Sept
2010

Issue
No. 593

Tarsus

CIRCULAR OF THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES Inc

Next Meeting of the Entomological Society of NSW Inc

Where: Meeting Room 2, Ermington Community Centre, River Road, Ermington
When: 7.30 pm on Wednesday, 1st September 2010

Cave insects (some experiences from Australian and PNG caves)

Graeme Smith

In Graeme's younger years he spent quite a lot of his time in caves, including surveys of the invertebrates in caves at Wombeyan and Jenolan Caves as well as on the Muller Plateau in PNG. In this talk he will show some photos from these caves to illustrate the sort of habitats where invertebrates can be found, as well as the invertebrates themselves and discussing the types of adaptations that cave dwellers display.

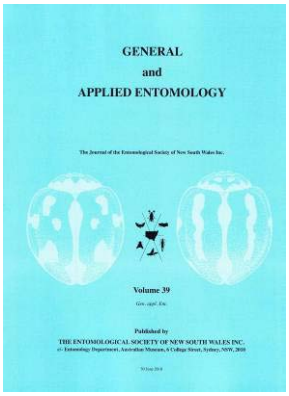
Thanks for this year's journal

The Councillors of our Society put in a lot of work in the background to keep the Society functioning. Most of them have been doing this work for many years however there comes a time when people decide that they need to devote their limited time to other things. After our crisis meeting at the beginning of the year we were lucky enough to have two country-based members take on the tasks of two of the retiring Councillors.

Robin Gunning has done a great job to get the journal completed on time. Garry Levot provided a lot of advice and technical assistance including doing the desktop publishing work.

Mark Stevens is now working hard to get the journal mailed out to members and the subscribers. Gith put in a big effort to sort out the very complicated subscriber invoicing so that we can hopefully minimise issues with billing and delivery that plague this part of our operations.

I would like to thank these four people, the contributors, as well as the rest of the Council for the efforts they put in to keep things running for the rest of the members.



Robin Parsons
President
Entomological Society of NSW Inc

Synopsis of the talk at the July meeting

On the origins of citrus, and huanglongbing and its vectors

Andrew Beattie

Centre for Plants and the Environment,
University of Western Sydney,
Locked Bag 1797,
Penrith South DC, NSW 1797.

Huanglongbing (HLB) has been a major focus of University of Western Sydney research on pests and diseases of horticultural crops over the past 10 years, mostly through a project funded by the Australian Centre for International Agricultural Research (ACIAR HORT/2000/043) and another, funded by Horticulture Australia Limited (HAL CT02005), that led to the development of an incursion management plan for the Australian citrus, nursery and garden industries, Version 2 of which (Beattie & Barkley 2009) is available from HAL and the authors.

Most of the following is based on a presentation at an international conference in Florida in December 2008. For additional details and references see Beattie et al. (2008): http://www.plantmanagementnetwork.org/proceedings/irchlb/2008/presentations/IRCHLB.K.2.pdf. What started as a relatively 'simple' project related to an insect vector of a disease, led to questions about the origins of the pathogens that cause the disease, their vectors, and hosts of the pathogens and their vectors. The projects highlighted the need for entomologists and plant pathologists to work closely together and with others, particularly botanists: never in isolation. Moreover, the projects highlighted the importance of systematics and reading original papers rather than relying on citations and reviews.

Figure 1. Adult *Diaphorina citri* female ovipositing in a *Murraya exotica* bud (left); huanglongbing devastated 3-4 year-old Siem mandarin (*Citrus reticulata* Blanco) orchard in Central Java (right).

