development of an Australian node for GBIF. I recently attended the 'Capacity Building and Outreach' subcommittee of the Science Committee of GBIF, held in Pretoria, South Africa, in July 2002. The meeting was held back-to-back with the BioNET INTERNATIONAL 3rd Global Workshop on Taxonomy.

I would like to finish on a recent highlight: the selection of 'ABRS and the Acacia team' who put together the *Flora of Australia* volumes on *Acacia* and the *WATTLE* interactive key on CD-ROM, as finalists in the Royal Botanic Gardens, Sydney, Eureka Award for Biodiversity Research. While we didn't win the award, this is our first nomination and we were in the top 4 out of 25 nominations. I believe this reflects well on all involved, and is testament to ABRS' commitment to the project over 20 years through good and bad times. It is worthwhile reflecting on the huge investment required to truly provide a solid taxonomic base for a multitude of uses into the future.

## ABRS Advisory Committee

Since the publication of the last *Biologue* the ABRS Advisory Committee has met twice. The first meeting was an out-of-session teleconference, held on 11th June 2002. Principal business revolved around management of the ABRS Participatory Program grants scheme, including special purpose grants for Bursaries, Scholarships, the Australian Botanical Liaison Officer at Kew, grants priority setting, and streamlining of the grants process. In addition, there was considerable discussion on mechanisms to reposition ABRS to maximise its profile in Government and the user community. A progress report from ACIL Consulting was received, documenting progress on the development of a 10 year strategic plan for research on the taxonomy of microorganisms.

The second meeting was held in Canberra on 5th-6th September. The meeting included, for the first time, a series of workshops jointly attended by staff and Committee members, to develop ideas on key topics: marketing and promotion, production methods for future CD products, and alternative financial models for ABRS. These workshops generated lively discussion, and provided an excellent underpinning for later committee business touching on similar topics.

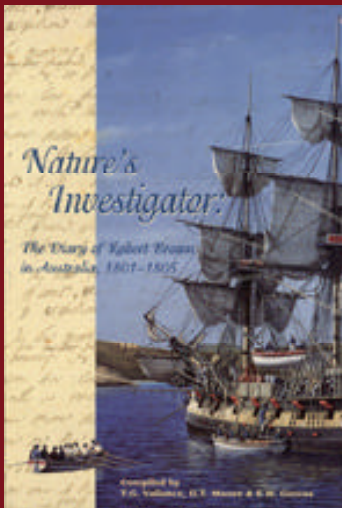
The Committee also received a final briefing on the ACIL consultancy and copies of the final report. A process of public consultation and a response to the report will be prepared over coming months. The meeting re-examined a number of governance issues, including fine tuning of the grants process, encouragement of the development of more partnerships between ABRS and other institutions (particularly in industry), better documentation of in-kind and financial contributions from grantee institutions to ABRS-funded projects, tighter monitoring of outcomes from ABRS grants and contracts, redevelopment of the ABRS website, and development of business plans for ABRS projects and the organisation as a whole. One of the more immediately noticeable outcomes from this meeting will be a decision to move the grants cycle back to a calendar year basis over the next year or so. The Committee advised that they considered this would provide improved efficiency in administration, and a better environment for applicants and those who must assess applications. The current call for applications will still close on 10th November, for a 12 month period, and ABRS will advise during the coming year on how the change in timing will be managed with minimum disruption to research projects.



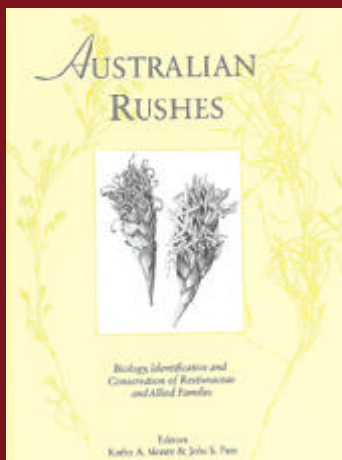
## A Rewarding Year

The Eureka Prizes administered by the Australian Museum are the premier awards for scientific excellence in Australia. It was most gratifying, therefore, when one of the projects that ABRS has been involved with for many years was amongst the finalists for a prize in this year's round. The *Acacia* research project, a joint initiative of ABRS, Bruce Maslin of the WA Department of Conservation & Land Management, and a team of collaborators from around the country, was nominated for a Royal Botanic Gardens, Sydney, Biodiversity Research prize, and was one of four projects shortlisted. The entry emphasised the contribution that completion of this major collaborative research project would make to conservation, management and sustainable use of Australia's largest genus of flowering plants. Materials provided in support of the application comprised volumes 11A and 11B of *Flora of Australia*, the *WATTLE* interactive CD, and the *Wattles of the Kalannie Region* CD.

The Eureka shortlisting topped off a very successful year in which ABRS publications were recognised with a number of awards.



ABRS' first major venture into biological biography, the book *Nature's Investigator: The Diary of Robert Brown in Australia 1801-1805*, published in December 2001, was awarded the Thackray Medal of the UK Society for the History of Natural History for its significant achievement in biological and earth sciences. Earlier, in July 2001, the book *Australian Rushes*, jointly published by ABRS and University of Western Australia Press, was awarded the 2001 Henry Allan Gleason Award of the New York Botanic Garden for an outstanding publication in the fields of plant taxonomy, plant ecology or plant geography. The same book was shortlisted for the WA Premier's Book Awards, the APA Design Awards (best designed tertiary and further education book) and The Australian Awards for Excellence in Educational Publishing. Another ABRS joint publication with University of Western Australia Press, *Marine Plants of Australia*, was a finalist for the Prescott Award of the Phycological Society of America.



Each year the Royal Zoological Society of New South Wales hosts the Whitley Awards, handing out some of the most sought after prizes for Australian zoological literature. These awards are presented to exceptional publications that contribute significantly to our knowledge of the fauna of the Australasian region. Nominated by CSIRO Publishing, two outstanding ABRS faunal publications were recognised at the awards ceremony held at the Australian Museum on 17th August 2001. The well-illustrated *Fauna of Australia* volume *Polychaetes & Allies: The Southern Synthesis. Volume 4A Polychaeta, Myzostomida, Pogonophora, Echiura, Sipuncula* (marine worms including fan worms, beach worms and peanut worms) was awarded a Certificate of Commendation for the Best Zoological Compendium and the *Zoological Catalogue of Australia. Volume 31.6 Lepidoptera: Hesperoidea, Papilionidae* (butterflies) was awarded a Certificate of Commendation for the Best Zoological Reference. Both volumes provide comprehensive and authoritative treatments in an accessible form of some of Australia's most amazing animal groups.

# Participatory Program

## Research Grants – Call for 2003/2004 Applications

ABRS is now calling for applications for research grants for the year 2003/2004. The application forms, guidelines and other instructions are available from the ABRS website at [www.ea.gov.au/biodiversity/abrs/about/programs/grants.html](http://www.ea.gov.au/biodiversity/abrs/about/programs/grants.html)

### Priority Areas for Research Grants for 2003/2004

The ABRS Participatory Program Research Grant Scheme supports the documentation of Australia's biological diversity, through the development of rigorous taxonomic treatments, mainly at species level, and research contributing to regional or continental generic or higher level reviews, including the development of identification tools.

In recent years ABRS has expanded its role, delivering taxonomic information in a range of formats including interactive identification guides, web-based products, databases, CD products, books and scientific papers.

Applicants should note that the research objectives of the ABRS Participatory Program are to develop taxonomic understanding of the Australian biota in areas of national priority including those taxa needed to support ABRS publications both electronically through the World Wide Web (Australian Biodiversity Information Facility and Species Bank) and on CD-ROMs, as well as our book series, which include the *Flora of Australia*, *Algae of Australia* and *Fungi of Australia*.

The ABRS Advisory Committee invites applications for grants in the year 2003/2004 for projects which meet several of the following criteria

- undertake the documentation of Australia's biological diversity
- undertake rigorous taxonomic treatment mainly at species level
- contribute to regional or continental generic or higher level taxonomic research
- contribute to taxonomic research in the following areas of national priority
  - soils
  - arid/semi-arid/rangeland zones
  - coastal/marine systems
  - freshwater systems

- will lead to published outcomes (e.g. papers in peer reviewed journals, book chapters or as an ABRS publication).
- will allow the completion of an ABRS publication. ABRS publications provide delivery of taxonomic information in a range of formats including web-based products, databases, CD products and books.

In 2003/2004 the following groups are nominated to support the ABRS publication program, but do not preclude applications for support of research in other groups.

**Bryophytes:** Dicranaceae; Catalogue of Australian Liverworts and Hornworts

**Lichens:** Teloschistaceae

**Fungi:** Plant pathogenic fungi; Sequestrate fungi; Agaricales *sensu lato*

**Vascular Flora:** Stylidiaceae (excluding woody species from SW WA); Campanulaceae - Campanuloideae; Asteraceae - Heliantheae; Rubiaceae (preparation of *Flora of Australia* texts)

**Algae:** Regional Floras, especially of tropical areas; Cyanobacteria

**Fauna:** Check-listing: any groups not yet check-listed for the Australian Faunal Database (AFD). The table at [www.ea.gov.au/biodiversity/abrs/abif/fauna/afd/frames/search.html](http://www.ea.gov.au/biodiversity/abrs/abif/fauna/afd/frames/search.html) details taxa already databased, or in preparation for the AFD.

Further information regarding grant applications or the research priorities may be obtained from

The Business Manager, ABRS, phone (02) 6250 9556, fax (02) 6250 9555 or email: [abrs@ea.gov.au](mailto:abrs@ea.gov.au)

**Deadline**

Applications must be received by 10 November 2002.

## Article from ABRS Grantee

### Untangling the Australian Miturgidae: Gordian Knots, Bananas or Onions?

In drier parts of Australia, large pillow-like sacs of web are often found in and under logs. These are the resting cells of large spiders of the genus *Miturga*, commonly called Racing Stripe spiders because of the long dark stripes down the pallid carapace and abdomen.

When disturbed, these large spiders scuttle quickly to the next point of cover. Nineteen species have been described in *Miturga* which, save for one species from New Guinea, are endemic to Australia. Of those species, all but three (Hickman, 1930) were described prior to 1910. Little is known of their biology but they are no doubt valuable supplements in the diet of endangered mammals.

