Entomological Society of Queensland

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Entomological Society of Queensland

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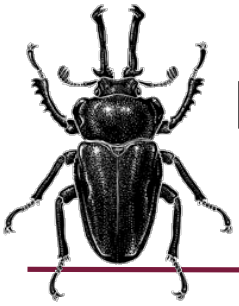
Front Cover: A photograph of the saltmarsh mosquito, *Aedes vigilax*. This species is found in coastal saltmarshes and mangroves from the south coast of New South Wales north around the continent and down to the southwest corner of Western Australia, and in the Riverland and Adelaide region of South Australia. Its drought-resistant eggs are laid in the margins of temporary pools that are flooded by peak tides or rain events. On subsequent inundation, these eggs can hatch simultaneously in millions, taking as little as 7-8 days to develop into adults. The adult mosquitoes are renowned for their capacity to disperse over many kilometres. This makes them the worst pest species in coastal Queensland, where the larvae are the target of aerial spraying programs by councils from the Gold Coast to Noosa. *Photo by Stephen Doggett, Department of Medical Entomology, NSW Health Pathology, Westmead Hospital. Used with permission.*

ISSN 1037-2989



Entomological Society of Queensland

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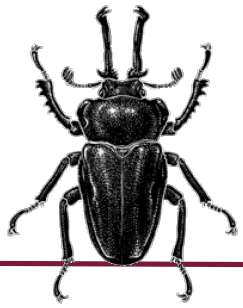
The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News 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. Emblem illustration by Sybil Curtis.



Entomological Society of Queensland
Minutes for General Meeting

Tuesday, August 14th, 2018
Held in the Seminar Rooms, Ecosciences Precinct, Boggo Rd, Dutton Park.
Meeting open: 1:05 pm

Attendance (58):

Members (41): Mark Schutze, Susan Wright, Chris Lambkin, Des Foley, Colleen Foelz, Vivian Sandoval, Justin Bartlett, Shannon Close, Kerri Moore, Matt Purcell, Christine Goosem, John Neldner, Don Sands, Richard Bull, Ian Buddle, Michael Jeffries, Penny Mills, Lyn Cook, Graham Forbes, Luke Barnett, Lance Maddock, Greg Daglish, Andrew Maynard, Liam Bromley, Ross Kendall, David Exton, Lachlan Jones, Andrew Wang, Richard Zietek, Austin McLennan, Geoff Monteith, Nadine Baldwin, Robert Raven, Jessa Thurman, Harriet Clark, Kathy Ebert, Bradley Brown, Rachel Whitlock, Owen Seeman, Cathy Neelaraju, Mike Muller

Visitors (17): Katie Hiller, Christine Horlock, Elizabeth Williams, Tobias Bickel, Belinda Walters, Brad Mayger, Nicole Forrest, Chen Wu, Lynne Griffin, Lara Senior, Marianne Eelkema, David Hessey, Ethan Briggs, Matt Elmer, Judy Rix, Alan Rix, Janine Rix.

Minutes: The minutes of the last meeting were circulated in News Bulletin 46[4] June/July 2018. Moved the minutes be accepted as a true record: Mark Schutze; Seconded: Geoff Monteith; Carried: All.

Nominations for membership approved by council:

General Members:

1. Stuart Harris
2. Robert Hewson

Student Members:

1. Braxton Jones (Macquarie Univ.)
2. Marlene Walter (HNE Eberswalde, Germany)
3. Alexander Davies (Ambrose Treacy College, Indooroopilly)

General Business:
Chris Lambkin reminded members to contact her with regards to collecting permits.

Don Sands requested a note be placed in the Bulletin with respect to the collection of threatened species, which is not covered under the standard ESQ collection permits; Kathy Ebert nominated Don to supply something for the next Bulletin.

Main Business:
Presentation: *Life down under: evolution and conservation of Australia's trap door spiders"* presented by Mike Rix.

Chris Lambkin provided the vote of thanks.

