ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC

NEWS BULLETIN

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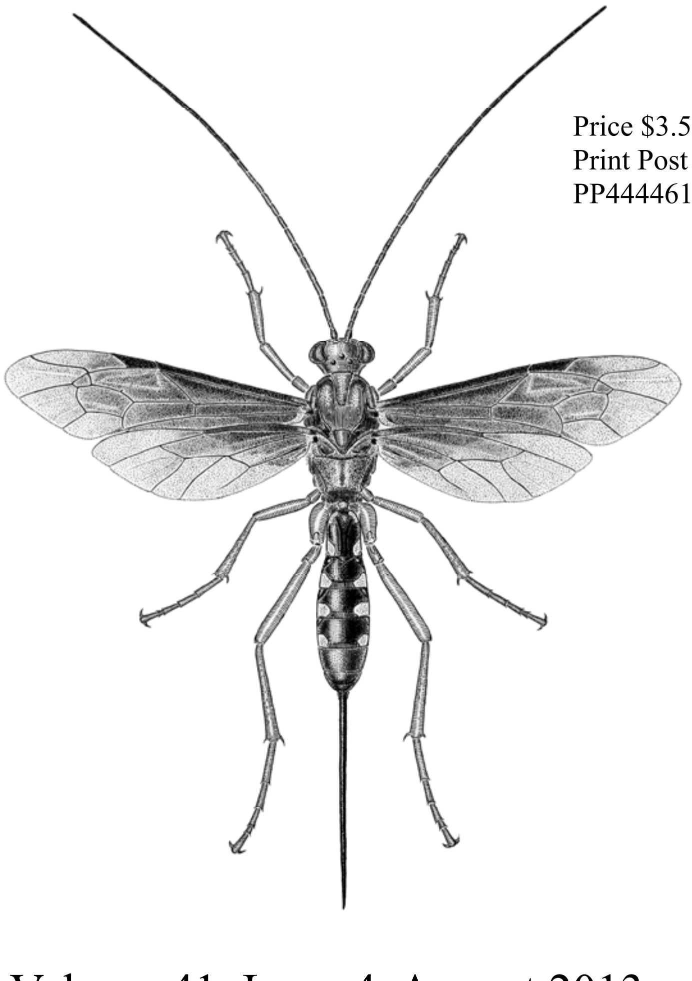

Volume 41, Issue 4, August 2013

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

Front Cover Illustration: Ink illustration by William Manley of a female *Lissopimpla excelsa* (Costa, 1864) (Hymenoptera: Ichneumonidae: Pimplinae), a parasitic wasp (image copyright Qld Department of Agriculture, Fisheries & Forestry).

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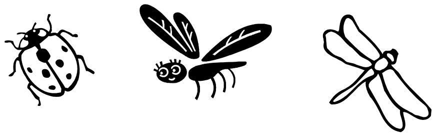


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The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News Bulletin* to members. Meetings are announced in the *News Bulletin*, and are normally held on the second Tuesday of each month (March to June, August to December). Visitors and members are welcome. Membership information can be obtained from the Honorary Secretary, or other office bearers of the Society. Membership is open to anyone interested in Entomology.

Contributions to the *News Bulletin* such as items of news, trip reports, announcements, etc are welcome and should be sent to the News Bulletin Editor.

The Society publishes **THE AUSTRALIAN ENTOMOLOGIST**. This is a refereed, illustrated journal devoted to Entomology in the Australian region, including New Zealand, Papua New Guinea and the islands of the South Western Pacific. The journal is published in four parts annually.

EMBLEM: The Society's emblem, chosen in 1973 on the 50th anniversary of the Society, is the king stag beetle, *Phalacrognathus muelleri* (Macleay), family Lucanidae (Coleoptera). Its magnificent purple and green colouration makes it one of the most attractive beetle species in Australia. It is restricted to the rainforests of northern Queensland.

Minutes of General Meeting

Held in the Seminar Room, Ecosciences Precinct, Boggo Rd, Dutton Park, Tuesday June 11th at 1.00pm.

Chair: Simon Lawson

Attendance: Kathy Ebert, Federica Turco, Geoff Thompson, Alisha Steward, Geoff Monteith, Desley Tree, Kathy Thomson, Penny Mills, Justin Bartlett, Chris Moeseneder, Diana Leemon, Peter James, David Holdom, Mike Barnett, Bill Palmer, Don Sands, Andrew Hayes, Susan House, Alexandra Glauerdt, Lance Maddock, Chris Lambkin, Noel Starick, Gary Cochrane, Brenton Peters

Visitors: Andrew Maynard

Apologies: Lyn Cook, Morris McKee, Bradley Brown, Judy King, Ross Kendall, Susan Wright, Julianne Farrell, Mark Day

Minutes: The minutes of the May Meeting were circulated in News Bulletin Vol. 41 Issue 3, June 2013.
Moved the minutes be accepted as a true record: Simon Lawson, *seconded:* Geoff Thomson, carried: unanimously

Nominations for Membership:
The following nominations for Membership were received and approved by Council, and are put forward for election:

General Membership:
Dr Mike Downes, Townsville, QLD, *nominated by*,Geoff Monteith , *seconded by* Geoff Thompson
Mr Steve Hey, Millaa Millaa, QLD; *nominated by* Barry Moore *seconded by* Geoff Monteith
Carried: Unanimously

General Business

We congratulate Dr. David Rentz, who has received a Member of the Order of Australia (AM) for service to science in the field of entomology.

Main Business

Student Award Presentation:

Andrew Maynard is a recent Honours graduate from The University of Queensland who studied the circadian biology and phylogeography of Australasian bioluminescent fungus gnats (glowworms). He is currently working as a research assistant at The University of Queensland and will commence his PhD in July 2013 where he will study the invasion biology and evolution of the Asian tiger mosquito, *Aedes albopictus*, in Australasia.

President Simon Lawson (on left) presented Andrew with the Society's $500 2013 Student Award prize for his thesis on bioluminescence.