Basically, a miturgid has been regarded as a 2-clawed spider with claw tufts and the back eye row recurved, but not strongly so; the definition is far too broad. Nonetheless, the genus *Miturga* is very distinctive and soon became the type genus of the family Miturgidae, elevated by Lehtinen (1967) in his massive and creative restructuring of spider families. Into the family Lehtinen also placed spider genera from all other continents, with the result that the family concept became quite vague. More recently, Levy (1990) began dismantling the family by first removing *Zoropsis* and reinstating the Zoropsidae. Soon after, Griswold (1993) focused on the Lycosoidea and proved Lehtinen's family concept to be both unworkable and unsupported cladistically. Griswold's work soon led to further dismantling of the Miturgidae with reinstatement of the Tengellidae and elevation of the Udubidae.

The situation in Australia, however, was no clearer. The Miturgidae were still not well defined and were soon expanded again. Bonaldo (1994) added the well-known Slender Sac spiders of the genus *Cheiracanthium* (along with related genera forming the subfamily Eutichirinae), which had never before been separated from the Clubionidae, to which they have now been restored by Raven & Stumkat (2002a). However, as with many groups, when the endemic Australian fauna are



The resting web of *Miturga lineata* Thorell, the type species of *Miturga*, is often found empty but often attains the size of a hand.

Robert J Raven  
Queensland Museum,  
South Brisbane  
Queensland

described, the narrow family concepts based on the depauperate boreal faunas are soon found inadequate. Intensive cladistic attention was needed to resolve the conflicts.

The work of Griswold (1993) was then the key. However, Griswold represented the Miturgidae in his cladogram by only one taxon, *Uliodon tarantulinus* (Koch, 1873), which was soon found to be a very widespread and highly autapomorphic species. Koch (1873) had placed this species in the otherwise European genus, *Zora*, not in *Uliodon*, to which genus it was transferred by Simon (1892). On revising the genus *Uliodon* (Raven & Stumkat 2002b), it was quickly apparent that the type species, *Uliodon albopunctatus* Koch, 1873, always listed from Australia, could no longer be found here, nor did it appear closely related to *U. tarantulinus*. Discrepancies between the original specimen label and the register data provided the critical clue: Koch (1873) had included only two new species in *Uliodon* and both were endemic to New Zealand. Based on Griswold's cladogram, it was clear that *Uliodon* was correctly placed in the family Zoropsidae, not previously reported from Australasia although the possibility was certainly wrestled with by Gray & Thompson (2001). Nevertheless, Griswold's (1993) recognition of *U. tarantulinus* as a miturgid was correct, but a new genus name was required.



*Miturga gilva* Koch, male, a widespread Australian miturgid species and one of the smaller ones that features strongly in the diet of egrets.

A second and tropical genus, *Amauropelma* Raven & Stumkat, 2001, also challenged the concept of the Miturgidae and only when it was placed in the wider perspective of a world review of the Ctenidae (Silva, PhD, dissertation, Cornell University, 2001) was it clear that it was the sister group of the African-Asian genus *Thoriosa*. Although these taxa indeed compromise the boundaries of the Ctenidae and Miturgidae, only through a global analysis will a clear resolution be found. In the meantime, I and my co-authors continue to strip away the outer shells from the core genera related to *Miturga* hoping that it is a banana we are peeling and not an onion!

In the absence of a sound cladistic concept, through the foresight of the good folk at ABRS, a very workable system for recognising Australian spider families has been funded. In a collaborative project involving Dr Mark Harvey, Western Australian Museum, and Dr Barbara Baehr (also QM) and the enduring patience of ABRS & LucID development staff, we have forged an interactive identification key in LucID. The data, originally captured in DELTA and then imported into LucID, allow the Australian user to identify spiders to subfamily, sometimes a genus and even to species. The key comes with a glossary and the first checklist of Australian spiders since Rainbow (1911). The illustrations (mostly by Barbara Baehr) are rich, detailed and labelled; notes on and descriptions (based on the key characters) of the subfamilies are provided along with distribution maps and photographs of the spiders. The key works on either sex and in most cases will allow the identification of non-adults. In some cases, a subfamily can be identified by picking the one very unusual character; in the Theridiidae, however, a minimum of two but typically nine or more characters are needed. Above all, the key resolves the problems of recognising the Miturgidae and also those intertwined amaurobioid families, including the Amaurobiidae, Amphinectidae, Desidae and Stiphidiidae.

#### Literature Cited

Bonaldo, A.B. (1994). A subfamília Eutichurinae na região neotropical, com a revisão do gênero *Eutichurus* Simon, 1896 (Araneae, Miturgidae). *Iheringia (Zool.)* 76: 101-159.

Gray, M.R. & Thompson, J. (2001). New lycosoid spiders from southern Australia and North West Cape Peninsula (Araneae: Lycosoidea). *Records of the Western Australian Museum Supplementary Series* 64: 159-170.

Griswold, C.E. (1993). Investigations into the phylogeny of the lycosoid spiders and their kin (Arachnida, Araneae, Lycosoidea). *Smithsonian Contributions to Zoology* 539: 1-39.



"*Uliodon*" *tarantulinus* (Koch) a widespread Australian miturgid species that, like many hunting spiders, is powerfully attracted to the steady idling of 4x4 diesel.

Hickman, V.V. (1930). Studies in Tasmanian spiders. Part IV. *Papers and Proceedings of the Royal Society of Tasmania* 1929: 87-122.

Koch, L. (1873). *Die Arachniden Australiens, nach der natur beschrieben und abgebildet*. Nürnberg, 1871, pp. 1-472.

Lehtinen, P.T. (1967). Classification of the Cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. *Annales Zoologici Fennici* 4:199-467.

Levy, G. (1990). On the cribellate spider *Zoropsis lutea* in Israel (Araneae, Zoropsidae). *Bulletin of the British Arachnological Society* 8: 139-143.

Rainbow, W.J. (1911). A census of Australian Araneidae. *Records of the Australian Museum* 9: 107-319.

Raven, R.J. & Stumkat, K. (2002a). *Pteroneta* Deeleman-Reinhold and a remarkable sympatric *Clubiona* (Clubionidae: Araneomorphae: Arachnida) in northern Australia. *Memoirs of the Queensland Museum* 48: 199-206.

Raven, R.J. & Stumkat, K. (2002b). Problem solving in the spider families Miturgidae, Ctenidae and Psechridae (Araneae) in Australia and New Zealand. *Journal of Arachnology* [in press].

Raven, R.J., Stumkat, K. & Gray, M.R. (2001). Revisions of Australian ground-hunting spiders: I. *Amauropelma* gen. nov. (Araneomorphae: Ctenidae). *Records of the Western Australian Museum Supplementary Series* 64: 187-227.

Simon, E. (1892). *Histoire naturelle des araignées*. Roret: Paris, 1: 1-256.

# Article from ABRS Grantee

## Trigger plants

The trigger plant genus *Stylidium* is amongst the most abundant and diversified genera in Australia, but knowledge of the group is currently insufficient for scientific and conservation needs. This project will provide a taxonomic treatment of a subset of south-west Australian trigger plants based on a combination of morphological, anatomical and cytological data. Core taxonomic characters will be databased to form a framework for an interactive identification key and taxonomic descriptions will be produced for approximately 110 species. This represents a substantial contribution towards a complete treatment of Stylidiaceae for the *Flora of Australia* series.

With over 230 species, *Stylidium* is by far the largest genus in the family Stylidiaceae and one of the largest genera in Australia. Species of *Stylidium* can be recognised by their unique pollination system in which the central floral column, which is usually held under tension, typically “triggers” in response to insect contact (*Figure 1*). The column functions firstly to shed pollen onto an insect and secondly, after the stigma has developed, to pick up pollen that an insect may have been carrying. South-west Western Australia is the primary centre of trigger plant diversification: approximately 70% of species occur here and of these, 96% are endemic to the region. Many of these species are restricted to fragmented populations that occur in a localised area.



Figure 1: *Stylidium schoenoides*: the column (in the flower on the left) is poised to strike and has been triggered in the flower on the right.

Juliet Wege  
Western Australian Herbarium  
Dept of Conservation & Land Management  
Western Australia

Although considerable taxonomic work has been conducted on *Stylidium* in recent years, no comprehensive treatment of the genus has been published since Mildbraed (1908), nor is there an up-to-date identification aid to the taxa currently known from south-west Western Australia. Within this region, numerous species complexes remain poorly understood and there are many taxa with restricted distributions whose conservation status requires clarification. This project aims to clarify species boundaries in a subset of south-western species using a combination of morphological, anatomical and cytological data.

*Stylidium* comprises both annual and perennial herbs that display remarkable variation in habit and floral morphology. The flowers are often brightly coloured, and a range of nectar guides (e.g. colourful corolla markings and conspicuous throat appendages) that attract pollinators toward the throat of the corolla has evolved. The corolla consists of four regular lobes and a highly differentiated fifth petal termed the labellum (*Figure 2*). In open flowers it typically points directly down towards the base of the calyx, an orientation that accommodates the column in its poised position. The structure of the labellum is incredibly varied, so much so that it is often possible to identify a plant from the appearance of the labellum alone (*Figure 3*). Similarly the shape, size and colour of the larger corolla lobes and the throat appendages are highly diagnostic.

Trigger plant leaves are similarly variable with features such as arrangement, shape, and the structure of the margin, apices and bases forming important taxonomic characters. Corresponding to this morphological diversity is a high degree of anatomical diversity. There is variation in epidermal cell size, shape and orientation, the structure of the margin cells, the distribution pattern of stomata, composition of the mesophyll and the presence of sclerenchyma (Burns 1900; Mildbraed 1908; Wege 1999).



Figure 2: Flower of *Stylidium articulatum* with inset showing labellum detail.

The importance of leaf anatomical characteristics was recognised by Mildbraed (1908) in his subgeneric classification, but variation in leaf anatomy has not been fully utilised in alpha-taxonomy. It will be used in the present study to supplement morphological observations.

James (1979) demonstrated that the speciation of *Stylidium* in the south-west of Western Australia is associated with extensive chromosome number change. Numbers range from  $n=6$  to  $n=16$ , with polyploidy on 13, 14 and 15 reported for some species. Studies on morphologically allied species complexes have further established that chromosome number change is often a feature of species differentiation (Banyard & James 1979; Farrell & James 1979; Coates 1982; Burbidge 1984). Where possible, chromosome numbers will be sought for those species for which there is no current record, including newly described species.

