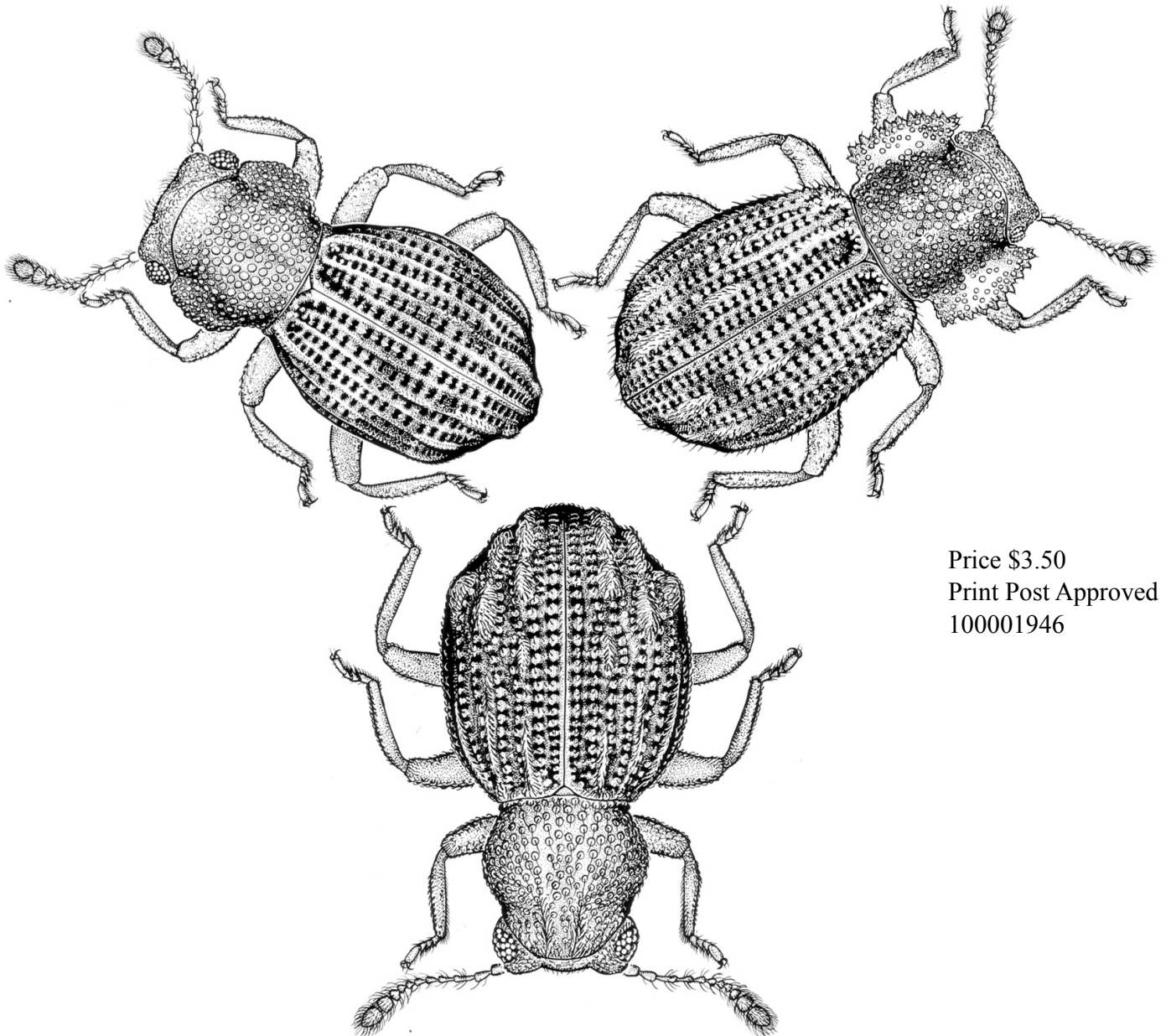


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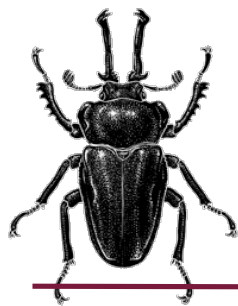
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Front Cover Illustration: Three species of recently revised *Enhypon* beetles (Zopheridae). Clockwise from top left: *E. cordicollis* Turco & Ślipiński, *E. costatum* (Carter) and *E. laticeps* Carter. The genus is an Australian endemic with a hotspot of diversity in Tasmanian forests. These are small cryptic beetles inhabiting forest leaf litter and moss, where they conceal themselves by encrusting a thin layer of dirt over their bodies. The beautiful illustrations are by Sybil Curtis when she was employed as an artist by CSIRO.

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Entomological Society of Queensland

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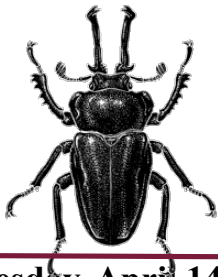
The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News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

Tuesday, April 14, 2015

Held in the Library, Ecosciences Precinct,
Boggo Rd, Dutton Park at 1pm

Attendance (31): Justin Bartlett, Bradley Brown, Mike Barnett, Justin Cappadonna, Gary Cochrane, Lyn Cook, Kara Dal-Cin, Kathy Ebert, Des Foley, Alexandra Glauert, Rosie Godwin, Manon Griffiths, Andrew Hayes, David Hughes, Andrew Hulthen, Peter James, Michael Jeffries, Diana Leemon, Lance Maddock, Penny Mills, Sakuntala Muthuthantri, Peter Osborne, Bill Palmer, Cate Paull, Brenton Peters, Don Sands, Nancy Schellhorn, Helen Schwenke, Geoff Thompson, Desley Tree, Richard Zietek

Visitors (5): Brogan Amos, Shannon Close, Michael Galloway, Laura Jones, John McKeown, Steven Rice,

Apologies: Julianne Farrell, Susan House, Judy King, Chris Lambkin, Morris McKee, John Moss

Minutes: The minutes of the last meeting were circulated in News Bulletin 43[1] March 2015.

Moved the minutes be accepted as a true record: Geoff Monteith

Seconded: Cate Paull *Carried:* all

Nominations for membership:

The following nominations for membership were approved by council:

General memberships:

1. Mr Robert Hewson, *Nominated by:* Federica Turco, *Seconded:* Kathy Ebert

Student memberships:

2. Mr Perry Bennion, *Nominated by* Kathy Ebert, *Seconded:* Federica Turco

3. Ms Shannon Close,
Nominated by: David Merritt,
Seconded: Kathy Ebert

General Business:

1. Five entries have been received for the Student Award this year. The winner will be announced at our next meeting.

2. Unfortunately, Michelle Gleeson was unable to attend, so Geoff Monteith kindly stepped in to present a lecture on native dung beetles.

Main Business:

Federica Turco introduced Geoff and his presentation on “*Native Australian Dung Beetles.*” (see page 24 for the transcript of the talk).

Don Sands gave a vote of thanks.

Next meeting: May 12th at 1pm with Penny Mills and Paul Lin from the University of Queensland. This meeting will be held in the library.

Meeting closed: 2:05pm



Lydda elongata (Fabricius), a leafhopper in the Family Derbidae, feeding on *Pandanus* near Mareeba, Queensland, April 2015. Photo: D.Rentz.