Understanding bioluminescence synchronisation displayed by larvae of *Arachnocampa tasmaniensis*: A behavioural and phylogenetic approach

Andrew Maynard
University of Queensland

Introduction

Collective behaviours such as the formation of shoals, flocks and herds can play a major role in animal survival, facilitating predator evasion, increasing reproduction, enhancing social bonds, and enhancing foraging success (Sumpter 2006). Synchronisation is a collective behaviour in which individuals of a group act in unison by co-ordinating their activity (Sumpter 2006). One of the most visually spectacular examples of synchronisation is the simultaneous flashing by congregations of male fireflies (family Lampyridae) (Buck & Buck 1976). I explored another instance of bioluminescence synchronisation displayed by larvae of the genus *Arachnocampa* (Diptera: Keroplatidae), commonly known as glowworms. There are currently nine described species of *Arachnocampa* found in Australia and New Zealand. Larvae of *Arachnocampa* create webs composed of silk and sticky mucus which ensnares prey attracted to the bluish-green light they produce.

Interestingly, glowworm bioluminescence is under circadian control. If larvae are placed in artificial constant darkness they display daily sine wave-like oscillations in bioluminescence intensity (Merritt & Aotani 2008; Merritt & Clarke 2011). Although a number of external variables can entrain this 'internal clock', light is arguably the most influential in nature. However, different species of glowworm exhibit opposing underlying circadian responses to light exposure. Two species have been the focus of comparative studies of bioluminescence rhythmicity because of their different habitats; *Arachnocampa flava* from south-east Queensland is primarily a rainforest inhabitant, whereas *Arachnocampa tasmaniensis* is found in both caves and wet forest. The total lack of sunlight in the dark zone of caves has meant that the ability of larvae of *A. tasmaniensis* in cave colonies to maintain precise 24 h rhythms has been the subject of investigation.

Larvae of *Arachnocampa flava* display the bioluminescence rhythm expected of a typical nocturnal insect, glowing most brightly at night during the dark phase of its circadian rhythm. This is termed a scotophasic bioluminescence propensity rhythm (BPR). In contrast, the Tasmanian cave-dwelling species, *Arachnocampa tasmaniensis*, exhibits an opposite underlying rhythm to *A. flava.* Larvae of this species show a peak bioluminescence propensity during the light phase of when they are exposed to light:dark (LD) cycles (termed a photophasic BPR) (Merritt *et al.* 2012).

Recent studies have shown that cave colonies of larvae of *A. tasmaniensis* are synchronised and exhibit high-amplitude, daily oscillations of bioluminescence (Merritt & Clarke 2011; Merritt *et al.* 2012). Both cave and laboratory -based experiments on larvae of *A. tasmaniensis* have highlighted that the bioluminescence peak phase of a colony is influenced by light exposure (Merritt & Clarke 2011; Merritt *et al.* 2012). This response to light could explain the mechanism by which larvae of *A. tasmaniensis* synchronise bioluminescence: larvae might synchronise their bioluminescence rhythm by detecting and matching the bioluminescent light cues of others (Merritt & Clarke 2011; Merritt *et al.* 2012). However, to date, the synchronisation of larvae to each other's bioluminescence has not been demonstrated.

Synchronisation Experiments

A major aim of this study was to determine if larvae of *A. tasmaniensis* could synchronise to each other. Larvae of *A. tasmaniensis* were collected from colonies within the dark zone of Mystery Creek Cave, Southern Tasmania, while larvae of *A. flava* were collected from an off-road rainforest gully at Springbrook National Park, Queensland. Both species were transported to the laboratory and kept in incubators with species-specific conditions.

I used controlled laboratory conditions where the dynamics of bioluminescence synchronisation could be observed. This consisted of replicated groups, each with

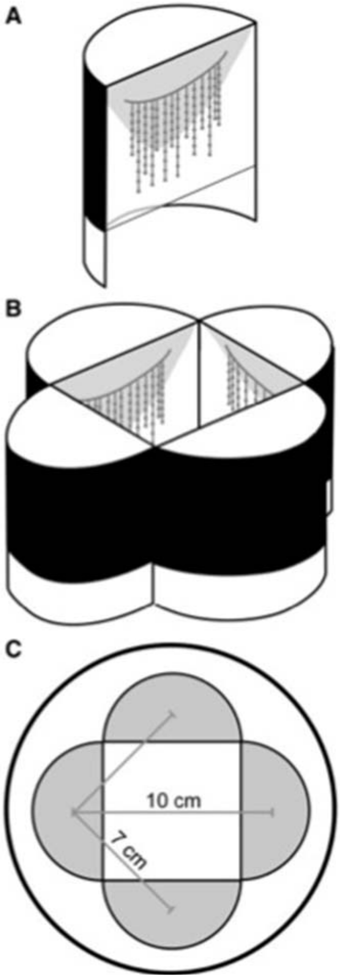

Figure 1 - Arrangement of larvae for synchronisation experiments. (A) Individual larvae were maintained in transparent plastic-fronted containers. (B) Four containers were arranged in a square so that each larva was in line of sight of the others but was separated from them by transparent plastic sheeting. (C) Containers were placed in a transparent aquarium, and groups of four were visually isolated from other groups by placing an opaque tube around each. Light emitted by larvae was imaged from below. (adapted from Maynard & Merritt 2013).

four larvae facing one another. Within each group, three of the larvae were pre-treated to possess a similar bioluminescence periodicity (in-phase) while one displayed an opposing periodicity (out-of-phase), allowing me to explore phase changes in response to larval light cues from within the group (Fig. 1). Synchronisation experiments were conducted for larvae of both *A. tasmaniensis* and *A. flava* individually in constant darkness and at a constant temperature over a number of days. A firewire camera (connected to a computer) was programmed to take a photograph every ten minutes over the duration of experiments in order to record larval bioluminescence. Image sets were analysed using ImageJ to calculate the number and intensity of pixels (light) produced by each bioluminescing larva, from which the average bioluminescence peak time of each larval position was calculated. If peak times between larval positions were significantly different ($P>0.05$) I classed this as not being synchronised. However, if peaks times were similar ($P\leq0.05$) and larvae displayed similar free-running periods (FRP), I classed this as being synchronised.

