The newsletter of the Society of Australian Systematic Biologists. Issue 5 (December 2010)

In this issue:

Editorial

At this time of year, it is traditional that people take stock of their situation and refresh themselves for the year ahead. In this spirit, I offer the following thoughts about the state of our field.

Recently, I've come to the conclusion that we really are living in a golden age for taxonomy. More and more of the heritage literature is being made available online thanks to BHL; imaging capacity has increased substantially making more informative pictures of taxa and characters easier to obtain; electronic publishing has made page limits of nearly no consequence and research much easier to disseminate; and molecular tools allow us to quantify variation within species with unprecedented precision and detail.

Of course, there remain many challenges and obstacles to the pursuit of taxonomic research. Funding, politics (at all levels) and the constant loss of biodiversity continue to remind us not to become complacent. But nor should we lapse into pessimism. With 7,893 authors publishing in Zootaxa over the past ten years, and over 400 issues published this year, (with apologies to Mark Twain) rumours of the death of taxonomy are greatly exaggerated.

Samuel Brown

About the Society

SASB Officers:

The Society:

The Society of Australian Systematic Biologists is open to all people who utilise the science of biological systematics as a basis for the study and understanding of nature. The Society is a non-profit inter-disciplinary organisation whose purposes are to promote the scientific study of biological systematics and to disseminate scientific and educational information related to its fields of interests.

Membership:

Membership is free. Details are available on the society website (http://www.sasb.org.au/contacts.html) and from the secretary.

Unlikely taxonomists: stratigraphic palynology, or why an Aussie, a kiwi and an American met in Halifax Canada.

We may think of plant systematics as being the concern of determining the phylogeny of major clades and lineages, or perhaps a more prosaic 'taxonomy' rooted in the practicality of tools for an ecologist to identify the plants in his or her quadrats. We may debate the merits of molecular versus morphological characters, or combined data sets, or even fret about which fossil to use to place a date on a branching point or root a phylogeny. There are many uses and users for systematics.

I am a palaeobotanist, and my primary 'use' for systematics is to paint a picture of long dead ecosystems, and the climates they grew under (e.g., Greenwood et al., 2010), and occasionally systematics (e.g., Basinger et al., 2007). However, recently I have been dabbling in an even darker and arcane art: palynology (e.g., Eldrett et al., 2009). This journey takes me back to 1980 when I was first introduced to fossil pollen and spores by Wayne Harris (then at Western Mining Co. in Adelaide) and David Christophel, whose palaeobotany class I was taking as part of my BSc in Botany at Adelaide. As part of this new exploration of the plant fossil record I ventured to Halifax in Nova Scotia (Canada), accompanied by my new honours student, to participate in Nova Scotia 2010—the joint meeting of the American Association of Stratigraphic Palynologists, Canadian Palaeontology Conference and the Canadian Association of Palynology held from 29 September to 2 October 2010. The meeting was actually held across Halifax Harbour in Dartmouth, but 'Halifax' fixes the spot nicely on Google Earth or other internet mapping tools.

The meeting featured (as they always do) opportunities to catch up with old friends, and make new ones. One old friend I ran into was Dave Macintyre, a long displaced New Zealand palynologist long since settled into life in Calgary Alberta. But I also met an 'Australian' palynologist from GeoScience Australia, but he turned out to be a friendly Irishman; all the Australian palynologists, he declared were either recently retired or nearly so. I also realized that all the Canadian palynologists were mostly grey-haired fellows close to retirement. It struck me then that palaeobotany, which includes within its folds palaeo-systematics and palynology, was undergoing an evolutionary pinch-point. Why should we care, and why indeed should readers of "Banksia" care?

