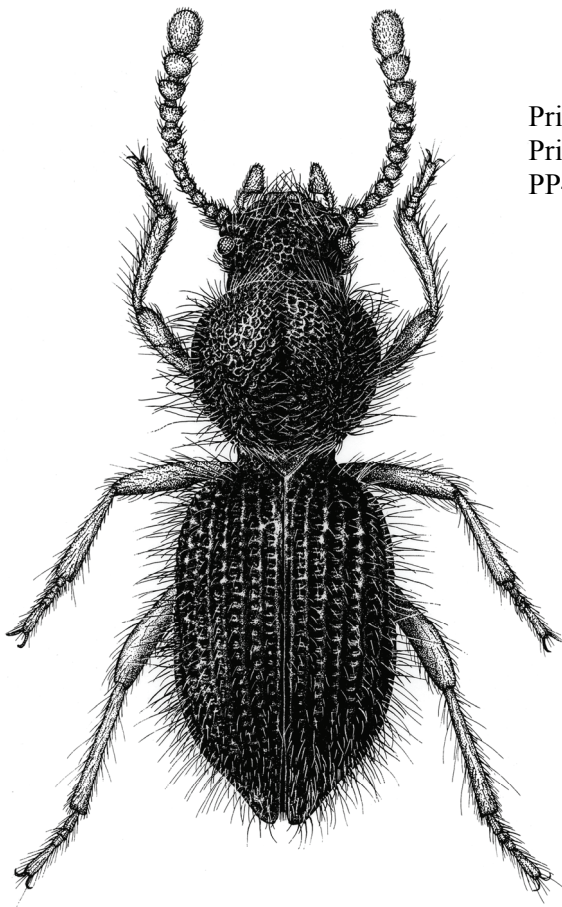
ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC

NEWS BULLETIN



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THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

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Front Cover Illustration: *Apocryphodes thompsoni* Matthews, 1998 (Tenebrionidae; Adeliini). This specimen is a paratype illustrated by Geoff Thompson for the original description; collected from leaf litter in 1984 on one of Geoff Monteith's North Queensland field trips by Val Davies, Geoff Thompson and Julie Gallon, at Gayundah Creek on Hinchinbrook Island.

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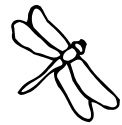


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The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists 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 Monday of each month (March to June, August to December), or on Tuesday if Monday is a public holiday. 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.

The issue of this document does **NOT** constitute a formal publication for the purposes of the "International Code of Zoological Nomenclature 4th edition, 1999". Authors alone are responsible for the views expressed.

Minutes of General Meeting

Held in the Seminar Room, Ecosciences Precinct, Boggo Rd, Dutton Park, Tuesday August 14 2012 at 1.00pm.

Chair: Geoff Thompson,

Attendance: Justin Bartlett, Bradley Brown, Lyn Cook, Sarah Corcoran, Kathy Ebert, Alexandra Glauerdt, Andrew Hayes, Tim Heard, David Holdom, Judy King, Chris Lambkin, Simon Lawson, Lance Maddock, Doug McCarron, Rachel McFadyen, Penny Mills, Chris Moeseneder, Geoff Monteith, John Moss, Mike Muller, Bill Palmer, Brenton Peters, Vanessa Ryan, Don Sands, Greg Stepen(?), Martin Shivas, Noel Starick, Robert Teakle, Geoff Thompson.

Visitors: Dean Beasley, Nils Collinet, Lynne Griffin, Paige Galvin, Christine Horlock, Susan House, Ian Myles, Michael Onn, Darren Peck, Ross Wylie.

Apologies: Gary Fitt, Graham Forbes, Ross Kendall, Morris McKee, Federica Turco, Matthew Purcell Morris McKee, Helen Schwencke, Alisha Steward, Desley Tree.