Next meeting: 11th of September: *"Zika Mozzie Seeker – exploring Citizen Science as a tool to monitor invasive and urban mosquitoes"* presented by Brian Montgomery.

Meeting closed: 14:10

This month's meeting was well attended with everyone eager to learn about trapdoor spiders! (Photo: K. Ebert).

At our next meeting...

"Zika Mozzie Seeker – exploring Citizen Science as a tool to monitor invasive and urban mosquitoes"

presented by
Brian Montgomery
Advanced Medical Entomologist
Metro South Health, Queensland Health

Zika has emerged as a global disease, with outbreaks driven by the bite from infectious mosquito vector species, particularly *Aedes aegypti* and *Aedes albopictus*. Queensland hosts both of these invasive species, but neither are thought to be established in the populous region of South East Queensland. Ideally, invasions should be detected and eradicated before there is any risk of disease transmission. Contemporaneous and systematic surveillance programs are logistically challenging for health authorities because adult mosquitoes typically do not disperse far (500m) from a wide variety of water-bearing containers that provide 'breeding sites'. However, adult mosquitoes are being detected in airports and immature stages are spreading globally in freight. Relying on a notification of Zika disease as the trigger for detecting an invasion by vector species is unsatisfactory because delays in detection risk larger cryptic outbreaks. Many adult cases will be asymptomatic, risking severe congenital abnormalities that manifest as microcephaly.

So how do you find a focalised mosquito species, potentially hidden within vast tracts of suburbia? Citizen science holds the key to unlocking potentially very large surveillance networks. In this seminar we examine the Zika Mozzie Seeker project, where the Metro South communities (Brisbane south, Redland, Logan and parts of Scenic Rim councils) were invited to conduct Do-It-Yourself egg trapping (ovitraps) to link them to a world-first methodology developed by Queensland Health to screen large numbers of local species for traces of genetic material from *Ae. aegypti*. Each contribution is important and results are fed back to the participant once the all clear is given for all diagnostic tests via SMS texts and egg abundance 'heat maps' on the website. Zika Mozzie Seeker can empower communities and individuals by increasing public awareness of the risks of exotic invasion and mosquito-borne disease, and by helping to instill preventative behaviours.

About Brian:
Brian completed a Master of Science (Research) at the University of Queensland and during his career has been exposed to a broad spectrum of medical entomology issues for 26 years in the Northern Territory, north Queensland and Brisbane. Highlights have included involvement in various roles to successfully eradicate some 30 dengue outbreaks, innovation of tools to improve vector mosquito surveillance programs, and supervision of operational elements of the first field trials for the Eliminate Dengue *Wolbachia* program.

His current challenge is helping south east Queensland prepare for invasion by *Aedes* mosquitoes (*Aedes aegypti* and/or *Ae. albopictus*). This involves the development of Zika Mozzie Seeker, a partnership between the community and Metro South Health that synchronises DIY mosquito ovitrapping by large numbers of citizen scientists to expedite presence-absence *Ae. aegypti* surveys.

Tuesday 11 September at 1 pm

Seminar Room at EcoSciences. Tea & coffee following.
All welcome!

Feature article

Life Down Under: evolution and conservation of Australia's trapdoor spiders

Presented by
Dr Mike Rix
ABRS Research Fellow and
Acting Head of the Biodiversity & Geosciences Program
Queensland Museum

Trapdoor spiders and their kin (infraorder Mygalomorphae) are a major component of the Australasian ground-dwelling spider fauna, increasingly renowned for their longevity, cryptic fossorial life history, biogeography and conservation significance. Australia itself is home to over 400 described species in 10 families (Fig. 1), although numerous undescribed species await taxonomic description. Recent collaborative research since 2012, focusing on the 'spiny trapdoor spiders' of the Gondwanan family Idiopidae, has revealed a remarkably diverse and highly endemic fauna. This work has provided important insights into the phylogeny, biogeography and taxonomy of Australia's trapdoor spiders, and the conservation challenges faced by some species.