At our next meeting...

Two presentations from Dr Lyn Cook's lab at the University of Queensland

The triptych of asexuality, chastity and cryptic diversity in *Parasaissetia nigra* (Nietner, 1861)

presented by Yen-Po (Paul) Lin^{1,2}

¹College of Life Science, Shanxi University, Taiyuan, Shanxi, China

²School of Biological Sciences, The University of Queensland, Brisbane, QLD, Australia

The maintenance of sex has been dubbed “the queen of questions in evolutionary biology”. Though the cost of sex is profound (disease, death, slower reproduction), most eukaryotes reproduce sexually and this might be because it can bring together advantageous loci and remove deleterious alleles. Conversely, asexuality is uncommon in eukaryotes: deemed a ticket to swift extinction or an evolutionary dead-end. This might be evidenced by many asexual lineages being narrowly distributed and by ancient asexuality being rare. However, some scale insects reproduce asexually and are among the worst invasive pests worldwide. *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae) provides an excellent example of this. It is extremely polyphagous and can feed on more than 90 plant families. In addition, previous morphological work on this species has suggested that it might be a cryptic species complex. Here, we try to estimate the age of the lineage and assess the species status of *P. nigra* using DNA sequences from multiple gene regions and different analyses. We also attempt to confirm whether this scale insect has been chaste for a long evolutionary time period, in contrast to some commonly recognised parthenogenetic organisms that have been shown to have infrequent sex. Our results raise questions about how organisms such as *P. nigra* survive without sex, and have important implications for how this pest species should be considered for quarantine purposes.

The *Apiomorpha minor* species group (Hemiptera: Coccoidea: Eriococcidae)

presented by Penelope Mills

School of Biological Sciences, The University of Queensland, Brisbane, QLD, Australia

Australia is home to the most species of gall-inducing scale insects, including the genus *Apiomorpha*. It currently has 42 described species and all induce galls on the well-known and widespread plant genus *Eucalyptus*.

Apiomorpha is one of the most chromosomally diverse of all the animal genera, with chromosome counts ranging from $2n=4$ to 192. This unusual chromosome variation in conjunction with a seemingly lack of morphological characters makes the genus a good case study to investigate questions relating to codiversification, evolution and speciation.

I was first introduced to *Apiomorpha* by my primary supervisor, Lyn Cook, during my undergraduate degree at the University of Queensland, and have worked on the genus ever since. My main focus has been on the *A. minor* species group, which currently has four described species. However, chromosomal variation, host-use specificity and DNA sequences have shown that there are at least nine undescribed species in the species group.

I have also been revisiting the morphology of the *A. minor* species group to see whether there are morphological characters that can be used to differentiate species along with the molecular, karyological and host use data.



May 12th at 1pm
in the Library at EcoSciences Precinct
All welcome!!

AUSTRALIAN NATIVE DUNG BEETLES



*Geoff Monteith
Queensland Museum*

During the 1970s and 1980s, CSIRO ran a well publicised campaign to introduce African dung beetles to Australia to bury and disperse cattle dung. This was done as a means of returning dung nutrients to the soil and breaking the breeding cycle of deleterious organisms such as biting flies, bush flies and intestinal cattle parasites which breed or disperse via unburied cattle dung. More than 40 foreign dung beetle species were released and, of these, 23 species established permanently, covering most of mainland Australia.

Many people, and especially the public, got the idea that this introduction program was undertaken because there were few or no native dung beetles in Australia. This is far from the truth and we know of almost 500 species that are native to Australia. But these native dung beetles evolved on a dry continent where the principal dung source was the dry, hard pellets of marsupial dung and they couldn't deal with the large wet, squishy piles of dung which cattle produce. Having been raised on a dairy farm, I know how they felt!

SIZE OF THE FAUNA

Early in the introduction program, CSIRO realised that the native dung beetles were poorly known, no one having worked on them thoroughly for more than 50 years. A brilliant young American coleopterist, Eric Matthews,



fresh from completing a PhD on dung beetles of Puerto Rico, was engaged to review the Australia fauna. He did extensive field work, right around the continent, and eventually published a series of three user-friendly monographs revising the whole Scarabaeinae fauna (Matthews 1972, 1974, 1976) with many new genera and species. To Australia's immense benefit, Eric stayed on in Australia at the South Australia Museum and is still busily working there long after retirement, though tenebrionid beetles became his main focus.

Eric's monographs brought the known Australia native fauna to 284 species. Since then, papers by Eric himself, Zdzislawa Stebnicka (Poland), Chris Reid (Aust. Mus.), Tom Weir (ANIC), the late Ross Storey (Qld DPI) and myself (Qld Mus.) have described another 62 species bringing the described fauna to 346 species. We know of many additional species which still have not been

named. To bring uniformity to the way these undescribed species were dealt with in the different museum collections in Australia, Tom Weir and I devised a code name system (e.g. *Onthophagus NQ23*) for them which is now used widely. We currently recognise 128 undescribed species in collections and these bring the total known Australian fauna to 474 species (and counting!) These statistics, broken down by genera, are shown in Table 1.

AUSTRALIAN TRIBES AND GENERA OF NATIVE DUNG BEETLES	NUMBER OF SPECIES. (named+un-named)	
	1976	2015
CANTHONINI		
<i>Amphistomus</i>	18	18+8
<i>Aptenocanthon</i>	2	8
<i>Aulacopris</i>	3	3
<i>Boletoscapter</i>	2	2
<i>Canthonosoma</i>	3	3+1
<i>Cephalodesmius</i>	3	3+1
<i>Coproecus</i>	1	1+1
<i>Diorygopyx</i>	8	8
<i>Labroma</i>	3	3
<i>Lepanus</i>	18	25+59
<i>Mentophilus</i>	2	2
<i>Monoplistes</i>	6	6+2
<i>Pseudignambia</i>	2	2+18
<i>Sauvagesinella</i>	3	3
<i>Temnoplectron</i>	11	16
<i>Tesserodon</i>	8	13
DICHOTOMINI		
<i>Coptodactyla</i>	11	14
<i>Demarziella</i>	11	14+1
<i>Thyregis</i>	4	4
ONTHOPHAGINI		
<i>Onthophagus</i>	165	198+36
TOTALS	284	346+128

Table 1: Comparison of number of native dung beetles after Matthews' revisions in 1976 with our knowledge in 2015.

DATABASING THE COLLECTIONS

Dung beetles are ideal organisms for survey and environmental assessment. They are easy to sample with baited pitfall traps, they are relatively easy to identify, they are very sensitive to environmental factors such as soil type and vegetation cover, and because of their diet, are linked to the vertebrate fauna. Many countries such as Madagascar and Costa Rica have used dung beetles for county-wide mapping exercises. They've been used as indicators of forest health in Mexico and Brazil, and in altitudinal transect studies in many parts of the world. Recognising this, the Commonwealth Dept. of Environment assisted Australian museums to database their collections and subsequently bought dung beetle data from them. This was merged into a database of around 120, 000 records and I was engaged in 2006 to travel around the museums and do a validation exercise on the data. The Queensland Museum contributed about 70,000 of these records, many of them arising from the massive dung beetle surveys we did in the heyday of Wet Tropics research in the 1980s and 1990s. The QM now has more than 87,000 specimen records.