HLB, also called citrus greening, is a devastating disease of citrus caused by phloem-limited, putative species of Gram-negative liberibacters (α-Proteobacteria): a 'heat-tolerant' form, '*Candidatus* Liberibacter asiaticus', and two 'heat-sensitive' forms, '*Ca*. L. africanus' and '*Ca*. L. americanus' (Bové 2006). A 'heat-sensitive' subspecies, '*Ca*. L. africanus ssp. capensis', also occurs in Cape chestnut (*Calodendrum capense* (L. f.) Thunb. [Rutaceae: Rutoideae], an ornamental tree in southern Africa. The most widespread and severe form, '*Ca.* L. asiaticus', threatens the viability of commercial citrus production (a major source of vitamin C) and rare and endangered germplasm. It occurs in tropical and subtropical Asia, and has spread within this region, from an unknown origin, over a century or more. Since 2000, it has been detected in New Guinea, in the south-eastern United States of America, in Caribbean and Central American countries, and in Brazil.

It can destroy initially pathogen-free orchards before trees bear fruit. There is no known cure. 'Effective' management of the '*Ca.* L. asiaticus' can be only achieved through efficient detection of symptoms and immediate removal of diseased trees.

The Asiatic citrus psyllid, *Diaphorina citri* Kuwayama [Hemiptera: Sternorrhyncha: Psyllidae] is the only known vector of *Ca*. L. asiaticus' in Asia (excluding Arabia) and New Guinea, and the only known vector of '*Ca.* L. asiaticus' and '*Ca*. L. americanus' in the Americas. The African citrus psyllid, *Trioza erytreae* (del Guercio) [Hemiptera: Sternorrhyncha: Triozidae] is only known vector of the '*Ca*. L. africanus' in Africa. Heavy use of insecticides for 'control' of *D. citri* slows, but does not prevent spread of HLB. Such use of pesticides (35-52 'cocktail' sprays per year have been reported) disrupts biological control of other pests, and leads to insecticide resistance in a range of pests, and unacceptable residues on and in fruit. Populations of both psyllids can increase rapidly and reach very high numbers: Ahmad (1961) estimated a population of 4,571,710 *D. citri* adults and nymphs in 1 acre (> 11 million per hectare) of 110 mature sour lime trees (*Citrus* × *aurantiifolia* (Christm.) Swingle).

Conjecture surrounds the origins of HLB. It is widely considered to have been first observed in southern China in the late 1800s and to have originated and spread from there. These assumptions are based on: (a) the widely held view that the genus *Citrus* (Sapindales: Rutaceae: Aurantioideae: Aurantieae] originated in Asia; (b) misinterpretation of literature; and (c) interviews with farmers. Whilst the origins of HLB are still in doubt, all evidence indicates that *Citrus* is an unnatural host of the disease and that the first record of HLB in Asia was in the Indian Punjab before partition, in a report by two entomologists (Husain & Nath 1927) that included a description of damage caused by *D. citri*. Other Indian records suggest that the disease may have been present in India in the mid 1700s. *D. citri*, though first recorded and described in Taiwan in 1908, is native to the Indian subcontinent, not Southeast Asia. It was not recorded to southern China until the mid 1930s (Hoffman 1936). HLB became widespread in southern China some 10 years later, reaching devastating levels by the mid 1950s (Lin 1956). Both *D. citri* and '*Ca.* L. asiaticus' may have been introduced to China in the early 1930s by American botanists and horticulturist.

