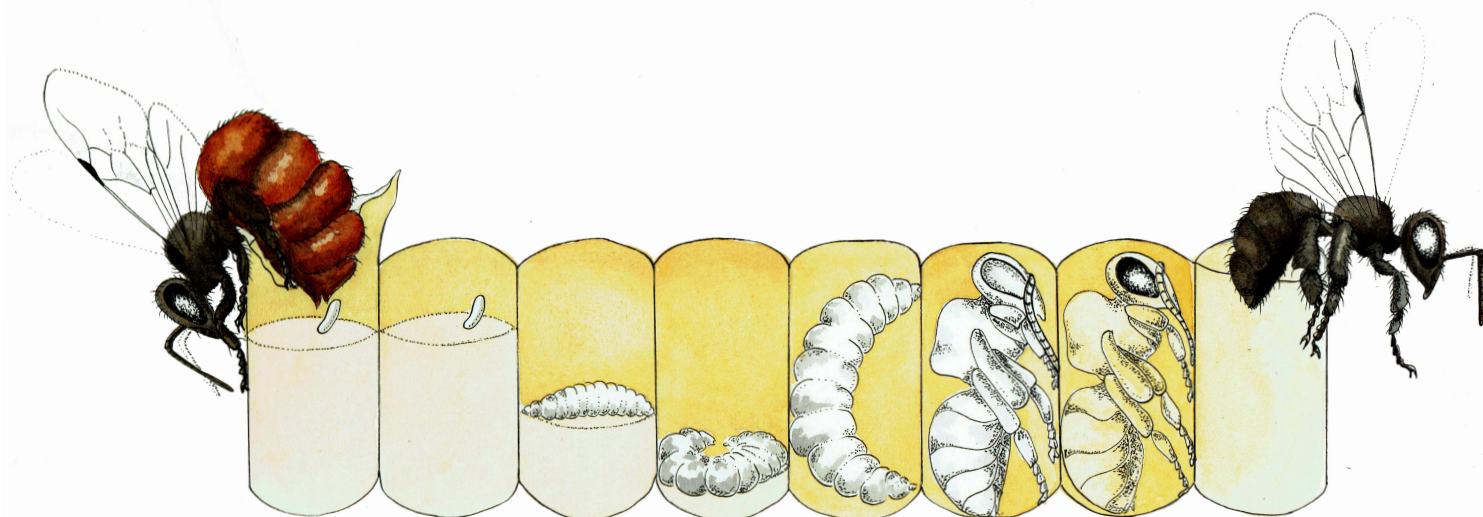




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Entomological Society of Queensland

Website: www.esq.org.au

Address: PO Box 537, Indooroopilly QLD 4068

President

Dr Tim Heard

Email: tim@sugarbag.net

Vice President

Mike Muller

Email: mike.muller@brisbane.qld.gov.au

Past President

Bradley Brown

Ph: (07) 3833 5695

Email: bradley.brown@csiro.au

Secretary

Dr Mark Schutze

Email: m.schutze@qut.edu.au

Treasurer

Dr Brenton Peters

Ph: (07) 3376 4342

Email: petersbc@tpg.com.au

Councillors

Julianne Farrell

Email: juliannefarrell17@gmail.com

Dr Cate Paull

Email: cate.paull@csiro.au

Penny Mills

Email: penelope.mills@uqconnect.edu.au

News Bulletin Editor/Web Manager

Kathy Ebert

Email: k.ebert@uq.edu.au

Assistant News Bulletin Editor

Penny Mills

Email: penelope.mills@uqconnect.edu.au

Permit Information Officer

Dr Christine Lambkin

Ph: (07) 3840 7699

Fax: (07) 3846 1226

Email: christine.lambkin@qm.qld.gov.au

Honorary Life Members

R.A.I. Drew

D.L. Hancock

R.P. Kleinschmidt

C. Lambkin

G. B. Monteith

M. S. Moulds

D.P.A. Sands

THE AUSTRALIAN ENTOMOLOGIST Editor

Dr David Hancock

Ph: (07) 4053 1574

Email: davidhancock50@bigpond.com

Assistant Editor

Mr Greg Daniels

Email: greg.daniels@qm.qld.gov.au

Business Manager/Assistant Editor

Dr Geoff Monteith

Ph: (07) 3371 2621

Email: geoff.monteith@bigpond.com

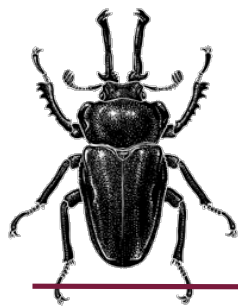
Assistant Editor

Dr Lindsay Popple

Email: Lindsay.Popple@uqconnect.edu.au

Front Cover Illustration: This illustration by Gina Cranson represents a cross-section through the brood comb of a generic stingless bee showing the process of rearing brood. A cell is mass provisioned by nurse workers before the queen lays an egg. The cell is then immediately capped so that the larva can develop in a closed cell. This resembles the ancestral nesting behaviour of the solitary bees, which also cap cells immediately after provisioning and laying an egg, and not the highly-derived behaviour of honey bees which progressively provision their larvae.

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Entomological Society of Queensland

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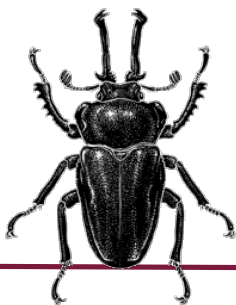
The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News 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. Other common names include Rainbow, Golden and Magnificent Stag Beetle. 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.



Entomological Society of Queensland

Minutes for Annual General Meeting

Tuesday, March 14th, 2017

Held in the Seminar Room, Ecosciences Precinct,
Boggo Rd, Dutton Park.

Meeting open: 1pm

Attendance (30): Tim Heard, Mark Schutze, Geoff Monteith, Stephen Frances, Desmond Foley, Bradley Brown, Alisha Steward, Diana Leemon, Brogan Amos,, Greg Daglish, Shannon Close, William Arnold, Noel Starick, Chris Lambkin, Saku Muthuthantri, Penny Mills, Susan House, Simon Lawson, Mike Barnett, Mike Muller, Christine Powett, Gio Fichera, Julianne Farrell, Brenton Peters, David Holdom, Nadine Baldwin, Claudia Schipp, Lui Lawrence-Rangger, Tara Wheatland, Jane Royer

Visitors (14): Lachlan Jones, Emily Daniels, Christopher Wrona, Raymod Chin, Steven Rice, Sarah Forsyth, Anne Bourne, Tracey Steinrudun, Li Pei Lee, Annarose Chamberlain, Tobias Bickel, Joel McKechnie, Michelle Rafter, Shun-Ichiro Takano

Apologies: Morris C. McKee, Cate Paull, Kathy Ebert, Ross Kendall, Federica Turco, Susan Wright