USING THE DATA

Using this extensive database and mapping resource, it is possible to quickly place local surveys into an Australia-wide context and evaluate their significance. We've found that local bush-care community groups, especially Catchment Care Groups in Queensland are keen to trap dung beetles and get feedback. A QM survey in 2005 located 63 native species in the Greater Brisbane Area. The Catchment Group which covers the suburbs from St Lucia to Kenmore collected 28 species in 2009. A large survey by the Moggill Creek Catchment Group in 2010/11 collected 1385 specimens of 31 species. The report Tania Kenyon and I prepared for them can be viewed at <http://www.moggillcreek.org/>

[wildlife-1/dung-beetle-survey-2010-2011](#) . Susan Cully and a very small band of helpers collected 13,588 specimens of 43 native and 7 introduced species on the Beechmont Plateau in 2012-14, making it the most diverse area for its size in Australia yet sampled and allowing detailed mapping of the species. An essential component of these surveys by community groups is that everyone has fun, albeit rather scatological fun!!



Fig 1. PhD student Mia Derhe (left) and Dr Rosa Menendez, both of Lancaster University, setting up dung in a small vertebrate exclusion cage in the Thiaki rainforest for measurement of dung removal by beetles.

At the more professional level, Rosa Menendez, of Lancaster University in the UK, and I trapped dung beetles during four different seasons along the 20 sites of the big IBISCA altitudinal transect study at Lamington. The 33 species we encountered were highly stratified, with two species totally restricted to small areas above 1000m and thus very vulnerable to climate change. Rosa and I have also been monitoring dung beetle populations every two years on the 64 plots of the big Thiaki regeneration study on the Atherton Tableland where we have found 33 species of which 26 occur in the original rainforest and 16 are in the adjacent cleared grassland. Rosa has postgraduate students

working on the Atherton Tableland plots and both Tania Kenyon (Honours, completed) and Mia Derhe (PhD in progress) have been using quantified dung removal monitoring to assess dung beetle impact (Fig 1). Chris Reid (Aust. Mus.) and PhD student, John Gollan, have used dung beetles as indicator groups in vegetation disturbance studies along the Hunter River valley. Without the solid framework of taxonomy and the availability of the enormous background dataset, these projects would not be possible.

WHAT DO DUNG BEETLES DO WITH DUNG?

Adult dung beetles have reduced mandibles and cannot eat solid material, so they just suck up the bacterial “gravy” from moist dung, leaving behind a pile of plant fibres they have licked clean. But the main thing they do with dung is to use it as food for their larvae which DO have functional mandibles and can consume dung in its entirety. Most dung beetles are what we call “buriers”. Adults arrive at a dung source and then bulldoze dung down into long nest burrows they



Fig 2. Front view of a male of *Onthophagus tweedensis*. This is a common early season species around Brisbane (Photo: QM).

excavate beneath the dung pile. In the burrow they form the dung into portions, each sufficient to feed a single larva to maturity, and then lay an egg in each. The spectacular horns on the males of many “burier” species are used to defend the nest burrow against invaders and to fight with other males (Fig 2).

Because it gets very “busy” beneath a dung mass when many beetles are competing to dig burrows in close approximation, some species have evolved behaviour which enables them to carry some dung away into a quiet private spot where they can make their brood nest without disturbance. These are the famous “ball rollers” which have curved legs used to shape pieces of dung into balls and roll them away from the source dung pile. In the Australian fauna, the Onthophagini and Coprini are “buriers” while most of the Canthonini are “ball rollers” (Table 1).



Fig 3. Cut-away brood ball showing larva of the African *Sisyphus spinipes* feeding inside. At left is where the female inserted the original egg (Photo: CSIRO).

Inside the dung masses the beetles form in a nest burrow, the hatching larva is C-shaped and grows by feeding round and round in the central chamber of the dung mass (Fig 3). The stored faeces inside the larva’s inflated gut is later evacuated and used to seal the empty ball which becomes the pupal chamber.

There are many variations on this basic life cycle plan among the native species and I will mention a few.

THE CUCKOOS

As in birds, some species have learned to lay their eggs in the nest burrows of other beetles. In Australia, the genus *Demarziella* (Fig 4) is similar morphologically to species that do this overseas and there is one old record of adults being found in the nest of an



Fig 4. *Demarziella interrupta* (photo: QM)

Onthophagus near Toowoomba. We assume that all Australian species probably do this, but more observations would be very valuable.

THE PREHENSILES

Dung beetles need to get to dung while it is still moist and able to be worked. Australia is an arid continent and the already dry dung pellets of macropods dry out very quickly after deposition. About 7-8 Australian species of *Onthophagus* have solved this problem in a remarkable way.

The adult beetles have tarsal claws adapted to grip hair and they cling around the anus of macropods. There they wait at the “factory door” and leap aboard as the dung pellets emerge, thus epitomizing Woolworths’ “fresh food” slogan! They have been recorded on introduced mammals such as goats and rabbits. One of the species, *Onthophagus parvus* (Fig 5), occurs in



Fig 5. The prehensile species, *Onthophagus parvus*. Note the deeply cleft claw on the right midleg (Photo:QM).

Brisbane's outskirts where nude sunbathing is clearly not recommended. Eric Matthews showed that the specialised prehensile claws (Fig 6) have arisen in two different species groups in

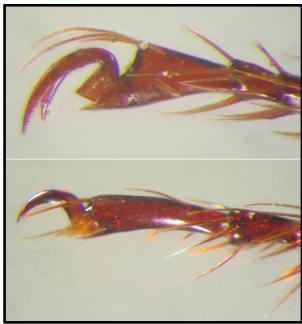


Fig 6. Tarsal claw of *Onthophagus parvus* (top) compared with that of a normal *Onthophagus* species (photo: QM).

Australian *Onthophagus* with a different locking device to anchor the hair in the claw in each group. The resultant claws are remarkably similar to the specialised claws seen in other insects that live among mammal fur, such as fleas and both hippoboscids and streblid flies (Fig 7).



Fig 7. Prehensile claws of ectoparasitic hippoboscids (left) and streblid flies

SOME USE MUSHROOMS INSTEAD OF DUNG

Another Australian eccentricity is that a number of species have changed from dung to mushrooms as their source of adult and larval food, either wholly or partly. This has occurred in unrelated species in all three Australian Tribes including several different species groups within *Onthophagus*. Species in both the *dunningi*-group of *Onthophagus* and the canthonine genus *Boletoscapter* (both taxa being entirely mycetophagous) hollow out the stipe (stalk) of mushroom-type fruiting bodies and use it as a tunnel upwards to reach the more nutritious gill material which is taken down to a nest burrow in



Fig 8. *Onthophagus dunningi* male (photo: QM).



Fig 9. *Boletoscapter furcatus* male (photo:QM).

the soil at the base. *Onthophagus dunningi* (Fig 8) and *Boletoscapter furcatus* (Fig 9) are both common in the Brisbane area. The number of mushroom feeding species is much greater in tropical areas of Australia. During surveys we always trap simultaneously with both dung and mushroom baits to make sure we sample the whole fauna.