Minutes: The minutes of the last General Meeting were circulated in News Bulletin Vol. 40, Issue 4, June-July 2012.
Moved that the minutes be accepted as a true record: Christine Lambkin.
Seconded: Bradley Brown.
Carried unanimously.

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

General Membership:
Mrs Julianne Farrell, Toowoomba. Nominated G.Monteith, Seconded B.Cantrell.
Dr Monty Wood, Canadian National Collection of Insects, Agriculture Canada, Ottawa, Nominated Jeff Skevington, seconded Judy King
Mrs Karyn Cooper-Smith, Innisfail, Qld. Nominated G. Monteith, seconded Federica Turco.
Mr Mike Halsey, Yackandandah, Victoria. Nominated by D. Hilton, seconded by A. Kallies.
Dr Jaime (James) G. Mayoral, School of Biological Sciences, University of Queensland, Nominated by Owen Seeman, seconded by Judy King.
Mr Tony Robinson, DAFF Biosecurity, Eagle Farm. Nominated Bill Crowe, seconded Darren Peck.
The nominees were elected unanimously.

General Business:
1. The Behind the Scenes Visit to Queensland Museum will be on Saturday, August 18, as announced in the Bulletin. Intending participants were asked to let Christine Lambkin or Geoff Thompson know.

Main Business

Queensland's Fire Ant War: Upping the Ante

Ross Wylie, DAFF (Qld)

The ant in the Americas - origin and spread

The myrmicine ant *Solenopsis invicta*, commonly known as the Red Imported Fire Ant (RIFA), is native to South America, its original home being the seasonally flooded Pantanal region of Brazil, Bolivia and Paraguay. It is believed to have entered the United States in the 1930's via shipping and was first noticed around the harbour at Mobile, Alabama in about 1940. From this initial point of introduction it rapidly expanded its range, partly by means of its own dispersive mating flights but mostly through human assistance, especially movement of nursery stock. By 1949 the ant had spread

to Mississippi and Florida and by 1953 had been recorded from 10 southern States. In 2012, *S. invicta* is widespread in the southern US in hundreds of counties across 17 States and has spread 50 million hectares in the last 25 years. Its range is still expanding, even into areas previously thought unsuitable.

The US fire ant wars

The first fire ant war was waged in Mississippi in response to the reported devastation of the hay industry there, and commenced in 1948. The newly-developed insecticide chlordane was the weapon of choice and farmers used a 5% dust spread over the mound or mixed into it. The program was begun with little or no knowledge of the biology of the ant, a common theme in many eradication programs. Chlordane proved no match for RIFA and the program was discontinued in 1951.

The second fire ant war commenced in 1957, this time using dieldrin and heptachlor. The plan was to spray 8-12 million hectares of fire-ant infested land in 10 States from the air and ground. A quarantine was finally placed on movement of nursery stock and soil-containing products in 1958, but by then the ant had spread widely. The environmental effects of the spraying program were disastrous, prompting Rachel Carson to write her classic book *Silent Spring*, published in 1962. The program was halted in that year with only one million hectares treated. During this second war, RIFA increased its range by another four million hectares.

The third fire ant war began on the heels of the second using the supposedly more selective granular mirex bait (a chlorocarbon). In the early 1970s evidence began to surface that mirex was a serious threat to aquatic life, was carcinogenic and was not specific. Funding for the program ceased in 1975, by which time mirex had been applied three times to an estimated 20 million hectares. Mirex was banned in 1978 and during the period of its use RIFA expanded its range by another 50 million hectares. The fire ant wars were lost and eradication was no longer an option.

RIFA infested site in Browns Plains in 2009.