Results & Discussion

The out-of-phase larvae of *A. tasmaniensis* within groups phase-delayed at a consistent rate over seven days until the average peak time of their bioluminescence rhythm closely matched that of the other larvae within the group (Fig. 2A). The bioluminescence peak times of a visually-isolated control larva from the same initial LD treatment as the out-of-phase larvae, displayed a consistent >24 FRP over the duration of the experiment (Fig. 2A). This difference indicates that the out-of-phase larvae within groups were reacting and altering the phase of their bioluminescence rhythm in response to the light cues of the surrounding larvae. After the point of synchronisation when the average peak times of all larvae had closely converged, all larvae within groups displayed a consistent >24 h FRP and the average bioluminescence peak time of larvae at each of the four positions

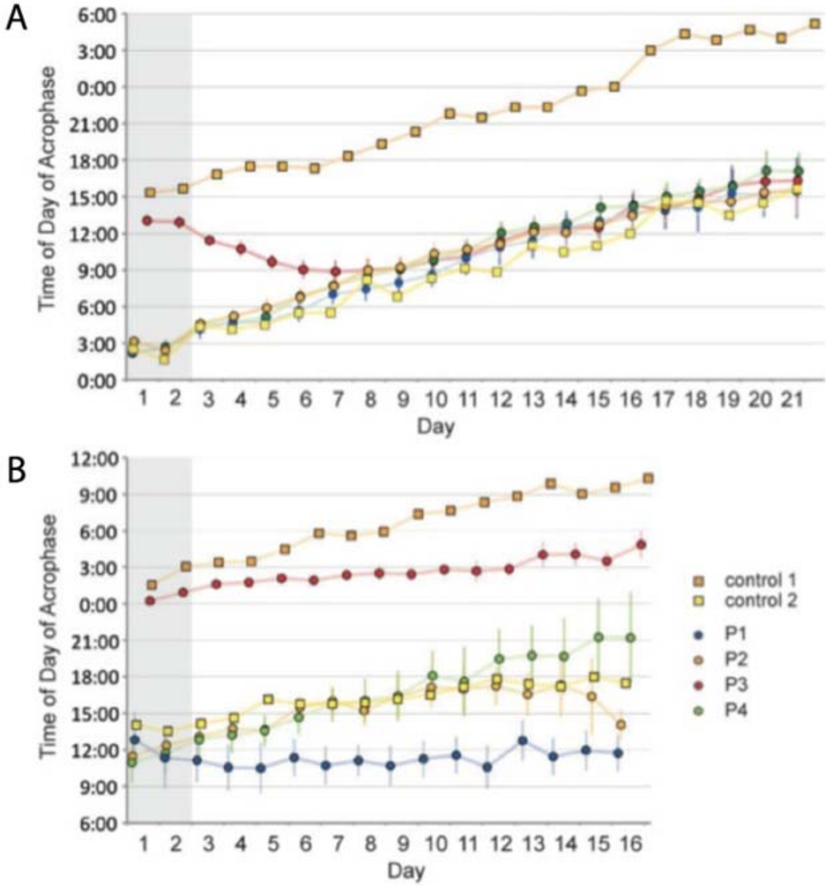

Figure 2—Time-course of synchronisation of bioluminescence in *Arachnocampa tasmaniensis* (A) and *A. flava* (B). The time of day of the acrophase of the bioluminescence cycle was calculated and plotted over 21 and 16 days, respectively. For days 1 and 2 in both treatments (grey box), all larvae were visually isolated from one another to confirm their pre-set rhythm. Subsequently, one larva of one phase (out-of-phase) was exposed to three larvae (in-phase) of another phase in seven replicates. Each point represents the mean and standard error of the time of acrophase of larvae at positions 1–4 (P1–P4) with larva P3 being the single larva initially on a different phase to the other three (P1, P2, and P4). The time of day of the acrophase of the single control larvae are represented by the square symbols. Control-1 larvae were from the out-of-phase treatment while control-2 larvae were from the in-phase treatment. (adapted from Maynard & Merritt 2013).

within each group did not vary significantly, confirming the maintenance of the group synchronisation (Fig. 2A). Thus synchronisation is achieved through the underlying photophasic BPR of larvae of *A. tasmaniensis*. Light from other larvae has caused the subjects to change phase so that their acrophase (bioluminescence peak) closely matches the source acrophase (i.e. the bioluminescence peak of surrounding larvae). In contrast, larvae of *A. flava* showed no sign of bioluminescence synchronisation within groups when tested in the same arrangement as *A. tasmaniensis*. The in-phase larvae maintained consistent >24 h periodicity over the experimental time frame (Fig. 2B). Similarly, out-of-phase larvae continued to show the same periodicity throughout the experimental period and did not exhibit any clear phase-delaying response that larvae of *A. tasmaniensis* showed while synchronising (Fig. 2B). Unlike *A. tasmaniensis*, the average bioluminescence peak times of out-of-phase larvae compared to the control larva from the same initial treatment was similar across days; although over time, these start to diverge due to slightly different FRP (Fig. 2B). Likewise, the average bioluminescence rhythm of the in-phase larvae and their respective LD treatment control showed similar and consistent rhythms over time. I conclude that larvae of *A. flava* do not synchronise their bioluminescence rhythms to match those of neighbouring larvae, which can be attributed to their underlying scotophasic BPR.

This is the first demonstration that larvae of *A. tasmaniensis* synchronise their bioluminescence rhythms through the detection and matching of surrounding larval light cues. The divergent responses of larvae of the two closely related species raises questions as to why they evolved opposing underlying BPRs and what adaptive advantages it may provide for each species. I propose these differences in the circadian systems between species are probably related to major differences in their ecology; *A. tasmaniensis* is strongly associated with both cave and rainforest habitats while *A. flava* lives exclusively in rainforest environments. Presumably, the ability for cave colonies to synchronise would increase group foraging efficiency, whereby the collective light output of a synchronised colony would appear more attractive to phototactic prey than a less synchronous one. This would cause colony-wide increased prey capture rates and might provide a period for metabolic substrates (used for bioluminescence) to replenish during the trough of a colony's bioluminescence rhythm (Willis *et al.* 2011). Future work should concentrate on exploring the circadian system and synchronisation capabilities of the other species of *Arachnocampa*.

Acknowledgements

I wish to thank my supervisors David Merritt and Lyn Cook for their support throughout the project. In addition, I would like to thank Penny Mills, Arthur Clarke, Travis Cross and Claire Baker.