The original host of '*Ca.* L. asiaticus' is unknown. It could be a *Citrus* relative such as a species of *Murraya* [Aurantioideae: Aurantieae], *Bergera* or *Clausena* [Aurantioideae: Clauseneae] on which *D. citri* and other psyllids feed. However, there is no evidence to support this assumption and it is possible that the pathogen could have been transmitted to *Citrus* from a non-rutaceous host by a species of dodder (*Cuscuta* spp. [Solanales: Convolvulaceae]) or dodder laurel (*Cassytha* spp. [Magnoliales: Lauraceae]). Moreover, host records for *D. citri* and '*Ca.* L. asiaticus' are beset by multiple synonyms for some hosts, possible inaccurate recording of hosts, lack of host-plant voucher specimens, and systematic uncertainties about the identities and relatedness of hosts. There are some 1000 names for species and cultivars of *Citrus*, but only 25-30 true species, some 50% of which are Australasian, from Australia, New Guinea and New Caledonia. Orange jasmine is regarded as a preferred host of *D. citri* but its specific identity is uncertain. Widely considered to comprise variable forms of *Murraya paniculata* (L.) Jack, including the common ornamental form, it may comprise two species, *Mu. paniculata* and *Mu. exotica* L., the latter being orange jasmine. This distinction has been debated for more than 250 years since Rumphius described the plants in 1747. Current PhD studies at the University of Western Sydney indicate that *Mu. exotica* is a valid species. If so, it is more preferred by *D. citri* than *Mu. paniculata*. It is also known to be host, possibly transient, of '*Ca.* L. asiaticus' and '*Ca*. L. americanus'.

Symptoms of the African form of HLB caused by '*Ca*. L. africanus' were first reported in late 1920s (van der Merwe & Andersen 1937, Oberholzer et al. 1965). The original host of the pathogen, '*Ca*. L. africanus', and its African vector, *T. erytreae*, appears to be *Vepris lanceolata* (Lam.) G. Don [Rutaceae: Rutoideae] but little is known about relationships between the pathogen, the psyllid and other species of *Vepris*. Beattie et al. (2008) hypothesised that '*Ca*. L. africanus' may have evolved in association with *V. lanceolata* and *T. erytreae* in Africa and perhaps, less than 1000 years ago, transmitted to introduced citrus cultivars and their derivatives, one of which, Mosambi sweet orange (*Citrus* × *aurantium* L.), was introduced to India, possibly as HLB-infected seedlings. Beattie et al. (2008) speculated that '*Ca*. L. africanus' was acquired by *D. citri* in India and evolved to become '*Ca.* L. asiaticus'. The hypotheses remain unresolved. Alternative hypotheses have been proposed, but these are also questionable. For example, the origin of '*Ca*. L. americanus' is unknown. Although claimed to have evolved up to 300 million years ago (Eveillard et al. 2008) it has not been detected in Africa. There is also no evidence that it evolved in South America. It and '*Ca.* L. asiaticus' were first found in Brazil in 2004 in the same region of São Paulo State (Bové 2006). *D. citri* has been present in Brazil since before 1940. The puzzle has become more complex with the recent discoveries of another psyllid transmitted liberibacter in carrots and solanaceous plants (Liefting et al. 2009, Munyaneza et al. 2010).

The HLB pathogens and there vectors do not occur naturally in Australasia. *D. citri* was recorded in the Northern Territory shortly before, but not after, successful eradication of citrus canker (*Xanthomonas citri* subsp. *citri* (*ex* Hasse 1915)) between 1916 and 1922 was accomplished by removal of citrus trees above the 19th parallel (fortunately, the rare

Australian native *Citrus gracilis* Mabberley was not discovered until 1971(Mabberley 1998)). The proportion of true citrus species native to Australasia, the absence liberibacters in them and psyllids feeding on them, and recent molecular studies on the genus *Citrus*, led to a hypothesis that *Citrus* originated in Australasia some 30+ million years ago and dispersed to Asia by one or more means: with equatorial currents, on moving terrains, and with movement of birds and bats. In the molecular studies Bayer et al. (2009) the species fall into two clades, one Asiatic the other Australasian, the latter including *Citrus medica* L. and *Citrus indica* Tanaka, both widely assumed to be of Indian origin.

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Thanks from the Circular Editor

I am grateful for the efforts of people outside the Council over the last couple of months.

George Hangay and Graham Brown have offered to write book reviews, Cameron Webb has provided a book review for this issue of Tarsus and Dinah Hales enlisted her friend, Robyn Stutchbury, to write our September "Insect of the Month"

It makes life a lot easier for me to have this support and no doubt makes for more interesting reading.