Minutes: The minutes of the last meeting were circulated in News Bulletin 44[9] January/February 2017. Moved the minutes be accepted as a true record: Christine Lambkin; Seconded: Noel Starick Carried: all

Nominations for membership approved by council:

Students:

Jan/Feb Council Meeting

1. William Arnold (University of Queensland)
2. Christopher Wilson (James Cook University)

March Council Meeting

1. Rachel Whitlock (University of Queensland)
2. Matthew Keir (Queensland University of Technology)
3. Craig Edwards (University of Queensland)

General Business:

1. Annual Reports and Financial Statements
 - a. The Society's annual reports, financial statements, and the independent Auditor's report were published in News Bulletin 44[9] January/February 2017.
 - b. There were no questions from the floor regarding any of the reports.
 - c. President's report:
 - i. Move that it be accepted: Bradley Brown
 - ii. Seconded: Simon Lawson
 - iii. Carried: All
 - d. Secretary's report:
 - i. Move that it be accepted: Mark Schutze
 - ii. Seconded: Brenton Peters
 - iii. Carried: All
 - e. Treasurer's report:
 - i. Move that it be accepted: Brenton Peters
 - ii. Seconded: Penny Mills
 - iii. Carried: All
 - f. Permit Officer's report:
 - i. Move that it be accepted: Christine Lambkin
 - ii. Seconded: Mark Schutze
 - iii. Carried: All
 - g. Business Manager's report:

- i. Move that it be accepted:
Geoff Monteith
- ii. Seconded: Christine Lambkin
- iii. Carried: All
- h. New Bulletin Editor's report:
 - i. Move that it be accepted:
Penny Mills
 - ii. Seconded: Brenton Peters
 - iii. Carried: All

2. Election of 2017 Council

- a. Brad Brown, as incoming Past President, did not require election and, as the most senior officer of the Society, declared all position on Council vacant.
- b. The following nominations were put to the meeting for election:
 - i. President: **Tim Heard**, nominated by Brad Brown; seconded by Julianne Farrell
 - ii. Vice President: **Mike Muller**, nominated by Tim Heard; seconded by Brad Brown
 - iii. Secretary: **Mark Schutze**, nominated by Jane Royer; seconded by Julianne Farrell
 - iv. Treasurer: **Brenton Peters**, nominated by Mark Schutze; seconded by Penny Mills
 - v. News Bulletin Editor: **Kathy Ebert**, nominated by Geoff Monteith, seconded by Mark Schutze
 - vi. Business Manager (Australian Entomologist Journal): **Geoff Monteith**, nominated by Kathy Ebert, seconded by Mark Schutze
 - vii. Councillors:
 - 1. **Penelope Mills**, nominated by Perry Bennion, seconded by Lyn Cook
 - 2. **Julianne Farrell**, nominated by Brenton Peters, seconded by Mark Schutze

- 3. **Cate Paull**, nominated by Anna Marcora, seconded by Andrew Hulthen.

- c. As nominations were required to be to the Secretary six weeks prior to this meeting, and there was only one nominee for each position, a secret ballot was not required. However, all needed to be accepted at the AGM with a show of hands (as required by Constitution, despite only one nominee per position).

- i. Move to accept all: Tim Heard
- ii. Seconded: Christine Lambkin
- iii. Carried: All

Main Business:

- 1. Tim introduced the Presidential Address given by our outgoing President: Bradley Brown: "*Exploration in biological control - a US perspective*"
- 2. Christine Lambkin took the opportunity to remind all members that the ESQ Permit arrangements may become dramatically restricted after January 2018, and encouraged all members to undertake as much as possible before this date if possible.
- 3. Mark Schutze reminded members of the March 31 deadline for 2017 Small Grant Scheme applications.

Next meeting: The next meeting will be on 11th of April, presented by Graeme Smith on the topic of "*Silverfish - Who cares?!*"

Meeting closed: 13:50

At our next meeting...

“Silverfish - who cares!”

*presented by Graeme Smith
Honorary Research Associate
Australian Museum*

Silverfish (Order Zygentoma) are the first hexapods to have appeared once plants had colonised land, predating the first winged insects by several million years. Today the order survives in relic habitats but is not uncommon and reasonably diverse. Worldwide some 600 species in five families have been described with almost 70 of these species endemic to Australia. Recent work suggests this is a

great underestimate and is more a reflection on the attention paid to the group than their abundance.

Graeme Smith worked within the agrochemical industry for more than 30 years but took early retirement in 2010 to work on this group of wingless insects that had interested him since his undergraduate days. He is now an honorary research associate with the Australian Museum in Sydney and is nearing the end of his PhD project through Federation University in Ballarat.

Graeme will share his interest in this poorly known order with the Society at the April meeting, revealing the situations where these insects thrive and the tricks they use to get by.



Tuesday, April 14th at 1pm, Seminar Room at EcoSciences.

All welcome!



2017 Presidential Address

Exploration in Biological Control - a US perspective

presented by Bradley Brown

Outgoing ESQ President

Research Technician

Australian Biological Control Laboratory

CSIRO Health & Biosecurity

Ecosciences Precinct

I've been very lucky to be a part of a unique team at CSIRO Health and Biosecurity being part of the USDA ARS Australian Biological Control Laboratory (ABCL), a USA funded program that conducts exploration for biological control agents for invasive plants and pests in the USA. The Australian Biological Control Laboratory started over 30 years ago when CSIRO and the USDA ARS formed a cooperative agreement during a project looking for biological control agents of the broad-leaved paperbark tree, *Melaleuca quinquenervia*. I joined the team during this project and started work collecting, culturing and testing potential agents. I've also conducted exploration work for *Casuarina* spp, or she oaks, and have been very lucky to travel to Asia and remote parts of Australia in search for biocontrol agents of *Lygodium microphyllum* and *Rhodomirtus tomentosa*, both of which are invasive in the USA. I also contributed to a smaller project on *Salvinia molesta*, an invasive plant in both Australia and the USA.

Melaleuca quinquenervia is invasive in the USA where this plant was first introduced in the early 1900's as an ornamental and to dry up the Everglades for development in south Florida. It became one of the most invasive plants to hit the state of Florida, invading over 200,000 hectares and threatened the famous Everglades National Park. Flowering multiple times per year, *M. quinquenervia*

seed capsule clusters contain ± 70 seed capsules with around ± 450 seeds in each capsule. A mature tree of about 21m tall can hold around 50 million seeds in its canopy. Even though only 9 % of these seeds are viable, 4.5 million seedlings can still germinate from just one tree.