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Notes and Exhibits

Results of Coolola Monster trapping last summer

Geoff Monteith
Queensland Museum

At the Notes and Exhibits meeting in June last year I exhibited a specimen of an apparently new species of the strange subterranean orthopteran genus, *Cooloola*, which had been taken by Christine Lambkin and Noel Starick in pitfall traps they operated in sandy soil at the Mt Moffatt Section of Carnarvon NP (Monteith 2013). This area is more than 500 km inland from the coast and represented a considerable western extension of the range of these highly modified insects which were dubbed "Cooloola Monsters" by David Rentz when he first described them thirty years ago (Rentz 1980). We know of another probably new species from unusual, deep, powdery red soils on the Gurgeeena Tableland which lies between Gayndah and Mundubbera, about half way between Mt Moffatt and the coast. This one is known from just two nymphs taken there about ten years ago by myself and Chris Burwell.

There is current interest in the status and relationships of the family Cooloolidae with molecular and morphological phylogeny studies underway by David Weissman in California, Dave Rentz here in Australia and Amy Vandergast, a DNA specialist at San Diego. David Weissman is an authority on the North American "Jerusalem Crickets", *Stenoplematus spp*., which, like *Cooloola spp*, are also largely subterranean with seasonally wandering males, but are placed in a different family, the Stenopelmatidae. This seemed a fine reason to try to round up fresh material of the two apparent new *Cooloola* species mentioned above and we did a lot of trapping last summer that I will briefly report on here.

When we were trying to collect *Cooloola spp* back in the 1980s, at the time they were first discovered, we found the only way to reliably get them was to target the wandering males using traps we invented then and called "gutter traps". These consisted of a 2-3m length of metal roof guttering sunk into the ground flush with the surface. At one end a large aperture in the floor led to short downpipe into a bucket of preservative glycol buried in the sand beneath the trap. By ensuring the gutter sloped away from the aperture end, rain was diverted to gauzed drain holes at the other end and did not flood the bucket. These traps could be set at the beginning of summer and then serviced every month or two. Whenever rains triggered wandering males to come to the surface the traps were waiting to ambush them.

For last summer's campaign I built a set of 15 gutter traps on a slightly smaller scale and used 90mm PVC drainpipe as the material. The top was sliced off the cylinder to turn the tube into a gutter and a right angle bend was attached at one end leading into a small buried bucket of glycol (Figs 1 and 2). Christine, Noel and Susan Wright took 9 of the traps out to Mt Moffatt in September 2012. Six were installed at different sites with the help of National Park staff Greg Keith and Peter Mowatt. They also had the opportunity to visit Carnarvon Station, about 30km west of Mt Moffatt, and they installed 3 traps there. Carnarvon Station is now a private conservation reserve run by Bush Heritage and they were helped by the local manager Chris Wilson. I took six traps up to Gurgeena in October and installed a pair at each of three sites, two being in dense eucalypt forest and the third in a patch of rainforest.

All the traps remained in place through the summer until the end of January 2013. The Mt Moffatt and Carnarvon Station ones were serviced from time to time by the local

Figure 1 - A gutter trap being installed at Gurgeena Tableland. Note the dark red soil.

Figure 2 - A gutter trap fully installed at Mt Moffatt. Note the pale sandy soil which is usual for Cooloola Monster sites.

Figure 3 - Excitement at finding the first adult male of the Gurgeena species. From L to R: Alberto Venchi, Federica Turco, Alison Jarrett and Adrienne Naismith.

Figure 4 - A newly caught specimen of the new *Cooloola* species from Gurgeena Tableland. Note its long legs and unusual dark colour. Other species are pale yellow-brown as is usual for subterranean insects.

staff mentioned above and we are very grateful for their help. I commuted up to Gayndah every few weeks to check the Gurgeena traps, on one occasion accompanied by Federica Turco and Alberto Venchi (Fig 3), and I went out to Moffatt and Carnarvon in late January to recover the samples from those traps.

The good news is that a total of 13 adult male *Cooloola* were taken in the traps during this summer period. These included 8 from Mt Moffatt, 3 from Carnarvon Station and two from Gurgeena. Four of the six traps at Mt Moffatt yielded monsters so they are obviously widespread on the deep sandy plains there. All l3 specimens are currently with David Rentz in Kuranda for taxonomic study. The midlegs of 9 specimens were removed for DNA extraction and have been sent to Amy Vandergast in San Diego (California, US) for possible sequencing and this will be in collaboration with David Weissman in San Francisco. There are clearly two new species involved. The Gurgeena species is very distinctive with large wing remnants, slender legs, narrow digging spurs and very long tarsi (Fig 4). It is the only species which is substantially dark in colour (at least in males) and this is presumably correlated with the dark soil where it is found and would give surface-moving males some camouflage protection. There may be some differentiation between the populations of the other species at Carnarvon and Mt Moffatt, the Carnarvon specimens having very small wing vestiges. It will be interesting to see what the DNA reveals.

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Paracalais macleayi (Candèze, 1857), QM

Another one bites (in) the dust! A brief account on an outstanding beetle larva found in the Gurgeena Plateau, Queensland

Dr. Federica Turco, Queensland Museum

In January 2013 I had the opportunity to join Dr Geoff Monteith (QM) in his quest for the Cooloola Monster population (Orthoptera, Cooloolidae) in the Gurgeena Plateau (see Geoff's contribution to this number of the News Bulletin).

Aerial photograph of the Gurgeena Plateau, Queensland.

Gurgeena Plateau is located in SE Queensland at about 18 km NNE of Mundubbera and about 29 km NW of Gayndah. It is occupied in large part by agricultural land and for the rest by a State Forest, which includes open *Eucalyptus* forests and vine scrubs.

It was in these forested areas that we focused our attention looking for the "monstrous crickets"; that is where Geoff had put his special pitfall traps. These were targeting males wandering in the forest in their own quest for large females (patiently waiting in their burrows) and instead falling into treacherous entomological traps!

Servicing Geoff's traps was not the only activity that kept us busy. We were also trying to find some of those burrowing females. This was done by simply digging the ground randomly and hoping to be lucky! That's how it needs to be done because there is no obvious sign of the female burrow on the surface. So, all you can do is to start digging and then stop, only to start again in a different spot! Entertaining endeavour indeed and we dug several times in an incredibly dusty and fine soil. Unfortunately we had no luck and no female Cooloola Monsters were secured for science that day but something else emerged from the ground. Something somehow unexpected… two biting jaws! Two rather large jaws indeed and the rest of the animal was not less outstanding. The creature was (and still is) a very large larva of an interesting Click Beetle of the genus *Paracalais* (Coleoptera, Elateridae).