I hope the trend continues.

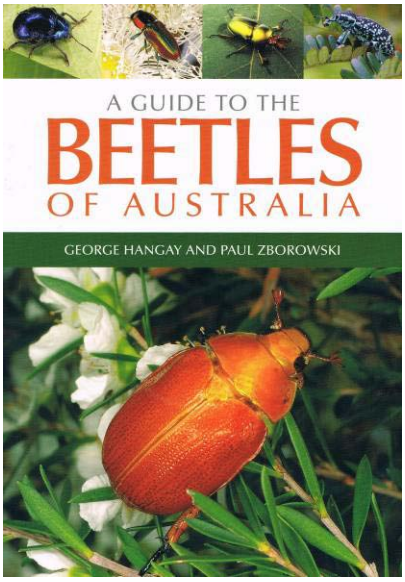
Thanks

Graeme Smith
Circular Editor
Entomological Society of NSW Inc

Book Review

A Guide to the Beetles of Australia

by George Hangay and Paul Zborowski
ISBN-9780643094871
Published in paperback by CSIRO Publishing 2010
Price $44.95



The authors' preface states that 'the aim of this book is to enable the reader to recognise most of the Australian beetle families' – which it does very well.

My first thought was the expectation of finding many familiar local (Sydney) species but this was not the case and correctly so considering the 30,000 species (and counting) within Australia.

However the combination of text and brilliant macro photography (and some familiar species) provided a thorough and fascinating journey through the Australian Coleoptera.

The first few chapters cover general subjects such as anatomy, reproduction and general biology well supported by diagrams and close up photos.

Then follows the 'Family Descriptions' end notes, adequate glossary and an index under both common and scientific names.

Each of the 'Family Descriptions' commence with between three to eight helpful key characters preceding a general discussion of the family's biology, taxonomy and behaviour supported by excellent photos of representative species.

Text descriptions are clear and concise and relate well to supporting photos and diagrams.
For those of us who are bit behind, the text also provides updates on recent changes in taxonomy and spelling.

Sub family level is well attended to for the larger families but a slightly broader representation of the Scarabaeidae, Tenebrionidae and Carabidae would, I feel, have been a significant contribution – perhaps another book please just for those families?

The 'in situ' photographs (in the manner of Paul Zborowski & Ted Edwards', A Guide to Australian Moths, 2007) are very attractive and informative and would assist non-professionals to make and provide more reliable identifications to family level.

The photos of very small species are a pleasure to see as, on occasions, I have had only drawings or keys to work with; (no disrespect to the excellent drawings in CSIRO's The Insects of Australia) and even found confirmation I had identified some correctly.

This is an essential book for naturalists and students working with broad ecological assessment and less emphasis on collecting specimens.

This publication is an encouragement to use the alternative of photography personally or (for the lazy photographer) the accumulated visual reference provided by this type of publication and computer based data resources.

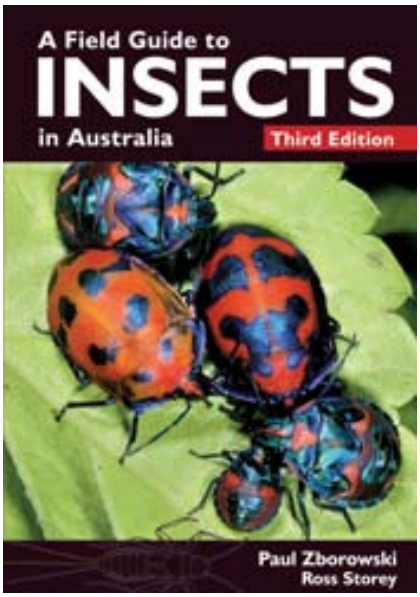
An exquisite reminder of the diversity and importance of one group of Australia's fauna.