Data will be entered into a DELTA database to produce an interactive key to trigger plant identification. An interactive approach will increase the ease with which plants can be identified, most notably for pressed specimens in which taxonomically crucial features of the corolla lobes, labellum and throat are not easily observed. The database will be used to generate species descriptions for the *Flora of Australia* account as well as *Florabase*, and will form a framework for my long-term career aims, which include the production of a species-level phylogeny of *Stylidium* and a re-assessment of the infrageneric boundaries within the genus.

## References

- Banyard, B.J. & James, S. H. (1979). Biosystematic studies in the *Stylidium crassifolium* complex (Stylidiaceae). *Australian Journal of Botany* 27: 27-37.
- Burbidge, A. H. (1984). Breeding systems in Triggerplants (*Stylidium*; Stylidiaceae). PhD Thesis. Department of Botany, The University of Western Australia.
- Burns, G. P. (1900). Beitrage zur kenntnis der Stylidiaceen. *Flora* 87: 313-354.
- Coates, D. J. (1982). Chromosome variation and species relationships in the scale-leaved triggerplants (*Stylidium* Section Squamosae). *Australian Journal of Botany* 30: 121-130.
- Farrell, P. G. & James, S. H. (1979). *Stylidium ecorne* (F. Muell. ex Erickson & Willis) comb. et stat. nov. (Stylidiaceae). *Australian Journal of Botany* 27: 39-45.
- James, S. H. (1979). Chromosome numbers and genetic systems in the triggerplants of Western Australia (*Stylidium*; Stylidiaceae). *Australian Journal of Botany* 27: 17 - 25.
- Mildbraed, J. (1908). *Stylidiaceae*: in Engler, A. *Das Pflanzenreich* IV: 278. Wilhelm Engelmann: Leipzig.
- Wege, J. A. (1999). *Morphological and anatomical Variation in Stylidium (Stylidiaceae) - a systematic Perspective*. PhD Thesis. Department of Botany, The University of Western Australia.

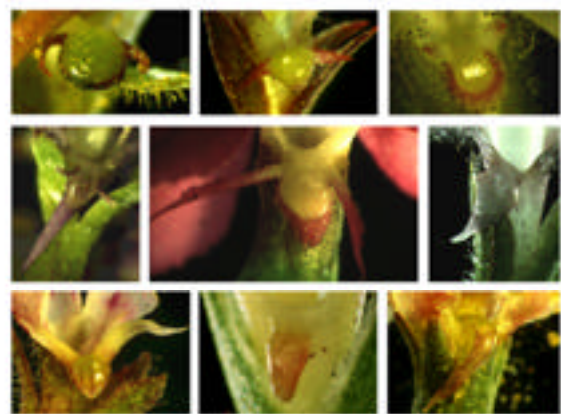


Figure 3: The labellum in *Stylidium* is morphologically diverse and taxonomically informative.

# Article from ABRS Grantee

## Australian Myxomycetes

The myxomycetes (plasmodial slime moulds) are a group of fungus-like organisms usually present and sometimes abundant in terrestrial ecosystems. Because of their life-history strategy and inconspicuous nature, myxomycetes tend to be overlooked in nature. However, careful searching of suitable substrates, especially after a period of rainy weather during summer and autumn, will almost invariably yield a number of their fruiting bodies.

Myxomycetes have been known from their fruiting bodies since at least the middle of the seventeenth century, and their life history has been understood for more than a century. Although "slime mould" is not a particularly attractive common name, fruiting bodies produced by members of the group exhibit incredibly diverse forms and colours and are often objects of considerable beauty. Moreover, since those of many of the more common species achieve macroscopic dimensions, they can be collected and preserved for study in much the same way as the sporocarps of fungi or even specimens of bryophytes, lichens, and vascular plants. If handled carefully, properly stored myxomycete fruiting bodies will remain suitable for study for many years (Stephenson & Stempen 1994).



*Leocarpus fragilis*, one of the more distinctive myxomycetes, is likely to be encountered in the forests of more southern regions of Australia.  
Photo: Heino Lepp

Article by Steven L. Stephenson  
Department of Biology, Fairmont State College  
Fairmont, West Virginia, USA

There are approximately 870 recognised species of myxomycetes (Lado 2001), and these have been placed in six different taxonomic orders (Ceratiomyxales, Echinosteliales, Liceales, Physarales, Stemonitales and Trichiales). The majority of species are probably cosmopolitan, but a few appear to be confined to the tropics or subtropics and some others have been collected only in temperate regions. Most of what is known about the assemblages of myxomycetes associated with particular types of terrestrial ecosystems has been derived from studies carried out in temperate regions of the Northern Hemisphere. Myxomycetes appear to be particularly abundant in temperate forests, but at least some species apparently occur in any terrestrial ecosystem with plants (and thus plant detritus) present (Stephenson & Stempen 1994). In temperate forests, myxomycetes are associated with a number of different microhabitats. These include coarse woody debris on the forest floor, the bark surface of living trees, forest floor litter, soil, the dung of herbivorous animals, and dead but still attached plant parts above the ground. Each of these microhabitats tends to be characterised by a distinct assemblage of species (Stephenson 1989).

There have been very few papers published on the myxomycetes of Australia, and the majority of these either appeared long ago (e.g., Cheesman & Lister 1915) or report only a few species (e.g., Hnatiuk 1978; Stephenson et al. 1992; Ing & Spooner 1994). The only really significant paper is that of Mitchell (1995), who compiled a checklist of all species recorded from Australia. This checklist was based on published records, specimens obtained on loan from herbaria known to have Australian material, and specimens obtained from moist chamber cultures prepared with bark samples sent to him by contacts in Australia. Mitchell listed a total of 147 species from Australia, but many of



*Physarum* is the largest genus of myxomycetes, with more than 100 described species. Some of these, such as the one shown here, are quite variable and often difficult to identify. Photo: Heino Lepp

the records were based solely upon published reports by one or more of the early workers and were not all supported by voucher specimens. Even if a voucher specimen was collected at the time, it may no longer exist in any extant herbarium collection.

The funding provided over the next three years by ABRS will allow the author and David W. Mitchell (a "myxo person" from England who wrote the 1995 paper mentioned above) to collect and study myxomycetes at a number of localities throughout Australia. Our ultimate objective is to produce a comprehensive monographic treatment of the myxomycetes reported from or known to occur on the Australian continent. No comparable monograph on the group yet exists for any region of Australasia.

For the most part, the myxomycetes have been a rather understudied group both in Australia and throughout the remainder of the Southern Hemisphere. However, results obtained from an intensive study of myxomycete biodiversity on subantarctic Macquarie

Island in 1995, when the author spent almost four months at the AAD Research Station on the island, and more limited studies carried out in and around Alice Springs (in 2001) and in northern Queensland (in both 2001 and 2002), suggest that Australia is characterised by a diverse assemblage of myxomycetes. Hopefully, the information obtained as a result of the work we plan to carry out over the next three years will help stimulate further studies of these truly fascinating but relatively little known organisms.

#### References

- Cheesman W.N. & Lister, G. (1915). Mycetozoa of Australia and New Zealand. *Journal of Botany, British and Foreign* 53: 203-212.
- Hnatiuk R.J. (1978). Records of myxomycetes from Western Australia. *Western Australian Herbarium Research Notes* 1: 17-18.
- Ing B. & Spooner, B.M. (1994). Myxomycetes from the Kimberley Region, Western Australia. *Botanical Journal of the Linnean Society* 116: 71-76.
- Lado C. (2001). *Nomenmyx*. A nomenclatural taxabase of Myxomycetes. *Cuadernos de Trabajo Flora Micológica Ibérica* 16: 1-221.
- Mitchell D.W. (1995). The Myxomycota of Australia. *Nova Hedwigia* 60: 269-295.
- Stephenson S.L. (1989). Distribution and ecology of myxomycetes in temperate forests. II. Patterns of occurrence on bark surface of living trees, leaf litter, and dung. *Mycologia* 81: 608-621.
- Stephenson S.L., Seppelt, R.L. & Laursen, G.A. (1992). The first record of a Myxomycete from subantarctic Macquarie Island. *Antarctic Science* 4: 431-432.
- Stephenson S.L. & Stempen, H. (1994). *Myxomycetes: a Handbook of Slime Molds*. Timber Press, Portland, Oregon.

#### Articles from ABRS grantees

In each October issue of *Biologue* we include articles from ABRS grantees. The articles discuss current projects and expected outcomes of the research. Other grantees are encouraged to submit an article for inclusion in forthcoming issues of *Biologue*. Please contact The Business Manager at ABRS for more details.

## Research Scholarships

### Call for 2003 applications

#### Aim and entitlements

ABRS awards postgraduate scholarships to foster research and training in taxonomy. Awards are offered to outstanding students wishing to pursue higher degrees within this discipline and are equivalent to the Australian Postgraduate Award given by the Department of Education, Training and Youth Affairs. A stipend (currently \$17,609 per annum) together with a research support grant of \$2,500 is provided for up to 3 years.

#### Eligibility

ABRS scholarships are open to Australian citizens or persons who have been granted permanent resident status and have lived in Australia continuously for the 12 months prior to November 2002. Candidates should hold a first or upper second class honours degree or equivalent in an appropriate discipline and be strongly motivated to make a professional career as a taxonomist. Applicants will be considered only if they undertake a PhD by research, and they must enrol as a full-time student. Applicants are also encouraged to move from the university at which they undertook their first degree.

#### Obtaining applications

Application forms can be obtained from the ABRS website: <http://www.ea.gov.au/biodiversity/abrs/about/training/postgrad.html>

or from:

The Business Manager

ABRS

GPO BOX 787

CANBERRA ACT 2601

Ph (02) 6250 9556 Fax (02) 6250 9555

Email: [abrs@ea.gov.au](mailto:abrs@ea.gov.au)

#### Deadline

Applications must be received by 10 November 2002.

## Bursaries

### Call for 2003 applications

#### ABRS Bursaries for student travel awards

Each year ABRS offers financial support to postgraduate students in Australian institutions for travel to a national or international conference relevant to both the student's research program in systematics or taxonomy, and to the Aim and Objectives of ABRS. A maximum of \$1,000 is available for an international conference and \$500 for travel within Australia. Up to \$10,000 is available each year for these awards.