SOME MAKE THEIR OWN DUNG

Back about 1970, Ross Storey and I were having smoko at our camp table in the Tooloom Scrub, near Woodenbong NSW when, to our amazement, we saw a large dung beetle emerge from a burrow and walk 50cm over the rough leaf litter terrain to a piece of discarded watermelon. It methodically cut off a piece of the red flesh with its toothed forelegs and dragged it (backwards and unerringly) across the obstacle course to the burrow and dragged it inside. We carefully dug the burrow up. It went vertically down about 10 cm then turned at right angles for a short way and ended in a large chamber. Inside were a male and female of the flightless canthonine *Cephalodesmius armiger* (Fig 10), a heap of loose bits of vegetable matter (leaves, small flowers, small fruits and our watermelon piece), a large mass of compacted vegetable matter and about six neat balls of dung-like material each with a larva feeding in the centre.



Fig 10. *Cephalodesmius laticollis*, the largest of the species which make their own "dung" (photo:QM).

We had stumbled on what is still known as the most remarkable dung beetle behaviour in the world. We camped at that same spot for a weekend every month for 18 months, scoring the contents of about 20 burrows each time. We found we could set up pairs in glass fronted plaster nests at UQ (where we both then worked),

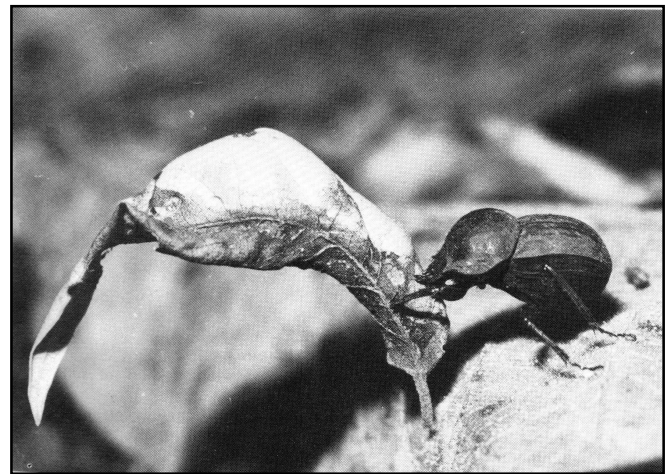


Fig 11. A male *Cephalodesmius armiger* dragging a leaf back to the burrow (from Monteith & Storey, 1981).

feed them on clover flowers from the lawn of the Great Court and watch the whole process take place. The story was as follows. Mated pairs dug burrows and remained together for nearly 12 months. Males foraged for plant pieces (Fig 11) which the female shredded and squeezed into a large mass which became inoculated with a fungus which converted it to a dung-like consistency. The female then tore off pieces and rolled them into neat balls which she hollowed out to form a thin-walled cup into which she laid a large egg (Fig 12). She then sealed the cup up into a ball again. Each day for about eight days she laid another egg in this way, ending up with a

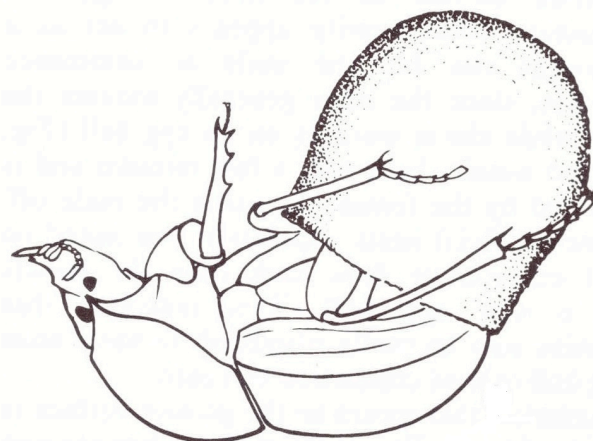
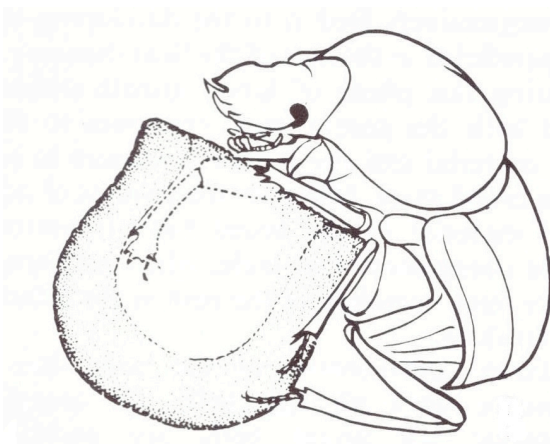


Fig 12. *Cephalodesmius armiger* hallowing out an egg ball (left) and depositing an egg into it (from Monteith & Storey, 1981).

row of “egg balls”. The larvae soon hatched and started to feed on the internal wall of the egg ball. For the next two months the male continued to bring new plant material to be added to the “compost heap” and the female constantly removed pieces of sticky goo from the heap to plaster on the outside of the egg balls. The balls, and the larvae inside, grew until the balls were much larger than the adult beetles. Thus this was “progressive feeding”, a level of parental care previously unknown in dung beetles. Eventually the larva ejected its stored faeces to the outside through a hole bitten in the wall and the female smeared it over the ball surface where it set to a hard shell while the larva pupated inside. The artificial dung made in the nest was so attractive to other dung breeding insects that we regularly found sphaerocerid flies (Fig 13) and oxyteline

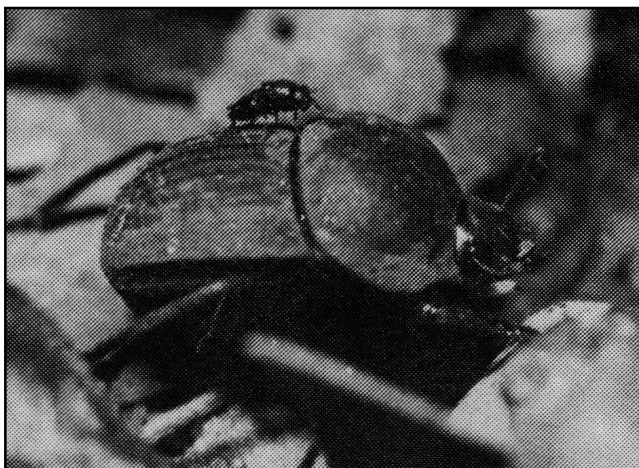


Fig 13. Sphaerocerid fly riding a male *C. armiger* back to the nest so it can lay eggs in the brood mass (from Monteith & Storey, 1981).

staphylinids riding the foraging males back to the nest where they oviposited in the brood mass. Our population estimate showed there were between 20,000 and 50,000 of these beetles per hectare, so they have a significant role in turnover of soil and leaf litter. We also found that all three species of *Cephalodesmius* have the same behaviour. *Cephalodesmius quadridens*

occurs in Brisbane suburbs. The whole story is told in Monteith & Storey (1981).