Paracalais beetles belong to the subfamily Agrypninae and are also known as Mottled Predatory Click Beetles. The name obviously refers to the pattern of whitish, dense and scale-like setae that decorates the body of these beetles as well as to its feeding habits.

Paracalais sp., Gurgeena larva

Elaterid larvae are in fact generally omnivorous feeding on other invertebrates as well as on various organic and decaying matter. The most commonly known elaterid larvae are called ‘wireworms’ for their tough integument; they are relatively small and feed on plant roots, particularly in grasslands. Conversely, *Paracalais* larvae are strictly predatory and are known to live in decaying wood where they prey on other beetle larvae, such as longicorns and weevils (Froggart, 1925; Calder, 1996). The microhabitat usually inhabited by these larvae leads to another peculiar aspect of this finding in Gurgeena. The larva was in fact sitting a few centimetres deep in the ground, probably crawling around looking for prey, and it was not associated with any decaying wood.

Moreover, the time itself of this finding is also quite interesting. According to available literature in fact, *Paracalais* larvae cease feeding in November and by late December oval pupal chambers are constructed with the adults emerging between mid January and early March (Froggatt, 1925; 1926; Calder, 1996). In our case normal developmental times might have been disrupted and the larval development delayed by the very low rain levels registered between the end of 2012 and the beginning of 2013.

The genus *Paracalais* (Neboiss, 1967) is distributed in Australia (except Tasmania), Norfolk Island and New Guinea. In Australia it currently comprises 19 species (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/Paracalais/checklist), of which 12 occur in Queensland (Calder, 1996). After comparison with material held at QM the most probable species, according to known distribution and habitat preference, are among those with the largest body size in the group, e.g. *P. gibboni*

(Newman, 1857) and *P. macleayi* (Candèze, 1857).

I'm still rearing the larva from Gurgeena, which is comfortably sitting under 6-7 cm of soil and is now 1.2 cm thick and 8.5 cm long (at maximum extension)! I'm hoping to get to the adult stage and have a chance to confidently identify this specimen. Its occurrence in a microhabitat that does not fit with what is known for other *Paracalais* species might indicate a possible new species from Gurgeena or maybe just a population peculiarity. In any case, this was an interesting finding and this specimen will most probably be the largest in QM collection!

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BiCEP: A global alliance for the biological control of eucalypt pests

Dr Simon Lawson, Queensland Department of Agriculture, Fisheries and Forestry

Australian-origin insect pests threaten the productivity and sustainability of eucalypt plantations worldwide. New pests such as the bronze bug (*Thaumastocoris peregrinus*), two gall wasps (*Leptocybe invasa* and *Ophelimus maskelli*) and the lerp psyllid (*Glycaspis brimblecombei*) have emerged as key global pests, while longer established pests such as the eucalyptus snout beetle (*Gonipterus* species complex) are re-emerging as significant issues. The speed at which these new pests have emerged, invaded and spread globally has been taxing industry's ability to manage them effectively using resistant germplasm and insecticides. To address these problems, the University of the Sunshine Coast is establishing the Biological Control of Eucalypt Pest Research Alliance (BiCEP) to provide a focus for developing effective biological control solutions for key eucalypt pests. BiCEP will be funded by the global eucalypt plantation industry and will deliver the R&D required to underpin effective biological control of pests in three identified categories of need:

Discovery: pests that do not have known effective biocontrol agents. Application: pests with known but not yet established or evaluated biocontrol agents. Fine-tuning: pests that have established biocontrol agents but which require better climate/host matching.

Membership of BiCEP is being sought from a broad base of countries that have industrial scale eucalypt plantation estates. BiCEP will begin in 2013/14 by establishing a core partnership based on collaborators in Australia, Brazil and South Africa, with a strategic intent to expand to include other countries in South America (e.g. Chile), Asia (e.g. China), and Europe (e.g. Portugal) and elsewhere. The project will run for an initial three-year period.

Fruit Flies of Australia Poster

Richard Piper, Scientific Advisory Services in Tully

Following the successful eradication of papaya fruit fly, ***Bactrocera papayae*** from northern Australia in 1998 and the more recent discovery of a lure for ***Bactrocera jarvisi*** it was decided to reprint the poster "Fruit Flies of Australia". That poster had been produced in 1996 following the incursion of ***B. papayae*** and has been obtained by a range of clients including primary producers, government agencies, universities, schools and home gardeners.

The recent removal of several insecticides used for fruit fly control including fenthion and dimethoate, has meant that the monitoring and identification of fruit flies is even more important in production of fruit fly-free produce. The new poster will assist growers and pest monitors to identify flies caught in traps and to understand the life cycle of this group of insects.

The new poster includes high quality images of seven pest fruit flies found in Australia along with four species not found here and of quarantine significance. All photographs are of live adults and show the relevant wing and body colours to enable specific identification. These exotic species are ***Bactrocera cucurbitae*** (melon fly), ***Bactrocera dorsalis*** (Oriental fruit fly), ***Bactrocera zonata*** (peach fruit fly) and ***Bactrocera latifrons*** (Malaysian fruit fly).

The new poster is titled "Fruit Fly Pests of Australia 1" and forms a set with another poster "Fruit Flies of Australia 2", which includes photographs of a further 8 species including 3 minor pest species, 5 commonly trapped non-pest species and 3 exotic pest species.

