



Our third issue

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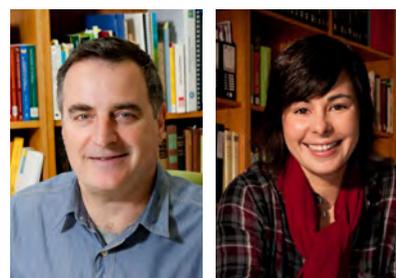
David Yeates, Director, and Beth Mantle, Manager, ANIC

It has been another very busy 6 months in ANIC. In July Professor Tim Senden hosted a microCT scanning and 3D imaging workshop for ANIC staff at ANU, and you can read more about that workshop in this edition. Postdoctoral Fellow Karen Meusemann joined ANIC from Bernie Misof's lab in Museum Koenig Germany to work on Dipteran phylogenomics. In September David Yeates, Adam Slipinski and Karen Meusemann attended workshops and conferences in Germany for the 1000 insect transcriptome evolution project (1KITE), and for the 6TH Dresden Meeting on Insect Phylogeny.

The last few months has also seen the publication of two major books that Adam Slipinski has been working on over the past few years. Both are the first volumes of 3-volume sets to be published by CSIRO publishing. The first is Australian Longicorns (Coleoptera: Cerambycidae), by Adam and Hermes Escalona, and the second is Australian Beetles, authored with John Lawrence. Both are available for purchase through the CSIRO Publishing website, and both include sumptuous illustrative material produced by Anne Hastings. Needless to say, these books will be landmark contributions for decades.

We have hosted a multitude of visitors and students (including Paul Brock from the UK in the phasmids, Rhiannon Dalrymple in Lepidoptera, Gil Nelson from iDigBio in the US, and Lesley Ballantyne in Coleoptera). You can read more about Nicole Fisher's work with Gil Nelson and iDigBio in this edition of ANICdotes. Beth Mantle coordinated a special workshop on biodiversity informatics and digitisation in natural history

collections at the [Pacific Science Intercongress](#) in Fiji in July. The workshop was presented as a webinar to enable remote attendance, and you can hear their presentations [here](#).



David Yeates

Beth Mantle

In September, ANIC was the proud recipient of John Kerr's invaluable Lepidoptera collection. This donation has added immense scientific value to ANIC's collection and we are very grateful for John's generous donation. Many donations are tax deductible under the government's Cultural Gifts Program (CGP). You can read more about the CGP initiative [here](#) and learn about John's collection in the article in this edition of ANICdotes.

We said farewell to two of our curation staff in September. Fiona Spier is taking a break from working, while Kim Pullen has moved to greener pastures in Plant Industry. We wish both of them well in their new endeavours. Meanwhile, we hope to add a new face to our team in the next few months with a new appointment for a biodiversity informatics manager in ANIC. Contact [Beth Mantle](#) if you have any enquiries about this position.

INSIDE THIS ISSUE

Our third issue.....	1
MicroCT Scanning Course	2
Book Launch: Australian Longhorn Beetles (Coleoptera: Cerambycidae). Vol. 1	3
Professor J.F.R Kerr's butterfly collection donated to ANIC	4
Digitisation Update.....	5
ACE Science	6
Moth weekend	6
Recent publications.....	7

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BANNER: *Graphium macleayanus* image from the [Biodiversity Heritage Library](#).
PHOTOS: all photos taken by Chris Manchester except pages 3 & 4 taken by You Ning Su.

MicroCT Scanning Course

David Yeates

MicroCT scanning has become a new and important tool in the analysis of phenotypes and functional morphology. Various software packages can take the scan data and render 3D images of internal and external soft tissue and sclerotised structures of insects that bring a whole new level of detail and precision to the comparison of morphological characters. These scans have been used extensively in recent years to build up larger and more precise phylogenetic data matrices and analyses based on phenotypic data.

The Australian National University has some very high precision microCT scanners that they build themselves, however these have only been rarely been used for animal tissues. ANIC invited a special scientific visitor from Museum Koenig in Bonn Germany, Dr Alexander Blanke, to run a microCT scanning course for ANIC staff from 29-31 July 2013 in the ANU.