The exploration for biocontrol agents of *M. quinquenervia* by ABCL started in the mid 1980's and over 450 insect herbivores species were recorded feeding on *M. quinquenervia*. During the project, many herbivores were evaluated but only four biological control agents were approved for release into the USA. The first was a weevil, *Oxyops vitiosa* released in Florida in 1997, mostly performing well in drier (or at least seasonally inundated) areas because the pupation stage is in the soil. The second agent, the sap sucking psyllid, *Boreioglycaspis melaleucacae*, had a greater impact in wetter areas of south Florida. High numbers of juveniles can cause leaf drop which significantly impacts the trees. Soon after release of this agent, the population was so high that reports indicated the white flocculent produced by the juveniles fell like snow from infested trees. In 2005, the gall fly *Fergusonina turneri* and its obligate nematode, *Fergusobia quinquenerviae* were introduced. These agents together had a unique mutualist association forming galls on *M. quinquenervia* leaf and flower buds but unfortunately could not be established in

Florida. The last agent to be released was the stem galling Cecidomyiidae fly, *Lophodiplosis trifida*, which is performing well in more humid environments. So far these agents combined have contributed in reducing the initial density of 28,000 trees/acre at some sites to 4,000 trees per acre. Flowering has been reduced by over 95% and around 85% of saplings and seedlings are now killed. Most of the impact is on seedling recruitment.

Another gall-forming Cecidomyiidae, *Lophodiplosis*



Fig. 1. *Lophodiplosis indentata* female

indentata (Fig.1) is currently in quarantine in Gainesville, Florida. Indications are that it will also be specific to *M. quinquenervia* and could be the next agent to contribute to the already successful suite of released biological control agents.

Between 2010 and 2012, we decided to investigate the possible interactions between *L. indentata* with the released and established gall fly, *L. trifida*. Specifically, we were interested in whether (a) these insects would compete with or complement each other and (b) whether their impacts would be consistent across different juvenile life stages (i.e. seedling and sapling) of *M. quinquenervia*. Through these studies we wished to identify whether an additional agent would be of some value for *M. quinquenervia* biological control. The experiment had been comprised of 5 different treatments and one control treatment (no insects). One treatment each of *L. trifida* and *L. indentata* insects separately, and one treatment with both species introduced

together at the same time. The last two treatments had one species introduced for one week before the other species and vice versa. Plants were exposed to the insect treatments (200 adult pairs) over a two week period (16 replicates/treatment). After exposure to these treatments, we tracked the growth of the plants over a twenty week period (with the insects continuing to develop populations on the plants) to document the impacts of these two gall insects in isolation and in combination. These two galling agents have a life cycle of around 28 days from egg to adult, meaning 3-5 generations impacted the *M. quinquenervia* plants in this experiment. In general, our studies showed that both agents had significant impacts to the plant in isolation and in combination (Fig. 2). Findings from experiments with seedlings and saplings found that *L. trifida* has the biggest impact on growth especially at the seedling stage. Even when introduced in combination with *L. indentata*, the impact on the plant is mostly caused by *L. trifida* to seedlings of *M. quinquenervia*. *Lophodiplosis indentata* can contribute to reducing growth but has its greatest impact on reducing root biomass when attacking



Fig. 2. Galls from *Lophodiplosis indentata* on *Melaleuca quinquenervia*

sapling *M. quinquenervia*. This study found that *Lophodiplosis indentata* potentially has a complementary role to play, but is unlikely to significantly interfere with the contributions of *L. trifida*.



Fig. 3. Rosette gall on *M. quinquenervia* formed by *Lophodiplosis bidentata* (inset).

While US stakeholders are happy with the biological control agents introduced so far, we have researched two further insects in case better control is required in future. Another two gall forming Cecidomyiidae flies could be considered. Currently I'm trying to colonise the rosette gall former, *Lophodiplosis bidentata* (Fig. 3) for biology and host range testing. This fly is only found north of Townsville on *M. quinquenervia*, forming flower-like single or multi-chambered galls that can restrict growth beyond the growing tip. So far attempts to colonize this insect have determined that galls will only develop on *M. quinquenervia* sourced from north of Townsville.

Another midge, *Contarinia melaleuca* (Fig. 4), was recently described by Peter Kolesik in South Australia. The larvae cause the growth to retard or kill the buds. This fly was discovered while collecting rosette galls around Cardwell. Collected sprigs with rosette galls were introduced into cages in greenhouses at ABCL and *C. melaleuca* adults emerged with *L. bidentata* adults and colonised on potted *M. quinquenervia* plants. Adult specimens sent to Peter were found to be undescribed species. Larvae feed within the leaf bud and exit or pupate around the bud's surface. While currently not a high

priority agent, it could be considered for biological control of *M. quinquenervia* in future.

Over the past 7 years I have been exploring potential



Fig. 4. Leaf bud damage by larval *Contarinia melaleuca* (inset).

agents of *Casuarina* spp. There are three species of she oaks that have become invasive in the USA: *Casuarina equisetifolia*, *C. glauca*, and *C. cunninghamiana*. *Casuarina equisetifolia* is native to Australia, Asia and southern India, and is the most invasive of these three species being found in 30 state parks and covering nearly 400,000 acres. The environmental damage includes interference with nesting of endangered sea turtles, American crocodiles and the rare swallow-tailed kites. *Casuarina* has a natural ability to suppress any undergrowth and can be easily toppled over in storms due to the shallow root systems. Currently herbicide treatment is the main method of control.

Preliminary surveys for biocontrol agents began in the 1980s but soon ceased due to conflict of interest by homeowners and the agriculture industry which used the trees for shade and windbreaks. Extensive surveys were initiated in 2004 in collaboration with Gary Taylor from the University of Adelaide. During



Fig. 5. The *Casuarina* defoliating moth, *Zauclophora pelodes*.

these surveys many species of potential biological control agents were identified. These surveys are ongoing by ABCL focusing along the east coast of Australia from Sydney to Cape York and the Northern Territory.

I colonised and conducted preliminary host range testing on many potential agents and thus far four have proven to be specific to *Casuarina* spp. Two defoliating Lepidoptera, *Zauclophora pelodes* (Fig. 5) and *Cryptophasa irrorata* both bind the foliage to form huge webbed retreats. Larvae pull in further foliage from around these colonies into their webbed tubes which can result in completely defoliated branches.

Selitrichodes utilis is a gall-forming Hymenoptera, tested by myself and Kumaran Nagalingam. We found that *S. utilis* was specific to within *Casuarina* spp. and would be a potential agent. A similar species in the genus, *S. casuarinae* is regarded as a pest on *C. equisetifolia* in Guam where it is used as a wind break. The damage by *S. casuarinae* has caused the decline of *C. equisetifolia* trees that are dying throughout Guam.

