Tarsus

November 2007

Issue No. 578

CIRCULAR OF THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES Inc

Next Meeting of the Entomological Society of NSW Inc

Where: "Backyard to Bush" section of Taronga Park Zoo
When: 7.00 pm on Wednesday, 7 November 2007

Host: Warwick Angus,
Taronga Park Zoo
Invertebrate section – How it works

ZOO VISIT

November Meeting
Wednesday 7th November, 2007

Come and see the Invertebrate Section of
"Backyard to Bush"

The Society will be holding their next meeting at the zoo with members of SFIS joining us.

As at 2 November we have 30 confirmed participants so there's room for a just a couple more. If you want to come please phone Graeme Smith no later than Monday 5th to see if there are any spaces available.
See page 119 for more details.

CHRISTMAS FUNCTION

Saturday 8th December
6.30 pm

By popular demand we will be going back to the Boatshed Café at La Perouse

See page 116 for details.

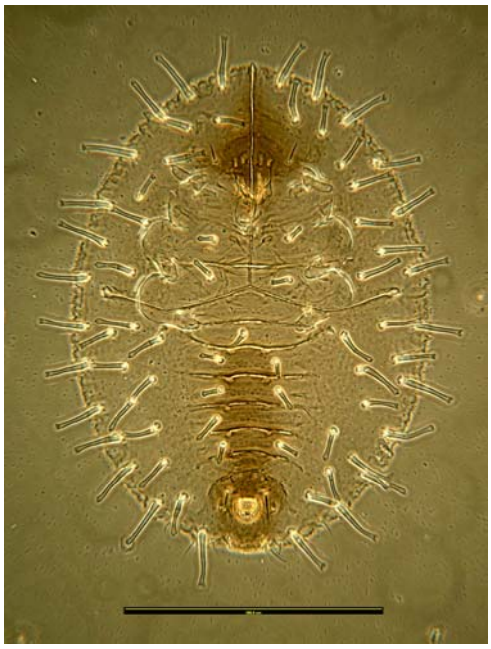
TARSUS is prepared by for ESNSW by Graeme Smith Ph: 02 9981 3749 Email: le_gbsmith@optusnet.com.au

Australian Whitefly Diversity

A synopsis of the talk presented at the September meeting

Peter S. Gillespie
NSW DPI – ASCU, Orange, NSW
peter.s.gillespie@dpi.nsw.gov.au

Close scrutiny of Australia's whiteflies shows it has a diverse and interesting fauna closely allied to many of its unique floral components. Unfortunately most of this diversity has not been recognised until relatively recently. Dumbleton in 1956 provided Australia's first assessment of the family Aleyrodidae and accounted for just 22 species including three cosmopolitan pests in 13 genera. It was not until Jon Martin's couple of visits in the late 1990's that some serious scrutiny of the whitefly fauna occurred and this resulted in the publication of Jon's "The whitefly fauna of Australia" in 1999. To give some idea of how little the Australian whitefly fauna had not been assessed prior to Jon's book, he included 101 species in 40 genera (where 53 species were described as new) based on the examination of but a few collections and only a total of about 5 weeks field collecting. He recognised that many other taxa remained undescribed, either known only from small or poor quality material.



The family Aleyrodidae are a group of Hemipterans related to scales (sessile immatures, wax production) and also to psyllids (free living adults of both sexes) and like all of these they feed on the phloem of their host plants both as adults and juveniles. The Aleyrodidae differ from both these groups through the presence of a vasiform orifice, a cup-shaped excretory organ, persistent on the dorsal posterior part of the abdomen of all life stages. The vasiform orifice has a lid (opercula) and tongue (lingula) that it uses to respectively open and flick away excreta.

Unusually for most groups of insects, the major taxonomy of the Aleyrodidae is based primarily on the morphology of the pupa, with adults of many species not providing enough characters to reliably separate them. The pupa has many ornamental and functional features that can be used to discern various taxa. Such features include dorsal and marginal spines, marginal crenulations, creases and folds in the abdomen and thorax, moulting sutures, pores and features of the vasiform orifice. Some species can produce copious wax through large compound pores and this is characteristic of one particular subfamily, the Aleurodicinae. The other major subfamily, the Aleyrodinae typically lacks these compound pores.

Recent investigations show that through inconsistencies in the morphology (Gillespie 2006) and molecular traits (deBarro unpublished data) that it is likely Australia is host to a third undescribed subfamily. This group has only a few relictual species and is restricted to SW Western Australia and the rainforests of SE Queensland and is found only on a few Proteaceous hosts.