Review by Mr Robin Parsons
Circular Editor
Entomological Society of NSW Inc

Book Review

A Field Guide to Insects in Australia
(3rd Edition) 2010

by Paul Zborowski and Ross Storey
ISBN-9781877069659
Published by New Holland Publishers (Australia) Pty Ltd.
Price $35.00



This third edition of **A Field Guide to Insects in Australia** by Paul Zborowski and Ross Storey comes 15 years after the first edition of their wonderful overview of Australia's insect fauna. Sadly, Storey passed away in 2008 and this edition, as Zborowski writes in the preface, is a memorial to his contribution to the study of insects, particularly beetles, in this country.

The author's objective here is to provide a means to identify common insects to the level of order with only minimal knowledge of insect taxonomy. This objective is certainly met and for many insect groups, thanks to the quality photographs throughout this publication, it is possible to provide much more specific identification. It isn't just amateur entomologists that will find this text useful. While there are already plenty of resources for professional entomologists requiring species level identification, this text still provides a useful resource as a quick reference to some of the less commonly encountered Australian insect groups.

There is a series of introductory chapters that set out what exactly an insect is, their general life cycles, a quick but detailed guide on collecting and preserving insects, and some background on crypsis and mimicry as well as an overview of insect classification. It is, however, the chapters dedicated to the insect orders that make up the bulk of this text. Each chapter generally deals with one Order of insects with introductory sections on the characteristics of the order, life cycle, biology and classification before getting into the illustrated descriptions of common families. As well as a colour photograph, there is some general information included where appropriate such as the number of species within the family, habitat associations, distinctive taxonomic characteristics and other points of interest.

There are some stunning photographs in the book including the corroboree cicada (*Macrotristria intersecta*), migrating seed bug (*Graptostethus servus*), neon cuckoo bee (*Thyreus nitidulus*), communal shield bugs (*Poecilometis* sp.) and hawk moth (*Angonyx papuana*). These are just a few of the over 300 full colour photographs throughout the text. While the collection of photographs obviously represents many years of collecting, it is still remarkable that the authors have managed to collect so many from such a wide range of habitats and behaviours, from mid flight to underwater and from rainforest plants to human hair!

Review by *Cameron Webb*

Insect of the Month

Backyard moth sleuthing

I came very close to ignoring the caterpillars' tiny nest. I cast my eye over it a few times when on our timber deck during the week of 7 March 2010. From a distance the little elongated protuberances over its shrivelled covering made it look like the dried remains of the tip of a lavender flower. I decided to take a closer look when I found another not far away. By this time I believed I was looking at possums' scats with fungal outgrowths (fig 1). The first surprise was that the tiny object was 'stuck' to the decking and when I pulled it away, part remained fixed. Perhaps the 'scat' had been rotting there for some time and fungal activity had caused it to adhere?

Fig 1. The mystery object found on the deck showing the small protuberances projecting from its shrivelled outer cover. (scale bar = 10mm)

As I carried the 'scat' in my hand to examine it through a stereomicroscope, there was the unexpected sensation of slight movement from the protuberances. I felt sure that this was not possible. It appeared to be so obviously withered and dead.

More surprises were revealed through the microscope. The 'scat' was indeed moving; very slightly, but moving. Each protuberance projecting from the parchment-like covering of the central core appeared to be composed of tiny faecal pellets (fig 1a) connected by web-like material. Perhaps the 'scat' had been invaded by other than fungal material.

Fig 1a. (right) Detail of a faecal-pellet structured protuberance which is about 7 mm long.

The section that had been exposed by pulling the 'scat' away from the deck contained a jumble of macerated plant material, faecal material and other debris (fig 2). It was obviously not the material of a possum scat.

