November 2010

Issue No. 594

Tarsus

CIRCULAR OF THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES Inc

Next Meeting of the Entomological Society of NSW Inc

Where: Meeting Room 2, Ermington Community Centre, River Road, Ermington
When: 7.30 pm on Wednesday, 3rd November 2010

Markus Riegler

Insect herbivore and plant responses in eucalypt forests under climate change at physiological, species and community scales.

Markus will present snapshots of ongoing entomological work at the Hawkesbury Forest Experiment, a large field experiment that includes variable carbon dioxide, water and nutrient supply treatments on different eucalypt species. The goals are to elucidate and test predicted responses of individual insects, insect populations and arthropod communities in eucalypt forests to Australian climate change scenarios for 2050. The specific aims are (i) to survey the arthropod biodiversity of the Hawkesbury Forest Experiment, (ii) to assess effects of treatments on plant chemistry and plant defence, and (iii) to quantify the physiological, symbiotic and behavioural responses of representative species of eucalypt feeding guilds to these treatments. Results will permit an understanding of the effects of climate change and resources on higher-order trophic levels beyond the plant.

CHRISTMAS FUNCTION

27th November, 2009
6.30pm

BOATSHED CAFÉ

1609 Anzac Parade
La Perouse
(see map)
Tel: 9661 9315

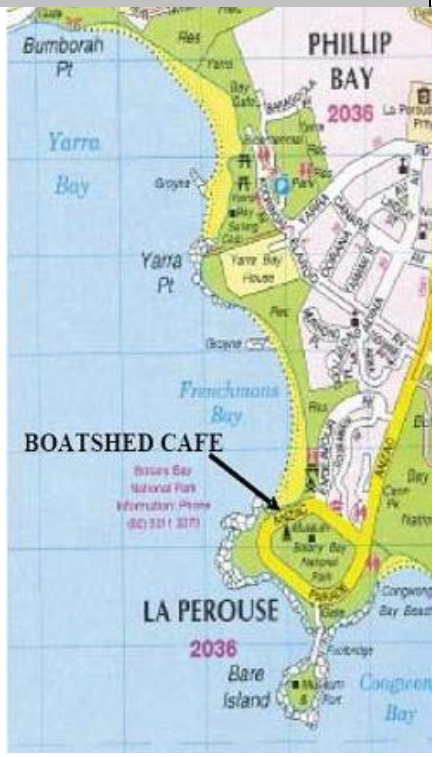
Cost about $38.00 per head
Example menu includes entrée (chicken caesar salad), main (barramundi or salmon with salad and fries) & dessert (with tea or coffee)

Not licenced so BYO alcoholic drinks

RSVP by 20th November

Ted Taylor 9661 3627

marylynne_ted@yahoo.com.au

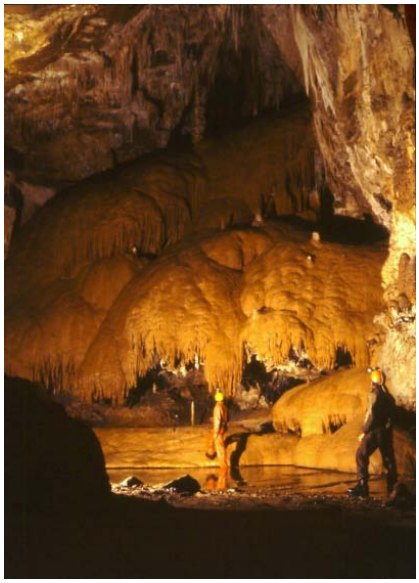


Synopsis of the talk at the September meeting

Cave invertebrates- some experiences from Australian and PNG caves

Graeme Smith

Caves are formed when slightly acidic water, moving through small cracks in limestone, dissolves the rock, gradually enlarging the cavity. Over millennia these can become very large spaces accessible to speleologists. In contrast to many other habitats, caves are continually dark, temperatures are relatively constant (usually cool) and food supply is dependent on some means of transporting organic matter from surface habitats into the cave. While we tend to think of caves as something people can walk or crawl through, the vast majority of subterranean habitat is probably just small cracks- fine for small invertebrates but not for people.