Recent collection of much undescribed material has shown many new species of whiteflies in Australia. Many seem restricted to individual plant species and such monophagy highlights why so many species remain undetected as most hosts are endemic plants. It is estimated that the true number of whitefly species in Australia may number about 300-350 species (Gillespie unpublished data, De Barro pers comm.)

One or two highly studied, cosmopolitan polyphagous pest species are the familiar icons people envisage when talking of whiteflies but the truth is many more fascinating endemic whiteflies remain to be discovered. The study of whitefly taxonomy in Australia shows great potential as these often overlooked insects languish often undiscovered in parks, gardens or bushland and certainly there are many more ecological relationships to be explored pertaining to the host specificity and relationships of this insect group with the Australian flora.

References

Dumbleton, L. J. (1956). "The Australian Aleyrodidae (Hemiptera: Homoptera)." Proceedings of the Linnean Society of New South Wales **81**: 159-180.

Gillespie, P. S. (2006). "A new genus and two new species of whiteflies from Australia (Hemiptera: Aleyrodidae)." Zootaxa **1306**: 1-23.

Martin, J. H. (1999). The whitefly fauna of Australia (Sternorrhyncha: Aleyrodidae). A taxonomic account and identification guide. Canberra, CSIRO Division of Entomology.

Society stall at the Ku-ring-gai Wildflower Festival

This nature oriented Festival, held on the weekend 25-26 August, was well attended this year as the weather was good and there were no other major community events locally. The Festival Coordinator, Valerie Close at Ku-ring -gai Municipal Council, reminded us that our Society had participated for 12 years now! The Festival theme and program vary slightly from year to year and this weekend there was no invitation for us to guide entomological walks, which is a pity since visitors have had a great interest in previous years.

Louise , Barbara and Gith

Joe Stivala from the Society for Insect Studies again honoured us by lending his superb display drawers, one with large, exotic insects and the other containing a display of entomological preservation techniques. Ted Taylor brought his broad educational material on wood boring insect, including posters, a great variety of insect damaged wood pieces, and live termites, grubs and several other insects of interest under microscope, all of which he gave specialist advice on. Barbara displayed books, posters and pinned native and exotic bees, among others, and she and Ted amused all with their toy bugs and spiders - Barbara partially dressed up as a bug as well! A giant inflatable spider almost shocked some.

Ted amused by Barbara's efforts to inflate a plastic spider

I brought Spiny Stick Insects (*Extatosoma tiaratum*) to entice visitors of all ages, as these insects have a very 'charming' character and looks - great suggestion for pets. I put up a poster display on mosquito biology, control and personal protection, including a poster with mosquito species of south-eastern Australia and a professionally used "dry-ice baited light trap" for sampling of adult mosquitoes. Visitors had access to many 'bug' and spider books to browse and look at. Graeme Smith with wife Louise arrived directly from an overseas trip to man the stall, and Robin Parsons could not help but come as well to assist and amuse visitors at the stall.

Robin introducing stick insects to kids

Again, we ran an insect quiz, and a boy named David in St Ives won a booklet on Australian insect and spiders by Steve Parish.

It is as always heart warming and worth while to be able to inspire children as well as adults to find out more about insects and other 'littlies' of the world, and we may just as well return to the Festival next year to participate. Anyone interested in contributing towards displays or presence at our Society stall in August / September 2008, please don't hesitate to contact us.

The next generation of entomologist?

September meeting- Show & Tell

Ted Taylor showed a National Geographic article on cave arthropods

Martin Horwood bought along some Drywood termite frass from a house in St Ives. He had collected *Porotermes* in skirting boards but thought that they we not responsible for the type of frass he'd found.

Fred Swindley bought along some photos of Fiddler Beetle from a rotted Indian Fig Tree. Several pupae emerged quickly once collected and Fred wonders whether the disturbance triggered their emergence? They could fly very quickly after emerging.

He also showed us a photo of a Eucalyptus Longicorn from West Ryde.

Howard Greening took advantage of the expertise of our speaker to bring along a sample of one of his garden plants that had been severely attacked by white fly.

Christmas function – Saturday 8th December at 6.30pm

Last year's dinner and organisation was so enjoyable the Council readily accepted Ted's offer to arrange this event at the same venue.