Other potential agents of *Casuarina* spp. found by Gary Taylor during his initial surveys included the seed-feeding Hymenoptera, *Bootanellus orientalis* (Fig 6) and several Cecidomyiidae which reduce seed by feeding on the developing tissue causing deformed growth. Potentially these insects could be

used for biological control, but practical difficulties exist in testing these insects as plants with developing fruits are required for rearing and testing which could be problematic. Currently the *Casuarina* project is on hold and exploration has ceased until interest in the US is reignited and plants continue to be treated using herbicides. We are currently curating a backlog of specimens and compiling an herbivore list. A new casual employee and UQ honours student, David Comben, is assisting.

Some of the exploration field trips have taken me to



Fig. 6. Seed-feeding Hymenoptera, *Bootanellus orientalis*.

various remote parts of Australia but also overseas to countries like China, Hong Kong, Malaysia, and Singapore. These adventures are focused on exploratory work for two projects involving *Lygodium microphyllum* and *Rhodomyrtus tomentosa*.

Lygodium microphyllum is native to Australia and Asia, and was first found naturalized in Florida in 1965, where it had been originally introduced as an ornamental. As a climbing fern *Ly. microphyllum* smothers native vegetation (Fig. 7) and increases the fire risk by assisting the flames to spread to the top of the canopy of native trees in south Florida. This fern now covers more than 107,000 acres, and *L. microphyllum* is a priority for biological control. Currently three agents have been released into the USA: two defoliating moths, *Austromusotima camptozonale* (released in 2004) and *Neomusotima conspurcatalis* (2008), and an eriophyidae mite,



Fig. 7. *Lygodium microphyllum*, an Australian climbing fern which smothers native vegetation and increases fire risk where it has been introduced into Florida.



Floracarus perrepae (2008). Even though over 10,000 adults and 30,000 larvae were released, *A. camptozonale* never established in Florida on *Ly. microphyllum*. *Floracarus perrepae* has been slow to establish on *Ly. microphyllum* but recently range expansion has been observed and this mite is starting to have an impact in Florida. *Neomusotima conspurcatalis* has been the most successful agent so far with ‘brown out’ events of complete defoliation of large sections of *Ly. microphyllum* being seen across wide areas. However these outbreaks are patchy and native parasitoids and frosts impact *N. conspurcatalis* and could be determining factors for the success for this agent.

Personally, I was heavily involved with collection of stem-boring Lepidoptera on *Lygodium microphyllum* both here in Australia and in Hong Kong. The two species collected are both in the same genus *Siamusotima*: the Australian species is undescribed and the Hong Kong species is *S. disrupta*. I’ve been lucky to have collected with Ryan Zonneveld in the top end of Australia which is certainly a beautiful place for collecting (Fig. 8). The added dangers of

large lizards (crocs) potentially hiding in any water body up there and those little biting green tree ants which seem to come out of nowhere have certainly added to the adventure. Searching for *S. disrupta* in Hong Kong can also be challenging as these borers usually appear in high numbers during high heat and humidity. Larvae are collected and shipped directly to our collaborators at the USDA ARS Invasive Plants Research Laboratory (IPRL) in Florida. The Bamaga borer is being colonized here in Brisbane. These stem-boring *Siamusotima* spp, larvae can do considerable damage, causing death of the entire *Ly. microphyllum* plant above the feeding point. However these species have been extremely difficult to rear and maintain. Pupation occurs on the stem or near the rhizome, and are difficult to find in the field and laboratory. Larvae are typically collected from the field in the section of stem they are feeding, to be later removed and transferred to a live stem under a microscope.

Rhodomyrtus tomentosa or Downy rose myrtle is also a serious invasive plant in central Florida (Fig. 9). This myrtaceous plant was initially introduced as an ornamental in the 1920s where it soon escaped

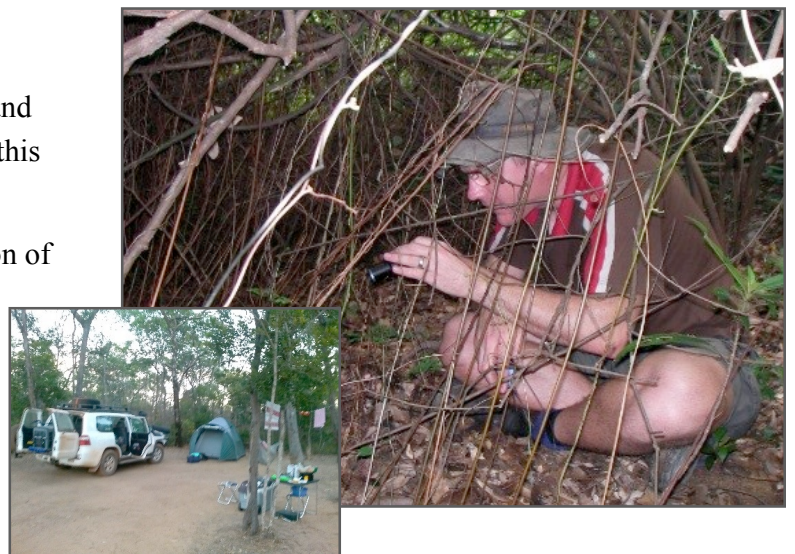


Fig. 8. Camping and collecting in Cape York. Brad collecting *Lygodium* borers (right).

and rapidly became a serious problem that was difficult to kill. Native to various parts of Asia, exploration surveys began by ABCL staff in 2001, where Tony Wright, Jeff Makinson, Matthew Purcell and I along with our valuable collaborating colleagues at the Thailand Department of Agriculture have conducted surveys for direct shipment to our collaborators at IPRL quarantines in Fort Lauderdale and Gainesville. At least 70 species of insect herbivores have been collected, nine of which have been colonised and tested by IPRL colleagues, but none have proved to be specific. The high priority agent is a stem boring

Fig. 10. The stem boring Lepidoptera (Cossidae), *Casmara subagronoma*, which is present in Hong Kong and mainland China.



Fig. 11. Brad collecting in Hong Kong.

Lepidoptera (Cossidae), *Casmara subagronoma*, which is present in Hong Kong and mainland China. The larvae feed within the stem and feed downwards to the base of the plant, causing huge damage and death to tips and branches. The life cycle is long, about 2 years when cultured on cut stem material, but observed to be 1 year on live plants in the field. Adult *C. subagronoma* (Fig. 10) live for about three weeks but have yet to be collected in the field, only larvae are collected and shipped to the USA.



Fig. 9. Downy rose myrtle, *Rhodomyrtus tomentosa*

Cyrtobagous salviniae was discovered by CSIRO in South America as a control agent of *Salvinia molesta*. *C. salviniae* (Fig. 12) has been released in many countries around the world where *S. molesta* has become invasive. *Cyrtobagous salviniae* weevils that were released in north Louisiana did

not survive harsh winters. It was identified that the population of *C. salviniae* near Camden, west of Sydney in NSW, had persisted since introduced into Australia during the 1980s and this population was cold tolerant. Weevils from Camden were collected and shipped to the Texas A&M University where cold tolerant studies results indicated the Camden population were more cold tolerant than weevils in culture in Texas. Dr Seth Johnson of Louisiana State University will conduct further cold tolerance studies including super cooling point, lethal temperature determined in temperature controlled alcohol bath and survival after exposure of 5h and 10h to range (0° to -10°C) of maximum low temperatures in refrigerated incubators.