Arrival in Queensland: the war begins

Solenopsis invicta was detected in the south-western suburbs of Brisbane (centred on Wacol) and the Port of Brisbane in February 2001. Delimiting surveillance identified an infestation of about 60,000 hectares. Early work on climate suitability and likely rate of spread indicated that the ant could occur over many parts of Australia, even arid areas if irrigated, and could cover more than 4 million km^2 by the year 2035 in the absence of any control measures. A cost benefit analysis in 2001 conservatively estimated the potential cost of fire ants in Australia over a 30 year period at $8.9 billion (a second study in 2009 raised this figure to $43 billion). It was concluded that it was in Australia's best interest to undertake an eradication program for RIFA, and the National Red Imported Fire Ant Eradication Program commenced in September 2001 with shared funding from the Federal Government and all Australian States and Territories.

The Program was planned to run for five years with a budget of AUS$150 million and a workforce of approximately 700 in the initial phase. On advice from US fire ant experts the intent was to treat every infested property with baits containing hydramethylnon (toxicant) and pyriproxyfen or s-methoprene (Insect Growth Regulators) three to four times annually for 3 years. This was to be followed by 2 years of surveillance to ensure that the ants had been killed. As well as the broadcast bait treatment, all fire ant mounds found were directly injected with a contact insecticide

The same site in 2005: survey of past satellite imagery enabled correlation between urban RIFA populations and recent disturbance to those sites.

(chlorpyrifos at the start of the Program and later fipronil). Surveillance buffers of up to 5 km were established around the treatment area. Controls were imposed on the movement out of a declared restricted area of materials that could harbour fire ants, particularly soil and nursery stock. An active community engagement program enlisted the public's help in finding and reporting fire ants.

Tides of war

Two years after treatment commenced, it seemed that the Program was winning the battle. A survey in 2003 of 1095 known infested properties showed that only 25 still had viable fire ant colonies, a success rate of nearly 98%. Dense infestations such as that at 'fire ant mountain' in the western suburbs, with 1679 mounds per hectare, had been eliminated. An important science achievement was the development of a model to predict areas of suitable habitat for *S. invicta*, allowing better targeting of surveillance. Then, at the end of 2003, RIFA 'outliers' were found to the south-west of the known infested area on semi-rural lands. Some steep terrain and the size of the area made surveillance difficult. The treatment zone was extended by 5 km (the reported maximum flight distance of a mated queen) in an attempt to get ahead of the ant and the whole area was aerially treated for two years. Validation surveillance indicated that the treatment was successful. This, coupled with relatively few new finds in 2004 and early 2005, engendered cautious optimism until the discovery in mid-2005 of a major

Paddock heavily infested with RIFA

infestation in market gardens at Rochedale in the east of Brisbane. Again, treatment and surveillance zones were extended as was the duration of the Program, a pattern to be repeated in the years that followed.