Many of the tiny plant fragments had distinct parallel venation characteristic of monocots. One of the greatest surprises was that amongst the debris were caterpillars chomping away at seemingly unpalatable dried plant matter. The caterpillars were hard to see in entirety, but Dr Noel Tait, honorary research invertebrate zoologist, confirmed them as caterpillars because of their abdominal prolegs (fig 3). It was then that it became obvious that I was looking at a nest of caterpillars each of which was making, or had made a faecal-covered,elongated flattened tube through the outer covering of the nest. There were between seven and 10 protuberances per nest, many of which were at various stages of development

Fig 2. Macerated plant material and debris found within the torn object.

Fig 3. Caterpillars in the nest feeding on macerated plant material.

Fig 4. A comparison of a possum scat and an *Agave* bulbil as the culprit of caterpillar infestation. The chalk mark was made in an effort to check whether the nest was capable of locomotion. It seemed very unlikely.

After deciding the caterpillar nests were infested bulbils, I checked whether any bulbils still remained in the area around the base of the *Agave* plant. There were many. Those that had landed in conditions supporting growth had either developed into small plants or were in the early stages of 'germination'. A couple that remained hidden behind furniture on the deck looked remarkably like the nests less faecal-covered protuberances (fig 6). No doubt analysis of the macerated stem material of the nests could confirm that they were derived from *Agave* bulbils.

Fig 6. Bulbils at various stages of development some eight or nine months after falling from the spike.

The shape and size of the nest with its macerated monocot stems and parchment-like covering suddenly reminded me that it was similar in size and shape to a number of bulbils (plantlets) (fig 4 & 6) that had fallen on the deck from a 6m spike of an *Agave* plant growing below (fig 5). Could some of the bulbils have been infested before they fell from the spike? The spike had reached deck level and bloomed some eight or nine months before I found the nests.

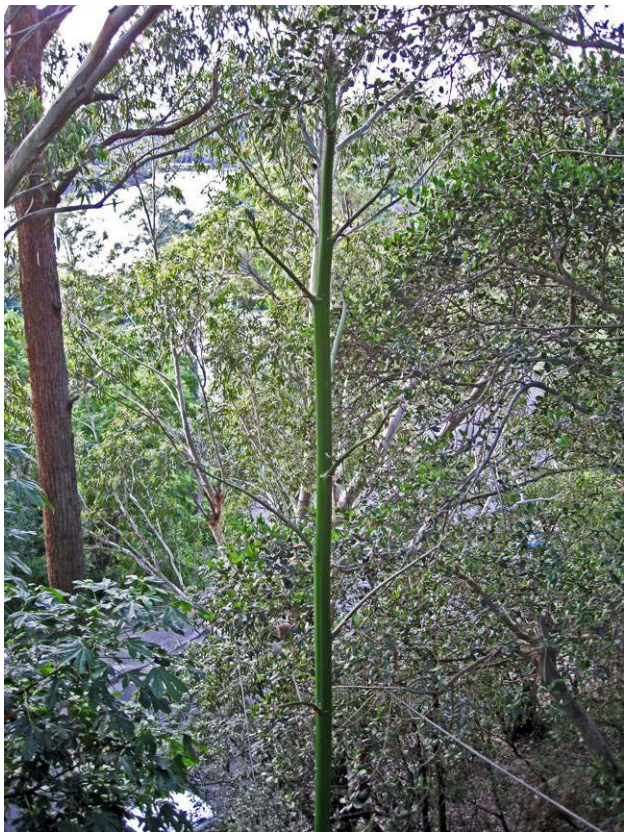


Fig 5. The top of the 6m flower spike of the *Agave* plant showing spikelets bearing flower buds and the occasional green bulbil. As it finished flowering, more bulbils developed.

Of the five remaining nests adhered to the deck, two were collected and the other three were circled with chalk. Were they able to shift from one place to another? It was surprising that they had not been trodden on in so exposed a location. Apart from that hazard, there had been bouts of severe weather over the months since removing the spike. After two weeks, there was no evidence of any relocation.

The urge to open the protuberances was overwhelming. I finally compromised by opening only two. Not unexpectedly, each housed a tiny brown chrysalis (fig 7). The nest was kept in a covered plastic Petri dish beside the microscope for easy examination and at the end of two weeks the moths began to emerge (22-23 March).