The course was run in collaboration with Professor Tim Senden, Head, Department of Applied Mathematics (DAM), Research School of Physics and Engineering at the ANU. The course attracted 15 participants, including ANIC staff, and PhD students from ANU and the University of NSW.

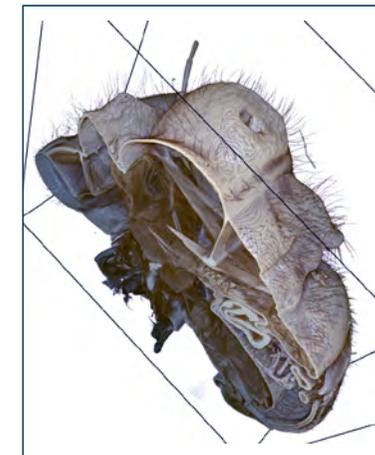
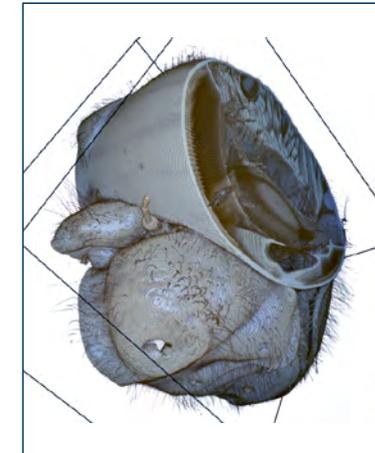
Tim first gave workshop attendees a tour of the scanning, visualisation and 3D printing facilities in the DAM, and Alex explained the physical principles of the scanning itself. Specimens can take up to 18 hours to scan at high resolution.

Alex and Dr Ajay Limaye (DAM) demonstrated various software applications to render and segment the scanner data including Blender and Drishti. All participants came away from the course with a much greater appreciation of the power of this technique, and also with the knowledge that software for analysing the data is also powerful and complex. During the course some specimens supplied by participants were scanned,



Professor Tim Senden showing course participants (L to R) Adam Slipinski, Rolf Oberprieler, Karen Meusemann and Anne Hastings the inner workings of a microCT scanner. Photo by David Yeates.

and these datasets await further analysis. David Yeates and PhD student Michaela Purcell are using the technique to examine the secret life of fly larvae and nematodes inside Fergusoninidae galls.



Examples of a data set of a slice of dragon fly head rendered in Drishti reconstruction software. The reconstruction can be examined in 3 dimensional space.

Book Launch: Australian Longhorn Beetles (Coleoptera: Cerambycidae). Vol. 1.

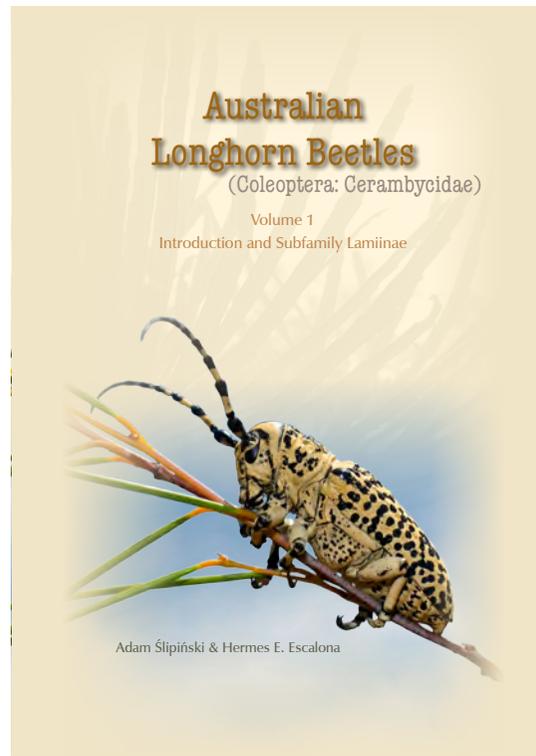
Introduction and Subfamily Lamiinae by Adam Ślipiński and Hermes E. Escalona

This magnificent and colourful title was exhibited on 13 August by the Secretary of the Department of Agriculture, Fisheries and Forestry (DAFF), Andrew Metcalfe AO. The book was a highlight of the DAFF Science Strategy launch event at the Academy of Science's famous 'Shine Dome'. The event was also attended by Dr Paul Grimes, Secretary of the Department of Sustainability, Environment, Water, Population and Communities.