The ant enemy

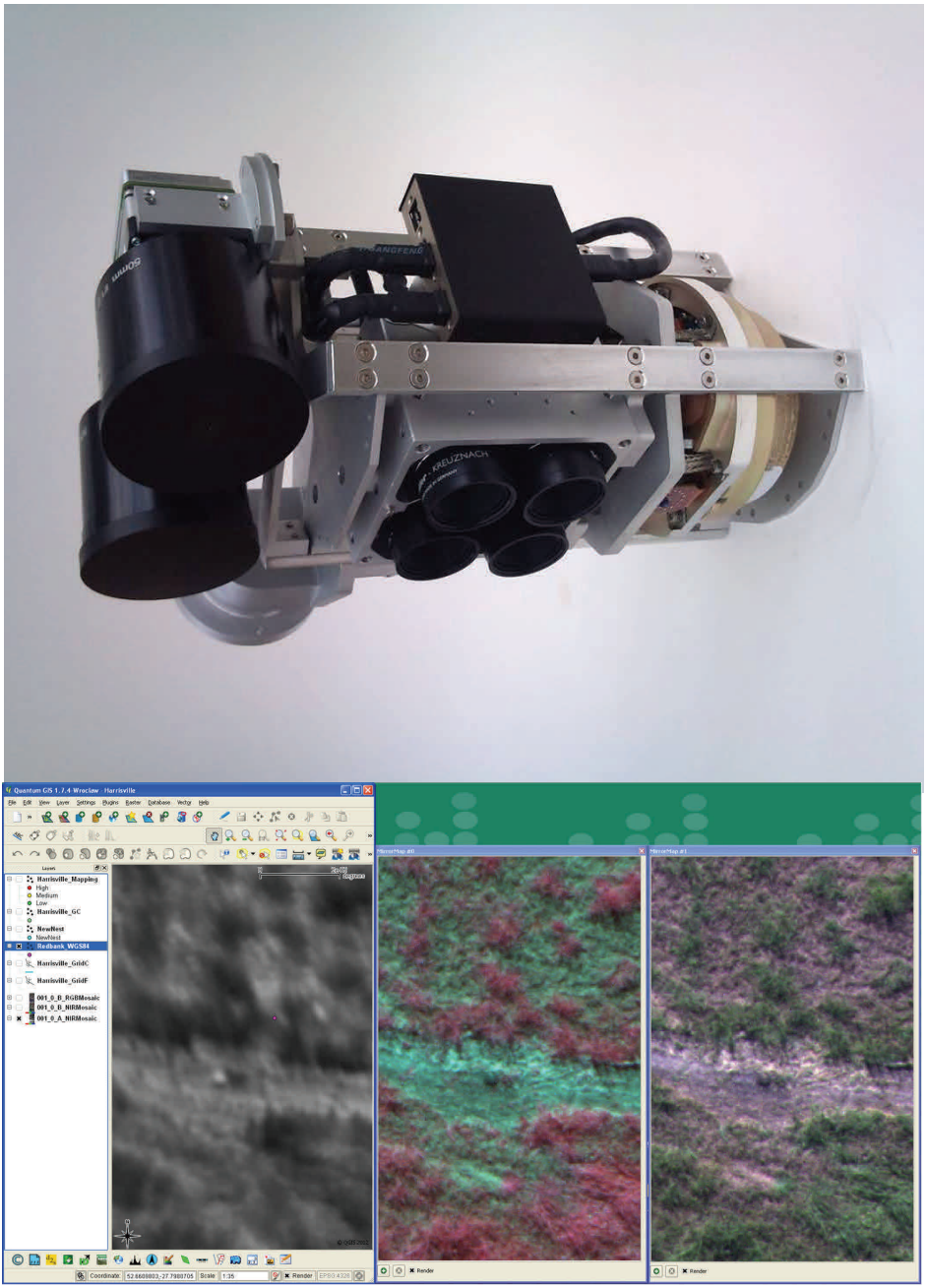
Solenopsis invicta deservedly has the reputation of being one of the world's worst invasive species. It is a tramp ant readily moved with commerce from one country to another and, on arrival, is capable of colonising a variety of habitats. It is aggressive, can disperse by flight or human assistance and is the ultimate survivor. There is a lot to admire about this ant. It has two social forms, monogyne (single queen colony) and polygyne (multiple queen colony). Monogyne colonies are territorial and their workers will fight with fire ants from another colony while polygynes get on well with each other and can form supercolonies. Monogyne queens are capable of flying up to 5 km unaided, although most land within 2 km of their parental nest. Polygyne queens are weak flyers and polygyne colonies generally spread by 'budding'. However the polygyne form, by nature of its many queens, is more readily transported by human assistance, particularly soil movements. It is the ant's ability to adapt and survive that impresses. Apart from aggressive colony defence and a painful sting they are able to rapidly relocate the colony should conditions become unfavourable (or should better habitat be found elsewhere) and can competitively dominate food resources. In the US, fire ants have been reported to establish a colony in detritus under a car's bonnet and forage on insects caught in the grille. Their ability to raft when their colony is inundated by water is well known. In Brisbane, we have observed survival of colonies that have been submerged in floodwaters for at least five days.

Blisters resulting from RIFA stings.

Odour detection dog (above); nest injection treatment (right).