BOATSHED CAFÉ

1609 ANZAC PARADE
LA PEROUSE
(see map)
TEL: 9661 9315

ENTRÉE: CHICKEN CAESAR SALAD

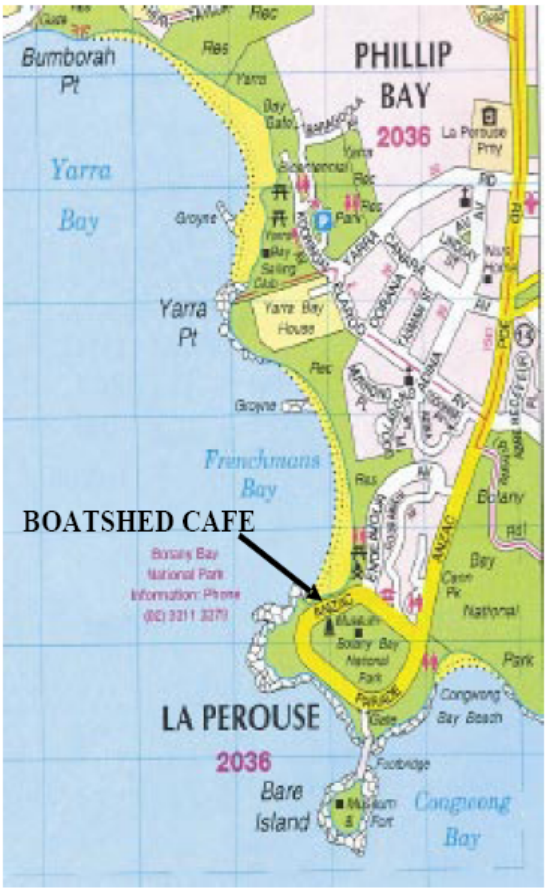
MAIN: A choice of:

GRILLED BARRAMUNDI
OR
FRIED FLATHEAD FILLETS
OR
TASMANIAN SALMON WITH CAPERS & LEMON

Chicken dish is available for those not keen on seafood

DESSERT and Tea or Coffee

COST: $38 per person
Soft drinks available at restaurant;
BYO alcohol



RSVP: Ted TAYLOR – 96613627 by 1st December
Email: marylynne_ted@yahoo.com.au

For an interactive map go to: www.eatability.com.au/au/sydney/boatshed_the/map.htm

Insect of the Month

Re-discovery of the **Bungonia Caves silverfish**

Graeme Smith

Silverfish of the family Nicoletiidae are often collected in caves, with many species being described from European and Central American caves. At least one American species, *Texoreddellia texensis* (Ulrich), can be up to 70 mm long, including the antennae and long tail filaments. Other species in the family are collected in soil or under stones or logs but all nicoletiids, whether collected in caves or not, are white in colour and eyeless, features often considered as indicators that the species is an obligate cavernicole or troglobite. Cave-adapted silverfish do however display greater elongation of the appendages (longer, thinner legs and antennae > head and body length etc). Nicoletiids feed on decaying vegetable matter and thus pre-adapted to a life in caves where the main source of food is organic matter washed in during heavy rain.

There are 14 species of this family described from Australia with several species collected from caves; **Qld:** *Metrinura russendenensis* from Russenden Cave, Texas, *Metrinura subtropica* from Bayliss Cave, Undarra as well as an unidentified juvenile specimen of *Metrinura* from Marachoo Cave, Chillagoe; **NT:** two female *Trinemura* from Bat Caves, nr Alice Springs; **NSW:** *Subtrinemura anemone* from Bungonia; **SA:** *Subtrinemura spelea* from Kelly Caves, Kangaroo Island and a juvenile specimen probably *S. excelsa* from Narracoorte and in **WA:** *Trinemura troglophila* from Cape Range and a juvenile, probably *T. novaehollandiae* from Kinnenabbra Cave, Cervantes. *M. russendenensis* is probably already extinct as it appears to be cave adapted and the only caves it is known from are now submerged beneath the waters of Pike Creek dam.

Fig. 1 Adult silverfish

The Bungonia Caves silverfish (Fig. 1) was collected on several trips by members of the Highland Caving Group, between June 1975 and June 1976. Specimens were found in UNSWSS Hole and Argyle Hole but most commonly in Phoenix Cave (Smith 1976). It was first described as *Trinemura anemone* (Smith 1988) but later transferred to a new genus *Subtrinemura* when the taxonomy of the Australian Nicoletiid fauna was revised (Smith 1998).