#### Eligibility

1. ABRS Bursaries are open to permanent residents of Australia.
2. The student must be currently enrolled in a PhD or Masters degree (including a research component) in the field of Systematics or Taxonomy.
3. The conference must be relevant to Systematics or Taxonomy.
4. The student must show that a poster or oral paper presentation has been submitted to the conference.
5. The student must demonstrate the benefits of the travel to their research and ABRS' Aim and Objectives.
6. Preference may be given to applicants who receive matching funding from their home institution or other source.

#### Obtaining applications

Application forms can be obtained from the ABRS website at [www.ea.gov.au/biodiversity/abrs/about/training/bursaries.html](http://www.ea.gov.au/biodiversity/abrs/about/training/bursaries.html)

or from:

The Business Manager

ABRS

GPO BOX 787

CANBERRA ACT 2601

Ph (02) 6250 9556 Fax (02) 6250 9555

Email: [abrs@ea.gov.au](mailto:abrs@ea.gov.au)

#### Deadline

Applications must be received by 10 March 2003 or 10 September 2003.

# Conservation Status



of the Agaricales, Boletales, Cantharellales, Lycoperdales, Phallales & Russulales of

## South Australia



Table 1. Conservation status of ecological groups.

Biological Group	Total	Species with holotype, lectotype or syntype described from a collection from South Australia	Species introduced from other primarily in introduced vegetation in South Australia
Number of species	110	202 (37%)	130 (27%)
Conspicuous species	20	7 (35%)	3 (15%)
Edible/ornamental species	156	65 (41%)	34 (22%)
Other saprotrophic	30	16 (53%)	21 (70%)
Soil saprotrophic	126	14 (11%)	22 (17%)
Wood inhabiting saprotrophic	87	40 (46%)	21 (24%)

1 State Herbarium of South Australia, PO Box 202, North Rd, 5001, Adelaide, SA, Australia.

2 Australian Biological Resources Study, GPO Box 702, Canberra, ACT 2601, Australia.

### References

Briggs, J.E. & Leigh, J.E. (2004) *Red and Greenland*. Australian Plants Catalogue, Canberra, and Australian Nature Conservation Agency, Canberra.

Claridge, A.W., Berry, S.C. & Trappe, J.M. (1994) Diversity and biogeography of the mycorrhizal fungus *L. Strobilifer*, including techniques and general survey results. *Biological Conservation* 5, 283–291.

Claridge, A.W., Berry, S.C., Cook, S.J. & Trappe, J.M. (2000) Diversity and habitat relationships of mycorrhizal fungi in *Callitris* afforestation in southern and central Australia. *Biodiversity and Conservation* 9, 109–126.

Department of Conservation and Heritage, South Australia. The Botanic Gardens of Adelaide and State Herbarium & The Fauna and Flora of South Australia Herbarium, Adelaide.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Conservation status of five macrofungi in the Adelaide, Cantharellales, Lycoperdales, Phallales and Russulales of South Australia. *Biodiversity* 2, 27–32.

Claridge, A.W. & Trappe, J.M. (2000) Spore ecology of *L. Strobilifer* community of Lane Cove National Park (NSW) in the Sydney region. *Environmental Botany Conservation* 10, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

Department of Conservation and Heritage, South Australia. Herbarium, Adelaide. Botany 19, 191–196.

J.A. Simpson<sup>1</sup> & C.A. Grgurinic<sup>2</sup>

In Australia studies of the conservation status of fungi, both individual species and communities, has lagged behind that of the angiosperms and vertebrates. Since European first settled in Australia over two centuries ago large areas, particularly in higher rainfall zones (>100 mm per year), have been cleared for agriculture and exotic tree plantations. (See map.) At present in Australia there is only one site protected by legislation for the conservation of fungi: Lane Cove Bushland Park, Sydney for species of *Hygrocybaceae* (Kearney & Kearney, 2000).

The conservation status of 110 species of Holobasidiomycota known from the State of South Australia in southern Australia has been evaluated (Grgurinic & Simpson, 2003). The majority of the fungi in this study come from the cleared/ modified vegetation areas in South Australia.

The World Conservation Union Red List criteria introduced in 1989 were found to be inappropriate as the decision rules are based on quantitative thresholds of population size, distributional ranges, rates of decline and extinction risk. Data of this type is not available for South Australia, as little systematic collecting was done between 1933 and 2000. We used a modified version of the system used to prepare the list of Rare or Threatened Australian Plants (ROTA). In the ROTA system threat is qualitatively assessed according to available expert knowledge (Briggs & Leigh, 1996).

At present a large proportion of the macrofungi in this study appear to be endemic to South Australia. Fifty-seven per cent of the 110 species studied have been described as a South Australian collection. Of these 228 are known only from the holotype, lectotype or syntype collection. Only 21% of the 110 species are known to be in conservation areas. (See Table 1.)

Edible/ornamental fungi comprises 35% of the mycorrhizal studied (Table 2). Of these 20 taxa are edemycorrhizal with exotic trees. Fifty-six taxa (12%) have been introduced from overseas.

The data (Table 2) indicate a high degree of endemism in both edemycorrhizal and saprotrophic macrofungi in South Australia. This is in agreement with other studies of the Indigenous Australian mycorrhizal (Grgurinic, 1992, 2002; Claridge et al., 2000a, b).

Particular challenges are faced in identifying threatened fungus species owing to the nature of their life history, ephemeral and often cryptic basidiocarps, and the diffuse and not morphologically distinctive vegetative phases invertebrate in a large and often heterogeneous substratum. Rarity is an important attribute of most threatened fungi possibly predisposing taxa to threats. We can confidently say that in South Australia in the twentieth century there was a considerable decrease in the range of most species of macrofungi as a consequence of land clearing for agriculture, horticulture, exotic plantation forestry, industry and urban development. It is likely fragmentation and genetic isolation of populations has accompanied range reduction. Lack of systematic monitoring of fungal communities and paucity of mycologists makes it impossible to determine if there has been a general decline in fungal populations or diversity within conservation areas.

### Extent of native vegetation in Australia.



Table 2. Ecological attributes of the Orders studied.

Attribute	Agaricales	Boletales	Cantharellales	Lycoperdales	Phallales	Russulales	Total
No. of species	100	31	3	51	21	21	212
Introduced species	295	215	-	-	-	25	535
Conspicuous species	7%	-	-	-	-	-	55
Introduced conspicuous species	1%	-	-	-	-	-	25
Edible/ornamental species	21%	1%	100%	6%	10%	10%	21%
Introduced edible/ornamental species	2%	2%	-	-	-	1%	1%
Unchanged species	12%	-	-	-	-	-	12%
Ultra saprotrophic	17%	-	-	-	20%	-	37%
Introduced ultra saprotrophic	1%	-	-	-	-	-	1%
Soil saprotrophic	63%	2%	-	1%	2%	-	71%
Introduced soil saprotrophic	4%	-	-	-	-	-	4%
Wood inhabiting saprotrophic	21%	2%	-	-	-	-	23%
Introduced wood inhabiting saprotrophic	1%	2%	-	-	-	-	3%
Herbarium type collection	1%	-	-	-	-	-	1%

[www.ea.gov.au/biodiversity/abrs](http://www.ea.gov.au/biodiversity/abrs)



# Retirement of Arthur Chapman

One of the earliest appointees to what was to become the Australian Biological Resources Study, Arthur Chapman, announced his retirement from EA on 15th September.

The early days of ABRS were tortuous and uncertain (see *Flora of Australia Volume 1 Introduction* (2nd edn), pp. 105-124). While the task of persuading Government of the wisdom of initiating a biological survey of Australia proceeded on a number of fronts, private funding from Sir Maurice Mawby was made available to the Australian Academy of Science, funding preliminary work on a 'Flora Project'. Leadership of this project fell to Nancy Burbidge, and one of the first tasks was production of an *Australian Plant Name Index* (APNI). Compilation of APNI began in April 1973, with the appointment of Penelope Hack as biographer, and she was succeeded in January 1974 by Arthur Chapman. He worked alongside Helen Hewson who was commissioned to prepare a sample treatment of Brassicaceae as a model for the *Flora of Australia*. When ABRS was officially established in 1977, Chapman and Hewson became two of its foundation staff.

Arthur worked on APNI for 17 years, producing one of the world's largest and most detailed nomenclators for vascular plants in modern times. The work was published in 4 volumes in 1991. It contained over 62,350 names of taxa at ranks ranging from genus to variety. For each name he provided the meticulously researched author citation, bibliographic reference, base name (if applicable), type citation, lectotype or neotype where appropriate, key Australian references and, frequently, comments on nomenclatural matters. The work provided no taxonomic judgements – it was designed purely as a guide to existing names.

In the ensuing years a generation of botanists have silently thanked Arthur for this monumental work. His scholarship has saved us immeasurable hours of searching in obscure and not so obscure literature. I can personally attest that APNI has frequently provided a timely reminder for names that might otherwise have been overlooked. As one would expect in a work of this size, there are omissions and even errors, but these are remarkably few. Arthur's work has stood the test of time. Now, like Arthur, it has joined the electronic age, and is available on-line at <http://www.anbg.gov.au/cpbr/databases/apni.html> It has also joined some of its overseas relatives as an integral part of the *International Plant Name Index* (<http://www.ipni.org/index.html>).

In a recent email to friends and colleagues Arthur reminisced about the early days of ABRS. I hope he will not mind if I quote from his message:

"The Department has come a long way since the 70s. Apart from the changes in the way both Government and the public view the environment - largely due to the work of this Department, there have been several major stages in the way this Department uses technology and information. To me the three largest changes were:

1. the move from typing pools to individuals working on networked computers
2. the setup of ERIN and the linking of EA to the Internet
3. implementation of the EPBC Act and the beginning of EA staff using GIS and data in their day-to-day work.

One little anecdote on working in EA in its early days was working in the Wales Center in Civic. We worked on old Decstation78 computers with a fixed keyboard and 8.5" floppy discs. For the young ones in our midst, this was a computer screen and keyboard all in one and was a great way to get RSI - we had a lot of staff suffer RSI in those days. The building also had synthetic carpets and if someone walked within a meter or so of a computer it would crash. We had to have watering cans to water the floor every few hours and request that staff not wear nylon underwear. How things have changed!