Upping the ante

There is no question about the ability of the Program to eliminate fire ants as they are found when the correct regime of treatments is applied. Science has shown that monogyne colonies can be killed in 12 months with 4 broadcast bait treatments with IGRs, and polygynes within 18-24 months. The big problem has always been to find the ants in the first instance. In the past few years, there has been a considerable investment of resources into novel ways to detect fire ants. One of the first was the use of odour detection dogs whose noses are 10,000 times more sensitive than that of a human and which can distinguish *S. invicta* from all other ants including native *Solenopsis* and the ginger ant *S. geminata*. The dogs are used strategically for inspections before allowing movement of soil or other carriers off-site and to validate the success of treatment, but usually not for broad-scale surveillance because of limits



Remote sensing camera-rig (top) and resulting images— left to right—thermal, near infared and red-green-blue—RIFA mound visible near centre of image (bottom).

on the area they can survey in a day. Another very useful, and now more affordable, tool is genetic analysis. Worker ants from a colony are routinely tested to determine social form; if polygyne, then this prompts an investigation into human-assisted movement of products since this is the most likely mode of spread for this form. For monogynes, genetic analysis is used to determine relatedness between colonies which can help to locate the source of the infestation. Recent modelling and epidemiology studies are continuing to refine predictions of the preferred habitat for fire ants, allowing targeted surveillance and treatment. Finally, cutting-edge remote sensing technology is being used to find fire ant mounds. This entails the use of a helicopter-borne pod containing 6 cameras capturing colour (RGB), near-infrared (NIR) and thermal imagery from a height of 150m with a resolution of 2.5cm for the RGB and NIR images and 5cm for the thermal. The imagery is processed, then analysed using a combination of automated classification (a 'learning" algorithm) and manual identification by trained operators. This produces a number of 'points of interest' (suspected fire ant mounds) which can then be ground-truthed by surveillance teams. In this way, large areas of land can be surveyed efficiently and cost-effectively. Not all mounds will be detected in a single pass since some will be too small to discern or may have a weak thermal signal, so multiple passes will be required. Remote sensing over the next three years should allow delimiting of the infestation for the first time.

Can we win the war?

While it is true that after 11 years of the Program the ant is still with us; nevertheless, there have been successes and cause for optimism. Genetic analysis shows that there have been three separate introductions of RIFA into Queensland, all from the US. Two of these populations, a small population at Yarwun near Gladstone and a large population at the Port of Brisbane have been eradicated; these genotypes have not-been found since 2006. The remaining Brisbane population has been heavily reduced and fragmented. Genetic analysis indicates a lower genetic diversity in the remaining Australian population than is observed in other invaded countries and genetic diversity is decreasing over time. In countries without an effective eradication program no such reduction is observed in the genetic diversity of their populations. While the footprint of the ant in southeast Queensland has doubled since 2001, the actual area of land that is infested is probably less than 1,000 hectares. Passive surveillance has been very effective and nearly 70% of new finds of RIFA in the past few years have come from the public. Another indicator of Program efficacy is that very few people living in the Restricted Area for RIFA have ever come in contact with a fire ant and there have been no major incidents of people or animals being stung. Contrast this with the situation in the US where there have been 80 deaths and where more than 200,000 people each year receive medical treatment for fire ant stings. The war is by no means won. If remote sensing is successful and the infestation is delineated it will be several more years before eradication is achieved. However, with the science tools now available, the Program is in the best position it has been to defeat the ant provided we hold the course.

Vote of Thanks: Alexandra Glauerdt

Any other business:
1. The next meeting will be on Tuesday September 11, and the speaker will be Owen Seeman from Queensland Museum.

2. Christine Lambkin reminded members that the next Bug Catch will be on October 6th at the Brisbane Koala Bushlands, Burbank, from 10.00 am. We will be joined by Entomology students from UQ.