Mygalomorph spiders include some of Australia's most iconic arachnids, including the highly venomous and biomedically-significant funnel-web spiders (family Atracidae) of eastern Australia, the large and popular tarantulas (family Theraphosidae) of inland and tropical regions, and the distinctive mouse spiders (family Actinopodidae) which can sometimes be found commonly in semi-urban environments (Fig. 1). Mygalomorph spiders have a fairly conservative morphology by spider standards, and the group is unambiguously monophyletic; all species have the symplesiomorphic four pairs of respiratory book lungs, downward striking chelicerae and distinctive spinnerets at the end of the abdomen. In Australia the vast majority of species are fossorial and none are cursorial hunters, although a number of taxa build burrows or retreats on or in tree bark. With few exceptions they are nocturnal sit-and-wait ambush predators, characterised by relatively limited dispersal abilities as both juveniles and adults, and extreme longevity relative to other spiders. Males are usually strongly sexually dimorphic, possessing modified pedipalps for sperm transfer (as do all spiders) and longer legs for wandering during the mating season. Their deep evolutionary history, low vagility, long generation times, often limited inter-population gene flow, strong genetic structure within and between populations, high habitat or substrate specificity, and generally high species turnover across landscapes make mygalomorph spiders eminently suited to evolutionary and biogeographic research.

Over six years of dedicated research on spiny trapdoor spiders of the family Idiopidae has highlighted a number of central themes underlying our understanding of mygalomorph spider evolution and biogeography in an Australian context. One of the most obvious themes, in line with numerous studies on other vertebrate and invertebrate taxa, is: (i) the presence of old endemic lineages in the

Figure 1: Four iconic Australian mygalomorph spider lineages: top-left, funnel-web spider (*Hadronyche versuta*), image by M. Rix; top-right, tarantula (family Theraphosidae), image by M. Rix; bottom-left, mouse spider (*Missulena* sp.), image by J. Wilson; bottom-right, spiny trapdoor spider (*Euoplos* sp.), image by M. Rix.

eastern mesic zone; and (ii) the allopatric distributions of included species in mesic refuges (e.g. upland rainforests) separated by more xeric inter-zones. There are a number of trapdoor spider genera in Australia that are characteristic of the eastern rainforests, including at least four species which have extraordinary 'palisade' burrows (Fig. 2). One of these, a highly restricted and soon to be described new species from south-eastern Queensland, has an extraordinary crenate burrow lid morphology – among the most remarkable built by any spider (Fig. 2). This species, being worked on by Griffith University Ph.D. student Jeremy Wilson (see Wilson et al., 2018), is evidence of just how much remains to be discovered in our precious rainforest habitats.

Another major theme in trapdoor spider research, and indeed something of a central tenet for Australian biogeography more generally, is the recognition that within old endemic lineages, a number of phylogenetically derived groups have managed to radiate into the central arid zone since the Miocene. Idiopid trapdoor spiders are an old element of the fauna, having been in temperate Australia since the continent was still attached to Antarctica. However, lineages within at least seven

Figure 2: Palisade trapdoor spider burrows of a new species of *Euoplos* (family Idiopidae) from rainforest in south-eastern Queensland. Note the extraordinary crenate morphology of the burrow lids. Image by J. Wilson.

genera have independently moved into arid zone habitats across Australia, including species of *Gaius* and *Idiosoma* (Fig. 3).

A third theme is the observation that trapdoor spiders in multiple families are extremely diverse in more transitional (semi-arid) habitats, situated between the mesic zone and the inland arid zone. This is best exemplified by the idiopid genus *Bungulla*, which is remarkably diverse in the Southern Carnarvon Basin (SCB) of Western Australia. The SCB is a stunning region south of Shark Bay, and is home to at least 12 endemic species of *Bungulla*. It seems as though a diversity of species-group lineages within *Bungulla*, and a wide variety of habitats and substrates in the region, creates a landscape in which numerous species can occur together (or nearly so). This situation is replicated in places like the Wheatbelt of Western Australia and parts of southern South Australia, where a suite of genera and a diverse assemblage of species can be found in remnant woodland habitats.