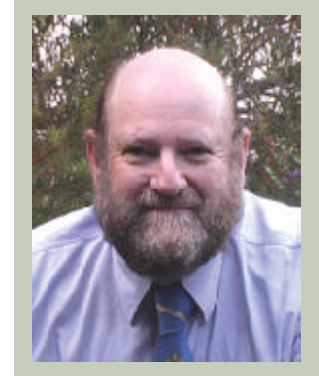
I came across the specifications for one of those computers recently. Among other things, the specifications included - and this was pretty high tech for the time!

1. At least 16,000 characters of usable memory
2. A Cathode Ray Tube display unit, with keyboard
3. A printer which will output both upper and lower case characters
4. On-line storage of approximately 500,000 characters"

From ABRS, Arthur moved on to our daughter organisation, ERIN, where he became involved in the development of some very innovative GIS tools, but that is another story.

I am sure we all wish Arthur well in his "retirement". I understand that he has plans for consulting work in Brazil, among other activities, so it is unlikely that we have heard the last of him. Thank you Arthur for helping to lay the foundations of ABRS, the *Flora of Australia*, and so much more beside.

Tony Orchard





Isabel Hallam  
(Photo Liz Visher)



Graham Ross  
(Photo Liz Visher)



Keith Houston



Marlene Nuda  
(Photo Liz Visher)



Liz Visher  
(Photo provided by Liz Visher)

## Staff Changes at ABRS

The last few months have seen significant staff changes in ABRS. In March 2002 ABRS' graphic artist Ms Isabel Hallam decided to seek new challenges after 7 years with ABRS. Isabel had a varied range of tasks over the years, although her major work was associated with the *Fauna of Australia* series. She brought to us artistic skills of the highest order, combined with a great eye for design, and a familiarity with emerging graphics and desktop publishing software that helped ABRS move into new technology at a time of rapid change.

In May 2002 ABRS, along with many other areas in Government, was presented with the necessity of making budget savings. As a consequence, a review of the staffing structure of ABRS was undertaken, resulting in a decision to dispense with the three Deputy Director positions, and the Administrative Assistant. At the same time new positions of Database Manager, Information Officer and a new Scientific Editor/Assistant Scientific Editor were created. Two of the Deputy Directors, Dr Keith Houston and Dr Graham Ross, opted to take accelerated retirement. The departure of these two staff members is a major loss of expertise within ABRS, as between them they represent 27 years of senior management history and knowledge. Keith had been at ABRS since 1987, building on the successful book series the *Zoological Catalogue of Australia* to develop its electronic successor the *Australian Fauna Directory* (a major part of ABIF-Fauna) using the software package *Platypus*. Graham joined ABRS in 1990 to develop the other major faunal series, *Fauna of Australia*, and more recently has been working on the design and implementation of a new electronic facility, *Species Bank*.

After 7 years with ABRS our administrative assistant, Ms Marlene Nuda, has moved to Environment Australia in an acting capacity and is currently seeking a permanent position. At about the same time, another of our senior managers, Ms Liz Visher, who has managed the ABRS Participatory Program for 9 years, resigned to take up a new job as Assistant Director, Biological Sciences & Biotechnology with the Australian Research Council. Dr Tony Orchard agreed to take on the policy/coordinating role of Liz and Marlene, and Mr Philip Hodgson was temporarily recruited from Environment Australia as Acting Business Manager to manage the Participatory Program.

The position of Graphic Designer, its duties modified to include greater Web work, has been filled by Ms Virginia Du Toit, who took up her new position on 15th August. Appointments to the positions of Database Manager and Information Officer are expected in coming weeks. Dr Tony Orchard has agreed to accept the newly created Scientific Editor position, and will be responsible for the Algae program and policy development. His former responsibility for vascular flora (particularly that associated with the *Flora of Australia*) now passes to Miss Annette Wilson.

The net result is a reduction of one staff position in ABRS, but with a 33% turnover in personnel and an infusion of considerable new skills. The challenge over coming months will be for the new team to quickly rise to the demands facing the 'New ABRS'.

# Publications

## Recent ABRS Publications

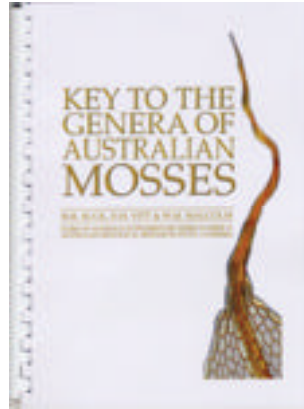
### *Key to the Genera of Australian Mosses*

W.R. Buck, D.H. Vitt &

W.M. Malcolm

FLORA OF AUSTRALIA  
SUPPLEMENTARY SERIES  
NUMBER 14 (2002)

This is the first illustrated identification guide to the 291 genera of mosses known from Australia and its island territories. Primary diagnostic characters are accompanied by 50–80 word descriptions of the morphology and anatomy of the gametophyte and sporophyte. Substratum preferences are indicated, and the current diversity and broad-scale distribution within Australia and its Territories are outlined. A selected bibliography of checklists, monographs and other publications of particular relevance to Australia is included. The key is supplemented by almost 700 colour illustrations.



### *Tasmanian Lichens: Identification, Distribution and Conservation Status. I. Parmeliaceae*

G. Kantvilas, J.A. Elix & S.J. Jarman

FLORA OF AUSTRALIA SUPPLEMENTARY SERIES  
NUMBER 15 (2002)

Published by ABRS & Tasmanian Herbarium, Hobart.

This volume is the first in a series that collates the available floristic, distributional and ecological data on the Tasmanian lichen flora. It deals with the family Parmeliaceae, the most diverse family of Tasmanian lichens, which accounts for more than 15% of the total lichen flora and a very significant proportion of the macrolichens. It is proposed to deal with other families and genera as resources become available.

The work presented provides background information on the Parmeliaceae; an authoritative, strictly specimen-based census of the family in Tasmania; identification keys to genera and species; diagnostic descriptive notes on the recognition of each species, its habitat and chemical composition; summaries of global distribution; maps of the known Tasmanian distribution of each species; assigned or provisional conservation

status categories; and a list of names of Parmeliaceae previously recorded but not currently accepted for Tasmania. It is noteworthy that of the 148 taxa recorded here for Tasmania, 37 are new species or new records not included in the previous comprehensive treatment of the family presented in 1994 (*Flora of Australia*, Volume 55).

### *AusGrass: Grasses of Australia*

D.Sharp & B.K.Simon, CD-ROM ABRS Identification Series.

This CD was published in September 2002 as a companion to *Flora of Australia* volume 43.

*AusGrass* is the largest and most comprehensive interactive identification guide to a plant group ever published. It provides both an interactive key and updated dichotomous keys to all 1300 native and naturalised species of grasses in Australia. This powerful identification tool can be used with living plants or dry specimens, and can aid the identification of sterile material in a family notoriously difficult to identify.

The key uses Lucid Player v.2.2, which provides an easy-to-use interface with comprehensive fact sheets for each species, including a botanical description, notes on distribution and placement within the family, keys to infraspecific taxa if

appropriate, as well as images including diagnostic line drawings, scanned specimens, photographs, maps and stereomicrographs. Navigation is simple and the presence of additional information makes it possible to search by species, genus, common name or commonly used synonyms. It is supplemented with over 4000 images, including c. 1400 distribution maps, a glossary, a guide to grass terminology and more general essays on grasses.



*AusGrass* will be an invaluable tool for taxonomists, ecologists, agricultural extension officers, landcare and bushcare coordinators, environmental consultants, or anyone with an interest in Australian grasses.

*Flora of Australia* volume 43, *Poaceae* 1  
*Introduction and Atlas*

Published by ABRS and CSIRO Publishing.

This volume of the *Flora of Australia* introduces the Poaceae (Grasses). The grasses, with about 1300 species represented, are the third largest family of flowering plants in Australia. They are found throughout the country, in virtually all habitats, from the wettest to the driest, from sea-level to the tops of the highest ranges. In many parts of the country they form the dominant vegetation.

Grasses also play an indispensable role in human economies. They provide the major cereals (wheat, barley, oats, rye, millet, sorghum, maize, rice), other crops (sugar) and a wide variety of pasture species that sustain animal husbandry.

This volume provides a substantial advance in compiling the present knowledge of grasses in Australia. It provides an introduction to the family, identification keys, and an Atlas of the family in Australia. It is intended to stand alone as an overview of this important family, to provide information on its phylogeny, classification, physiology, ecology, palaeohistory and economic value. It also provides an introduction to the species which will be described in detail in the several parts of volume 44.

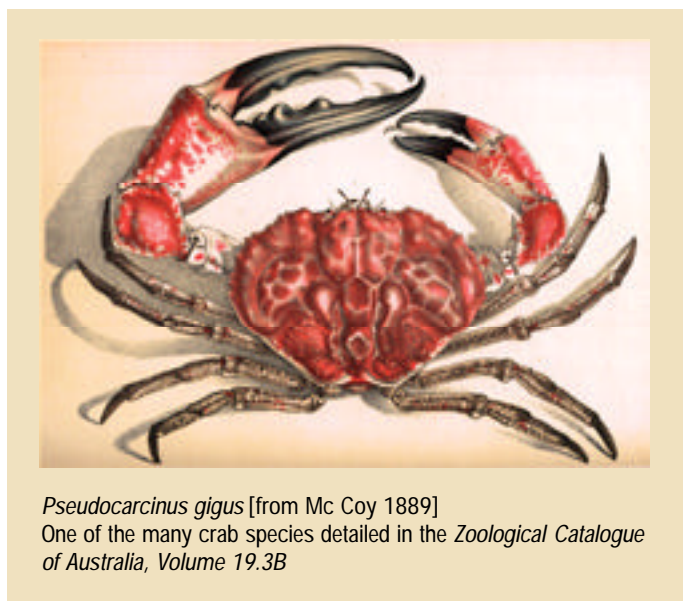
There are contributions by 15 authors, 14 illustrators and 12 photographers to this volume, which should be of interest to all those who want to know about the distribution and biology of one of the most ubiquitous plant families.