With over 300 described genera and 1300 species, Cerambycidae is one of the largest families of Australian beetles. In spite of its economic importance and obvious attractiveness to entomologists, this group has been neglected for a long time. The number of genera and species to be treated and the problems in higher classification of Cerambycidae have been the main impediments to research on this group in Australia. As a result, many publications are mostly limited to isolated species or generic descriptions, often without illustrations or the reference to the increasingly confused world classification of the family.

Volume One, dealing with the Lamiinae, is the first in a series of three volumes dedicated to the genera of the Australian Cerambycidae. This text contains a general introduction to the Australian longhorn beetles, keys to identification of subfamilies based on adults and larvae, and the treatment of the subfamily Lamiinae, comprising 74 genera and 600 described species. Volume Two in this series is expected to be published in 2015 and will cover about 100 genera of the subfamily Cerambycinae. The last volume will be devoted to the genera and species of Parandrinae, Spondylidinae and Prioninae.

The Lamiinae volume was produced as a co-publication between the Australian Biological Resources Study (ABRS)



Front cover of Australian Longhorn Beetle

and CSIRO Publishing, in a funding partnership with DAFF. The book is a result of three years research on Australian Lamiinae supported by an ABRS research grant to Adam Ślipiński, funding used to support the contributions of Hermes Escalona, visiting researcher from the Universidad Central de Venezuela. It was edited by Dr Alice Wells and very beautifully designed and formatted by Brigitte Kuchlmayr (both ABRS).



Hermes, Adam and Alice Wells (ABRS, book editor) with DAFF Secretary Andrew Metcalfe AO



Large poster of a plate from the book on display at the launch

Professor J.F.R Kerr's butterfly collection donated to ANIC

Ted Edwards

John has modestly provided the following notes.

"I developed a passion for butterflies at an early age under the guidance of the legendary Dr G.A. Waterhouse. Despite my youth he managed to implant the notion that collecting is not merely a diverting pastime but should involve scientific study.

Throughout my adult life most holidays were devoted to collecting trips to various parts of Australia. A highlight was two trips to Iron Range on Cape York Peninsula with Jack Macqueen. During the first of these, in 1961, we were guests of BHP and lived in relative luxury. We discovered two New Guinean butterfly species previously unknown from Australia, *Hypochrysops hippuris* and *Toxidia inornata*. The second trip, in 1966, yielded *Philiris ziska*, *Philiris diana papuana*, *Allora major* and a distinctive subspecies of *Candalides consimilis*. We also found the early stages of *Jalmenus eichhorni*, at that time considered to be a subspecies of *Jalmenus evagoras*. The structure of the larvae and the nature of the attendant ants suggested that it was a distinct species, which was confirmed by study of the male genitalia. I have been involved in the discovery of six new endemic Australian species: *Trapezites macqueeni*, *Hesperilla furva*, *Candalides geminus*, *Jalmenus pseudictinus*, *Hypochrysops piceatus* and *Acrodipsas mortoni*.

I started collecting moths after Jack Macqueen and I had spent a couple of weeks renting a house in the rainforest at Paluma. I was fascinated by the diversity of species that came to his mercury vapour lamp.

I am pleased that the ANIC has agreed to accept my collection of butterflies; my moths will go to them in due course."