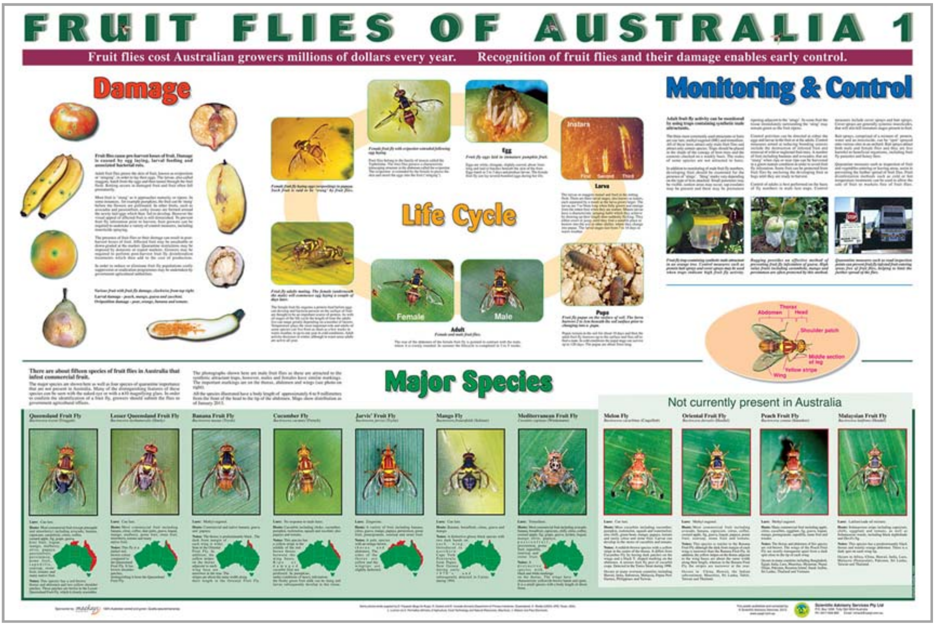
Richard Piper, from Scientific Advisory Services in Tully has produced the new poster and further details about it can be obtained by contacting Richard on 0417 644 660 or by email: richard@saspl.com.au The posters shown at the meeting were donated to the University of Queensland for teaching purposes.

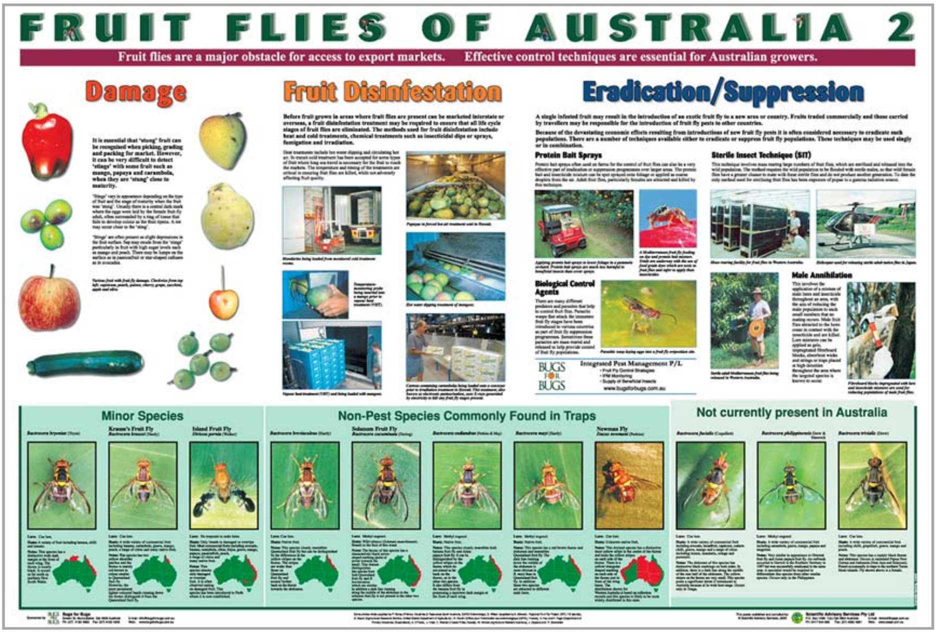
Vote of thanks: Bradley Brown

Any other business:

There is no meeting in July. The next meeting will be on Tuesday August 13, and the speaker will be Dr Doland Nichols speaking on Bell Minor associated dieback of eucalypt forest.

Meeting closed: 1:52pm


FRUIT FLIES OF AUSTRALIA 1
Fruit flies cost Australian growers millions of dollars every year. Recognition of fruit flies and their damage enables early control.
Damage
Life Cycle
Monitoring & Control
Egg
Larva
Pupa
Adult
Female
Male
Major Species
Not currently present in Australia
Thorax
Head
Abdomen
Shoulder patch
Wing
Yellow stripe
Middle section of leg


FRUIT FLIES OF AUSTRALIA 2
Fruit flies are a major obstacle for access to export markets. Effective control techniques are essential for Australian growers.
Damage
Fruit Disinfestation
Eradication/Suppression
Protein Bait Sprays
Sterile Insect Technique (SIT)
Biological Control Agents
Male Annihilation
Integrated Pest Management P/L
BUGS FOR BUGS
Minor Species
Non-Pest Species Commonly Found in Traps
Not currently present in Australia

Order of Australia to David Rentz

Congratulation to our long term member, Dr David Rentz, who became a newly-minted Member of the General Division of the Order of Australia on the Queen's Birthday in June this year. This equips him to use the letters AM after his name and the award states that it was given for "significant service to science, particularly entomology"

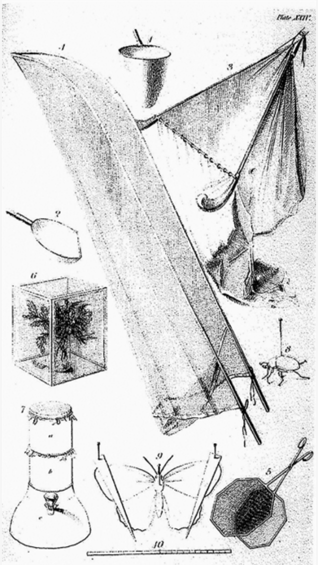
Dave was originally from California, trained at UC (Berkeley), and after stints at both Philadelphia and California Academies of Science, took up the Curatorship of Orthoptera at the Australian National Insect Collection at CSIRO Canberra in 1979, filling comfortably the big shoes vacated by Ken Key in that position. Whereas Ken had been preoccupied with the 'short horn' section of the Orthoptera, especially the Eumastacidae and Pyrgomorphidae, Dave's interests lay with the "long horns". After a short diversion with erecting a new family for the enigmatic subterranean Cooloola Monster which appeared on his plate soon after arriving in Australia, Dave set out on a career-long study of Australia's diverse fauna of katydids (Tettigoniidae) and has produced many monographic studies, including several hard-cover book-sized works, on this fascinating family. Ever interested in the biology of the living animals, Dave has done extensive field work all over Australia and his taxonomic work is always laced with observations on the living animals. Orthoptera are highly acoustic animals and Dave has done much towards recording and analysing their songs. The big-bodied Orthoptera are notoriously difficult to preserve in good condition, with colours often distorted and destroyed by internal decay. Dave is famous for his meticulous preparation of specimens before pinning, always cleaning abdomens and dusting with preservative to give excellent colour preservation.