*Zoological Catalogue of Australia, Volume 19.3A, Crustacea: Malacostraca: Phyllocarida, Hoplocarida, Eucarida (Part 1)*

P.J.F. Davie & S. Ah Yong

Published by ABRS and CSIRO Publishing.

The first of four volumes on the Malacostracan Crustacea, this *Catalogue* summarises the baseline data on nomenclature and taxonomy of all the prawns, shrimps, lobsters, yabbies and their allies—that is the Hoplocarida, Phyllocarida and Decapoda with the exception of crabs and hermit crabs—and gives brief notes on biology and distribution of all species. It includes comprehensive bibliographic information, and clarifies a number of problematic dates of publication of names. The Introduction tells some fascinating tales of the major decapod crustacean workers. This is an



*Pseudocarcinus gigus* [from Mc Coy 1889]  
One of the many crab species detailed in the *Zoological Catalogue of Australia, Volume 19.3B*

essential handbook for fisheries workers, fisheries managers, ecologists, environmental managers and consultants, and research workers.

*Zoological Catalogue of Australia, Volume 19.3B, Crustacea: Malacostraca: Eucarida (Part 2): Decapoda - Anomura, Brachyura.*

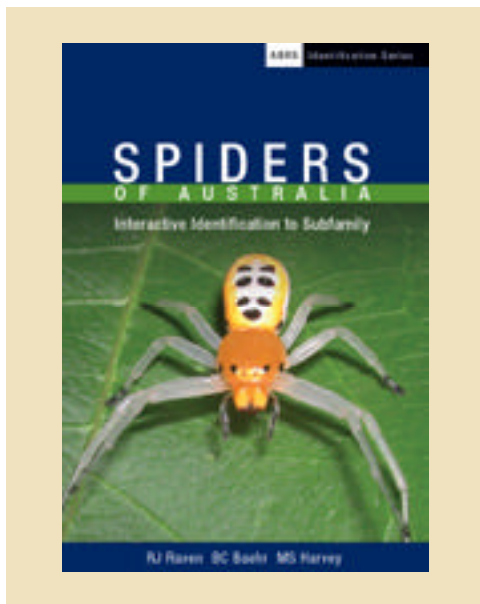
P.J.F. Davie

Published by ABRS and CSIRO Publishing.

This book catalogues more than 1200 species of Australian crabs (Brachyura) and related groups such as hermit crabs, porcelain crabs, squat lobsters, mole crabs, and their ilk (Anomura). Full taxonomic information is provided, with the original literature as well as museum data on the original type specimens. For all species known to occur in the Australian fauna broad distributions are indicated, both inside and outside Australian waters, and, where possible, a short summary of known ecological data is given.

References are given to key works that can help identify the fauna at all taxonomic levels. Of special interest is the fact that all taxonomic groups down to families and subfamilies are fully diagnosed, and the latest literature discussing their status is reviewed and summarised, including genetic and larval studies if available. This volume is a must for all crustacean workers, and especially fisheries managers, environmental managers and consultants, and research workers.

And for the bargain hunters, the two Crustacea volumes are available as a set for \$260.00, from CSIRO Publishing.



*Spiders of Australia: interactive identification to subfamily*

Robert Raven, Barbara Baehr & Mark Harvey. CD-ROM ABRS Identification Series.

Published by ABRS and CSIRO Publishing.

*Spiders* includes three fully illustrated keys to all families and subfamilies in Australia and New Guinea and all but two families in New Zealand. It provides an excellent overview of the group and introductions to families, and an illustrated glossary of terms, distribution maps and full species lists. The skilful line drawings and splendid scanning micrographs and photographs make the keys a pictorial feast, and the information on each group will be invaluable to conservationists, resource managers, health professionals and the public in general.

*POLiKEY: an information system for polychaete families and higher taxa*

Christopher J. Glasby & Kristian Fauchald.

This is an on-line product available at: [www.ea.gov.au/biodiversity/abrs/about/publications/polikey/](http://www.ea.gov.au/biodiversity/abrs/about/publications/polikey/)

POLiKEY is a comprehensive identification program and information package for polychaetes, one of the most diverse and abundant of all the marine invertebrate groups.

This group includes the familiar beach worms, bloodworms, fan worms and featherduster worms. The on-line interactive key allows accurate identification of adult polychaetes from any part of the world to any one of 104 polychaete taxa, comprising 17 higher-level taxa, 82 families and 5 subfamily groups. Features include an extensive glossary and bibliography, taxonomic descriptions and biological and distributional information. Over 300 colour-enhanced line drawings of taxonomically important features are provided to assist identification, and more than 200 line drawings and superb colour photographs illustrate the families. This key complements the book *Polychaetes & Allies*, published by ABRS in 2000.

*Platypus Software*

The new release of Platypus v.3.3 is available free from the Platypus website at [www.ea.gov.au/biodiversity/abrs/abif/platypus/index.html](http://www.ea.gov.au/biodiversity/abrs/abif/platypus/index.html)

A Platypus CD-ROM may be ordered from CSIRO Publishing.

Significant upgrades have been made to the successful Platypus software. These include a museums (specimen) collections facility, improved import functions and graphic database enhancements, modifications to the map function, an etymology field, changes to the ecology and museum forms, options to embed graphic codes and display graphic captions, options to list and report the history of all combinations used for species level taxa, and dropdown lists that maintain the search history of Museum, Journal and Search fields.



Between February and August 2002 ACIL consulting has been conducting stakeholder consultation to help develop strategies for formulating and disseminating new research on microorganisms (see *Biologue* No. 26 page 6).

The final report from this project will be available in October 2002, and will be made available on the ABRS website [www.ea.gov.au/biodiversity/abrs](http://www.ea.gov.au/biodiversity/abrs) or copies can be requested in writing from The Director, ABRS, GPO Box 787, Canberra, ACT, 2601.

## Australian Faunal Directory

[www.ea.gov.au/biodiversity/abrs/abif/fauna/](http://www.ea.gov.au/biodiversity/abrs/abif/fauna/)

The Directory is an on-line public enquiry database that provides taxonomic and biological information on all animal species known to occur in Australia. It incorporates data from the *Zoological Catalogue of Australia* database project and is constantly being updated and expanded with new data sets.

About 39,000 species are now available on the Australian Faunal Directory site including the recent additions of 438 families and 10,391 species in the groups Crustacea, Myriapoda, Hemiptera, Coleoptera, Diptera, Lepidoptera, Hymenoptera, Amphibia and Aves (see Table for details).

Taxon	Common name	Level of data	Families	Genera	Species
Brachiopoda	lamp shells	Checklist	16	35	58
Mollusca: Pulmonata	snails	Catalogue	47	322	1,082
Hirudinea	leeches	Catalogue	7	40	59
Crustacea: Malacostraca (part 1)	shrimps	Checklist	170	775	2,307
Pycnogonida	sea spiders	Checklist	8	41	175
Symphyla	symphylans	Catalogue	2	6	26
Diplopoda	millipedes	Catalogue	20	92	230
Paupoda	paupods	Catalogue	2	7	18
Hemiptera: Psylloidea	jumping plant lice, lerps	Checklist	6	57	349
Hemiptera: Aleyrodoidea	white flies	Checklist	1	41	103
Hemiptera: Cicadoidea	cicadas	Checklist	2	40	223
Hemiptera: Cercopoidea	froghoppers, spittle bugs	Checklist	3	20	32
Hemiptera: Membracoidea	leafhoppers, treehoppers	Checklist	2	264	792
Hemiptera: Fulgoroidea	planthoppers	Checklist	13	179	438
Hemiptera: Coleorrhyncha to Cimicomorpha	gerrids, water-striders, reduviids	Catalogue	31	352	914
Coleoptera: Staphylinidae: Pselaphinae	pselaphids	Catalogue	1	96	496
Coleoptera: Lymexyloidea	lymexylids	Catalogue	1	3	8
Diptera: Tephritidae	fruit flies	Catalogue	1	70	275
Hymenoptera: Ichneumonoidea: Braconidae	braconids	Checklist	1	186	578
Hymenoptera: Proctotrupoidea	proctotrupoids	Catalogue	5	46	180
Hymenoptera: Vespoidea	potter wasps, social wasps	Catalogue	1	40	352
Hymenoptera: Sphecoidea	mud-daubers, sand wasps	Catalogue	1	57	655
Aves	birds	Checklist / Catalogue	92	342	827
Amphibia	frogs, toads	Catalogue	5	28	214
Totals			438	3,139	10,391

*Recent additions to the Australian Faunal Directory*

## Forthcoming Publications

### *The Mosses of Norfolk Island (2002)*

H. Streimann

FLORA OF AUSTRALIA SUPPLEMENTARY SERIES  
NUMBER 16

Published by ABRS.

An account of the 69 species of moss known from subtropical Norfolk Island, an Australian territory in the south-western Pacific Ocean. Illustrated in colour and with numerous habit and anatomical drawings and distribution maps, it includes an introduction to the island and the history of bryological activity, identification keys to genera and species, detailed and synoptic species descriptions, specimen citations and information on habitat preferences and local and global distribution.

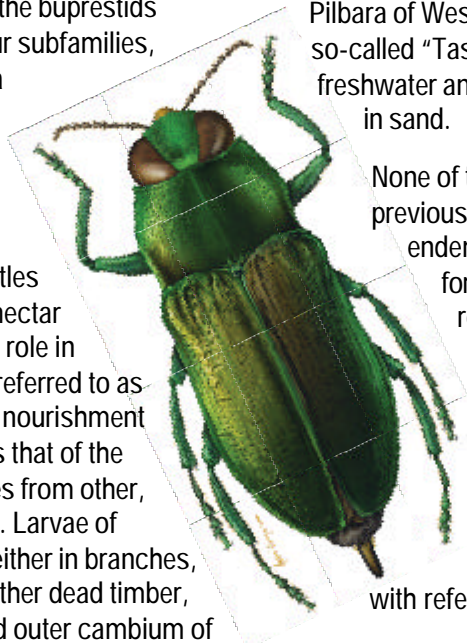
### *Zoological Catalogue of Australia, Volume 29.5, Coleoptera: Buprestoidea* [in press]

C.L. Bellamy

Published by ABRS and CSIRO Publishing.