Decorated stream passage- Croessus Cave, Tasmania

Cave explorers in Europe in the 1800's were astonished to find an array of animals living in these dark environments. The eyeless salamander *Proteus* salamander from Croatia with its white skin and pink gills being the classic example. Biospeleologists have since classified cave-dwelling animals according their ecology and level of adaptation to cave life.

Accidentals are those that fall into caves or get washed in after storms. They may survive for some time but eventually form a food source for the other cave inhabitants.

Trogloxenes are animals that shelter within caves but go outside to feed. Bats are the best known example but cave crickets also fall into this category as they will venture outside entrances.

Harvestman Holonuncia *sp. Moparrabah main cave, NSW [photo. Joe Sydney]*

Troglophiles are animals that can live their entire life cycle within caves but do not show any of the strong adaptations associated with cave life. Some of these species also exist in surface habitats while others are only known from caves. Glow worms are one well known example but there are also various carabid beetles, collembolan, moths, mites etc.

Troglobites are animals that have obvious morphological adaptations to cave life. Living in a totally dark environment they loose pigment and their eyes while their extremities often become elongated. Aquatic troglobites are usually referred to as stygobites.

In my younger years I spent some time investigating cave animals from caves in Australia especially Jenolan, Bungonia and Wombeyan Caves as well as participating in two expeditions to the caves of the Muller Plateau in Papua New Guinea. There is a surprising diversity of fauna in these caves and the types of animals found will vary with the type of habitat within the cave and the nature of the food available here.

Blind cave fish, Cape Range, WA

Twilight zone- an area with some light, fluctuating temperature and humidity and breezes. In these areas webbing spiders and cave crickets can be found.

Stream abandoned regions – which rarely, if ever, flood, so food is scarce. There may be a breeze transporting unfortunate flying insects deeper into the cave. Invertebrates in these areas may be spiders that have found a place to build a successful web but more often the animals in these areas are beetles or harvestmen that roam over wide areas in search of food.

Symphylan- Atea Kananda- PNG

Cave cricket- Deer Cave, Mulu, Malaysia

Flood-liable passages present different challenges. Food in the form of flood debris is regularly supplied but there is a risk of being washed away by the sometimes raging flood waters. Glow worms will hang their snares in these areas to capture flying adult insects emerging fromaquatic larvae washed in by the stream. Many other invertebrates can be found in these areas, feeding among the flood debris. Most of these are from typical leaf–litter and soil dwelling groups such as collembola, mites and millipedes but the presence of these herbivores provides opportunities for spiders, carabid beetles and pseudoscorpions. The huge mudbanks on the sides of low-gradient streams in PNG proved particularly rich in fauna including Oligochaete worms and isopods.

Pool surfaces - small pools on the surface of the cave decoration are fed by seepage with low levels of dissolved organic matter. In many caves these are fairly consistent environments and some small adapted crustaceans can be found in the pools and collembola can be collected on the surface of the water.

Cockroaches on guano- Deer Cave, Mulu, Malaysia

Aquatic environment – includes the streams and underground lakes but also the interstices between the gravel on the stream floor. Numerous adapted Syncarids, amphipods and dytiscids have been found here.

Tree roots – some caves are not far below the surface and tree roots penetrate into the void in search of a reliable source of water. Hemipterans, in some places lacking eyes and pigment, can be found sucking on the roots, but other detritis feeders (millipedes and collembola) will feed on the decaying root matter.