Attempts to photograph the moths in outdoors using available light proved to be a disaster (figs 8 & 9). It took less than a minute for them to be totally inactivated by sunlight and dead within minutes. Once dead all colour started to fade. Consequently, I was never able to capture them in their characteristic position of raised abdomen and forewings with expanded hind wings fanning out on either side, looking a little like the pectoral or pelvic fins of a flying fish. The relatively very long first legs extended down the edge and beyond the length of the forewings. Paired spines projected from the middle and lower joint of the tibia of the forelegs.

There were some remarkable features apart from the long forelegs and strange hind wings. Many of the scales were feather- or leaf-shaped. Some scales occurred in strikingly iridescent patches, particularly those of the ventral surface of the abdomen. Other scales formed long hair-like projections, some on the flattened tibia others at the wing tips. The eyes were a brilliant scarlet. There were large curved labial palps and the black and white 'striped' antennae had the appearance of barbers' poles.

We are fortunate in having a house copy of *A Guide to Australian Moths* by Paul Zborowski and Ted Edwards. I had met Ted at the Royal Zoological Society's Whitley Awards presentation at the time the book was highly commended. I was delighted to find on p85 a photograph of *Labdia ceraunia*, a cosmopterigid, that I felt sure was 'my' moth or at least its genus. Apart from it fitting all I had observed, the description in both *A Guide to Australian Moths* and *The Insects of Australia* seemed spot on. I contacted Ted, who asked if I could send specimens to him at the CSIRO Canberra.

Fig 8. (left) Dorsal view of the moth showing the scarlet eyes, curved labial palps, hindlegs extended beyond forewing.

Fig 9. (right) Ventral view of the moth showing remnants of the brilliant iridescence that was very striking in the living animal. The long spined hindlegs can be seen extending beyond the length of the wings. The scarlet eyes and curved labial palps are also visible.

Fig 7. The chrysalis exposed in the opened protuberance (upper right) surrounded by the cover from which it was removed.

At this time Noel had also contacted entomologist, Dr Dinah Hales, a colleague and friend who worked with Noel at Macquarie University. She had also been in touch with Ted Edwards.

Ted gave clear instructions on how to get the very delicate moths to Canberra. He suggested carefully placing them in a small vial with a little tissue and freezing them overnight to kill and preserve them with as little damage as possible. They died within an hour in the freezer! This was upsetting because I had hoped to cool some sufficiently to immobilise and photograph them more carefully.

Of the specimens, Ted wrote:

> *It is indeed a Cosmopterigidae and close to* Labdia. *It is* Pyroderces mesoptila *Meyrick, 1897. We have no previous biological knowledge of it.*
>
> *We have very few specimens in the collection and they are all from Qld between Rockhampton and Brisbane; the type specimen came from Brisbane.*

> Pyroderces *larvae as a group are fundamentally detritus feeders; they are found in heads of sorghum, in clusters of palm nuts and so on so their presence in your Agave bulbs probably originated in a mass of old dead tissue surrounding the bulbs. When well established they (the larvae) may go on and cause some damage to live tissue but that is not their main game. One other species is known to attack the inhabited nests of* Polistes *wasps (paper*

wasps) the "carton" of which is after all derived from the surface waxes of plants.

This species, P. mesoptila, *has a curiously expanded mid tibia (expanded by scale tufts) not known in other species and of which the function is unknown. It does confirm a definite identification.*

I continue to observe the remaining nests and dead (and disintegrating) moths. I had hoped that more moths might emerge. It has also been interesting to examine the detached scales. The browns, tans and orange of some scales are still evident, but many of the leaf-shaped scales, although apparently colourless remain highly opalescent or even iridescent. The eyes lost their colour shortly after death and in the remaining specimens are completely black.