The meeting closed at 2.05pm

NOTICE OF NEXT MEETING

Tuesday 11th September 2012, 1pm

~

Dr OWEN SEEMAN

Queensland Museum

Identification of Australian Herbivorous Mites: or, When a Duck is Definitely Not a Duck

Abstract: Herbivory is a common feeding method amongst the trombidiform mites, having evolved independently numerous times, most notably in the Eriophyoidea (erinose & gall mites) and Tetranychoidea (spider, flat & peacock mites). During the past decade, Dr Jenny Beard and I have worked on the Tetranychoidea, including several spectacular taxa from all manner of host plants. In this presentation I will cover Australia's fauna of beautiful peacock and flat mites, especially our exceptional diversity of flat mites on she-oaks. I will also discuss our more practical work on the rather uglier pest mites, especially *Tetranychus,* whose identification previously required the unusual combination of avian and mite morphology.

~

ABOUT DR SEEMAN: Owen Seeman is the Collection Manager for Arachnida at the Queensland Museum. Long ago, when there was a Department of Entomology at the University of Queensland, he ditched dreams of marine biology to become a bug nerd. Realising that eight legs were better than six, he became an acarologist as a postgraduate student under the supervision of Dr David Evans Walter. He has maintained a strong interest in the discipline ever since, with a somewhat broad focus on mites on insects and plants.

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

People and Projects

Queensland spider named for David Attenborough

Geoff Monteith, Queensland Museum

Queensland Museum Research Fellow in Arachnology, Barbara Baehr, flew to Perth in early August to attend a special function at the Western Australian Museum to honour the career of renowned naturalist/broadcaster, Sir David Attenborough, and to launch his speaking tour of Australia. Barbara and WA Museum arachnologist, Mark Harvey, have recently described a new species of spider after Sir David and they presented him with a framed photograph of the species (see photo). The species they named is *Prethopalpus attenboroughi* Baehr & Harvey and belongs to the goblin spider family Oonopidae. It is known only from Horn Island, in the southern part of Torres Strait. The genus is also new, and the species is one of 39 new species they described in the genus from areas stretching from Asia to Australia. The work is part of a global cooperative PBI biodiversity project aimed at describing the whole world fauna of this particular family. Their paper can be accessed at: http://digitallibrary.amnh.org/dspace/handle/2246/6185

From left to right: Mark Harvey, David Attenborough and Barbara Baehr at the big night at the Western Australian Museum in Perth (W.A.Museum Photo).

1st Joint Evolutionary Biology Conference, Ottawa, Canada (July 6-10)

Penny Mills, University of Queensland

The first joint Evolutionary Biology Congress was held this year July 6–10, 2012 in Ottawa, Canada. The five societies involved were American Society of Naturalists, Canadian Society for Ecology and Evolution, European Society for Evolutionary Biology plus Society for the Study of Evolution and Society of Systematic Biology. The large delegation of approximately 2,500 attendees consisted of scientists from across the globe working on various evolutionary questions.

On the first day of the conference delegates could attend a field trip to the University of Ottawa's Queens Research Station (~90 min drive from Ottawa). I opted to attend and I was glad I did. Being my first time in North America, I was fascinated by the plants and wildlife I've never had the chance to see. We explored several trails around the research centre and had a naturalist who pointed out and identified many of the species of animals and plants we passed along the way. My guide was particularly knowledgeable about the invertebrates and plants we observed. Some of the invertebrates we saw included moths, butterflies, grasshoppers, crickets, damselflies and dragonflies. I even found some galls, but unfortunately they weren't induced by hemipterans.

The main conference began on Saturday (July 7). Because there were so many delegates, each scheduled time slot had about 17 concurrent talks. It was extremely time-consuming organising which talks to sit in on and listen to, and unfortunately several talks that I wanted to go to were scheduled at the same time.

Symposia were held on a broad range of topics including adaptation and evolutionary genetics, invasion ecology and evolution, experimental evolution, phylogenetics, sexual selection and mating systems, and molecular genetics to name but a few, as well as several major symposia sponsored by the respective societies.