To be fair, stratigraphic palynologists—those geologists that use diagnostic spore and pollen species (and other microfossils, e.g. dinoflagellates, foraminifera etc.) to assign an age to a sedimentary sample—tend to come from a geological background. Nonetheless, what they primarily do is systematics; the identification, classification and use of palynomorphs based on their morphology is classic taxonomy, and is rooted in a phylogenetic understanding of the relationships of different pollen and spore groups. In the Australian context, Isabel Cookson' s classification of fossil *Nothofagus* pollen types mirrored and has proven compatible (with modifications) with modern cladistic analyses and molecular data for this genus (Hill and Read, 1991; Manos, 1997). Our understanding of the early evolution and radiation of angiosperms has been informed through the study of fossil pollen, and the pollen ultrastructure of living angiosperms, very much the pursuit of systematic botanists (Wolfe et al., 1976; Doyle, 1978; Doyle et al., 1990; Basinger et al., 2007). This latter point is germane as Jim Doyle was at this conference and Jim and I (being old acquaintances—just where we couldn't quite place; IBC in St Louis 1999? Melbourne 1988?) mused on the state of North American and Australian palaeobotany and palynology in particular. I suspect it' s parlous in the

David Greenwood with a giant 250 million year old Lycopod at Joggins Fossil Cliffs. Photo: David Greenwood.

sense that few are being trained, and even fewer actually have jobs where such training is being done. I am out of touch with the Australian scene, so perhaps things are better there than when I left in 2004. I fear not.

What of the conference? Sessions were held over four days, and there was a field trip (a bone-aching two hour bus ride on the most uncomfortable bus I have ridden outside of China, or perhaps Fiji) to the UNESCO World Heritage site, Joggins Fossil Cliffs featuring Carboniferous age exposures of standing lycopod trees and magnificent trackways by early tetrapods. The talks included application of stratigraphic palynology to find oil and gas reserves, environmental reconstructions, use of palynology in forensics (I can't report on the talk from the fellow who may have worked for the CIA... really), the wonderful story that can be told from goose poo, Ediacaran fossils (plentiful beyond the Flinders Ranges, apparently), ancient agriculture in Meso-America, past vegetation change and past climates of the Arctic, enigmatic land organisms that pre-date the earliest land plants, evidence of the earliest life, single test PCR on dinoflagellates—and Jim Doyle's provocative talk: 'Comparing fossil and molecular evidence for the early evolution of angiosperm pollen.'

The lesson to me was clear. We all meet with our 'peers' at our regular conferences and meetings and discuss the issues and problems current in our discipline. But we have our comfort zone, and we tend to meet with the same groups of people most of the time. We all know that going to an international meeting is an opportunity to meet colleagues long since dropped from our Christmas card list, and meet their students and be introduced to new colleagues from this country or that. But we still tend to meet and drink coffee (or beer, or wine, preferably with a fine Nova Scotian lobster) with people from our own discipline. We're tribal. The meeting in Halifax took me out of my comfort zone (I tend to attend botanical meetings, and specialist geological meetings focused on past climates), and brought into stark focus for me that there was this apparently isolated but well defined group of systematic biologists that in general (people like Jim Doyle being one of a group that are exceptions) don't mix with the neo-systematists; palaeo-palynologists. Something to consider.

David Greenwood (rather cold and wondering why he ever left Melbourne)

Brandon University, Manitoba, somewhere near the Arctic.

http://www2.brandonu.ca/academic/environmental/greenwood%20research.htm

Basinger JF, Greenwood DR, Wilson PG, Christophel DC. 2007. Flowers and fruits of the capsular Myrtaceae from the Eocene of South Australia. *Canadian Journal of Botany* 85(2): 204 - 215.

Doyle JA. 1978. Origin of Angiosperms. *Annual Review of Ecology and Systematics* 9: 365 - 392.

Doyle JA, Hotton CL, Ward JV. 1990. Early Cretaceous Tetrads, Zonasulculate Pollen, and Winteraceae. II. cladistic analysis and implications. *American Journal of Botany* 77 (12): 1558 - 1568.

Eldrett JS, Greenwood DR, Harding IC, Huber M. 2009. Increased seasonality through the Eocene to Oligocene transition in northern high latitudes. *Nature* 459 (7249): 969 - 974.