Fig 12. *Cyrtobagous salviniae*

Into the future, the ABCL group has several new weed targets: *Acacia auriculiformis* an Australian native of northern Australia, *Rotala rotundifolia* an aquatic plant that grows along the water margins, and *Nymphoides cristata*, a waterlily. *Acacia auriculiformis* was introduced into Florida in 1932 and is now recorded in 24 natural areas and considered a serious invasive weed. Both of the aquatic plants are native to Asia. They outcompete native vegetation and form dense canopies.

Of course, one of the best activities to do when you are travelling here in Australia, and Asia especially, is to try as many different foods as possible (Fig 13). Who knows, but maybe I've tried over 450 different meals?

To conclude, I would like to thank the support of the ESQ committee and fellow colleagues for helping me reach this point of my career. It's very clear to me that the ESQ is a strong society and with our new President Tim Heard at the wheel it will surely be introduced to the world of social media. Hopefully making ESQ more relevant to the next generation of new budding entomologists!

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Fig. 13. The food experiences!



Research Feature

This month's research feature presents an account of some of the CSIRO whitefly team's adventures in Africa. The whitefly CSIRO team consists of Paul De Barro, Sarina Macfadyen, Cate Paull, Andrew Hulthen & Andrew Kalyebi. Andrew Kalyebi is from the National Crops Resources Research Institute (Nacre) in Uganda and divides his time between his home country, Uganda, and Australia. It's a three year project and to date they have completed 3 field trips, each trip between 4 and 5 weeks duration. No more trips for a while to give them time to analyse the data!

Whitefly Safari in East Africa

By Cate Paull
CSIRO

Cassava (*Manihot esculenta* Crantz) is grown in over 90 countries and is the third most important source of calories in the tropics. It is the staple food of an estimated half a billion people in Sub Saharan Africa. The tuberous roots of cassava are an important source of carbohydrate in many parts of the low and mid-altitude tropics. The crop is widely grown in the tropical regions of Africa. Cassava production has increased greatly in Africa during the second half of the 20th century.

The Problem: Viruses, which are vectored by the whitefly *Bemisia tabaci* species complex, can compromise cassava production, in some cases by up to 80%. Historically research has focussed on developing cassava varieties, which are resistant to the viruses. However, one of the aims of the current project is to focus more on the interaction between the host and vector, to understand what drives periodic outbreaks of *B. tabaci* at a landscape scale.

Currently CSIRO is contributing to an international project lead by the Natural Resources Institute, University of Greenwich with funding provided by the Bill & Melinda Gates Foundation.

While the science that underpins the project is serious and we work long hours in the field there is a lighter side.

One of the interesting challenges of the project is planning just what we will need when we touch down in a different country. We rely heavily on our Ugandan research scientist, Dr Andrew Kalyebi, to help us navigate airport customs and security. There is no room for extras or just-in-case gear. Everything has to be thought through carefully and trialled before we go. On our first trip, we had over 130 kgs of field gear. After spending almost two hours clearing customs at Entebbe airport in Uganda, we entered the airport arrivals area to find that it was empty apart from the mountain of our gear. Clearly,



Young cassava crop in Uganda.

no one was interested in 1200 emergence traps and a few battery operated pooters.

Our first trip involved collecting samples from 60 sites, which stretched from Uganda south through Tanzania and then to Malawi. We collected data on the numbers of whitefly adults and the density of nymphs on cassava plants. We place a standardized sample of leaf with nymphs in our emergence containers so we can assess whitefly density and the degree of parasitism. Collecting the individuals that emerge provide samples of whitefly and parasitoids which can then be used for molecular work to confirm the species. The one catch is that our samples need to move with us as we travel, so that we can monitor and check for emergences each day. Often someone's room is conveniently turned into an insectary.

Tanzania is a country similar in size to New South Wales, but with a population of about 40 million. Driving in cities like Dar-es-Salaam, the cars, trucks, people, animals, push bikes and motorcycles all assertively jostle for space which creates a sort of continuous traffic jam north, south, east and west of the city. The traffic chaos is largely due to inadequate road infrastructure, which means travelling to and from anywhere can be a meter-by-



Our pop-up insectary in a Mwanza, Tanzania hotel room.

meter proposition. We asked the driver how he copes day in day out with this snail pace grind and he responded calmly, "This is life and we press on".

In the rural areas, there is a surprising amount of foot and bicycle traffic. People greet us with smiles and curiosity, not to be outdone by kids yelling "Mazungoo, Mazungoo" (white people, white people) especially when one of the sites is close by a school.

Moving away from the cities to the rural areas, utilities, like electricity, becomes less available. We were lucky we got to stay in accommodation with electricity but often this is interrupted, so head torches come in handy, not only to sort the samples from the day's catch, but to prepare for the following day.

Most of the team is now super adept at bathing using anything from a plastic cup to a standing tap mounted a meter off the ground. Those in the team who are keen on hot water and try to coax the electric heater perched on the showerhead to yield something other than cold water have felt the consequences.

Protecting yourself against mosquitoes and malaria has become a creative art. Checking into accommodation provides a range of mosquito-proofed rooms. But hey, we can cover just about any gap between window and frame or patch a hole in a mosquito net



An audience of school children watch Patrick Ocitti and Dr Sarina Macfadyen.

with micro-pore tape. Just to make sure we have added layers of ‘Bush man’ repellent, finally spraying our rooms with “DOOM”. Yes, bad luck if your room is the pop-up insectary.

The thing people always ask us is, “have you seen any big game?” “No”, we usually joke, “but we do get to see small game”.

Occasionally we did get to see a goat or donkey and lots of chickens but there is not a day the team doesn’t take an image of something small and wonderful, for example, frogs, lizards and of course insects. Unless you are in a premier tourist area like Zanzibar, attractions are largely understated across East Africa.



Pyrgomorphidae: *Zonocerus* sp.

Some days you pinch yourself and question whether what you are experiencing is real. On one such day we had an hour or so spare before going to the airport and the driver wanted to show off his city, Lilongwe, the capital of Malawi. The car pulled up and stopped at an imposing cement promenade and tall clock tower. No one else was there. This memorial commemorates the soldiers who fought in WW1 and WW2 when Malawi had been a British colony. There was also a statue of Dr Hastings Kamuzu Banda, Malawi's first president after independence. Then along came a student, and of course, he was studying history (how convenient!)