Guano mounds – bats roost in caves during the day and large piles of bat guano accumulate under their roosting sites. This extremely rich source of food can support massive population of mites, beetles, cockroaches, moths, pseudoscorpions, etc just to name a few

Cave silverfish (Subtrinemura anemone)- Bungonia, NSW

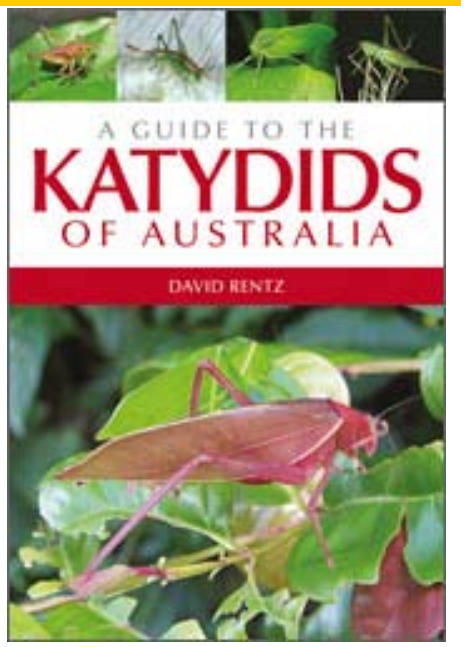
In summary, while the cave environment is relatively homogeneous in terms of light, temperature and humidity, caves do contain a number of microhabitats and thus permit a fairly diverse fauna. This fauna has usually evolved from groups of animals that exist in soil or leaf litter habitats above ground, and are thus somewhat pre-adapted for life in caves. These animals, once isolated within the cave, continue to adapt to this environment, losing unnecessary features such as eyes and pigment and enhancing others that allow them to find their food and mates such as longer legs and antennae.

Acknowledgements

I'd like to tank Stefan Eberhard of Subterranean Ecology, Perth and Joe Sydney (Highland Caving Group - Sydney) for allowing me to use some of their photographs during the presentation.

Book Review

A Guide to the Katydids of Australia



By David Rentz
ISBN: 9780643095540
Published in paperback by CSIRO Publishing, Melbourne (2010)
Price: $49.95

Once I mentioned to Dr Rentz that if I wouldn't be so much interested in beetles, I would become an orthopterist. I said this in jest – but I meant it, because the multi-faceted world of the Orthoptera always fascinated me. It is certain that I am not the only one. No wonder that entomologists – amateurs and professionals alike- are drawn to these interesting animals. Their varied shapes, colours and habits never fail to impress anyone who's interested in natural history.

Members of the Tettigoniidae (the katydids) are especially interesting. While katydids are among the most commonly seen Australian insects, many species lead secretive lives and thus escape the attention of the casual observer. Most of us – non-orthopterists – have to satisfy ourselves by listening to their songs or if we are lucky, with a glance of a fleeing specimen here and there. The lights at night may bring in a number of spectacular katydids and then we can wonder about their diversity, the richness of our fauna- and lament the fact that there are so few books available on the Australian Orthoptera.

This katydid guide is an answer to such lamentation, because it is a true guide, providing guidance to the newcomer and to those who already know a little about this fascinating group.

In the Introduction we can learn about the taxonomy of the Orthoptera and the placing of the Tettigoniidae within. Katydid anatomy is also discussed briefly here. The following section deals with biology, focusing on reproduction, eggs and growth and development, food and feeding and the enemies of the katydids. In a separate chapter the author tells us about these insects' sound producing methods and their hearing. Next comes a seven-page section, devoted to collecting and studying katydids. Collecting equipment and methods, field and lab preparation, labelling and keeping live insects are discussed. It is a most welcome addition to such a book, as in many other guide books the topic of collecting and specimen preparation is marginalised or simply omitted, usually for the want of space and/or the fear of difficulties it may present with wildlife protection authorities and animal ethics. The various katydid habitats, conservation and research are described in the next six pages.