In addition to the presentations there were two poster sessions with over 600 different posters. The posters were just as varied as the talks, with research using a huge range of organisms—from moss to butterflies to butcher birds—to address evolutionary questions.

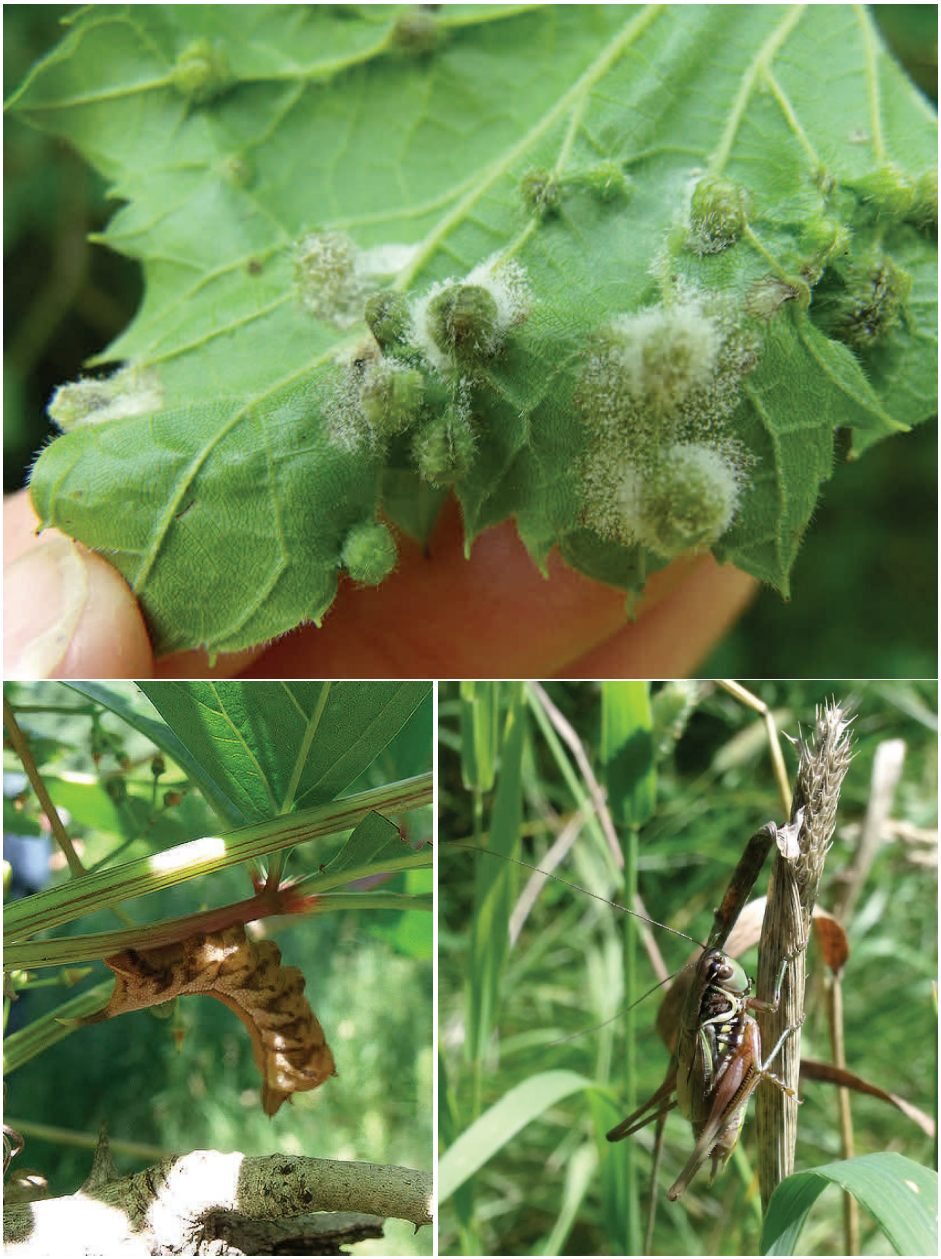
I managed to attend presentations given by experts in the field of chromosome evolution whose work had been influential throughout my own PhD research—the subject of which I was fortunate enough to have the opportunity to discuss with them. I also made sure I talked to the three other people at the conference who worked on scale insects, seeing as there were so few of us attending.