John Kerr first met Dr Waterhouse when John and his mother were evacuated during the height of the Japanese threat to Australia during World War II, when they boarded with

the Waterhouse family in Killara, Sydney. John went on to a medical career at the University of Queensland. He was, by all accounts, a very popular and engaging lecturer. He retired from the University in 1995 and was granted the title Professor Emeritus. His work in London, Brisbane and at the Pathology Department, University of Aberdeen, in 1971 resulted in a seminal paper on programmed cell death for which he, with A. H. Wyllie and A.R. Currie, coined the name "apoptosis" in 1972 and which has since become a major line of research on medical conditions such as cancer and various degenerative disorders. In following up on his apoptosis work John carved a very distinguished medical research career replete with honours and awards. He was invested as an Officer of the Order of Australia in 1996. For more biographical information see these links: <http://nla.gov.au/nla.party-1475777> and www.eoas.info/biogs/P004676b.htm.

I first met John in December 1964 when he was introduced by our mutual friend, Tom Guthrie, and there followed a wonderful day's collecting in the Blue Mountains and I first saw his magnificent collection in February 1969. A story I remember is that during his sabbatical in Aberdeen John became quite nostalgic for Australia and Tom Guthrie sent him a live pupa of *Ogyris abrota* to cheer him up. Another notable story is that Don Sands, while working for CSIRO Entomology in Papua New Guinea in the 1970s, asked his GP about a slight nigggle on his back. The GP diagnosed melanoma and Don promptly phoned John who quickly organised admission to hospital in Brisbane and removal of the tumour. This rapid action may have saved Don's life.

John mentions his 1961 trip to Iron Range, with its long WW II bomber airstrip, lush rainforest and road to the coast, which was so successful. Iron Range, or the Claudie River as the area is also called, has become a Mecca for butterfly and

moth collectors as a result of this exploratory trip. It is easy to see the significance today of the bombshell which burst on butterfly students following this trip and the realisation that there were more New Guinean species to discover in the north. Indeed John, Don Sands and Jack Macqueen showed there were also endemic new species to discover and pioneered a butterfly "enlightenment" during the 1960s, which endures to this day.

John's collection, one of the best in Australia, consists of nine twelve-drawer beautiful cedar cabinets with immaculately prepared specimens. It contains one holotype, 71 paratypes of 16 species and some unique and some historical specimens. It is an immensely valuable accession to the ANIC and we sincerely thank John and Maureen for their wonderful gift.



John Kerr as a boy with Doug Waterhouse

Digitisation Update

Nicole Fisher

Entomologists Gather for Insect Digitisation Workshop in Chicago

Nicole Fisher participated in the Dried Insect Digitisation Workshop held 23rd to 25th of April at Chicago's [Field Museum of Natural History](#) (FMNH).

[iDigBio](#), the National Science Foundation's national HUB for Advancing Digitization of Biological Collections (ADBC) hosted about 50 entomologists and digitisation professionals from the U.S., Australia and the United Kingdom, bringing together a diverse assemblage of knowledge and skill to address the complex job of digitising pinned insect collections.

The workshop started with a reception and dinner that afforded opportunities to create friendships and renew acquaintances, and to begin the discussion of insect specimen digitisation. The focus was on digitisation of dried insect collections (pinned or packaged), to include specimen label databasing, specimen imaging and the most recent technologies and equipment used in digitisation.

Remote attendance was high throughout the workshop as the day's proceedings and content were recorded and broadcasted. The workshop's agenda, presentations and collaborative notes documents are accessible from iDigBio's Digitization Resources Wiki, directly at https://www.idigbio.org/wiki/index.php/Dried_Insect_Digitization_Workshop where presentations and related documents are available for download.



Course participants

<https://www.idigbio.org/content/entomologists-gather-insect-digitization-workshop-chicago>

ACE SCIENCE

Katerina Stavridis

Each year, Beth Mantle mentors a female Year 10 science student from a local Canberran school, Melrose High School. The school's science teacher, Geoff McNamara, is the coordinator of an [award-winning](#) science program called ACE Science. This year, Katerina Stavridis spent a week working in ANIC, contributing to the work of the curatorial team and putting the finishing touches on her ACE Science project, a butterfly and moth collection. Katerina spent time with Ted Edwards, learning the correct procedure for pinning and setting Lepidoptera. Katerina was curious about morphological differences between day-flying and night-flying Lepidoptera. She collected moths and butterflies at different times of day and night and after setting them she carefully studied each specimen and created a character-matrix to search for differences between the two groups. Without a doubt, her finished collection and written report was of an exceptional standard and we at ANIC are all very proud of her!