On p. 41 begins the most important part. It starts with an explanation how to use the book and with a list of the subfamilies and tribes of Tettigoniidae, followed by descriptions of individual taxa. The sequence of subfamilies follows a traditional phylogenetic scheme and an effort was made to show as many tribes, genera and species as possible. As there are over 1000 spp. of katydids in Australia, it is more than obvious that not all can be included in a 214 pp. guide book. However, the selection shown is quite adequate to present the reader with a detailed picture of the Australian katydid fauna.

It is possible to determine many specimens to species level by reading the descriptions and view the many high quality photographs. On p. 191 we can find an excellent, illustrated key to the subfamilies and on p.195 begins a list of all Australian Tettigoniidae, known at the time of writing of the book.

A three page glossary lists many "specialist's" words used in the text, but it could be a little more extended for the benefit of those who may not be very familiar with the language of entomology.

The index at the end of the book includes scientific and common names as well as keywords to other subject matter mentioned in the text.

The illustrations are excellent right through the book. The photographs show the insects in their natural surroundings and most probably many of them weren't photographed before. The author's scanning electron micrographs are a great asset to the book and so are the very well drawn graphic illustrations. A few photographs are credited to a small number of photographers but the majority of illustrations are not credited and therefore one assumes that they are works of the author.

This book is a most welcome, very useful tome added to the growing body of Australian entomological writings. One of its great strength is that instead of encompassing an entire order it deals with one family of insects in detail. Authored by the country's most eminent orthopterist it is not an "ordinary" guide book but a true scientific work written in a language that is easy to understand.

A Guide to the Katydids of Australia is a great gap filler in the popular Australian entomological literature. It belongs to a genre that is most appreciated by amateurs and the professional entomologist alike.

Review by ***George Hangay***

Insect of the Month

GIANT FISH-KILLERS

Graham Brown (Darwin-based member) from his column "*Bugbits*" in the "Sunday Territorian"

Go driving at night in the countryside and you soon learn about the local wildlife. Hopefully not the hard way with a painful encounter with a large furry thing, but there are lots of other animals to be seen at night.

Everyone knows that moths are nocturnal and readily come to lights, including headlights. So do a lot of other insects. Drive over a creek-crossing at dusk in the wet season and your windscreen may suddenly go black in an instant as you hit a swarm of flying midges.

Recently, while driving through Kakadu National Park at night, I encountered large swarms of flying insects. There were thousands of them, for kilometres and on examination found to be fish-killers, *Diplonychus* sp. (family Belostomatidae). I had not seen this phenomenon with this genus before.

These bugs are pale yellow-brown and about 15 mm in length. They belong to the same family as the giant fish-killers, *Lethocerus* spp. which are much larger and more frequently seen in suburban car parks in the Wet underneath street lights.

These are not the same as toe-biters (family Nepidae) which are similar in behavior and appearance but have a long straw-like siphon at the end of the abdomen. They are also not killers of giant-fish, although they may have made a good indicating tool if they were.

Species in both *Diplonychus* and *Lethocerus* are fully aquatic and feed on aquatic insects as well as small fish and tadpoles if they can catch them. They have very strong fore legs which end in a stout spine and these are used to impale and hold prey while they feed on it.

They are ambush predators and spend most of their time hiding among water plants while waiting for prey to approach them. They are not fast swimmers and do not have the leg modifications found in the fast swimming aquatic predators.

Diplonychus is particularly unusual in that the female lays eggs on the back of the male. These are glued to the male until they hatch.

Although both are said to have a painful bite, some *Diplonychus* in south east Asia are thought to transmit disease by biting. This is poorly documented and not recorded in Australia. On the other hand both are also eaten in some parts of Asia, but I am yet to see this or to find a recipe to do so.

So why were they flying and filling up my vehicle? Two reasons: one it was the end of the Dry Season and ponds and streams were drying out; and secondly it was nearly full moon.

NB Cameron Webb also supplied an "Insect of the month" in response to my email. It will appear in the next issue of Tarsus

Contact with the Society web page

I probably get two or three phone calls per month from people ringing the number on our web page and a couple of e-mails. I greatly appreciate the support of members to answer those that are outside my experience.