The family Buprestidae, commonly known as Jewel beetles, is the eighth largest family of beetles in the world with approximately 14,700 known species. They are found in all biogeographical regions from the boreal forests of the Northern Hemisphere to many distant islands in the Pacific Ocean. This catalogue of the buprestids found in Australia documents four subfamilies, 24 tribes, 37 subtribes, 77 genera and 1,205 species.

Jewel beetles are obligatory associates with a wide variety of vascular plants. In Australia, well over half of the known Jewel beetles visit flowering plants to feed on nectar and pollen and play an important role in pollination. Other species, often referred to as "leaf chewers", obtain their adult nourishment by feeding on foliage, sometimes that of the larval host plant and at other times from other, unrelated shrub and tree species. Larvae of Jewel beetles are wood-boring, either in branches, trunks or in the root crowns, in either dead timber, dying branches or in the bark and outer cambium of otherwise healthy plants. In two groups, larvae bore into stems of herbaceous plants and mine the leaves.



### *Zoological Catalogue of Australia, Volume 19.2A, Crustacea: Eumalacostraca: Syncarida, Peracarida: Isopoda, Tanaidacea, Mictacea, Thermosbaenacea, Spelaeogriphacea* [in press]

G.C.B. Poore, N.L. Bruce, L.J. Cookson, Alison J. Green, B. Knott, P.S. Lake, H.M. Lew Ton, J.C. Markham, Jürgen Sieg & G.D.F. Wilson

Published by ABRS and CSIRO Publishing.

The third volume on the Malacostracan Crustacea catalogues 1,036 species of the peracarid order Isopoda, 34 species of Tanaidacea, one species each of the rare orders Mictacea, Spelaeogriphacea and Thermosbaenacea, plus 21 species of Syncarida. Isopods are more diverse in Australia than the figures indicate. We are generally familiar with the terrestrial slaters, woodlice and pill bugs, but more species live in marine environments where marine pill bugs, sealice and sea centipedes abound. Slaters are important leaf litter decomposers while their marine relatives parasitise fish, scavenge on the sea floor, or bore into wood and plants. Tanaidaceans are marine bottom dwellers and burrowers. The only representative of Mictacea is a deep-sea benthic species. Spelaeogriphaceans and thermosbaenaceans have only recently been recorded from caves and aquifers in the Pilbara of Western Australia. The syncarids include the so-called "Tasmanian mountain shrimp"; all are from freshwater and many are microscopic and interstitial in sand.

None of these groups has been catalogued previously and, given that most species are endemic, the catalogue provides a valuable basis for further taxonomic and phylogenetic research. While isopods have attracted considerable taxonomic attention during the last quarter-century, tanaidaceans and syncarids have not. For each species synonymies are given with location of type material, type localities and distribution and ecological information. All families and higher taxa are diagnosed with references to key literature.

## Forthcoming Publications (cont.)

*Zoological Catalogue of Australia, Volume 19.2B, Crustacea: Eumalacostraca: Peracarida:*

*Amphipoda, Cumacea, Mysidacea* [in press]

J.K. Lowry, G.E. Fenton, J.E. Gates, S.J. Keable & H.S. Stoddart

Published by ABRS and CSIRO Publishing.

The fourth volume on the Malacostracan Crustacea catalogues about 1,200 species of amphipods (sea fleas, scuds and the beach and land hoppers), cumaceans and mysidaceans (opossum shrimps). These small cryptic crustaceans are common in all marine and some terrestrial habitats. Amphipods are important herbivores on shallow water algae and on the sea bottom they are predators, detritivores and significant scavengers. They contribute to fouling communities on wharves and boat bottoms and are a major part of all sea bottom communities.

Hyperiid amphipods are significant micropredators in the plankton. In the terrestrial environment, talitroid amphipods play an important role as detritivores in the supralittoral zone of our beaches and on the floors of our wet forests. Cumaceans are particularly diverse in Australian sea bottom communities and mysidaceans occur in shallow waters around our coasts.

This catalogue brings the taxonomy of all known species in the Australian fauna up to date and is particularly important for the cumacean and mysidacean faunas which have not been previously catalogued. For each species there is information on primary synonymies, status and location of type material, type localities and general distribution and ecological information. In addition, there are new diagnoses for all families and subfamilies and references to key literature.

## International Conferences

Over the past six months ABRS has continued to be significantly involved in the ongoing work to drive major change in the resourcing for taxonomy and biodiversity informatics globally. Ian Cresswell has attended and played a major part in three international meetings related to the Global Taxonomy Initiative (GTI) in Asia, the Global Biodiversity Information Facility (GBIF), and BioNET INTERNATIONAL.

BioNET INTERNATIONAL held the 3rd Global Workshop on Taxonomy in Pretoria, South Africa 8th-12th July 2002, during which Ian Cresswell delivered a paper on 'Resourcing taxonomic capacity building in the Asia - Pacific Region'. Following on from this meeting the GBIF Outreach and Capacity Building Committee held its inaugural meeting in Pretoria, where Ian Cresswell co-convoked the working group to develop the Outreach work program for GBIF. The work programme will be presented to the next meeting of the GBIF Governing Board.

Ian Cresswell co-organised the 1st GTI Regional Meeting in Asia, held in Malaysia on 10th-13th September 2002. The meeting developed regional priorities for Asia under the GTI Programme of Work, which will be presented to the next meeting of the Convention on Biological Diversity (CBD) Science Advisory Body (known as SBSTTA).

The meeting was attended by over 125 delegates from more than 20 countries. The meeting provided a major opportunity for taxonomists and policy makers in the region to come together to listen to the major taxonomic needs of the region and to formulate projects to address these.



Meeting co-organisers Junko Shimura (Japan) and Ian Cresswell (Australia) stand ready to welcome participants to the 1st GTI Regional Meeting in Asia.

## 2nd International Congress on Phthiraptera

University of Queensland, Brisbane, 8th-12th July 2002  
Thirty years on from the first International Phthiraptera meeting, this second International gathering of louse workers was of particular interest to ABRS. Steve Barker, an author of our *Zoological Catalogue of Australia* section on Phthiraptera was Chairman of the Organising Committee. The Congress provided an excellent opportunity to highlight ABRS' databasing of the Australian fauna, and our progress, subsequent to publication of the *Catalogue*, to electronic delivery of taxonomic and nomenclatural information.

We promoted ABRS in a conference poster, adorned with images of lice, to which delegate's attention was drawn by the possibility of winning a copy of the *Catalogue*. The second author of the *Catalogue*, Ricardo Palma from the Te Papa Tongarewa Museum, Wellington, New Zealand, won the competition - perhaps he should have been excluded from entry! Conference papers and posters were a mix of biological papers and others covering public health issues. Papers highlighted the need for sound taxonomy and clarification of nomenclatural problems, essential bases for, among other studies, the interesting papers on co-evolution of lice and their hosts.

Alice Wells



Holding the prize—a copy of the *Zoological Catalogue of Australia*, volume 26, Alice Wells encouraged competition entrants to identify the lice on the ABRS promotional poster. Photo provided by A. Wells

## 7th International Mycological Congress (IMC7)

IMC7 was held at the University of Oslo, Norway on 11th-17th August 2002. More than 1,000 mycologists attended the conference.

The conference's scientific program had five themes:

- Biodiversity and conservation
- Systematics, phylogeny and evolution
- Pathogens and nuisances, food and medicine
- Population dynamics and ecology
- Cell biology and physiology

There were five symposia in the mornings and 10-12 contributed symposia in the afternoons. In total there were nearly 450 talks and over 750 posters contributed.

I contributed a poster co-authored with J.A. Simpson from NSW State Forests on the conservation status of fungi in South Australia. The poster gave an overview of work we have done applying conservation codes to the fungal species published in the book I wrote on J.B. Cleland's fungal collections at the State Herbarium of South Australia. A scaled down version of the poster is published on page 12.

For further information, including all abstracts, visit the IMC7 website at [www.uio.no/conferences/imc7/](http://www.uio.no/conferences/imc7/)

Cheryl Grgurinovic

Poster: 'Australian fungi and their kingdoms'

The poster 'Australian fungi and their kingdoms' will be available from early November. It will also be placed on the ABRS website with links to information pages providing more detail on the kingdoms and divisions of fungi.

Like the first poster, it will be aimed at lower secondary school age and above, and will be richly illustrated with colour to demonstrate the diversity of fungi.

This poster is free of charge. For your copy contact Cheryl Grgurinovic, ABRS, GPO Box 787, Canberra, ACT, 2601.

# List of Grants 2002/2003

## Research Grants

The Advisory Committee met on 19th-21th March 2002 to consider the over 150 grant applications for 2002/2003, plus program operational and policy issues.

Recommendations from the Advisory Committee on successful grants were sent to the Minister, and notification to applicants following ministerial approval of the Committee recommendations were distributed in June.

Unfortunately, a ruling following an ATO tax audit came just as grant payments were to be made. The ruling, that grants were in future to be subject to GST, delayed payments until the new system could be implemented. ABRS regrets these delays, which were beyond our control.

## List of Grants 2002

The Participatory Program budget for 2002/2003 was \$1.5 million. A total of \$453,350 was allocated to 21 continuing projects, with an additional \$105,579 allocated towards the existing ABRS training schemes: the postgraduate scholarship, the Ebbe Neilsen scholarship and student travel bursaries. Funding for the Australian Botanical Liaison Officer (ABLO) was suspended this year for budgetary reasons, but will be re-examined in the next grants round. Some \$941,071 was available for 32 new projects for 2002/2003.