Collection Management & Curation Column

Ted Edwards

The sixth biennial moth weekend

The meeting, held over the weekend of 6-7 July, was a resounding success with 42 participants, including lepidopterists associated with the ANIC. Attendees came from all corners of Australia; Perth, Darwin, Kuranda, Melbourne, Kangaroo Island and Hobart, mostly at their own expense to join in. We were particularly pleased to welcome John Landy from Melbourne and three colleagues from New Zealand and we hope a similar meeting may eventuate in New Zealand.

Organised by Marianne Horak supported by Ted Edwards, You Ning Su and Glenn Cocking, the agenda was informal with the main business to meet each other, chat, discuss projects, experiences, people, solicit specimens for projects, work on the ANIC and, importantly, learn from each other. We caught up on news, chatted about old friends, old times and recounted old stories. The talkfest generated great enthusiasm, much laughter, and a fantastic feeling of camaraderie and a deeply personal pleasure in having so many friends together. A session of short talks fascinated everyone with 7 informal talks of very high standard providing inspiration to raise the bar even further.

Such a meeting is made possible by the huge effort so many people made to attend, many flying long distances and for this we are intensely grateful.

The central location of Canberra, the unequalled collection and library facilitated the meeting, as did Marianne's willingness to organise it while in retirement and the willingness of CSIRO Ecosystem Sciences to act as host and ANIC staff to lend chairs and microscopes.

6th ANIC Moth Meeting 6-7 July 2013



The photo is by You Ning Su, who provided the legend and photo-shopped in two people who were absent from the group photography session.

Recent publications

D.J. Ferguson and **D.K. Yeates** (2013) "The courtship behaviour of the bee fly *Meomyia vetusta* Walker (Diptera: Bombyliidae)" *Australian Entomologist* 40(2): 89-92.

S.L. Winterton and **D.J. Ferguson** (2012) "New species of *Vomerina* Winterton (Diptera, Therevidae, Agapophytinae) from Australia" *ZooKeys* 218: 65-75.

D.J. Ferguson, M.E. Irwin and **D.K. Yeates** (2013) "New species of *Anabarhynchus* Macqurt (Diptera: Therevidae) from arid and monsoon tropical Australia" *Zootaxa* 3670 (1): 55-95.

M. Horak, **M. F. Day**, C. Barlow, **E. D. Edwards**, **Y. N. Su** and S. L. Cameron, 2012. Systematics and biology of the iconic Australian scribbly gum moths *Ogmograptis* Meyrick (Lepidoptera: Bucculatricidae) and their unique insect-plant interaction. *Invertebrate Systematics* 26 (4): 357-398.

R. Borovec and **R.G. Oberprieler** (2013) "*Afrophloeus*, a new genus of African weevils of the tribe Embrithini (Coleoptera: Curculionidae: Entiminae), with description of a new species and notes on the composition of Embrithini" *Zootaxa* 3693 (3): 365-378.

S.O. Shattuck and **S. Marsden** (2013) "Australian species of the ant genus *Dolichoderus* (Hymenoptera: Formicidae)" *Zootaxa* 3716 (2): 101-143.

D.P.A. Sands (2012) "Southern pink underwing moth *Phyllodes imperialis* H. Druce" pp. 38-39, in (eds Curtis LK, Dennis AJ, McDonald K, Kyne, PM and Debus, SJS), pp. 38-39, *Queensland's Threatened Animals*. CSIRO Publishing, Melbourne. 2012.

D.P.A. Sands (2012). "Review of Australian *Phyllodes imperialis* Druce (Lepidoptera: Erebidae) with description of a new subspecies from subtropical Australia" *The Australian Entomologist* 439: 281-292.

D.P.A. Sands and T.R. New (2013). Conservation of the Richmond birdwing butterfly in Australia. Springer, Dordrecht. 209 pp.