THE BIGGEST DUNG BEETLE LIKES THE SMALLEST DUNG

Our largest native dung beetle is the massive 35mm *Aulacopris maximus* (Fig 14) which was described from specimens collected in the 1920s in a bat cave near Kemsey NSW where a number of large brood balls were collected beside a



Fig 14. Our largest dung beetle, *Aulacopris maximus* (photo:QM).

guano heap. It occurs in normal rainforests without nearby cave systems but breeding activity is not seen. The species comes to rotten mushroom traps more often than dung baits and is often seen crawling on tree trunks at night. Doug Cook has also found an adult under a pile of decaying fungus. The mystery was probably solved by Tony Hiller a few years ago at Mt Glorious when he found an adult with several large brood balls on top of bat guano in the



Fig 15. The *Aulacopris maximus* adult and brood balls found by Tony Hiller (GBM photo).

bottom of a hollow dead tree in which a colony of insectivorous bats had long roosted (Fig 15). The balls are clearly made from bat droppings and are studded with digested insect fragments. Since bat droppings are very dry and do not have the “gravy” which adult dung beetles need to suck up, this may explain why *Aulacopris* seek alternative liquid food from decaying fungus. The adults crawling on tree trunks are probably seeking entry holes to hollow interiors where bats may be roosting.

ANOTHER PROGRESSIVE PROVISIONER?

The genus *Canthonosoma* has three large wingless species which live in the dry vine scrubs of inland central Queensland. One of them extends as far south as the hoop pine scrubs that grew along the Brisbane River but which are now largely gone. This is *C. castelnaui* (Fig 16), for which there are records as recently as the 1950s from the “Ashgrove Scrub”. But that rainforest patch is long gone under suburbs and the species seems extinct in Brisbane. The nearest population we know of is in the prickly pine scrubs along the River near Ipswich. There is evidence that this genus is also a progressive provisioner because we have found nests under logs in bottle

tree scrubs near Taroom that are lined with dry pulverised macropod pellet material. In the nests were single females of *Canthonosoma macleayi*, each with a set of tiny balls containing eggs or larvae. These would need extra dung added to the surface if there is to be enough food for the larva to feed to maturity. This may be a dry-adaption strategy where females may use one moist macropod pellet to start a batch of egg balls and then wait for the rare chance to get another moist pellet that can be used to enlarge all the existing small balls. If so this will be another unique Australian dung beetle strategy.



Fig 16. *Canthonosoma castelnaui* male (photo: QM).

A MEGA-DIVERSE GENUS

The smallest dung beetles in Australia are the little ball-rollers in the genus *Lepanus* with species as small as 2-3mm. It's our largest genus of ball-rollers with 25 described species. Both the local endemic, high-altitude species we found at Lamington belong to this genus, viz *L. glaber* and the beautiful *L. storeyi* (Fig. 17). Tom Weir at ANIC has long suspected there are many extra

unrecognised species of *Lepanus*. In a collaboration with molecular scientist Nicole Gunter (now at Cleveland Museum, Ohio USA) they've done a detailed comparison of morphological and molecular characteristics and have reached the conclusion that there may be around 60 new species, many of them in the Queensland Wet Tropics, and that there may be several generic entities involved. Nicole is planning more molecular studies. Watch this space!

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- Monteith, G.B. & Storey, R.I. 1981. The biology of *Cephalodesmus*, a genus of Australian dung beetles which synthesizes "dung" from plant material. *Mem. Qld. Mus.* **20**: 253-277.

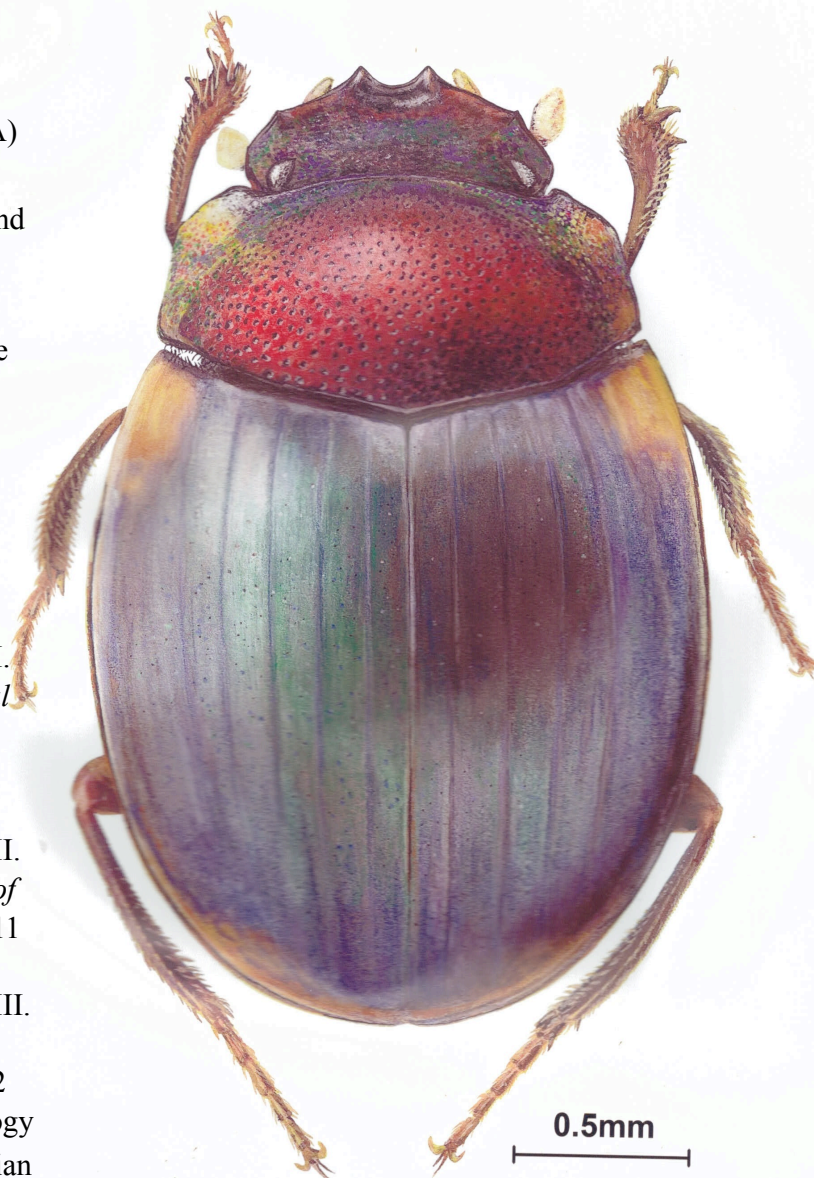


Fig 17. *Lepanus storeyi* (painting: Jacqui Recsei)

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Queensland Entomology News



Research news

A new moth family discovered on Kangaroo Island, South Australia.