I presented my research in the morning of the last day and received positive feedback from a number of people after my talk. The audience was apparently stunned at the amount of chromosome variation my scale insect species-group has.

The conference dinner (buffet style) was held on the last night at the Canadian Museum of Civilisation. Afterwards we were allowed to explore parts of the museum's exhibits—unfortunately there were no insect-themed exhibits.

All in all, it was a fantastic experience attending this international conference: going on the pre-conference field trip and seeing an assortment of insects, catching up with old friends and making new ones, and learning about research being undertaken across the globe and the questions being addressed in evolutionary biology.

Acknowledgements : Lyn Cook (supervisor), Student travel bursary (ABRS), Graduate Student Conference Support Scheme (UQ).



Insects encountered during a field trip to University of Ottawa's Queens Research Station. This page: Galls, possibly made by flies (top); Sphinx moth, *Darapsa myron*, caterpillar (bottom left); Roesel's bush cricket, *Metrioptera roeseli* (bottom right). Next page: Eastern pondhawk dragonfly, *Erythemis simplicicollis*.

NOTICE

WANTED ALIVE!

HARMONIA CONFORMIS

FOR SEMIOCHEMICAL RESEARCH PROJECT

PLEASE CONTACT HELEN NAHRUNG
0421 514 393
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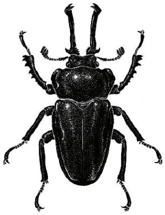

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Seconded by ____

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Please retain the receipt below for your records

Entomological Society of Queensland—Receipt for payment of membership fees

Name _____________________________________ Date ____________

Amount paid $_________________ for year/s ______________

DIARY DATES 2012

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

MAR—Monday 12th	Lyn Cook	AGM and President's Address
APR—Tuesday 10th	Stephen Cameron	Insect Evolutionary Genomics
MAY—Monday 14th	Bill Palmer	Weed biocontrol. Where to now?
JUN—Tuesday 12th	Notes & Exhibits / Student Award Presentation	
AUG—Tuesday 14th	Ross Wylie	Qld's fire ant war—upping the ante
SEP—Tuesday 11th	Owen Seeman	Australian Herbivorous Mites
OCT—Tuesday 9th	Jonathan Darbro	QMIR — mosquito control
NOV—Tuesday 13th	Ken Walker	Bowerbird—Citizen Science Portal
DEC—Tuesday 11th	Xmas BBQ	

SOCIETY SUBSCRIPTION RATES

GENERAL:	Person who has full membership privileges	**$30pa**
JOINT:	Residents in the same household who share a copy of the *News Bulletin*, but each otherwise have full membership privileges.	**$36pa**
STUDENT:	Students and others at the discretion of the Society Council	**$18pa**

Student membership conveys full membership privileges at a reduced rate.

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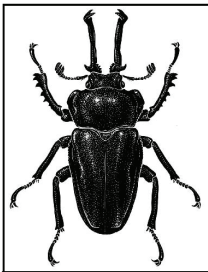

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

NOTICE OF NEXT MEETING

Tuesday 11th September 2012, 1pm

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Identification of Australian Herbivorous Mites: or, When a Duck is Definitely Not a Duck

Dr OWEN SEEMAN
Queensland Museum

~

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 40, Issue 6 (September 2012)
due early October

CONTRIBUTIONS WELCOME

DEADLINE - Monday September 17th, 2012
Send your news/stories/notices to the editor
(justin.bartlett@deedi.qld.gov.au)