Graeme Smith

Coequosa australasiae - CAN ANYBODY HELP JIM?

Last year I sent a message that I was co-authoring a book on the Sphingidae of Australia with Max Moulds and requested assistance in attempting to discover the life history of *Tetrachroa edwardsi* which was unknown up unto that point in time. As a result of a notice placed in your newsletter, Glenn Cocking contacted me regarding his recent encounter with adults in early November, 2009 in southern NSW. Two weeks later I visited with Glenn and he directed me to the exact site he had taken the adults just two weeks prior. Although the larval host was unknown, I had some suspicions and this ultimately led to discovering an egg and 1st instar larva. The entire life history has since been documented. We made a great deal of additional progress during the past field season, documenting several additional previously unknown life histories and filling in large gaps in others. As part of this process, we are attempting to formally describe and photograph each life history stage – an ominous and fully unobtainable goal.

Since last years plea for information on *T. edwardsi* worked so well, we would like the opportunity to rear *Coequosa australasiae* which can be taken with some frequency in eastern NSW. We have reviewed a paper on its life history but have some questions after having reared *C. triangularis* this past season and would like the opportunity to rear *C. australasiae* ourselves. Would it be possible to put a brief note in the newsletter asking members to be conscious of our interest in obtaining ova from a wild collected female? In any case, I thank you for your time and consideration.

Regards,
Jim Tuttle
St Kilda, Victoria
jtuttle164@hotmail.com
(03) 9537 3030; 0432 649 286



Barbara collected this at the Ku-ring-gai Wildflower day but the Circular Editor (=me) missed her explanation at the meeting. I'll try to follow up in the next issue.

Show & Tell – September Meeting

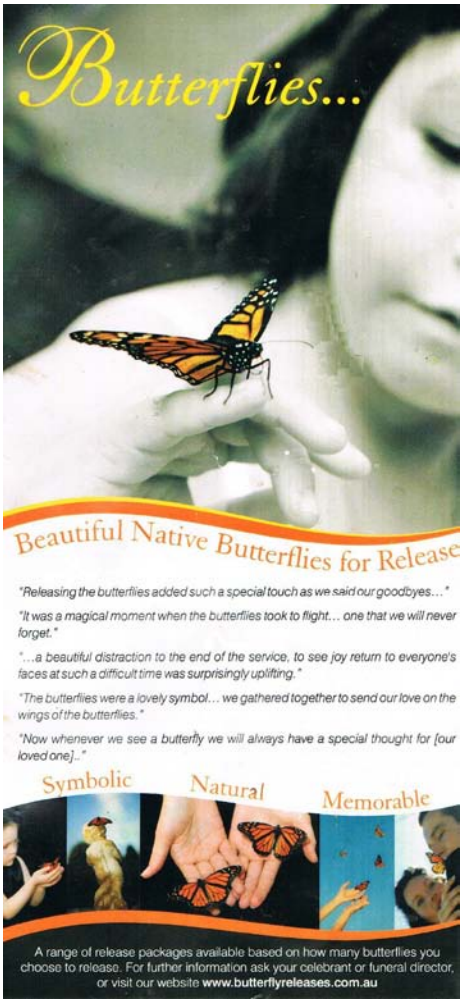
Graeme bought along a moth and the eggs she had laid on English spinach in his garden at Narraweena. We were unable to identify the species and suggestions were made that it is a notodontid or an Arctid. Does anyone else have thoughts on this?

Barbara showed an Indian grasshopper pest of staghorns, orchids etc. Robin thinks it could be the olive green katydid nymph which eats orchids and has a winged adult. Barbara also bought along an advertisement for butterflies at funerals (see below)

Howards Greening bought along his culture of grey silverfish (*Ctenolepisma longicaudata*). He 's had these for several years and they require very little effort to maintain, feeding simply on rolled oats, WeetBix and offering a cardboard tube harbourage. While this species is commonly encountered in households it rarely causes significant damage these days.