Back: left to right: Dr Paul De Barro, Dr Andrew Kalyebi and Mr. Andrew Hulthen. Front: Dr Sarina Macfadyen.

and offered to open the clock tower, and up we go. A random discussion between our in-country friends and the historian about the costs and benefits of colonisation ensues. We listen intently - such experiences are priceless.

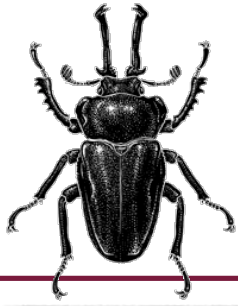
One of the most striking things across all of East Africa is the resilience, fortitude and positive nature of the people. We mostly met farmers and their families. They are always exceedingly generous and seem never to complain. They all smile and just press on!

--Cate Paull



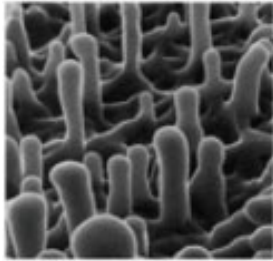
**CASSAVA WHITEFLY
PROJECT**
WHITEFLY CONTROL FOR AFRICAN SMALLHOLDERS





Entomology News

from Queensland and beyond...



Dragonfly wings may provide new ideas for biomimetic nanomaterials

Researchers at Queensland University of Technology have recently been involved with research on the nanotextured surfaces of dragonfly wings (*Orthetrum villosivittatum*). The surface of the dragonfly wing has tiny nanopillar-shaped rods similar to those that have been studied on cicada wings. In the cicada, the rods were thought to create a bacteria-killing surface and ruptured bacterial cell walls a bit like a “bed of nails”. However, the nanotextured surface of the dragonfly wing was found to have structures of two different heights. The researchers proposed that the bacteria are more likely to get stuck in the variable sized nanopillars and the adhesion, combined with shear forces when the bacteria move, is what actually causes the bacteria to rupture. Continued research into insect wing nanotopography will benefit the development of new antibacterial nanomaterials which will be useful in biomedical applications.

To read more see:

Bactericidal Effects of Natural Nanotopography of Dragonfly Wing on *Escherichia coli*. 2017. Bandara CD, Singh S, Afara IO, Wolff A, Tesfamichael T, Ostrikov K, Oloyede A. *ACS Appl. Mater. Interfaces* 9(8): 6746–6760

Biophysical Model of Bacterial Cell Interactions with Nanopatterned Cicada Wing Surfaces. 2013. Pogodin S, et al. *Biophys. J.* 104(4): 835–840

<http://acsh.org/news/2017/02/06/why-dragonfly-wings-kill-bacteria-10829>

<http://www.nature.com/news/insect-wings-shred-bacteria-to-pieces-1.12533>

Innovative method to help with microphotography

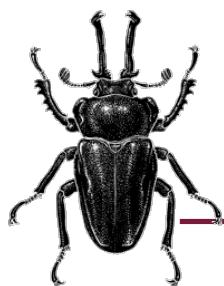
Frustrated trying to photograph small morphological structures? You Ning Su, from CSIRO/ANIC, has published a helpful note in *Zootaxa* explaining how to use hand sanitiser to aid with photographing small organisms or structures. A drop of alcohol-based hand sanitiser in an excavated block contains ethanol to match the preservative of the specimen and gel to keep it from ‘drifting’ during the photograph. It works well for stacking and doesn’t affect the specimen. To read the details and see some examples of his photos see:

Su YN. 2016. A simple and quick method of displaying liquid-preserved morphological structures for microphotography. *Zootaxa* 4208(6):592–593.



International Congress of Odonatology, co-sponsored by the Worldwide Dragonfly Association.

Three special sessions are planned: Dragonfly vision; Dragonfly flight; and Ten Years since Philip Corbet. Registration is now open but closes 31 March 2017 after which a late fee applies. Submission of paper proposals with abstracts due by 31 March 2017. As always, ICO 2017 is open to all, affiliated or unaffiliated to WDA. A limited number of scholarships are available for students. Location: Clare College, Cambridge UK. Date: July 16–20, 2017. Visit <http://www.ico2017.org/> for more information.



New Book

A new stag beetle guide

A Guide to Stag Beetles of Australia, written by George Hangay and Roger de Keyzer, provides information and fantastic photographs for the 98 species of stag beetle found in Australia (Family Lucanidae). Some of the stag beetles are well known, like the beautiful *Phalacrognathus muelleri* on the front cover, but many are cryptic and not often seen because they spend their lives living in and recycling decaying wood. This book introduces the reader to all these wonderful species with descriptions, distributions and a bit about their biology. It also includes sections on how to find them, rear them and preserve them, with a glossary of entomological terms included at the end of the book.

Paperback | April 2017 | \$ 49.95
ISBN: 9781486302086 | 256 pages | 215 x 148 mm
Publisher: CSIRO Publishing
Colour photographs, Illustrations



See more at: <http://www.publish.csiro.au/book/7303#features>



*Come celebrate
Queensland
Entomology
at the inaugural
Perkins
Memorial
Dinner
September 12, 2017*

Perkins Memorial Dinner 12 Sept 2017

Every two years the Entomological Society of Queensland holds the Perkins Memorial Lecture when a prominent entomologist is invited to give a lecture on a topical theme of entomology in memory of Athol Perkins who was the first Head of Entomology at the University of Queensland and one of the founders of the Society in 1923.

As the Society approaches its centenary year, Council has decided to initiate a dinner to be held on the evening of each Perkins Lecture day. The inaugural Perkins Dinner will be held in the beautiful function room of the St Lucia Golf Club on September 12 this year.

We invite members to note the date. Final details will be given in the News Bulletin later in the year.

We hope the Dinner will provide an opportunity for Queensland entomologists to meet up in a pleasant social occasion, especially for those who trained or taught at the University of Queensland and who would like to catch up. It will also be a chance to meet with the Perkins lecturer who will be a guest of honour. Come along if you are one of the hundreds of entomologists who have served on ESQ Council over the years and celebrate its ongoing success. We expect to have a roll call of past ESQ Presidents of whom 40 are still living. A new Honorary Life Member will also be inducted and we plan to have a photographic display of past entomologists and student groups. The Convenor of the event is Geoff Monteith (geoff.monteith@bigpond.com) and he would welcome ideas and especially group photographs that can be used in the displays.



Entomological opportunities...

Australian Lepidoptera Research Endowment

Call for grant applications 2017

We are pleased to announce grants of up to \$4500 from the Perpetual Foundation - Australian Lepidoptera Research Endowment (ALRE) for the financial year July 2017 to 2018, and are inviting applications.