Besides narrower studies on alpha systematics, Dave has produced many major overview works including Chapters on several Orders in "Insects of Australia", hard cover books on the Australian Orthoptera (Grasshopper Country) and the Acridoidea, as well as a field guide to the katydids. His field guide to the Australian cockroaches is currently with the publishers.

Always a great populariser of entomology, Dave has always been an engaging lecturer and an adept user of the media to promote our science. His irreverance for stodginess came through last year when he received (jointly with Darryl Gwynne) the hilarious IGNobel Award from Harvard University for their study on an Australian jewel beetle which mistakenly mates with discarded stubby beer bottles in Western Australia. Dave has wide interests in orchid growing, aquarium fish and for many years has presented a radio show drawing on his extensive collection of traditional jazz. In retirement he lives in the rainforest at Kuranda where the entomology work goes on in a well-equipped downstairs room surrounded by glass windows through which the promenading cassowaries peer.

For our portrait of **David Rentz AM** we've chosen one of him doing what he likes doing best - beating around the bush with a bunch of other entomologists. It was taken at Daintree, last December.

Dave Rentz and fellow Kuranda retiree, Max Moulds, visited the combined Queensland Museum and ANIC beetle-fest which spent 10 days chasing Coleoptera in the local rainforests. The happy looking folk are (L to R): Alberto Venchi, Federica Turco, Sara Pinzon-Navarro, Tom Weir, Dave Rentz, Max Moulds, Adam Slipinski, Geoff Monteith, Hermes Escalona.



The Museum and Art Gallery of the Northern Territory (MAGNT) is seeking examples of Victorian-era (~1850 to 1900) entomological field kit, including insect net/traps, collecting boxes, pins, forceps, scissors, scalpels, pliers, and a lamp (for attracting moths). The items would be used to support an exhibition on Alfred Russel Wallace, 'Wallace: The Evolutionary Man' to be staged at MAGNT, Darwin from 8 Novmber 2013 to 30 June 2014.

If you can assist please contact the exhibition co-ordinator, Chris Glasby, Senior Curator Annelida, MAGNT,chris.glasby@nt.gov.au.

Left: from Kirby, W. & Spencer, W. (1826). An Introduction to Entomology.

Matt Krosch

has moved upriver from QUT to take up a 3-year postdoctoral fellowship with the Centre for Water in the Minerals Industry. Matt successfully applied to UQ's centrally run round of postdoctoral fellowships and his proposed research will draw on his experience in chironomid systematics to answer questions about the evolution of pollution tolerance in the genus *Cricotopus*. This research is anticipated to have many applied outcomes in the fields of aquatic biomonitoring and environmental management.

Jack, Stephen and Andrew (left to right) in the foreground hanging fruit fly traps

Jack Hasenpusch

Australian Insect Farm, Innisfail

Stephen Gaimari and Andrew Cline from the Department of Food and Agriculture in California dropped by here at the Insect Farm for a few days collecting during their three week survey from Daintree to Innisfail focusing on fruit flies. They were collecting voucher specimens to support diagnostics and research related to Californian agriculture. Both are interested in biodiversity studies worldwide dealing with acalyptrate flies and cucujoid beetles. They were keen to see some Australian insects. Conditions were very wet and drizzly most of the time but the guys didn't seem to notice the rain as the hunt was on even though they were constantly wet. A number of fruit flies were trapped and beetles collected during their visit.

Andrew Cline preparing trap samples

Bottom left: Stephen Gaimari after flies.
Top right: One of Andrew's beetle traps baited with beer and rotten bananas was irresistible to the giant white tailed bush rat.

A buprestid killing ornamental *Metrosideros* in Brisbane

Geoff Monteith, Queensland Museum

The attractive myrtaceous plant, *Metrosideros excelsa,* has soft grey-green foliage and large red flowers, and has become a popular garden plant in Australia. In Brisbane it is commonly used by developers in laying down new gardens in newly developed suburbs. It is native to New Zealand where its common name is its original Maori name, Pohutukawa. In Australia it goes under the name of "New Zealand Christmas Bush".

In some areas of Brisbane, e.g. Banyo, the plants are dying in numbers due to beetle attack and some gardening websites refer to this as being due to a "weevil". Examination of affected plants at my son's house at Banyo revealed flattened larval burrows beneath shedding bark of dead stems that were typical of jewel beetle (Buprestidae) attack.

About 20 billets of stem from recently killed plants were placed in emergence containers in late September, 2012. Soon after, a small chunky, yellowish jewel beetle began to emerge and 90 specimens appeared between October 3 and October 18, after which emergence ceased. The species was determined as *Nascio simillima* Van der Poll 1886, one of only two species in the genus *Nascio*. This species is comparatively uncommon in Brisbane with a total of about 20 specimens being present in the Queensland Museum and DAFF collections combined.

A compilation of Australian buprestid host plant records has just been published (Bellamy *et al* 2013). All breeding records for species of *Nascio* are from trees in the Mytaceae. The other species, *Nascio vetusta* (Boisdval 1835) had been recorded from *Eucalyptus*, *Corymbia* and *Metrosideros* but the single previous larval record for *Nascio simillima* is from the ironbark eucalypt *Eucalyptus drepanophylla.*

Reference

Bellamy, C. L., Williams, G. A., Hasenpusch, J. & Sundholm, A. 2013. A summary of the published data on host plants and morphology of immature stages of Australian jewel beetles (Coleoptera: Buprestidae), with additional new records. *Insecta Mundi,* 0293, 1-172.