ESQ members, Douglas Hilton, Axel Kallies, Glenn Cocking, Ted Edwards and Mike Halsey, were part of the group that published a paper describing a new family of moths, the Aenigmatineidae, with a single genus *Aenigmatinea* and species *Aenigmatinea glatzella*. The moth was found by Dr Richard Glatz on Southern Cypress-pine trees (*Callitris gracilis*) in a remote area on Kangaroo Island. To read more see:

Kristensen, N. P., Hilton, D. J., Kallies, A., Milla, L., Rota, J., Wahlberg, N., Wilcox, S. A., Glatz, R. V., Young, D. A., Cocking, G., Edwards, T., Gibbs, G. W. and Halsey, M. (2015), A new extant family of primitive moths from Kangaroo Island, Australia, and its significance for understanding early Lepidoptera evolution. *Systematic Entomology*, 40: 5–16. doi: 10.1111/syen.12115

<http://onlinelibrary.wiley.com/doi/10.1111/syen.12115/abstract>

<http://www.csiro.au/en/News/News-releases/2015/Enigma-moth-helps-crack-evolutions-code>



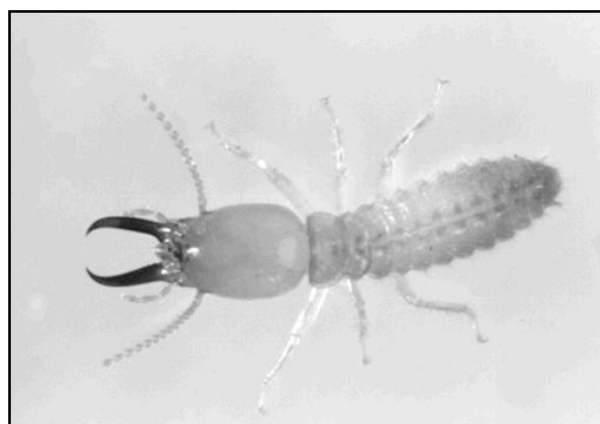
A female adult 'enigma' moth on a Southern Cypress-pine stem. Image: George Gibbs

<http://www.csiro.au/en/News/News-releases/2015/Enigma-moth-helps-crack-evolutions-code>

Termite Research

ESQ member Brenton Peters has recently published a paper with Henri Bailleres and Christopher Fitzgerald (both QDAF) on the susceptibility of coconut wood to damage by subterranean termites and implications for the utilisation of cocowood as a building resource. To read more about it see: *Susceptibility of coconut wood to damage by subterranean termites (Isoptera: Mastotermitidae, Rhinotermitidae)*. Brenton C. Peters, Henri Bailleres, Christopher J. Fitzgerald. *BioResources* 2014 9(2): 3132- 3142.

https://www.ncsu.edu/bioresources/BioRes_09/BioRes_09_2_3132_Peters_BF_Susceptib_Coconut_Wood_Termite_5139.pdf



Brenton has also published with David Wibowo, Chun-Xia Zhao and Anton P. J. Middelberg (AIBN, The University of Queensland) on the release of fipronil insecticide from silica nanocapsules for use as a bait toxicant against subterranean termites and for broader agricultural applications with minimal environmental risks. To read more see:

Sustained release of fipronil insecticide in vitro and in vivo from biocompatible silica nanocapsules. David Wibowo, Chun-Xia Zhao, Brenton C. Peters and Anton P. J. Middelberg. *Journal of Agricultural and Food Chemistry* 2014 62: 12504–12511.

<http://pubs.acs.org/doi/abs/10.1021/jf504455x>

(cont'd)

ESQ Members might be interested to source extension literature on drywood- and subterranean-termites ("white-ants") written by Brenton and freely available as:

Drywood termites in Queensland;

Subterranean termites in Queensland;

Subterranean termite infestation in buildings; and

Subterranean termite baiting systems.

<https://www.daf.qld.gov.au/forestry/pests-and-diseases/termites>

Using honeybees to understand neural circuits and human memory formation

Scientists at the Queensland Brain Institute at UQ have recently found that memory management in honeybee brains is controlled by microRNAs, small molecules that control nerve cell connections and the wiring of memory. Honey bee brains are being used as models for human brain dysfunctions that result in impaired memory. To read more details see:

<http://qbi.uq.edu.au/content/bee-brains-offer-insights-how-human-memories-form>

<http://www.nature.com/ncomms/2014/141120/ncomms6529/full/ncomms6529.html>

Road kill useful to monitor seasonal variability of forensically important insects



ESQ member, Julianne Farrell was recently interviewed by ABC Rural about

her research in forensic entomology. Monitoring insects at roadkills has helped her to understand the seasonal variability of forensically important insects in subtropical areas where not much work of this type has been done. To listen to the interview go to:

<http://www.abc.net.au/news/2015-04-06/road-kill-research-forensic-entomologists-insects/6358972>

Carabid Researcher Visits Queensland

Dr Martin Baehr from the Munich Museum in Germany visited the Queensland Museum for two days in early April before flying to Cairns to start five weeks' solo field work in the drier parts of Cape York Peninsula and across the Gulf of Carpentaria. Martin has worked on Australian Carabidae as his principal taxonomic interest for 25 years and has



described almost 1000 new Australian species. He has just about completed one of his most difficult challenges which has been revising the megadiverse group of small burrowing carabids in the genus *Clivina* and its allies. He has also been writing up the remarkable group of minute, blind, subterranean carabids in the tribe Anillini which have been discovered in deep bores by CALM surveys in the WA Pilbara region. He has made many field trips to Australia over the years and this trip is planned to cover a few remote corners he hasn't visited previously. He loves to collect along stream edges (and we told him about the crocodiles!).

Cyphophthalmi Team hits Queensland again



Fig 1: *Austropurcellia giribeti* Boyer & Quay, one of the species described from Daintree in their recent paper.

What are Cyphophthalmi, we hear you ask! This is the small Order of the arachnid Class Opiliones (harvestmen) which live in leaf litter and look like mites but have segmented abdomens (Fig 1) and are known as “mite harvestmen”. They are distributed around the world but are rarely encountered unless special leaf litter sorting techniques are used. They are of great biogeographic interest because they obviously have low dispersal powers and most species have quite small ranges. On the global scale most continents have endemic faunas at the family or genus level. Australia has just one family, the Petallidae, which has a classic Gondwanan distribution in Chile, New Zealand, New Caledonia, Australia, Sri Lanka, Madagascar and South Africa. Two genera occur in Australia: *Austropurcellia* in

rainforests of the eastern Queensland and *Karripurcellia* in the tall wet forests of the SW corner of Western Australia.

The international authority on the Cyphophthalmi is Gonzalo Giribet at Harvard University and he maintains a world checklist of the group at <http://giribet.oeb.harvard.edu/Cyphophthalmi/>. Gonzalo, with his students and colleagues, has run an exciting program of collection and study of the global fauna of this group using analyses of morphological and molecular data. His graduates include Dr Sarah Boyer (Fig 2), an academic at Macalester College, St Paul, Minnesota, who works on the Australian *Austropurcellia*, and Dr Prashant Sharma (Fig 3), currently at the American Museum of Natural

History in New York, but soon to start as an academic at University of Wisconsin. Prashant pioneered the study of the endemic New Caledonian genus *Troglosiro*.

Sarah and Prashant visited Queensland last year with two of Sarah's students and collected along the east coast, particularly in the Wet Tropics where the greatest diversity occurs. Sarah is senior author of a terrific paper (Boyer et al. 2015) which has just come out describing some new species, including one they got at Daintree (Fig 2) and named after the guru himself (Fig 1). It includes state-of-the-art analyses of distribution patterns in the Wet Tropics with a lot of molecular data. The gang is returning again this May for another bout of field work starting off in SEQ on May 20 and heading north to the Wet Tropics again via a stop at Kroombit Tops (SW of Gladstone) where they will try to recollect a



Fig 2: Sarah Boyer (right) and her two students from Macalester College showing off the Cyphophthalmi they sorted from sifted litter in their white trays at Cape Tribulation in 2014.

species the Queensland Museum got during surveys of this isolated plateau in 1985. Geoff Monteith and Kieran Aland from QM will be in the Wet Tropics in late April trying to recollect DNA quality material for Sarah from the Black Mountain and Mount Sorrow mountain massifs.