Finally, research on trapdoor spiders in Australia and around the world has revealed the conservation significance of these organisms. One Australian species–*Idiosoma nigrum* (the 'shield-backed trapdoor spider'; Fig 4) – is currently listed as threatened under both the Commonwealth and Western Australian State threatened species lists, and was recently upgraded from vulnerable to endangered. Two other species of *Idiosoma* are also listed as endangered in Western Australia, and a large number of other species across the country are likely also threatened. The reasons for this are manifold, but include land clearing, stocking, dryland salinity and feral species (see summary in Rix et al., 2017). The major threatening syndrome for species restricted to the temperate agricultural and arid zones is gradual decline among already isolated populations, and eventual local extinction. When this scenario is played out across heavily cleared or heavily modified landscapes, and species already have naturally small (short-range endemic) distributions, the outlook for certain species is grim. How we actually address conservation issues in Australian mygalomorph spiders is an important issue for invertebrate conservation more generally, and a number of integrative solutions have been proposed (see Rix et al., 2017).

For now, taxonomic documentation of Australia's mygalomorph fauna is a key priority, and a focus of ongoing research. Numerous new species remain to be described, and it is our hope that once we have a better handle on actual diversity and patterns of distribution, conservation recommendations can be developed.

References

Rix, M.G., Huey, J.A., Main, B.Y., Waldock, J.M., Harrison, S.E., Comer, S., Austin, A.D., and Harvey, M.S. 2017. Where have all the spiders gone? Highlighting the decline of a poorly known invertebrate fauna in the agricultural and arid zones of southern Australia. *Austral Entomology* **56**: 14–22.

Wilson, J.D., Rix, M.G., Raven, R.J., Schmidt, D.J., and Hughes, J.M. 2018. Systematics of the palisade trapdoor spiders (*Euoplos*) of south-eastern Queensland (Araneae: Mygalomorphae: Idiopidae): four new species distinguished by their burrow entrance architecture. *Invertebrate Systematics* **in press**.

Figure 3: Idiopid trapdoor spiders characteristic of the arid zone: *Gaius villosus* (left) and a new species of *Idiosoma* (right), with their burrows shown beneath. Images by M. Harvey (left) and M. Rix (right).

Figure 4: Female (left) and burrow (right) of the shield-backed trapdoor spider (*Idiosoma nigrum*) from the Wheatbelt of Western Australia. This species is currently listed as endangered, having suffered severe contemporary population declines. Images by M. Harvey.

Entomology News

from Queensland and beyond...

Queensland Museum Medal awarded to Robert Raven

Mike Rix (above left) with Robert Raven at the award presentation evening. Left: close-up of the Queensland Museum medal.

At a gala function in the upper gallery of the Queensland Museum on the evening of 16 August, Dr Robert Raven, long-time Curator of Arachnology and currently Head of Terrestrial Invertebrates, was awarded the Queensland Museum Medal. The medal is awarded periodically to an individual who has made an outstanding contribution to disciplines within the gambit of the Museum. On the evening, fellow QM arachnologist Michael Rix, once Robert's work experience student, then protégé, and now temporarily his boss as Acting Head of Biodiversity and Geosciences at the Museum, walked the audience through Robert's career. Robert started at the Museum as assistant to the former arachnology curator, Dr Valerie Davies, back in 1974. After completing his PhD at University of Queensland, he went on to postdocs at Australian National Insect Collection in Canberra, and at the American Museum of Natural History in New York, which culminated in a landmark publication restructuring of the classification of the mygalomorph spiders on a global scale. As Curator of Arachnology at the Museum he has built the collection to one of international importance, published prodigiously, run many public education activities on arachnids, been a media star, and built the largest research group on arachnids in Australia.

Well done, Robert!