Eligibility

Any lepidopterist, amateur or professional, working on the Australian fauna, is eligible to apply for any of the activities considered for support listed on the ALRE website:

<http://www.australianlepidopteraendowment.com/>

To be eligible, grants can only be handled by organisations that hold Australian Taxation Office Deductible Gift Recipient (DGR1) endorsement (covered by Item 1 of the table in section 30-15 of the Income Tax Assessment Act 1997). Further documentation may be requested during the selection process to confirm an organisation's eligibility.

Application

The application form can be found on the ALRE website and should be submitted by 1 April 2017 by email to Marianne.Horak@csiro.au

Selection Process

The applications will be assessed by the Scientific Advisory Committee and a recommendation with applications to be funded from the ALRE will be made to the trustee in May 2017. Successful applicants will be advised by the trustee by 30 June 2017 and the grant will be disbursed to the eligible beneficiary.

For queries please contact Marianne Horak (Marianne.Horak@csiro.au or Tel. 02-6246 4259)

NEW ESQ INITIATIVE! \$2000 Small Grants Scheme

Dear members,

Your Council has been working hard in 2016 to come up with ways to further encourage entomological research and study, especially in our wonderfully diverse state of Queensland!

One of the BIG decisions we've made is the establishment of a 'Small Grants Scheme' that we propose to run annually, starting in 2017. We see this as an excellent way to reinvest Society resources into our membership community, providing support to undertake a project that advances our understanding of the amazing insect world that surrounds us. Projects can be anything related to entomology, including targeted collecting trips, visits to museums or other institutions, ecological, physiological or behavioural studies, or even work that's more applied and in the agricultural or medical fields. It's all up to you and your imagination!

What are the details we hear you ask?

A pro forma is available on the ESQ website, with applications due in to the ESQ Secretary by no later than the 31st of March 2017. Contact the ESQ Secretary, Mark Schutze (m.schutze@qut.edu.au), if you would like a hard copy pro forma posted to you.

The maximum budget for the project is \$2000, with the successful applicant announced by the end of June 2017. Funds will be available from July 2017 and the project is to be undertaken between July 2017 and June 2018. While this grant scheme is open to all ESQ members, both far and wide, we encourage submission of project proposals with a Queensland entomology focus. We also encourage you to consider projects that may be suitable for submission to the *Australian Entomologist* journal, or even a note for the ESQ News Bulletin or presentation at one of ESQ's General Meetings!

It's over to you now, so put your thinking caps on for an exciting entomology project and be sure to submit your application by the end of March! All the best and good luck!

ESQ \$500 Student Awards for 2017

Have you recently finished your Honours degree or will be finishing this year? Is your project entomology related? Submissions for the student awards for 2017 are now being accepted. This is an award given by the society to encourage entomological research. Honours, Diploma and 4th year degree students who received their qualification from any Queensland tertiary education institution in 2015 or 2016 may submit their entomology based thesis or report for consideration. Deadline is 7 April 2017. You don't need to be a member to apply. The winner is announced at the May meeting and is invited to present a summary of their research at the June Notes and Exhibits meeting of the Society.

Crawford Fund Scholarships

The Crawford Fund is an Australian non-profit organisation comprising philanthropists, politicians, scientists and students who are dedicated to a food secure world. Two awards are available exclusively to students from Queensland - one for Honours students, and another for Masters/PhD students, and up to **\$3500** is awarded. If your research has an agricultural slant, then I strongly encourage you to apply for this award.

In addition to these scholarships, the Crawford Fund is introducing the International Training Awards Program, to support targeted training of overseas scientists and extension officers. Grants of up to **\$12,000** are available for short-term training activities including conference/workshop attendance, institute visits, extension or governance/management training. You can find out more about applying for this scholarship here:

[https://
www.crawfordfund.org/
training/state-programs/
qld-committee/](https://www.crawfordfund.org/training/state-programs/qld-committee/)

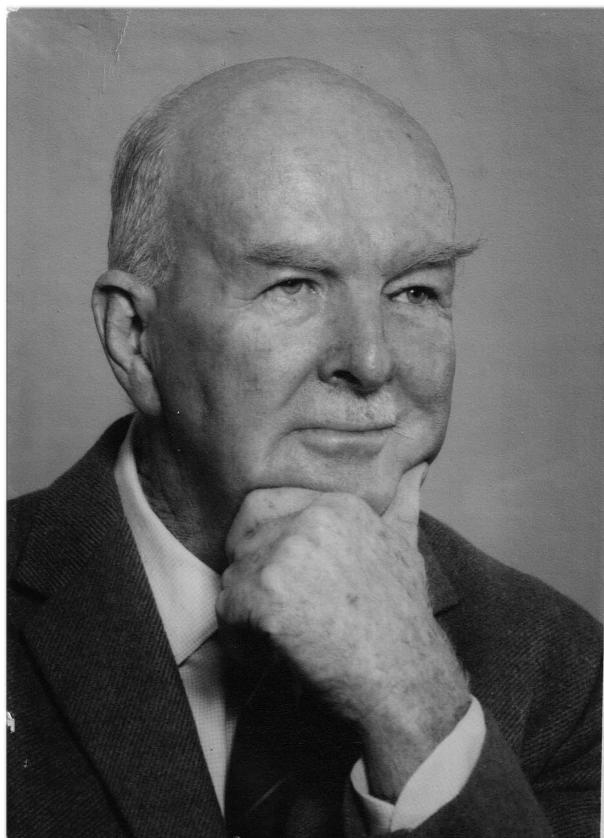
Please feel free to speak to me if you need more information or want to know more about the experience.

Gurion C.K. Ang
PhD Candidate / Graduate
Teaching Assistant
School of Biological Sciences,
University of Queensland



This beautiful gold-adorned shield bug, *Plisthenes australis* (male), occurs in rainforests from the tip of Cape York down to near Innisfail. Adults and their bright red nymphs suck sap from new shoots of trees in the genus *Aglaia* (Meliaceae). It belongs to the tessaratomid subfamily Oncomerinae which has 15 Australian species all restricted to the warmer parts of QLD and NSW. Most have some level of parental care of their eggs and young nymphs but no observations are yet available for *Plisthenes*. Photo by Victoria Mercier at the Daintree Rainforest Observatory.

The History Corner...



Jack MACQUEEN (1900-1986)

Born in Brisbane. A keen naturalist whose interest in Lepidoptera was stimulated by association with family neighbour G.A. Waterhouse in Sydney and later by moth specialist, A.J. Turner, in Brisbane. Farmed near Milmerran from 1922 until retirement to Toowoomba in 1960. Studied Lepidoptera of the diverse but fast disappearing brigalow ecosystem and made many life history discoveries. Also interested in Buprestidae and published on behaviour. Collected often with J.F.R. Kerr from Brisbane and the two pioneered modern butterfly exploration of remote Iron Range during the first post-War visit in 1961. Jack's immaculate collection of 31,000 specimens was donated to ANIC, Canberra, in 1985. His son, Angus, studied entomology at UQ and worked for CSIRO on the dung beetle introduction programme.