Greenwood DR, Basinger JF, Smith RY. 2010. How wet was the Arctic Eocene rainforest? Estimates of precipitation from Paleogene Arctic macrofloras. *Geology* 38(1): 15 - 18.

Hill RS, Read J. 1991. A revised infrageneric classification of *Nothofagus* (Fagaceae). *Botanical Journal of the Linnean Society* 105 (1): 37-72.

Manos P. 1997. Systematics of *Nothofagus* (Nothofagacae) based on R DNA spacer sequences (ITS): taxonomic congruence with morphology and plastid sequences. *American Journal of Botany* 84(9): 1137 - 1155.

Wolfe JA, Doyle JA, Page VM. 1976. The bases of angiosperm phylogeny: palaeobotany. *Annals of the Missouri Botanical Gardens* 62: 801 - 824.

10th IBCC announcement

The 10th Invertebrate Biodiversity and Conservation Conference will be a joint meeting with The Society of Australian Systematic Biologists (SASB) and will be held at St Mary's College, the University of Melbourne, from 4 to 7 December 2011 (with an associated workshop planned on Thursday 8 December). St Mary's College is ideally located on the northern part of the campus of the University of Melbourne and very close to the restaurants of Lygon Street, Carlton. The Carlton Gardens campus of Museum Victoria and the Victoria Market are within a 15 minute walk as is the Melbourne CBD.

The following session themes are planned, but individual presentations and suggestions for sessions on other topics will be welcomed.

- Tropical invertebrate diversity—From rainforest to reef
- Species in principle and in practice —Morphological and genetic approaches to defining species boundaries
- Assessing and countering threats to invertebrates
- Biodiversity and biosecurity—Can one work without the other?

The program will take place over the following dates:

- Sunday 4 Dec 2011—Registration and icebreaker
- Monday 5 Dec 2011—Tuesday 6 Dec 2011 - Conference presentations
- Tuesday 6 Dec 2011—Conference dinner
- Wednesday 7 Dec 2011—Final day of conference presentations

On Thursday 8 Dec 2011 it is proposed to hold a separate workshop "Invertebrate conservation" which will involve some conference registrants but will also involve other participants such as representatives of state and federal conservation agencies. The Conference website URL will be known shortly and will be posted to the SASB website and in the SASB Newsletter, "Banksia". For further details or to propose session themes please contact the chair of the Conference organising committee, Dr Alan Yen (Alan.Yen@dpi.vic.gov.au).

Robin Wilson

Giant millipede tracks at Joggins Fossil Cliffs. Photo: David Greenwood.

Early tretrapod tracks at Joggins Fossil Cliffs. Photo: David Greenwood.

Discussion topic

This issue's discussion topic is based on a quote from a Zookeys Special Issue highlighting new methods of streamlining publications of taxonomic papers from data entered into taxonomic databases.

"In order to make progress in documenting the diversity of life, we must remove the publishing impediment in order to move taxonomy 'from a cottage industry into a production line', and to make best use of new technologies warranting the fastest and widest distribution of these new results."

Penev L, Roberts D, Smith V, Agosti D, Erwin T. (2010). Taxonomy shifts up a gear: New publishing tools to accelerate biodiversity research. ZooKeys *50: i-iv*
http://pensoftonline.net/zookeys/index.php/journal/article/view/543/477

There was a muted response to this topic. One point of view is given below.

"I can see a lot of value in what ZooKeys is trying to do here in streamlining publication and making the process of writing, submission, peer-review and final publication easier, more robust, and less focussed on text format and rather on information content. The barriers that I perceive as being key here are ones of education and implementation. In particular, despite hearing a lot about XML, I have yet to see an easily understandable introduction to it in the context of taxonomy and systematics. In addition, my (admittedly limited) experience with scratchpads have left me with the feeling that they are unwieldy and difficult to navigate. More tutorials on data storage and more effort put into creating intuitive tools are required before the dream expressed in the quote can become reality."