New bee fly species named for Game of Thrones

A new genus and species of an unusual bee fly (Diptera: Bombyliidae) has been described from Western Australia. Specimens have only ever been collected in winter from a restricted area in the SW. Xuankun Li and David Yeates have named the new bee fly *Paramonovius nightking*. The generic name is a tribute to Dr Sergey Paramonov, a Ukrainian-Australian dipterist who worked in Australia from 1947 and described about 700 species. The species name comes from the Night King from the Game of Thrones series because it is covered in thick frosty-looking grey hairs! The details are published in the latest *Austral Entomology* journal.

Insect Paintings on council traffic control boxes

Driving around Brisbane you'll see lots of bright paintings on the control boxes that stand on the footpaths at each set of traffic lights. These are all part of a public art initiative by local councils, started by the Brisbane City Council but now spreading to other local government areas. The program is coordinated by Urban Smart Projects and you can see all 2890 painted boxes on their website at https://www.urbansmartprojects.com/gallery, together with details of the artist and subject matter for each one.

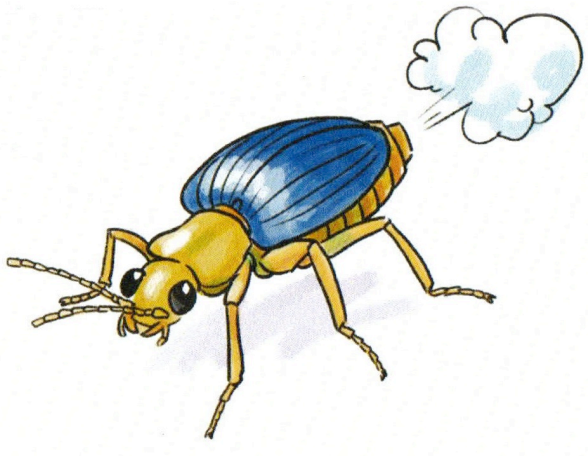
Georgina Ellett painting her traffic control box at the corner of Schonell Drive and Gailey Road at Toowong.

Insect images are moderately popular and we've reproduced some of these over the years. Our roving reporter came upon Georgina Ellett painting her new one entitled "Bee the Cure", at the Toowong end of Schonell Drive near the University of Queensland in July and it prompts us to reproduce a few more of the more recent ones with insect designs. If you'd like to get a team together to paint your local box with an insect design you can find out how to do it at https://www.brisbane.qld.gov.au/facilities-recreation/arts-culture/public-art/street-art/art-traffic-signal-boxes-artforce The Brisbane City Council provides the paint (and the hi-viz vests) if your proposal gets off the ground!

"Bee Haven', a box painted by Mieke van den Berg at the corner of Farrell and Fleming Roads at Yandina.

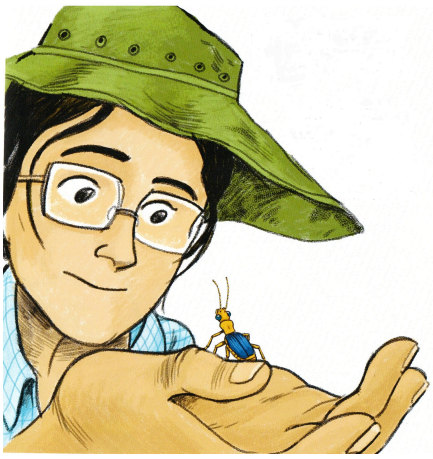
A box of real local butterflies painted by Alicia Lane at the corner of Vulture and Edmonstone Streets, South Brisbane.

Looking for a good insect book for the kids??



The National Science Foundation in the US has funded a book for kids called "Bombo's Big Question" about the adventures of a bombardier beetle called 'Bombo'. It tells a delightful pro-science and pro-evolution story about how little Bombo finds out that she has superpowers to defend herself from would-be predators. She sets out on a journey to find the answer about where she got these powers, and eventually encounters a young entomologist who explains it all to her.