S.O. Shattuck and A.J. O'Reilly (2013) "Revision of the Australian endemic ant genera *Pseudonotoncus* and *Teratomyrmex* (Hymenoptera: Formicidae: Formicinae)" *Zootaxa* 3669: 287-301.

B.D. Lessard, S.L. Cameron, K.M. Bayless, B.M. Wiegmann and **Yeates, D.K.** (2013) "The evolution and biogeography of the austral horse fly tribe Scionini (Diptera: Tabanidae: Pangoniinae) inferred from multiple mitochondrial and nuclear genes" *Molecular Phylogenetics and Evolution* 68: 516-540.

D.K. Yeates and P.S. Cranston, (2013) "Obituary-Donald Henry Colless 1922-2012" *Zootaxa*: 3680: 4-14.

B.D. Lessard, and **D.K. Yeates**, (2013) "New species of the hairy-eyed horse fly subgenera *Scaptia* (Myioscaptia) Mackerras, 1955 and *Scaptia* (Scaptia) Walker, 1850 (Diptera: Tabanidae) from Australia" *Zootaxa* 3680: 118-129.

D.K. Yeates and S.K. Oberprieler (2013) "Review of the Australian *Apiocera* minor Norris species-group (Diptera: Apioceridae) with a revised key to species" *Zootaxa* 3680: 195-209.

S.J. Scheffer, L.A. Nelson, K.A. Davies and **D.K. Yeates** (2013) "Sex-limited association of *Fergusonia* nematodes with female *Fergusonina* flies in a unique Australasian mutualism (Nematoda: Neotylenchidae; Diptera: Fergusoninidae)" *Australian Journal of Entomology* 52: 125-128.

A. Cavalleri, A.R. De Souza, F. Prezoto, **L.A. Mound** (2013) "Egg predation within the nests of social wasps: a new genus and species of Phlaeothripidae, and evolutionary consequences of Thysanoptera invasive behaviour" *Biological Journal of the Linnean Society* 109: 332-341.

L-H. Dang, **L.A. Mound** and G-X. Qiao (2013) "New records and nomenclatural changes among spore-feeding thrips from China (Thysanoptera, Phlaeothripidae, Idolothripinae)" *Acta Zootaxonomica Sinica* 38: 657-660.

L-H. Dang, **L.A. Mound** and G-X. Qiao (2013) "Leaf-litter thrips of the genus *Adraneothrips* from Asia and Australia (Thysanoptera, Phlaeothripinae)" *Zootaxa* 3716 (1): 001-021.

B.J. Garms, **L.A. Mound** and N.A. Schellhorn (2013) "Polyphagy in the Australian population of South African citrus thrips (*Scirtothrips aurantii* Faure)" *Australian Journal of Entomology* 52: 282-289.

L.A. Mound (2013) "Homologies and host-plant specificity: recurrent problems in the study of thrips" *Florida Entomologist* 96(2): 318-322.

L.A. Mound (2013) Tospoviruses and thrips – is there an evolutionary relationship? Proceedings of the 2013 International Symposium on Insect Vectors and Insect-borne diseases. *Taiwan Agricultural Research Institute Special Publication* 173: 231-237.

L.A. Mound (2013) Thysanoptera pp 49-50 in Animal Biodiversity: An Outline of Higher-level Classification and Survey of Taxonomic Richness (Addenda 2013). *Zootaxa* 3703 (1): 1-82.

L.A. Mound, **L-H. Dang** and D.J. Tree (2013) Genera of fungivorous Phlaeothripinae (Thysanoptera) from dead branches and leaf-litter in Australia. *Zootaxa* 3681 (3): 201-224.

L.A. Mound and **L-H. Dang** (2013) New Australian records of Asian or New Zealand Phlaeothripidae (Thysanoptera). *Australian Entomologist*, 40(3): 113-117.

L.A. Mound and D.J. Tree (2013) Fungus-feeding thrips from Australia in the worldwide genus *Hoplandrothrips* (Thysanoptera, Phlaeothripinae). *Zootaxa* 3700 (3): 476-494.