Samuel Brown

Churchill Fellowships

Applications are now invited for two 2011 Churchill Fellowships in taxonomy, in association with the Australian Biological Resources Study. For details, please visit the website [1].

One of the fellowships is for an early-career researcher, the other for an established taxonomist. The stipends are generous and will allow the Fellows to work in overseas collections.

Andrew Thornhill

[1] http://www.churchilltrust.com.au/sponsors/about/australian-biological-resources-study/

Conservation Biology Congress

The 25th International Congress for Conservation Biology is being held from 28th November to 2nd December 2011 in Christchurch, New Zealand. Proposals for symposia, workshops and short courses are being accepted until 17 January 2011. Complete instructions for submitting proposals are available on their website [1].

Ximena Nelson

[1] http://www.conbio.org/Activities/Meetings/2011/?CFID=11424486&CFTOKEN=43363700

2010 Survey of SASB Member Activities

Many thanks to the 115 SASB members who responded to our anonymous survey. Here are the results:

Did you author or co-author a Code-compliant taxonomic work that was published in a journal or book this year?
Yes 50%
No 50%

Did you author or co-author a publication on systematics that appeared this year? (i.e., one that did *not* include formal taxonomic actions)
Yes 40%
No 60%

Did you author or co-author a 2010 publication that presents the results of taxonomic or systematic work to a general audience? (e.g. field guide, article in magazine, etc)
Yes 19%
No 81%

Did you contribute this year to a Web-based resource which offers taxonomic or systematic information? (Including taxon-focused and methodological wikis, but not discussion forums)
Yes 51%
No 49%

Did you present the results of your taxonomic or systematic work at a formal scientific conference this year?
Yes 43%
No 57%

Did you present the results of your taxonomic or systematic work at a workshop, seminar, club meeting or other informal gathering?
Yes 47%
No 53%

Did you train or help train a colleague, co-worker, student or volunteer in taxonomic or systematic methods this year?
Yes 70%
No 30%

Did you identify specimens on request this year?
Yes 79%
No 21%

In summary, responding members were an active lot in 2010. They were admirably busy with identifying specimens and training other people, but were perhaps a little behind in reporting their science to a general audience. Four systematist super-heroes answered 'Yes' to every question, while seven respondents had an off-year and had to answer 'No' each time.

Other figures of note include:

- Of those who published a Code-compliant work in 2010, ca 80% also published a non-Code-compliant work on systematics.
- Of those who contributed to a Web-based resource, 2/3rds also published formally.
- The fit between formal and informal presentations was fairly loose. Of those who presented formally, 37% didn't give an informal presentation or presentations, and of those who presented informally, 44% didn't present at a formal conference.
- If you trained someone in 2010, you were (within the likely error of the survey) no more of an author or Web contributor than a non-trainer.

Bob Mesibov

Website review: Biodiversity Information Standards

As biologists, we work with a large amount of complex data, ranging from georeferences of collecting locations, details of the morphology and genetics of individual organisms. Biodiversity Information Standards (formerly known as the Taxonomic Database Working Group, explaining their acronym TDWG) exist to promote the standardisation of information relevant to biologists. Their website (http://www.tdwg.org) is the hub of the association and is where the data standards are made available for interested parties, as well as providing a place to publish reports of meetings. As the bulk of the pages are in a wiki format, the general feel of the site is that it is a work in progress which reinforces their desire for collaboration with people who deal with biodiversity information at all levels. Unfortunately, it also means that navigation is difficult at times.

The core of the website is the Standards section, where you can find descriptions of the standards endorsed by TDWG. Currently, only two standards are endorsed for full use, Darwin Core and TAPIR. Darwin Core provides guidance for the storage of biological data, focussing on collecting details of individual specimens, particularly details of collection locality, identification and associated information. This standard has gained wide acceptance, and is well worth becoming familiar with, particularly if you intend to use and build specimen databases. The other current standard, TAPIR (TDWG Access Protocol for Information Retrieval) is focussed on the transfer of information between users, and is more suited for program developers, network administrators and other primarily computer-based types.