The species name derives from the unusual structures, which resemble miniature sea-anemones, found on the cerci (outer tail filaments) of mature males (Fig. 2). The function of these structures is unknown, however the fact that they are only present on mature males, suggests that they are used to locate females within the sparsely inhabited subterranean environment.

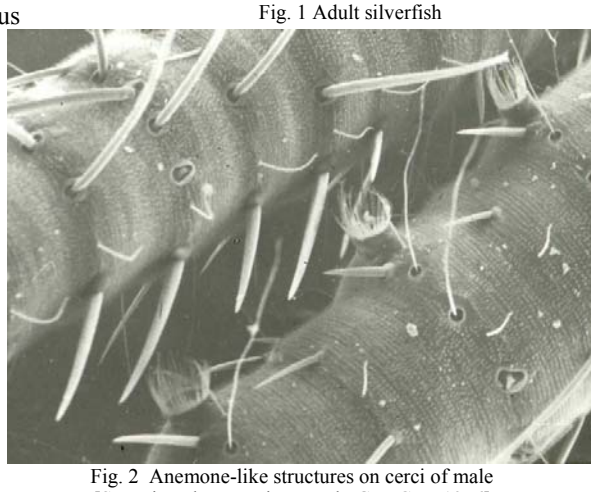


Fig. 2 Anemone-like structures on cerci of male
[Scanning electronmicrograph: Guy Cox, 1976]

At the time of their first discovery the silverfish were reasonably common in Phoenix Cave probably because this cave was only newly discovered and not degraded by caving activity (Smith, 1976). It was also a reasonably wet period with pools of water common on the floor of several cave passages so food may have been plentiful. No further sightings of this species appear to have been made since the initial discovery period, however this may be simply that sightings have not been reported. The author has been keeping an eye out for them on numerous caving trips over the intervening years to caves other than Phoenix Cave, but without success.

These silverfish live among the stones on the floor of cave passages and there is concern that they would be unknowingly killed by cavers simply moving through the cave. It was also feared that the drought of recent years may have made life impossible for these insects that rely on flood washing organic matter into the caves. Phoenix Cave was gated in the late 70's in an attempt to protect this insect species as well as the extensive fossil display and layered mud banks of scientific importance.

A permit was issued by DECC/NPWS to allow the Highland Caving Group to enter Phoenix Cave and search to see if silverfish could still be found. A first attempt to enter the cave in February, 2007 , was abandoned as heavy rains prior to that weekend had resulted in sediment burying the gate and jamming the lock. High carbon dioxide levels were found even at the entrance.

The rangers at the reserve replaced the lock and Joe Sydney and I entered Phoenix Cave on the 4th August, finding CO_2 levels to be acceptable, being low near the entrance but reaching a level of 1.5% at the bottom of the 3.5 m climb (see map in Bauer & Bauer, 1998).

Fig. 3 Female silverfish moving up the side walls of the passage [Photo Joe Sydney 2007]

Great care was taken on the descent to turn over small rocks and check whether invertebrates might be hiding underneath. Finally, just below the 3.5 m climb and just as we decided the level of carbon dioxide had reached levels too high to continue, an adult female silverfish was located among the stones on the floor. We photographed it as it moved off to the side of the passage (see Fig 3). It was very satisfying for me to see this species alive again after some 30 years of futile searching.

Fig. 4- site where silverfish found

Clearly this silverfish species has survived the drought within the protected environment of Phoenix Cave. High levels of CO_2 do not seem to bother them; something also noted for the *Metrinura subtropica* in Undara lava tubes (Howarth & Stone, 1990). From the limited observations now and in 1975-76, it is clear that the silverfish forage among the small stones on the floor of the passage (Fig. 5) and would therefore be quite vulnerable to being squashed by unaware cavers moving along the passage. They may well survive in other cracks too small for cavers to enter but may have to return to the main passage to feed on washed-in detritus and thus be vulnerable to caver's boots. This rare species would clearly benefit from continuing the current restrictions on access to Phoenix Cave.

I would like to thank the DECC\NPWS and Bungonia Conservation Area Rangers for granting permission and access to enter Phoenix Cave. Thanks also to Highland Caving Group for organising and the VRA Cave Rescue Squad for supporting this trip.

References

Bauer, Julie & Peter (1998). Under Bungonia. Alken Press, Smithfield, Sydney. 284pp.

Howarth, F.G. & Stone, F.D. 1990. Elevated carbon dioxide levels in Bayliss Cave, Australia: Implications for the evolution of obligate cave species. *Pacific Science* **44**, 207-218.