The book is authored by Kipling Will, Professor of Entomology and Director of the Essig Museum at Berkeley University in California. Kip works extensively on Australian carabids and has had a number of field trips to Australia. The wonderful illustrations are by another coleopterist, Ainsley Seago, who was a student of Kip's and is now the collection manager of the NSW Agriculture Department's insect collection at Orange, west of Sydney. It is a pleasure to see insects drawn morphologically correct, with legs attached to the right part of the body and even with coxae and trochanters in place!



In deference to the entomologists who have investigated the amazing structure and chemistry behind little Bombo's magical ability, the book also has cartoon profiles of 18 global entomologists who have studied bombardier beetles over the years.

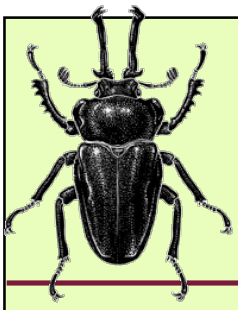
The good news is that the book is available free to download in pdf or e-book format. Go to the following site to read more from Kip about the book and get the links for downloads: https://pterostichini.wordpress.com/2018/05/02/bombos-big-question/

It is also available very cheaply in hardcopy from Amazon and the link for that is also given, but be warned that Amazon may not deliver goods to Australia while the dispute about import taxes is current.

Head lost in love

" A mating pair of mantids (*Hierodula majuscula* (Tindale, 1923)) photographed in my garden in the Daintree on the 25th of June. It shows the hazards facing a male! Although he is successfully transmitting his genes he has lost his head and prothorax in the process to a fat female that is 'licking her lips' in anticipation of the rest of the body. Unlike many insects, male mantids may only get one fatal chance to reproduce."

--Roger Farrow



S-t-r-e-t-c-h your Ento knowledge

Answer to last month's mystery photo:

The mystery photo showed the abdomen of a moth, *Amata bicolor* (Walker, 1854), photographed by David Rentz in north Queensland. Congratulations to John Neilson, Allen Sundholm and Peter Hendry for guessing correctly!

These are commonly called tiger moths and are currently placed in the Family Erebidae, subfamily Arctiinae. Many of the moths in this group are brightly coloured, and thought to be distasteful to predators. There are many species of *Amata* that all look very similar. It is thought that they are wasp mimics and are part of mimicry ring with many species mimicking each other.

The Arctiinae also have sound producing organs on the side of their thorax which make clicking sounds to deter bats. In some species, the sounds produced are thought to be a form of acoustic aposematism, in others, it appears to be a bat sonar jamming signal.

Read more:

Corcoran AJ, Conner WE, Barber JR. 2010. Anti-bat tiger moth sounds: form and function. *Current Zoology* 56(3): 358-369.

This month's mystery photo:

Any guesses?

If you think you know what it is, send me an email!

--the Editor

Word of the month:

epigeal: adj. (Greek, epi = upon+ ge =earth): living on or foraging upon the surface. Thanks to Dr Brenton Peters who shared the photo above of a termite mound in a Jindalee garden which perfectly illustrates the **epigeal** lifestyle!

Definition from:
Gordh G & Headrick D. 2011.
A dictionary of entomology. CSIRO Publishing.

Have you got a photo to share for the mystery photo challenge?

Announcements

For Sale

A collection of 25 cases of set and pinned Butterflies, Moths and Beetles. Many specimens are from the original collection of The Butterfly Man of Kuranda, Frederick Parkhurst Dodd and his son, Alan Parkhurst Dodd. This collection was put together with "spares" from the original collection plus specimens from other sources and re-organised into these cases by members of the Dodd family. Cases are for sale individually or as a complete collection. Also available are two, of the original three, trunks the FP Dodd collection toured in from 1918 to 1924 and were afterwards used to store the collection. In addition there is an original net (handle and hoop in good condition, net itself damaged). Enquiries to Anne Thorpe 0438108113 or anne.thorpe@yahoo.com.au.