There are a couple of other standards currently in development and worthy of keeping track of. In particular, the Structured Descriptive Data standard that aims to provide guidance for databases of taxonomic characters and enhance their portability and availability for analytical purposes.

This website is essential for those who are closely involved with the storage and transferal of biodiversity data. People who aren't so interested in this will find it rather dry. For those of us who are in between, who recognise the value of databases but are not entirely confident about their implementation, it is well worth a visit with the caveat

that a complete understanding of the world of data storage and transfer will not be gained by a single visit.

Samuel Brown

2nd Invertebrate Morphology Conference

The 2nd Invertebrate Morphology Conference will be held in the Museum of Comparative Zoology at Harvard University from June 20th to June 23rd 2011, hosted by Dr. Gonzalo Giribet. The following symposia are

- Neurophylogeny—Comparative evolutionary morphology of invertebrate nervous systems
- Meiofauna—Comparative morphology and evolution
- Invertebrates as parasites
- Sponge morphology and evolution
- Controversies about the morphological evolution of arthropods
- Nemertean morphology
- Invertebrate morphology in 3D—Non-invasive imaging, visualization, and data storage
- Round Table: Data and metadata standards in zoomorphology: A call to action
- Comparative developmental biology

Pre-registration and further details are available on the conference website [1].

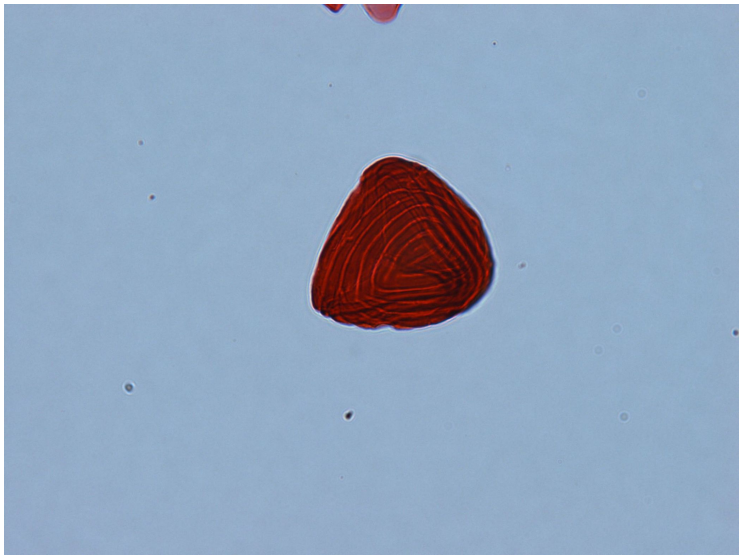
Ana Riesgo

[1] http://icim.harvard.edu/

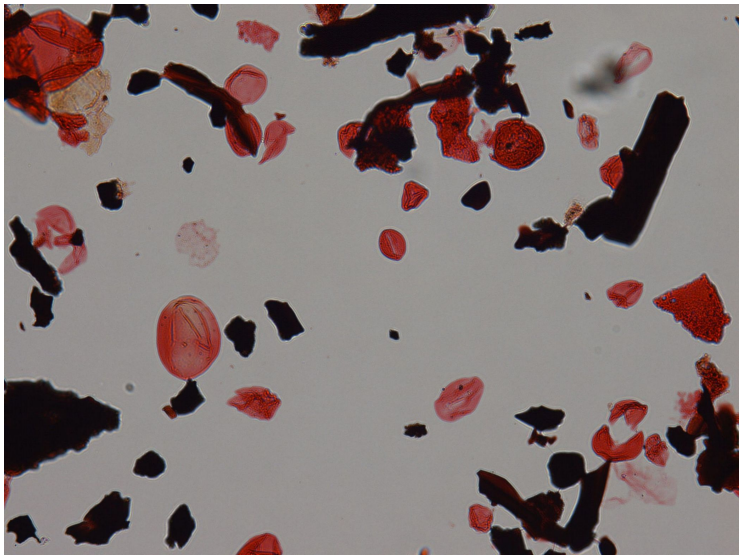
Fringe Taxonomy. Part 2

If you're a fan of the graphic novels starring Asterix the Gaul, you'll know how the village bard Cacofonix is introduced: Opinion is divided as to his musical gifts. Cacofonix thinks he's a genius. Everyone else thinks he's unspeakable. A similar situation applies to the taxonomic works of Dewanand Makhan. The publications are held in high esteem by Makhan and one other person. Everyone else thinks they're junk.

The 'one other person' deserves mention. His name is Trevor Hawkeswood, he lives in the Sydney area and he publishes a Code-compliant journal named "Calodema". Hawkeswood's website (http://www.calodema.com), modestly titled 'The Life and Works of Dr Trevor J Hawkeswood', has downloadable PDFs of Makhan's papers. In case you're wondering, Hawkeswood's two PhDs come from Cosmopolitan University, an unaccredited diploma farm which used to be based in Jefferson City, Missouri. I'm