Fig 3. Prashant Sharma

Now, without cheating, we'd like you to close the News Bulletin and spell Cyphophthalmi!

Reference

Boyer, S., Baker, C.M, Popkin-Hall, Z.R., Domokos, I., Laukó, A., Wiesner, H.A., and Quay, R.H. 2015. Phylogeny and biogeography of the mite harvestmen (Arachnida :Opiliones : Cyphophthalmi) of Queensland, Australia, with a description of six new species from the rainforests of the Wet Tropics. *Invertebrate Systematics* **29**: 37-70 (<http://dx.doi.org/10.1071/IS14025>)

Did you miss seeing *The Great Australian Fly* documentary?



Featuring Christine Lambkin and members at the BugCatch? You can still watch it online at

<http://iview.abc.net.au/programs/great-australian-fly/DO1344V001S00>

It will be available until 9:30pm, May 7th.



A message from the Treasurer

Membership subscriptions were due 1st January 2015. ESQ has 289 paying memberships: 184 (64%) had been paid by 31 March 2015. Many thanks. An increasing number of members are choosing to receive their News Bulletin electronically by email as a pdf (see graph below: 145 email, 144 postal).

If you are unsure of your subscription status, would like to receive the News Bulletin electronically, or have recently changed your email or postal details please contact me. A Membership Renewal Form is available at <http://www.esq.org.au/>

Dr Brenton Peters

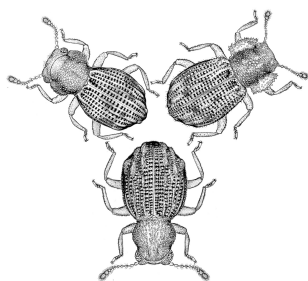
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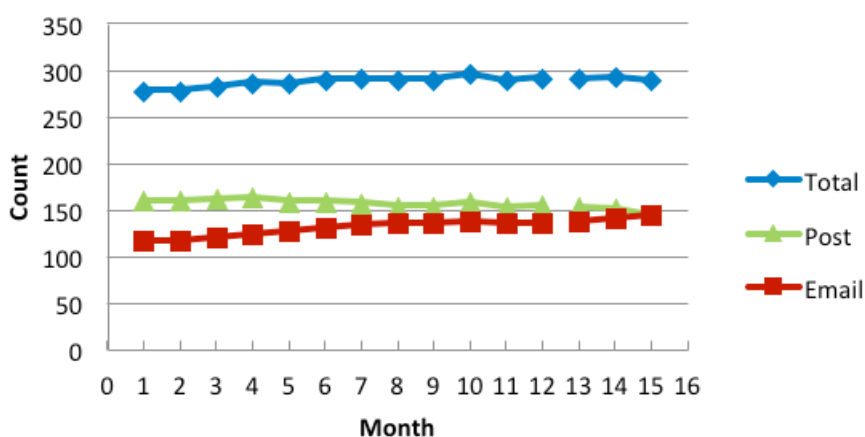
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Count vs Month 2014 & 2015



Native Beekeeping Workshops around Queensland

If you want to learn more about stingless bees and beekeeping, come along to Tim Heard's half and full day workshops held in various venues in Queensland. The workshops are a mix of photographic slideshow and practical sessions. You will learn how to divide hives and extract honey, and use the bees for pollinating your garden. Attendance price varies. Contact the organisers directly for details and to register. For images of workshops visit the Sugarbag Bees Facebook page <https://www.facebook.com/sugarbagbees/>.

Northey St City market, Brisbane, Qld,

2 May 2015, 9am - 4pm

Register at <http://www.nscf.org.au/sustainable-living-workshops-brisbane/>

Townsville, 22 and 23 May 2015

To register, contact Frana McKinstry, franajon@gmail.com

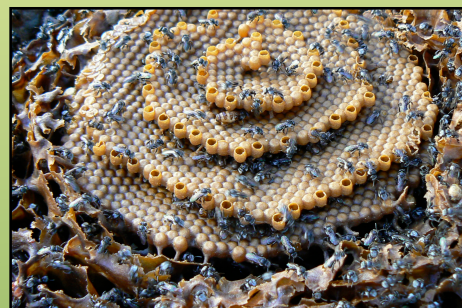
Townsville & District Beekeepers Assn Inc <http://www.beesnorth.org/>

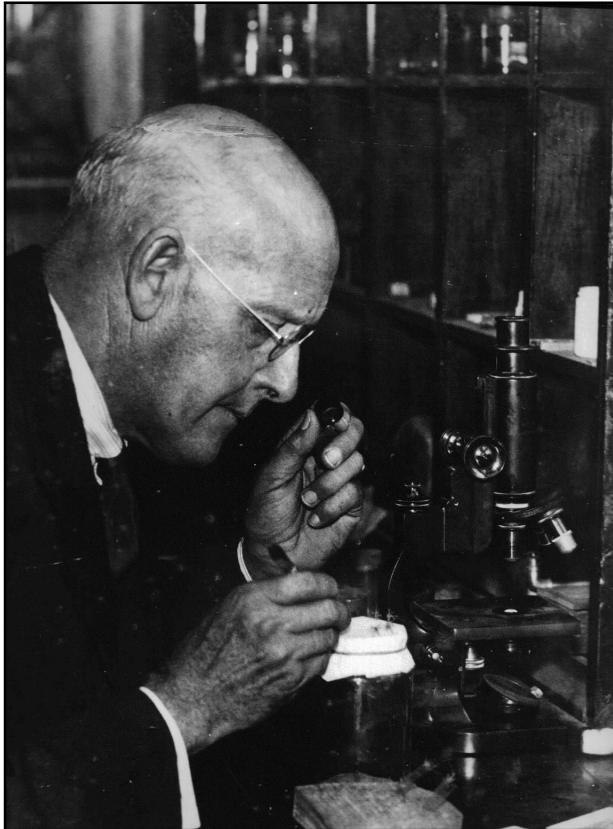
Rockhampton, 8 June 2015

When: 9am to 4 pm, 8 June 2015 and also 9 June if there is sufficient interest.

Where: Central Queensland University Price: \$40/person, (\$25 concessions)

Register with: Dan Coughlan, M 0419 733 746, Email dan_coughlan@internode.on.net





The History Corner...

Ronald HAMLYN-HARRIS (1874-1953)

Born Eastbourne, England, educated at Tübingen University in Germany and came to Australia in 1901. Science Master at Toowoomba Grammar School (1903-10) and then Director of Queensland Museum (1910-17). Joined the Hookworm Campaign doing insect-borne malaria and filaria vector surveys throughout Queensland 1922-1924. Became City Entomologist, Brisbane City Council (1928-33), the first full-time entomologist to be employed by an Australian municipality. Lectured in zoology at the University of Queensland (1937-43). Published on mosquito control problems in Queensland and ran campaigns to educate the public on mosquito breeding. President of Entomological Society of Queensland in 1933.