Tapinoschema digglesii (Janson, 1874)

Synanthropy in the flower chafer *Tapinoschema digglesii* (Janson, 1874)

Chris Moeseneder CSIRO CMAR

Many of the Australian flower chafers are not uncommon beetles. Some species, however, have been caught rarely but then in large numbers. This is the case with the up to 3 cm long, metallic blue and orange coloured *Tapinoschema digglesii*, which has been collected infrequently in its range in Southeast Queensland but then by the dozen. Geoff Monteith of the Queensland Museum mentioned that he observed the species in large numbers on few occasions.

In December 2012, Richard Zietek and I passed through the small town of Taroom to remove flight intercept traps in the surrounding area. I must credit Richard with being the first to find a live specimen—at a petrol station. Within the next hour we had collected several male specimens which seemed to be attracted to large, bright surfaces of buildings (a behaviour also observed from other cetonines). As the specimens in flight diminished towards noon, we found a hilltop residential property where males still flew and, following their general direction, we arrived at a patch covered with straw, garden cuttings and horse manure. The males circled this area constantly and disappeared into it and the surrounding area at times.

Cover of straw, garden cuttings and horse manure in a residential garden in Taroom.

Suspected larva of *Tapinoschema digglesii*

Digging on this occasion and in July 2013 produced several larvae which tunnelled in the soil immediately under the covering. I suspect them to be *T. digglesii*. A link to human habitation seems to exist since collection data and collectors consistently refer to the species having been collected in or near towns. I would appreciate any information which readers may have on this species (chris.moeseneder@csiro.au).

The Australian Entomologist

A quarterly, illustrated magazine of original research on insects of Australia and the south-west Pacific

An Invitation to subscribe

Commenced in Sydney by Max Moulds in 1974, the magazine is now published in Brisbane by the Entomological Society of Queensland and is recognised as one of the leading outlets for quality, refereed research on native insects in Australia. In particular, it publishes much of the new information on Australian butterflies with more than 200 papers since inception. Attractively presented on quality paper, it carries much colour work, while the cover features illustrations by Australia's top insect artists. Annual subscription for individuals is $33 in Australia, $40 in Asia/Pacfic and $45 elsewhere. To subscribe send name and address with cheque/money order (payable to *Australian Entomologist)*, to Business Manager, Box 537, Indooroopilly. Qld. 4068. To pay by credit card, send email request to *geoff.monteith@bigpond.com* and an email invoice will be sent to you, or use the subscription form at http://esq.org.au/entomologist.html Ask for a free inspection

Upcoming conferences and events

4-8 August 2013

Lamington National Park, Queensland
6th International Symposium on the Biology and Ecology of Gall inducing Arthropods and related Endophytes
http://6isbegia.org/

14-17 August 2013

State College, Pennsylvania
2nd International Conference on Pollinator Biology, Health and Policy
http://www.cvent.com/events/international-conference-on-pollinator-biology-health-and-policy/event-summary-7cf0d2799c954107b8c6bf3641778902.aspx

2-5 September 2013

Sofia, Bulgaria
XIII International Symposium on Scale Insect Studies
http://issis-bg.com/

29 September – 2 October 2013

Adelaide, South Australia
Australian Entomological Society 44th AGM and Scientific Conference
Theme: Invertebrates in Extreme Environments
http://www.aes2013.org/

8-12 November 2013

Kuching, Malaysia
2nd Global Conference on Entomology
http://www.gce2013.com/

10-13 November

Austin, Texas
Entomology 2013
(Entomology Society of America)
http://www.entsoc.org/entomology2013

NOTICE OF NEXT MEETING

Tuesday 13th August 2013, 1pm

Dr. Doland
Bell Minor associated dieback of eucalypt forests

Assoc Prof J. Doland Nichols began working in forestry in silviculture with the United States Forest Service in the Douglas fir region of western Oregon. Dr. Doland became interested in tropical forestry and spent six years in Costa Rica working as a forestry researcher, lecturer, and forestry extensionist, including projects for the Organization for Tropical Studies (USA). His Master's research at Purdue University, USA, was done on the ecology and silviculture of *Terminalia amazonia* in Costa Rica, where he still has on-going projects. His PhD research involved studies on the tropical tree *Milicia excelsa* at the Forestry Research Institute of Ghana (FORIG) West Africa. He served as Forestry project leader and lecturer on the Pacific island of American Samoa. Since coming to SCU in late 1998, Dr. Doland has worked with mixed subtropical rainforest in natural and planted stands, on various forest health issues, including psyllids in plantations of Eucalyptus dunnii, and on bell-miner associated dieback, in native eucalypt forest silviculture, and on pruning and thinning regimes in eucalypt plantations.

Seminar Room 1
Ground Floor, Ecosciences Precinct
Boggo Road, DUTTON PARK

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DIARY DATES 2013

Nine general meetings held per year on the 2nd Tuesday of the respective month

MAR—Tuesday 12th	Geoff Thompson	AGM and President's Address
APR—Tuesday 9th	Michael Ramsden	*Sirex* wood wasps in Queensland
MAY—Tuesday 14th	Dr Mike Furlong	Plant responses to herbivory: complex interactions between parasitoids, predators and prey
JUN—Tuesday 11th	Notes & Exhibits / Student Award Presentation	
AUG—Tuesday 13th	Dr. Doland Nichols	Bell Minor associated dieback of eucalypt forests
SEP—Tuesday 10th	Dr. Ken Walker	Perkins Memorial Lecture "Advancing Australian Biosecurity and Biodiversity through the web"
OCT—Tuesday 8th		
NOV—Tuesday 12th	Prof. Helen Wallace	Promiscuous plants and strange bee behaviour: reproduction in Australian plants
DEC—Tuesday 10th	Notes & Exhibits and Xmas BBQ	

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THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

NOTICE OF NEXT MEETING

Tuesday 13th August 2013, 1pm

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Dr. Doland Nichols

Bell Minor associated dieback of eucalpt forests

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Seminar Room 1
Ground Floor, Ecosciences Precinct
Boggo Road, DUTTON PARK

More venue details available at
http://www.esq.org.au/meetings.html

ALL WELCOME

NEXT NEWS BULLETIN

Volume 41, Issue 5 (September 2013)

CONTRIBUTIONS WELCOME

DEADLINE - Wednesday August 21st, 2013
Send your news/stories/notices to the editor
(chris.moeseneder@csiro.au)