Obituary: Common, I.F.B. (1986). *News Bull. Ent.Soc.Qld.* 14:123.

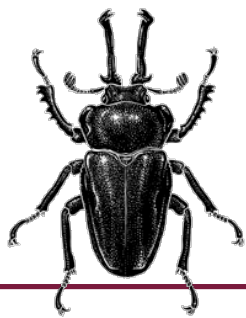
Withdrawal of article from ESQ News Bulletin 44[9]

Following communication from the family of late Bernard d'Abrera, an article written by Mr John Tennent in the last News Bulletin Vol.44[9], pp 201-203, is being withdrawn from publication and the society has apologised to the d'Abrera family.

--the Editor



Images from Wikimedia Commons



Announcements and Notices

Request for *Vanessa itea* and *Hypolimnas missipus* eggs

There are just a couple of species I now need to photograph the early stages of. If anyone has either of these species breeding near where they live could they please contact me. I can give instructions on how to get them to lay in containers. *H. missipus* used to be very common in the sugar cane growing areas when fields were cultivated for re-planting. The pig weed used to spring up before the cane and attract the females for laying. They were most common in the Bundaberg, Mackay and Ayr/Home Hill areas. Now most farmers use pre-emergent herbicides and so the pig weeds no longer grow.

Cheers, Garry Sankowsky
garry.sanko@westnet.com.au

REMINDER: Cricket photos still wanted (but only the 6-legged type!)

Dave Rentz and You Ning Su are putting together a CSIRO Guide to the Australian Crickets and are desperate for photos of crickets from any parts of the Australian continent. [Tasmania, Lord Howe and Norfolk included, of course]. It turns out that crickets are not as photogenic as cockroaches, for example. People just don't seem to take pictures of crickets. As with the cockroach book, any photos that are used will be credited to the photographer and a gratis copy of the book will be sent in appreciation. We have a full year of writing ahead of us so if you see crickets, please take their pictures! Thanks!



Dave Rentz orthopl@tpg.com.au



SESSION THEMES

- Plant-Vector-Pathogen Interactions
- Genomics
- Plant Resistance to Pests and Diseases
- Ecology and Epidemiology
- Pest and Pathogen Diversity
- Diagnostics and Surveillance
- Agrochemicals and Biopesticides
- Novel Methods of Pest and Disease Control
- Integrated Pest and Disease Management
- Soil Health
- Postharvest Protection
- Modelling
- Community and Industry Engagement
- Safeguarding Trade
- Biosecurity Policy
- Education

SAVE THE DATE

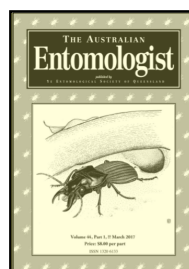
ABSTRACT SUBMISSIONS NOW OPEN

VISIT WEBSITE FOR FURTHER DETAILS

@sciplant17
www.sciplant2017.com.au

Conference partners
 

26-28 SEPTEMBER 2017
 BRISBANE, AUSTRALIA

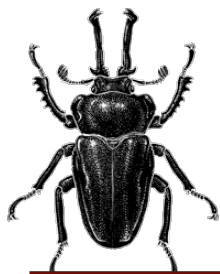


An invitation to subscribe

"The Australian Entomologist":

A quarterly scientific journal devoted to entomology of the Australian-Pacific Region. This journal was commenced in Sydney in 1974 by Max Moulds and is now published by the Entomological Society of Queensland. It is one of the leading outlets for research on native insects in Australia and adjacent areas. For subscription forms and price list for 2017 visit our website:

<http://www.esq.org.au/publications.html>



Diary Dates for 2017

Meetings held on the second Tuesday
of the respective month

MARCH 14	Bradley Brown	AGM and Presidential Address: “ <i>Exploration in biological control - a US perspective</i> ”
APRIL 11	Graeme Smith	“ <i>Silverfish - Who cares?!</i> ”
MAY 9	Mike Muller & Martin Shivas	“ <i>Mosquito management in Brisbane</i> ”
JUNE 13	Notes and Exhibits	Student Award Presentation/ Notes & Exhibits
AUGUST 8	Paul Ebert	<i>Topic: Stored product insect management</i>
SEPTEMBER 12	Perkins Memorial Lecture: Madeline Beekman	<i>Topic: Insects as model systems</i>
OCTOBER 11	Roger Kitching	“ <i>New molecular tools for gut content analysis</i> ”
NOVEMBER 14	Jon Marshall	<i>Topic: Aquatic insects</i>
DECEMBER 12	Notes & Exhibits	Notes and Exhibits/Christmas Afternoon Tea

SOCIETY SUBSCRIPTION RATES

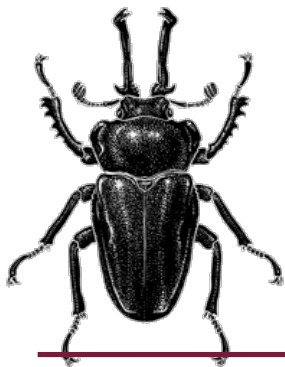
GENERAL	Person who has full membership privileges	\$30pa
JOINT	Residents in the same household who share a copy of the <i>News Bulletin</i> , but each otherwise have full membership privileges.	\$36pa
STUDENT	Student membership conveys full membership privileges at a reduced rate. Students and others at the discretion of the Society Council.	\$18pa

ESQ membership subscriptions should be sent to the Treasurer, PO Box 537, Indooroopilly, QLD 4068
<http://www.esq.org.au/membership.html>

THE AUSTRALIAN ENTOMOLOGIST SUBSCRIPTION RATES

AUSTRALIA	Individuals/Institutions	AU\$33pa/AU\$37pa
ASIA/PACIFIC	Individuals/Institutions	AU\$40pa/AU\$45pa
ELSEWHERE	Individuals/Institutions	AU\$45pa/AU\$50pa
ELECTRONIC	Individuals/Institutions	AU\$25pa/AU\$30pa

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<http://www.esq.org.au/publications.html>



Entomological Society of Queensland



Notice of next meeting:

Tuesday, April 11th, 2017, 1:00 pm



Graeme Smith

Honorary Research Associate

Australian Museum

will present:

Silverfish - who cares!

All welcome! Join us after the meeting for tea and coffee.

Ground floor Seminar Room, Ecosciences Precinct, Boggo Road, DUTTON PARK

More venue details available at <http://www.esq.org.au/events.html>

Next News Bulletin:

Volume 45, Issue 2 (April 2017)

CONTRIBUTIONS WELCOME

Deadline Wednesday, April 19th, 2017.

Send your news/stories/notices to the editor at: k.ebert@uq.edu.au