Obituary: Anon. (1986), *Mem.Qd. Mus.* 24:320-321

Deb Yarrow's Amazing Macro Photographs



Macrophotographer Deb Yarrow photographed a rattle ant (*Polyrhachis* sp.) drinking honeydew from a straw-like wax extrusion made by a scale insect (*Eriococcidae*: *Ourococcus* sp.) These scale insects live under the bark and must excrete their honeydew through a wax tube. These were photographed on ironbark trees in Oxley Creek Common, QLD, April 2015. For more of Deb's amazing macrophotography see: _

<http://www.aussiebugs.com.au>

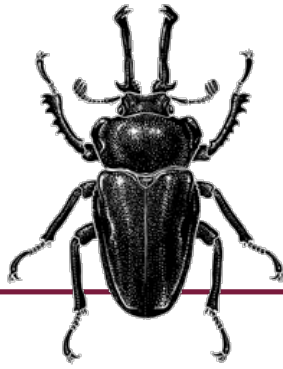
<http://www.aussiebugs.com.au/Hemiptera/Scale/i-7J2kGtC/A>



Photos: Deb Yarrow



Bark removed to show scale insect. Wax straw visible to the lower right.



Announcements and Notices



Australian Natural History Medallion

Field Naturalists Club of Victoria is looking for nominations for the Australian Natural History

Medallion. This award is awarded annually to recognize services to Australian natural history. Nominations are submitted by natural history associations or similar. Any person who has increased popular and/or scientific knowledge of Australian Natural History, biological or physical. Don Sands is a past medallion winner (2010). Deadline for nominations is May 1st. For more information see:

<http://www.fncv.org.au/australian-natural-history-medallion/>

Notes and Exhibits Meeting coming up in June!



Have you got something interesting to share? The June meeting is one of our “Notes and Exhibits” meetings. This is a chance for members to do a bit of “show and tell” or present any item of entomological interest. Have you got a short talk or display? An interesting observation? Now is your chance to share it with other members!

If you would like more information or have anything you would like to share at this meeting, please contact Federica Turco at federica.turco@qm.qld.gov.au

Cabbage white butterflies needed for the Pieris Project



A group of graduate students at the University of Notre Dame (US) has created a citizen science project that enlists the help of the public to collect the small cabbage white butterfly from all over the world ([Pieris](#)

[Project](#)) and they need your help. Although they have received help from entomological societies across Australia, they still do not have any specimens from the Queensland area (you can see their map of what we do have on their website). Thus, they were hoping that the Entomological Society of Queensland might be able to help collect cabbage whites for their project. They would be incredibly grateful for any help you could provide in both collecting and spreading the word about the project.

The purpose of this amazing collection will be to reconstruct the global invasion history of the small cabbage white butterfly (*Pieris rapae*). The collection will also be used to learn how this butterfly adapted to changes in its environment as it spread across the world; that is why they need samples from as many different locations as possible.

If you have any questions about the project you can email them at

pierisproject@gmail.com
or visit their website at pierisproject.org.



Meetings & conferences



XII International Symposium on Neuropterology

May 12-15, 2015
Mexico City, Mexico
<http://neuropterology.unam.mx>

9th Arthropod Genomics Symposium + Insect Genetic Technologies Research Coordination Network (IGTRCN)

June 17-19, 2015
K-State Alumni Center, Kansas State University,
Kansas, USA
<http://igtrcn.org/arthropod-genomics-symposium-igtrcn-in-2015/>

2015 Society of Systematic Biology conference

June 26-30, 2015
Casa Grande Hotel Resort, Guarujá,
BRAZIL
<http://www.evolution2015.org/>



Society for Molecular Biology and Evolution

July 12-16, 2015,
Hofburg Palace, Vienna, AUSTRIA
<http://smbe2015.at/>



15th Congress of the European Society for Evolutionary Biology (ESEB)

August 10-14, 2015
University of Lausanne,
Lausanne, SWITZERLAND
<http://www3.unil.ch/wpmu/eseb2015/>



6th International Barcode of Life Conference

August 18-20, 2015
University of Guelph,
Guelph, Canada
<http://dnabarcodes2015.org/>



Entomology Up North & To Asia Beyond - 46th AGM and Scientific Conference of the Australian Entomological Society

27-30 September 2015, Cairns, QLD
<http://www.aesconferences.com.au>

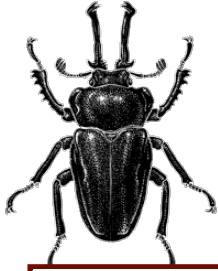


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2015 MEETING
Nov. 15-18 | Minneapolis, MN

Entomology 2015: Joint Entomology Society of America (ESA), American Society of Agronomy (ASA), the Crop Science Society of America (CSSA) and the Soil Science Society of America (SSSA) conference.

<http://www.entsoc.org/entomology2015>



Diary Dates for 2015

Meetings held on the second Tuesday
of the respective month

MARCH 10	Bill Palmer	AGM and Presidential Address
APRIL 14	Michelle Gleeson, Director of BugsEd	<i>"Little Bug-ers: educating and inspiring the next generation of budding entomologists"</i>
MAY 12	Penny Mills & Yen-Po (Paul) Lin	<i>"The Apiomorpha minor species group (Hemiptera: Coccoidea: Eriococcidae)" AND "Cryptic diversity in the parthenogenetic pest, Parasaissetia nigra (Nietner, 1861) (Hemiptera: Coccidae) and its implications for biosecurity"</i>
JUNE 9	Notes and Exhibits	Student Award Presentation/ Notes & Exhibits
AUGUST 11	Valerie Debuse	<i>"Boring into borer ecology: patterns of damage and potential drivers in eucalypt plantations"</i>
SEPTEMBER 8	Max Moulds	TBA
OCTOBER 13	Mark Schutze	<i>"Tephritid taxonomy: new solutions for old problems"</i>
NOVEMBER 10	David Yeates	Perkins Memorial Lecture: <i>"New phylogenomic perspectives on insect evolution from transcriptome sequencing"</i>
DECEMBER 8	Notes & Exhibits	Notes and Exhibits/Christmas BBQ

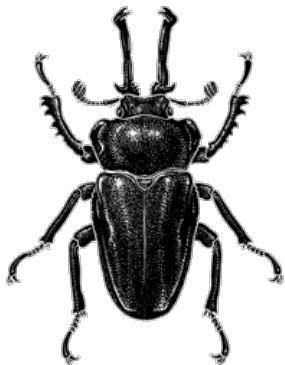
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Entomological Society of Queensland



NOTICE OF NEXT MEETING

Tuesday 12 May 2015, 1:00 pm

~

Guest Speakers:

Penelope Mills & Yen-Po Paul Lin

from the

University of Queensland

will present

The *Apiomorpha minor* species group (Hemiptera: Coccoidea: Eriococcidae)

and

The triptych of asexuality, chastity and cryptic diversity in *Parasaissetia nigra* (Nietner, 1861)

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Ground Floor, Ecosciences Precinct Boggo Road, DUTTON PARK

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

ALL WELCOME!

NEXT NEWS BULLETIN

Volume 43, Issue 3 (May 2015)

CONTRIBUTIONS WELCOME

DEADLINE - Wednesday, May 20th, 2015.

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