PhD projects available

University of Canterbury, School of Forestry, Christchurch, New Zealand

PhD scholarships are available in three project areas:

Insect-Plant interactions: selecting pest tolerant eucalyptus varieties for New Zealand forestry

Eucalyptus pest biological control: Host preference and biocontrol of variegated tortoise beetle in New Zealand eucalypt forestry

Insect conservation: Conservation management of threatened New Zealand insects

Details from Dr Tara Murray:

https://www.findaphd.com/search/projectDetails.aspx?PJID=98954
https://www.findaphd.com/search/projectDetails.aspx?PJID=98953
https://www.findaphd.com/search/projectDetails.aspx?PJID=98952

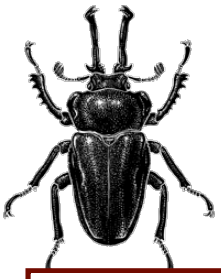
UQ Insect Science field trip

Once again this year the UQ insect science class will have a field trip to Gold Creek Reservoir at the end of Gold Creek Road in Brookfield on Saturday the 6th of October from 10am. We will be using the Moggill Creek Catchment Group's cottage on site as our base. ESQ members are welcomed and encouraged to join us to share your knowledge and expertise with these enthusiastic students.

This is also a great chance for other students and interested families to come along and learn about insects and collecting.

If you are interested in attending, please contact Kathy Ebert at k.ebert@uq.edu.au

For more information about the area see: http://www.moggillcreek.org



Diary Dates for 2018

Meetings held on the second Tuesday of the respective month

MARCH 13	Tim Heard	AGM and Presidential Address: "*Stingless Bees, their journey from obscurity to insect ambassadors"*
APRIL 10	Andy Walker	*"Exploring the world of insect venoms"*
MAY 8	Brendan Trewin	*"The history of* Aedes aegypti *in Southeast Queensland and novel techniques for its surveillance and control."*
JUNE 13	Notes and Exhibits	Notes & Exhibits
AUGUST 14	Mike Rix	*"Life down under: evolution and conservation of Australia's trap door spiders"*
SEPTEMBER 11	Brian Montgomery	*"Zika Mozzie Seeker - exploring Citizen Science as a tool to monitor invasive and urban mosquitoes"*
OCTOBER 9	Irene Terry	*"Wacky world of cycads: Thermogenesis, volatiles and pollinator interactions"*
NOVEMBER 13	John Neilson	*Quarantine entomology - topic to be announced*
DECEMBER 11	Notes & Exhibits	Notes and Exhibits/Christmas Afternoon Tea

SOCIETY SUBSCRIPTION RATES

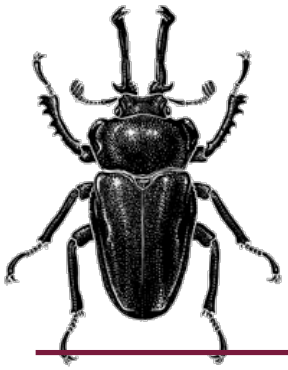
GENERAL	Person who has full membership privileges	**$30pa**
JOINT	Residents in the same household who share a copy of the *News Bulletin*, but each otherwise have full membership privileges.	**$36pa**
STUDENT	Student membership conveys full membership privileges at a reduced rate. **Free the first year**, $18pa subsequent years. 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**

Journal subscriptions should be sent to the Business Manager, PO Box 537, Indooroopilly QLD 4068
http://www.esq.org.au/publications.html



Entomological Society of Queensland

Notice of next meeting:

Tuesday, September 11th, 2018, 1:00 pm

Brian Montgomery

Advanced Medical Entomologist
Metro South Health
Queensland Health

presenting:

"Zika Mozzie Seeker - exploring Citizen Science as a tool to monitor invasive and urban mosquitoes"

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 46, Issue 6 (September 2018)

CONTRIBUTIONS WELCOME

Deadline Tuesday, 18 September 2018.

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