Smith, (1976) Distribution of silverfish in caves at Bungonia, NSW. *Journal of the Highland Caving Group* **2:** 30-31.

Smith, G.B. (1988) New species of *Trinemura* Silvestri (Thysanura: Nicoletiidae) from Australia. *J. Aust. Ent. Soc*. **27:** 47-52

Smith, G.B. (1998) Review of the Australian Nicoletiinae (Zygentoma: Nicoletiidae). *Invertebrate Taxonomy* **12:** 135-189.

Fig. 5- The entrance is getting tighter as I get older!

Next Meeting

Where: Invertebrate Section of "Backyard to Bush" Taronga Park Zoological Gardens

When: 7.00 pm on Wednesday, 7 November 2007

Thanks to a kind offer by Warrick Angus, the Society will be holding their next meeting in this section of the zoo. Members and families are welcome and we have extended this invitation to members of the SFIS.

Programme: Meet at the service gate in Bradley's Head road well below the Zoo function centre NOT at the main entrance to the zoo. This service gate is about 200 metres further along the road towards the ferry wharf.

A BBQ dinner with soft drink will be ready when you arrive and this will be followed by an inspection of the invertebrate exhibits in this area of the zoo. We will not be wandering from the "Backyard to Bush" section but I'm sure there will be enough to keep us interested in this area.

Alcohol is not permitted under the licensing conditions of the zoo so please do not bring any with you. Also please ring me if you have any questions. DO NOT ring the Zoo as staff answering the phone will have no idea about this meeting arrangement.

Cost: We will charge $10.00 per head to cover the cost of the food. You can pay Graeme Smith at the zoo.

RSVP is essential: We are limited to about 30 people on a first to RSVP basis. As we will be outlaying money for the food, letting us know you will be coming is taken as a commitment that you will be paying $10 per head even if you don't turn up on the night. Please call Graeme Smith at work or at home or send an email to le_gbsmith@optusnet.com.au DO NOT phone the zoo.

Getting there:

By Car: At this time of the evening there will be ample parking available in Bradley's head Rd but give yourself plenty of time to get through Sydney traffic

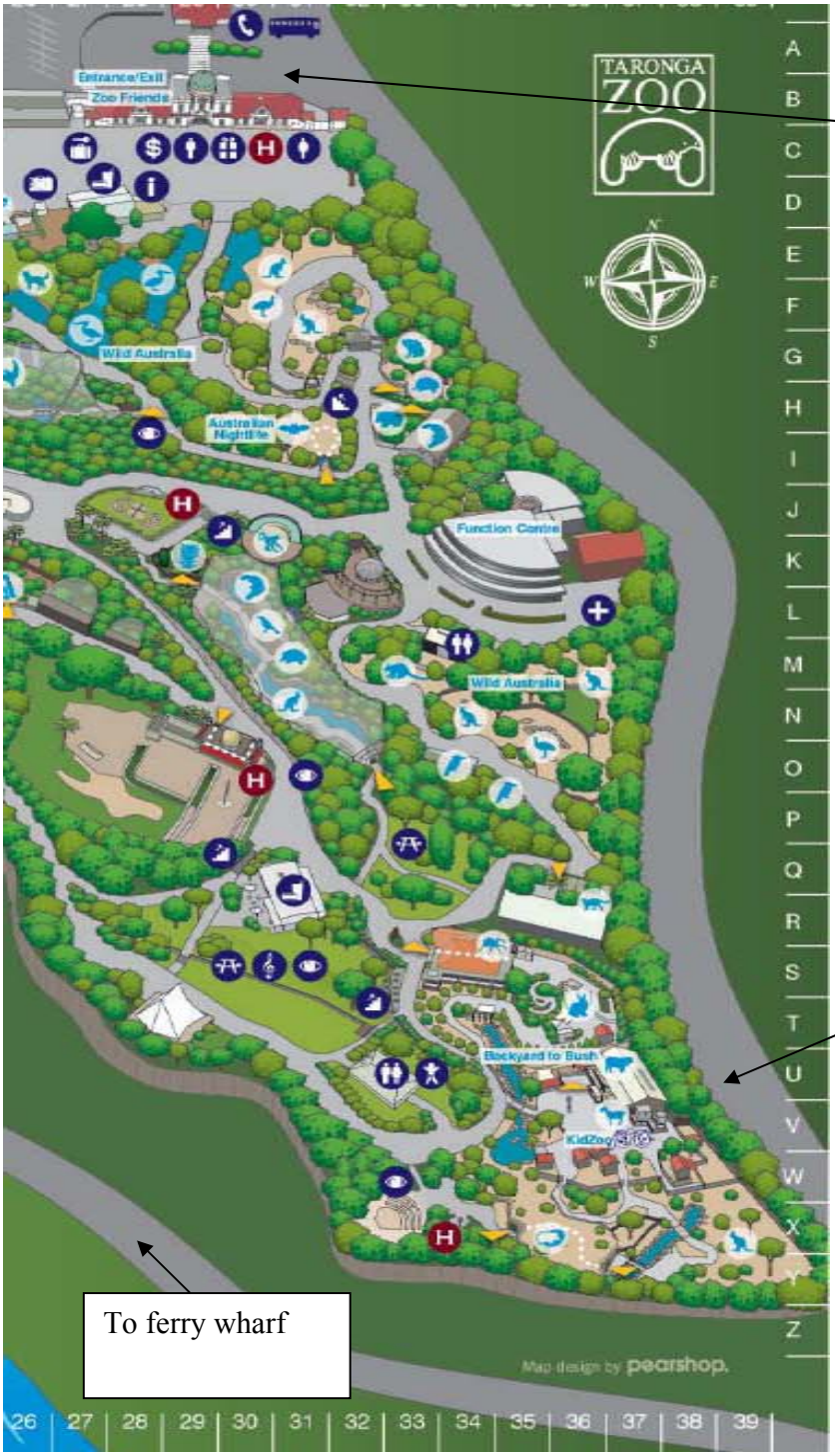
Note public transport details below are from the respective web pages. You might like to check details yourself in case you can find something better.