Cicatricosisporites dorogensis is a fossil spore taxon that is attributed to the modern fern family Schizeaceae. Judy Skog, a fern systematist and paleobotanist (current President, Botanical Society of America), was a guest speaker at the conference in Halifax. She spoke about this family of ferns and how evolution in the family can be documented from the fossil spore record. This specimen is from coals of Early Paleocene age (63 million years old) from southern Manitoba. Very similar grains are recorded from Australian and New Zealand rocks of similar age. Its presence is usually used as a tropical marker as the modern genus *Anemia* is tropical. The related temperate-climate *Schizea* has a different morphology. Photo: Cathy Greenwood.



Spores and pollen from the southern Manitoba Paleocene coals. A palm pollen grain is in centre view. Photo: Cathy Greenwood.

not qualified to say whether Hawkeswood's publications are worth reading. All I know for certain is that to question the man, his journal "Calodema" or his protégé Makhan, either in correspondence or on one of the many forums and blogs dealing with The Hawkeswood Problem, will earn you a swift and abusive response.

Makhan has recently been putting 'Dr' in front of his name. There's been no corresponding elevation in the quality of his work, which was described this way in 2006:

> [Makhan's] publications are uniformly very poor in quality and scholarship. New genera and species are never properly diagnosed or compared to existing nominal species. The descriptions and illustrations are often inconsequential or grossly inaccurate. Many descriptions do not conform to the International Code of Zoological Nomenclature (ICZN). Furthermore, Mr. Makhan engages in intellectual theft by describing species from already-labeled (but not yet published) paratypes of other authors before they are able to do so. . . , demands money (120,000 Euros) from persons requesting to see his specimens, and generally acts in a maniacal and personally highly insulting manner towards any other worker who criticises or questions his work. [1]

Makhan has published taxonomic works on ants, beetles, snails and millipedes, mostly in Calodema. He used to give his address as the University of Utrecht, where he was employed at the Herbarium. He now writes from Nieuwegein in the Netherlands, possibly thanks to a critical letter sent to the University of Utrecht in 2006 and signed by more than 120 scientists.

The choice for taxonomists is either to ignore Makhan's publications or to publish taxonomic 'corrections' for Makhan's mischief, and specialists have done both.

For further depressing reading about Makhan and Hawkeswood, see

http://myrmecos.wordpress.com/2007/12/13/the-rogue-taxonomist/

http://scienceblogs.com/myrmecos/2008/03/update-on-the-rogue-taxonomist.php

http://medlarcomfits.blogspot.com/2007/08/on-trevor-j-hawkeswood-part-2.html

[1] Jäch, M.A. 2006. Taxonomy and nomenclature threatened by D. Makhan. Koleopterologische Rundschau 76:360. (Downloadable from http://www.bio-nica.info/biblioteca/Jach2006Coleoptera.pdf)

Bob Mesibov