D. Sartiami and **L.A. Mound** (2013) Identification of the terebrantian thrips (Insecta, Thysanoptera) associated with cultivated plants in Java, Indonesia. *Zookeys* 306: 1-21.

Z. Jin, **H.E. Escalona**, **A. Ślipiński** and H. Pang (2013) "Phylogeny and classification of Rhipiceridae (Coleoptera: Rhipiceridae) with a review of the Australian taxa" *Annales Zoologici* 63: 275-317.

Z. Jin, **A. Ślipiński**, H. Pang and D. Ren (2013) "A new Mesozoic species of soft-bodied plant beetle (Coleoptera: Dascillidae) from the Early Cretaceous of Inner Mongolia, China with a review of fossil Dascillidae" *Annales Zoologici* 63: 501-509.

J.F. Lawrence and **A. Ślipiński**. 2013. "Australian Beetles Volume 1. Morphology, Classification and Keys" CSIRO Publishing, 576 pp.

J.F. Lawrence and **A. Ślipiński** (2013) "*Lycomimus*, a new genus of Australian Ptilodactylidae (Coleoptera: Byrrhoidea)" *Zootaxa* 3702: 71-78.

Recent publications continued

J.F. Lawrence and **A. Ślipiński** (2013) “*Globorentonium*, a new genus of rentoniine Trogossitidae (Coleoptera: Cleroidea) from Australia and Brazil” *Zootaxa* 3710: 257–270

J.F. Lawrence and **A. Ślipiński** (2013) “Lycomimodes, a new generic replacement name for preoccupied *Lycomimus* Lawrence and Slipinski, 2013 (Insecta: Coleoptera: Ptilodactylidae) non Melzer, 1931 (Insecta: Coleoptera: Cerambycidae)” *Zootaxa* 3709: 555.

J.F. Lawrence, **A. Ślipiński**, R.G. Beutel and A.F. Newton (2013) “A Possible Larva of *Lepicerus inaequalis* Motschulsky (Coleoptera: Myxophaga: Lepiceridae) from Panama. *Zootaxa* 3701: 393-400.

A. Ślipiński and **H.E Escalona** (2013) “Australian Longhorn Beetles (Coleoptera: Cerambycidae). Volume 1. Introduction and Subfamily Lamiinae” CSIRO Publishing & Australian Biological Resources Study, 504 pp.

F. Turco, **A. Ślipiński**, A and C. Lambkin (2013) “*Enhypon* Carter: a taxonomic revision of an endemic Australian genus of ground-dwelling beetles (Coleoptera: Zopheridae)” *Zootaxa* 3681: 371-394.

Y. Yu, **A. Ślipiński**, C.K. Shih, H. Pang and D. Ren (2013) “A new fossil jewel beetle (Coleoptera: Buprestidae) from the Early Cretaceous of Inner Mongolia, China” *Zootaxa* 3637: 355-360

O. Joharchi and **B. Halliday** (2013) “A new species and new records of *Gymnolaelaps* Berlese from Iran (Acari: Laelapidae), with a review of the species occurring in the Western Palearctic Region” *Zootaxa* 3646: 39-50.

R.B. Halliday (2013). “Higher taxon Acari”. In *Australian Faunal Directory*. <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/ACARI> Revised edition, published 30 April 2013. (Australian Biological Resources Study, Canberra).

B. Halliday (2013) “Electronic publishing has arrived” *Myrmecia* 49 (2): 8-11.

K. Tagami and **B. Halliday** (2013) “Mites of the family Histiotomatidae associated with the giant Australian earwig, *Titanolabis colossea* (Dohrn) (Dermaptera: Anisolabididae)” *Australian Journal of Entomology* 52: 218-226.

J Paretas-Martínez, M Forshage, M Buffington, **N Fisher**, J La Salle, J Pujade-Villar (2013) Overview of Australian Cynipoidea (Hymenoptera) *Australian Journal of Entomology* 52 (1): 73-86.

B.J. Richardson (2013) “New unidentate jumping spider genera (Araneae: Salticidae) from Australia” *Zootaxa* 3716 (3): 460-474.