## 2002/2003 List of renewed grants

Category	Project Title	Investigator	Located	Amount
Algae	Taxonomic revision of the order Oedogoniales (Chlorophyta) in Australia	Dr T. Entwisle	Royal Botanic Gardens, Sydney, NSW	\$30,000
	The Marine Red Algae of Tropical and Subtropical Eastern Australia	Dr G.T. Kraft	University of Melbourne, Melbourne, Victoria	\$10,000
Algae/fungi/protists	Completion of the Integrated Research Strategies Project on Algae, Fungi and Protists	ACIL Consulting Pty Ltd	Sydney, NSW	\$15,000
Invertebrates	Australian ant spiders (Araneae, Zodariidae, Storeninae): biodiversity of the Australian fauna, taxonomy, systematics and phylogeny of the Australian species	Dr B.Bachr & Dr R.Raven	Queensland Museum, Brisbane, QLD	\$40,000
	Australian Cerambycine Genera: Overview and Keys	Dr A.A. Calder	CSIRO, Division of Entomology, Canberra, ACT	\$25,000
	Taxonomy of the typhloplanid microturbellarians (Platyhelminthes) of Australia	Dr L.R.G. Cannon	Queensland Museum, Brisbane, QLD	\$35,000
	New spiders (Araneae: Amaurobioidea) from Australian forests	Dr V.E. Davies	Queensland Museum, Brisbane, QLD	\$10,000
	Generic overview of Australia non-psoroptid Astigmatata (Acari)	Dr B. Halliday	CSIRO Division of Entomology, Canberra, ACT	\$25,000
	Towards the documentation of the subterranean fresh-water fauna of inland Australia	Dr W.F. Humphreys	Western Australian Museum, Perth, WA	\$7,500
	Evanoid wasps of Australia (Insecta: Hymenoptera): taxonomy, distribution and host relationships	Dr J.T. Jennings & Assoc. Prof. A.D. Austin	University of Adelaide, Adelaide, SA	\$7,000
	Australia's Paramunnidae, marine Isopoda (Asellota, Janiroidea)	Dr J. Just	Queensland Museum, Brisbane, QLD	\$15,000
	Taxonomy of the Ascidiacea	Dr P. Mather	Queensland Museum, Brisbane, QLD	\$17,500
	Australian calcareous sponges (Porifera: Calcarea): biodiversity of the Great Barrier Reef fauna, taxonomy and systematics of Australian species	Dr G. Worheide & Dr J. Hooper	Queensland Museum, Brisbane, QLD	\$15,000
	Expeditions to inform systematic research on Australian Stiletto Flies (Diptera: Therevidae)	Dr D.K. Yeates & Prof. M.E. Irwin	University of Queensland, Brisbane, QLD	\$5,000

Category	Project Title	Investigator	Located	Amount
Fungi	A taxonomic and systematic revision of the sequestrate Russulales of Australia and their allies, based on morphological and molecular characters	Dr T. Lebel	Royal Botanic Gardens, Melbourne, Vic	\$10,000
	Interactive key and synopsis to the genera of macrofungi in Australia	Dr T.W. May & Mr S.H. Lewis	Royal Botanic Gardens, Melbourne, Vic	\$50,000
Protists	Molecular phylogeny and morphotaxonomy of Australian Gymnodinioid Dinoflagellates	Assoc. Prof. G.M. Hallegraef & Dr C.S. Bolch	University of Tasmania, Hobart, Tas	\$22,500
Vascular plants	Taxonomic revision and phylogenetic analysis of Aotus, Phyllota, Otion ined., Urodon, Eutaxia, Euchilopsis and Latrobea (Leguminosae, Mirbelieae)	Dr J.A. Chappill & Dr M.D. Crisp	University of WA, Perth, WA & Australian National University, Canberra, ACT	\$20,000
	Electronic Pteridophyte Flora of Australia: a collaboration to create and maintain a dynamic interactive resource of Australian ferns and fern-allies	Mr J. Croft	Centre for Plant Biodiversity Research, Canberra, ACT	\$50,000
	A systematic and biogeographic analysis of Phebalium (Rutaceae) and its allies based on morphology and molecules	Dr M.F. Duretto & Prof. P.Y. Ladiges	University of Melbourne, Melbourne, Vic	\$3,850
	A taxonomic review of Senecio (Asteraceae) and a treatment of taxa in tribes Senecioneae, Anthemideae and Lactuceae for Flora of Australia	Dr I.R. Thompson & Dr N.G. Walsh	University of Melbourne, Melbourne, Vic	\$40,000

## 2002/2003 List of new grants

Algae	Diatom Flora of tropical Australia	Dr J. John & Dr P. McBride	Curtin University of Technology, Perth, WA	\$20,000
	Morphology and molecular phylogeny of the brown algal order Sporochiales and the red algal order Gelidiales from Australia	Dr A.J.K. Millar, Dr D.W. Freshwater & Mr N.R. Yee	Royal Botanic Gardens, Sydney, NSW	\$10,000
	Molecular phylogeny and morpho-taxonomy of the Bangiophyceae from Australia	Prof. J.A. West & Dr G.C. Zuccarello	University of Melbourne, Melbourne, Vic	\$45,000
Invertebrates	Cestode parasites of herbivorous marsupials	Dr I. Beveridge	University of Melbourne, Melbourne, Vic	\$9,500
	Taxonomy and distribution of subterranean amphipods from calcrete aquifers in central Western Australia	Dr S.J.B. Cooper, Dr W.F. Humphreys & Mr J.H. Bradbury	South Australian Museum, Adelaide, SA	\$50,000
	Insects and nematodes associated with galls on Myrtaceae in Tasmania	Dr K.A. Davies	University of Adelaide, Adelaide, SA	\$1,500
	A revision of, and identification aids for, the Australian Cixiidae (Hemiptera: Fulgoromorpha)	Dr G.M. Gurr, Dr M.J. Fletcher & Dr M.-C. Larivière	University of Sydney, Sydney, NSW	\$22,600
	The systematics of the Australian wolf spiders (Araneae: Lycosidae)	Dr M.S. Harvey & Assoc. Prof. A.D. Austin	Western Australian Museum Perth, WA	\$50,000
	Revision of the subfamily Candoninae (Crustacea, Ostracoda, Candonidae) with web-presentation of the Australian subterranean fauna	Dr I. Karanovic	Western Australian Museum, Perth, WA	\$50,000
	Systematics of Australian signal flies (Diptera: Platystomatidae)	Dr D.K. McAlpine	Australian Museum, Sydney, NSW	\$2,900
	A Revision of Galeommatoidea, one of the most species-rich and least understood group of marine bivalves	Dr P.U. Middelfart	Australian Museum, Sydney, NSW	\$45,000

## 2002/2003 List of new grants (continued)

	Taxonomic review of oyster leeches (Platyhelminthes, Polycladida) from Australian coastal waters.	Dr L.J. Newman	Southern Cross University, Lismore, NSW	\$35,000
	Deep-sea octopuses of the Australian continental slope and seamounts (>200 m): composition and affinities	Dr M.D. Norman & Dr E. Hochberg	Museum Victoria, Melbourne, Vic	\$40,000
	A Monograph of, and Automated Identification Systems for, the Australasian Ground Spiders of the Family Prodidomidae (Araneae, Gnaphosoidea)	Dr N.I. Platnick & Dr B.C. Baehr	American Museum of Natural History, New York, USA & Queensland Museum, Brisbane, QLD	\$25,000
	Systematics of the Australasian Lymnaeidae and buliniform Planorbidae	Dr W.F. Ponder & Dr J.C. Walker	Australian Museum, Sydney, NSW	\$35,000
	The diversity, evolution and biology of snow scorpionflies (Insecta: Mecoptera: Apteropanorpidae)	Dr J. Trueman & Mr C. Palmer	Australian National University, Canberra, ACT	\$2,500
	Harpacticoida (Crustacea: Copepoda) from seagrasses and algae of southern Australia	Ms G. Walker-Smith	South Australian Museum, Adelaide, SA	\$50,000
	Interactive Key and Master Names List for the Families of Australian Diptera. Part 1: Interactive Key	Dr D.K. Yeates & Dr D.J. Bickel	CSIRO Division of Entomology Canberra, ACT	\$25,000
Bacteria	The characterisation of Actinobacteria biodiversity from Tasmanian cave microhabitats	Dr D.S. Nichols & Dr K. Sanderson	University of Tasmania, Hobart, Tas	\$15,000
Bryophytes	Revision of Australian Pterobryaceae	Dr A.E. Newton	Natural History Museum, London, UK	\$10,000
Fungi	Sequestrate Cortinariaceae in Australia	Dr N. Bougher, Dr I. Tommerup & Dr P. O'Brien	CSIRO, Division of Forestry & Forest Products, Wembley, WA	\$27,000
	A study of the fungal family Trichocomaceae in Australia, especially Aspergillus, Penicillium and their sexual stages	Dr J.I. Pitt, Dr A.D. Hocking & Dr D.A. Carter	Food Science Australia, North Ryde, NSW	\$41,000
	Molecular phylogeny and taxonomy of Hebeloma and Naucoria (Cortinariaceae) in Australia.	Dr B.J. Rees	University of NSW, Sydney, NSW	\$10,000
	Studies of Australian Myxomycetes	Prof. S.L. Stephenson & Mr D.W. Mitchell	Fairmont State College, Fairmont, West Virginia, USA	\$12,000
Lichens	A taxonomic revision of the Thelotremaaceae in Australia (Lichens)	Dr H.T. Lumbsch & Dr J.A. Elix	Field Museum of Natural History Chicago, Illinois, USA	\$41,000
Protists	Benthic dinoflagellates of Australia: description and review of species of the Peridinales, Prorocentrales and Gymnodiniaceae	Prof. D.J. Patterson, Ms S.A. Murray, Dr R.A. Cowan & Assoc. & Prof. P.J. Larsen	University of Sydney, Sydney, NSW	\$35,000
Vascular plants	AFLP & gene sequence data inform species limits & phylogeny of Homoranthus (Myrtaceae:Chamelaucieae)	Dr J.J. Bruhl & Mr L. Copeland	University of New England Armidale, NSW	\$12,716
	The taxonomy and phylogeny of the Western Australian species of Pultenaea (Fabaceae)	Dr R. de Kok	CSIRO, Division of Plant Industry, Canberra, ACT	\$9,551
	Interactive Identification and Information System for Australian Orchid Genera	Mr D.L. Jones	CSIRO Division of Plant Industry, Canberra, ACT	\$60,000
	Revision and Flora accounts of Baeckea and related genera	Dr B.L. Rye & Mr M.E. Trudgen	Western Australian Herbarium, Perth, WA	\$36,804
	A taxonomic treatment of some perennial trigger plants (Stylidium; Stylidiaceae) from south-west Western Australia	Dr J.A. Wege	Western Australian Herbarium, Perth, WA	\$72,000
	Defining generic limits within the Chamelaucium alliance (Myrtaceae)	Dr P.G. Wilson & Dr C.J. Quinn	Royal Botanic Gardens, Sydney, NSW	\$40,000

Training Grants	Existing training awards	\$77,079
New training awards	(Student Travel Bursaries, Ebbe Nielsen scholarship)	\$28,500