Dinah, showed a caterpillar of the orange palm dart butterfly feeding on Canary Is. Palm but collected on unidentified palm at Castle Hill. "Butterflies of Australia" pictures of adults and info on distribution and biology were supplied.

Cephrenes augiades is distributed from Cape York to the Illawara. Eggs are laid on the lower surface of young palm fronds. The larvae feed on young fronds making a shelter between two adjacent sections of frond which they join together with silk. They also pupate within this shelter



Infectious sex

A female aphid can reproduce without sex. In terms of her genetic legacy, it makes perfect sense to do this because she can produce many clones that carry all her genes down through the generations. So why do aphids make time for an annual bout of sex? This question puzzled Nancy Moran and Helen Dunbar at the University of Tucson in Arizona. Their surprising discovery is that aphids have sex to acquire sexually transmitted infections (*Proceedings of the National Academy of Sciences*, vol 103, p 12803).

Like you and me, aphids carry bacteria on and in their bodies, many of which are useful. Some break down plants the insect would not be able to digest unaided. Others confer resistance to extremes of temperature. One particularly valuable bacterium, *Hamiltonella defensa*, kills the grubs of parasitic wasps before they start growing within the aphid's body cavity and consume it from the inside. A female aphid can acquire such useful bacteria by having sex with an infected male, and she can also pass them to her future clones. "Once they are established in the clonal descendants of the sexual female, they can be quite stable and confer longer term resistance," Moran says. So her female offspring will continue favouring asexual reproduction while the males wait on the sidelines for a chance to exchange bacteria for sex.

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Ku-ring-gai Wildflower Festival

The Society again participated in the Ku-ring-gai festival. Ted, Howard, Barbara, Robin, Gith and Graeme enjoyed introducing keen children and sometimes reluctant parents to some Goliath stick insects and answering questions on a wide range of entomological themes. Ted's collection of termite damaged wood always attracts the attention of homeowners and nearly everybody has a story about how they have suffered at the hands of these industrious little recyclers.

Bi-monthly Meetings

The Society meets **BI-MONTHLY** unless otherwise advertised. General meetings with a speaker will generally be held only on the "odd numbered" months (March, May, July, September, November) while the Council will meet more frequently. Speakers tentatively scheduled for the coming general meetings are shown below.

This timing allows us to alternate meetings with the Society for Insect Studies (SFIS) which meets at the Australian Museum at 7.30 on the second Tuesday of the "even numbered" months.

Future Events

Date	Speaker	Title
3rd November, 2010	Markus Riegler	TBD
Sat 27th November, 2010	Christmas function	Boatshed
2nd March, 2011	AGM	

Venue:
Meeting Room 2
Ermington Community Centre
10 River Road Ermington

Meetings start at 7:30 p.m. (directly following the Council meeting)
Talks run for around 45 minutes, with 10 minutes for questions, followed by a light supper. Guests are most welcome.

Getting there:

By Car: From Victoria Rd turn into Spurway St (head towards Parramatta River). Turn right into Jackson St then left into River Rd. If heading north on Silverwater Rd, turn right into Victoria Rd then proceed as above. If heading south on Silverwater Rd take the Parramatta off ramp, cross Victoria Rd and proceed into River Rd. If you miss the off ramp, turn left into South St, then left into River Rd.

By Bus: Routes 525, 523 and L20 depart from Argyle St near Westfield shopping centre near Parramatta station. Routes 523 and L20 depart from West Ryde station. Get off at the Ermington shops. River Rd passes between the supermarket and the hotel.

SOCIETY POSTAL ADDRESS
C/- ENTOMOLOGY DEPARTMENT
THE AUSTRALIAN MUSEUM
6 COLLEGE STREET
SYDNEY NSW 2000

MEMBERSHIP FEES 2009

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