Arriving (only) by Ferry: Depart Circular Quay (Wharf 2) at 6.15pm; Arrive Taronga Park Zoo Wharf at 6.27; then either walk up the hill to the service gate of take Bus 238 from the wharf to Taronga Park Zoo (top gate) 6.30-6.35 and walk back down the hill to the service gate.

If you miss this ferry there is a later one departing at 6.45 with the bus departing at 7.00. You might however find that we are no longer waiting at the gate and will need to phone my mobile number so we can let you in. **Note there is no ferry service available back to the city after 7pm** (nor from Mosman South after 8.16 pm)- so a bus trip back is the only option

By Bus from the city: Bus 247 from Wynyard (Carrington St) at 6.19 pm arriving at Taronga Park Zoo top gate at 6.48. If you miss this there is another departing Wynyard at 6.49 arriving at 7.15, but you will need to phone me to let you in.
Return buses from the top gate: Bus 247 departing 9pm, arriving Wynyard York St at 9.21 or Bus 247 departing 9.30pm arriving Wynyard 9.51. You will need to walk down Bradleys Head Road some 400 metres to the service gate.

Graeme Smith 0421 617 377 (mobile) 9857 2470 (work); 9981 3749 (home)
As back up contact only on the day of the meeting- Warrick Angus 0420 960 308 (mobile)



Buses drop off and collect from here (Top Gate)

Meet here outside the service gate at 7 pm

To ferry wharf

Bi-monthly Meetings

The Council will continue the operation of the Society while we try to fill the position of President. However, the Society will meet only **BI-MONTHLY** until further notice. General meetings with a speaker will 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.

At this stage we are also planning an additional meeting in February to coincide with the peak mosquito season thus setting the scene for our speaker.

Future Events

Date	Speaker	Title
7 th November 7.00 pm	Host: Warwick Angus	Zoo visit- "Backyard to Bush"
8 th December 6.30 pm	Host: Ted Taylor	Christmas Dinner
6th Feb, 2008	Cameron Webb (Westmead Hospital)	"Mosquito fauna of NSW - from the mountains to the sea"
5th March, 2008	Annual General Meeting	
2008 TBD	Graeme Smith (Reckitt Benckiser)	Testing consumer pest control products

Venue:

NOTE: The November meeting will be held at Taronga Park Zoo NOT at Ermington

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

MEMBERSHIP FEES 2007

ORDINARY MEMBERS	$50
COMPANY ASSOCIATES	$60
STUDENT MEMBERS	$25
CORPORATE MEMBERS	$50

OFFICIALS

PRESIDENT	Could this be you?
HON SECRETARY	Ms MARY ANN TERRAS
HON TREASURER	Mr TED E TAYLOR
HON EDITOR	Dr GARY LEVOT
BUSINESS MANAGER	Ms GITH STRID-NWULAEKWE