It took some 30 years for the *Agave* to reach maturity and develop a flower spike. Other large agaves in the vicinity show no signs of producing a spike. But I will keep looking!

Locality: Linley Point, Lane Cove 2066; First noticed: 7 March 2010, kept over time that moths emerged 22-23 March; Lat long: 33˚49'34.46S 151.09'01.09"

Robyn Stutchbury
17 June 2010

Show & Tell – July Meeting

Gith bought some Hepialid pupal cases of collected under young mallee Eucalypts near Parkes in March. There was a pleasant Eucalypt odour to the pupal cases. They emerged from holes in soil about the size of a 10c coin. Ted says they often emerge in mass after rain.

Fred also showed a photo of a wanderer butterfly caterpillar on milk weed. He also bought some examples of a scale predator *Cryptolaemus montrouzieri*.

Fred Swindley- photos of mating Orb spiders and then some progeny from succeeding generation. He said mating lasted about 1.5 hours before the female killed the male.

Dinah bought a “flyer” from a pest control company showing a photo of aphids underneath the article on termites. Ted commented that PCOs are well trained in chemicals etc these days but know very little about pest biology.

Dinah also talked about finding small aggregations (up to 9) of overwintering scymnin ladybirds containing multiple species. She had worked on possible winter aggregation sites with Jenny Anderson some years back.

Ted bought a citrus gall wasp from La Perouse, a fig longicorn larvae and a lemon with at least 4 arthropod species attacking it including mites and scales.

Barbara bought a jar of small wasps which emerged from the parasitised pupae shown at the last meeting as well a two mounted sawflies from the Terpentine gall shown at the last meeting.

Ku-ring-gai Wildflower Festival

The Society will be participating again in 2010.

It is always an enjoyable day with lots of activities and interested visitors.

Come along for an hour or two on Sunday 29 August 2010, 9am - 4pm

http://www.kmc.nsw.gov.au/www/html/3743-festival-of-wildflowers.asp?intSiteID=1

Bi-monthly Meetings

The Society meets **BI-MONTHLY** unless otherwise advertised. General meetings with a speaker will generally be held only on the "odd numbered" months (March, May, July, September, November) while the Council will meet more frequently. Speakers tentatively scheduled for the coming general meetings are shown below.

This timing allows us to alternate meetings with the Society for Insect Studies (SFIS) which meets at the Australian Museum at 7.30 on the second Tuesday of the "even numbered" months.

Future Events

Date	Speaker	Title
1st September, 2010	Graeme Smith	Cave insects (some experiences from Australian and PNG caves)
3rd November, 2010	TBD	TBD

Venue:
Meeting Room 2
Ermington Community Centre
10 River Road Ermington

Meetings start at 7:30 p.m. (directly following the Council meeting)
Talks run for around 45 minutes, with 10 minutes for questions, followed by a light supper. Guests are most welcome.

Getting there:

By Car: From Victoria Rd turn into Spurway St (head towards Parramatta River). Turn right into Jackson St then left into River Rd. If heading north on Silverwater Rd, turn right into Victoria Rd then proceed as above. If heading south on Silverwater Rd take the Parramatta off ramp, cross Victoria Rd and proceed into River Rd. If you miss the off ramp, turn left into South St, then left into River Rd.

By Bus: Routes 525, 523 and L20 depart from Argyle St near Westfield shopping centre near Parramatta station. Routes 523 and L20 depart from West Ryde station. Get off at the Ermington shops. River Rd passes between the supermarket and the hotel.

SOCIETY POSTAL ADDRESS
C/- ENTOMOLOGY DEPARTMENT
THE AUSTRALIAN MUSEUM
6 COLLEGE STREET
SYDNEY NSW 2000

MEMBERSHIP FEES 2009

ORDINARY MEMBERS	$50
COMPANY ASSOCIATES	$60
STUDENT MEMBERS	$25
CORPORATE MEMBERS	$50

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