

Victorian Entomologist



Entomological Society
of Victoria

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THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

- (a) to stimulate the scientific study and discussion of all aspects of entomology,
- (b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
- (c) to compile a comprehensive list of all Victorian insect species,
- (d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at the Activity Room Ground Floor, Museum Victoria, Carlton Gardens, Melway reference Map 43 K5 at 7:45 p.m. on the third Tuesday of even months, with the exception of the December meeting which is held earlier in the month. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	\$35
Overseas Member with printed bulletin	\$65
Country Member	\$31 (Over 100 km from GPO Melbourne)
Student Member	\$23
Electronic (only)	\$20
Associate Member	\$ 7 (No News Bulletin)
Institution	\$40(overseas Institutions \$80)

Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

LIFE MEMBERS: P. Carwardine, D. Dobrosak, I. Endersby, R. Field, T. New, K. Walker.

Cover and logo design by Ray Besserdin 2017

Cover photo: *Persectania ewingii* showing prominent interfacetal setae. Such 'interfacetal setae' on the compound eyes are present in many families of moths, and other orders of insects, but are unusually long and visible to the naked eye in this group.

Photo Simon Hinkley at Melbourne Museum.

**Minutes of the Entomological Society of Victoria General Meeting,
Tuesday 16 October 2018 19:45 Melbourne Museum**

Attendance:

Members: Linda Rogan, Frank Pierce, Carol Page, Denise Deerson, Julia McCoe, Sharon Mason, Joshua Grubb, Ray Besserdin, Peter Carwardine, Glenise Moors, Angus Norman, Roch Desmier de Chenon, Ken Harris, Gordon Ley, Stuart Lay, Martin Steinbauer (speaker).

Guests: Melissa Griffin, Sebastian Steel, Caitlin Selleck, Linda Semeraro, Li Xin Eow, Li Sha Eow, Andrew Mitchell (speaker).

Apologies: Geoff Hogg, Robin and Gordon Sharp, Ian Endersby, Reiner Richter, Peter Muller.

The general meeting was opened and all were welcomed by President Peter Marriott.

Peter announced that copies of the *Morwell National Park Lepidoptera & Neuroptera* as well as *Gippsland Lakes Lepidoptera* were still available for those at the meeting. He mentioned that each of these publications were funded by local sources and thus could be distributed for free.

Bioscan of Otways: Organised by Museum Victoria in late October and late November. Participation is somewhat limited so if you are keen to be involved, contact Peter Marriott as soon as possible.

Peter then introduced the first of two informative speakers for the evening.

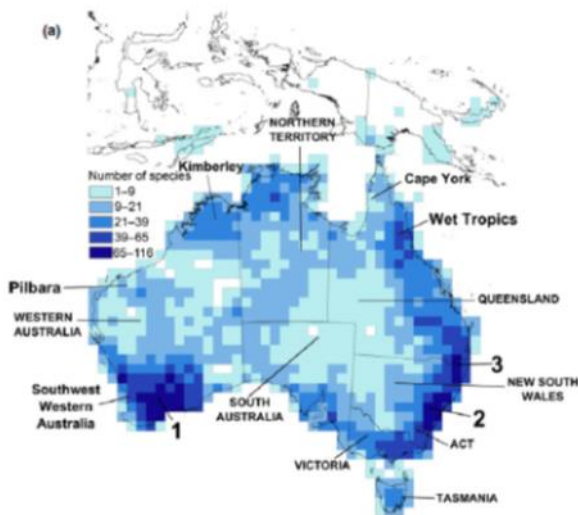
**Insect herbivory of eucalypts: bottom-up perspectives on biodiversity,
biology and ecology.**

Martin J. Steinbauer, Department of Ecology, Environment & Evolution, La Trobe University

Martin is Head of the Insect-Plant Interactions Laboratory. He explained that the information to be presented was the result of much work by himself and his many colleagues.

Eucalypts, the general term for *Eucalyptus*, *Corymbia* and *Angophora*, are the Ecologically dominant plant taxon of Australia. Eucalyptus alone contains more than 800 spp. and many of these

have a very restricted distribution. They are not evenly spread around the country but there are at least three areas of Eucalypt species diversity hot spots as shown on the map (Figure 1).



Being evergreen, the leaves of Eucalypts must last for several years. This requires toughness. The situation for herbivores is further complicated by the fact that many Eucalypts will have up to four distinct types of leaves at various times, a condition known as heteroblasty. Each leaf type may have differing characteristics with complex chemistry, oils, and compounds including tannins and waxes. In addition leaves have pronounced age-related colour change.

Figure 1. Eucalypt species richness.
González-Orozco et al. (2014) *Diversity Distrib* **20**: 46-58

These are some of the factors that influence the behaviour of insects that feed on Eucalypt leaves.

Where there are Eucalypt species diversity hot spots, one would expect similar species diversity in insects such as *Poecilometis* (Pentatomidae); lerp-forming psylloids (Spondyliaspinae); Eriococcidae; Chrysomelidae; Geometridae; Limacodidae and others.

This is seen in studies of *Amorbus* species. Some insects utilise only a limited range of host species. Where the Eucalypt species have short-range endemism, (ie. restricted geographic distributions nominally less than 10,000 square km), one would expect the same to be true of the relevant insects. An example can be found in the lerp forming genus *Glycaspis* (Psylloidea) (Figure 2). In this genus 79% of the species (65 spp.) are recorded from only one host.

Where leaf toughness (the physical difficulty involved in eating leaves) is high, insects must develop coping mechanisms.

The first bite for newly hatched chewing insects is often difficult. This may be why females of many species show a preference for oviposition on young expanding leaves, e.g. leaf beetles (Chrysomelidae) (Figure 3) .



Figure 2. *Glycaspis* sp. lerps and eggs.



Figure 3. *Paropisterna bimaculata* ovipositing on juvenile Eucalypt leaf.

For some insects, feeding together during earlier larval instars reduces effort needed by each individual (Figure 4).



Figure 4. *Paropsis atomaria* larvae group feeding.

In addition, very small larvae may skeletonise leaves, avoiding veins and glands e.g. *Mnesampela privata* the autumn gum moth (Geometridae) (Figure 4).

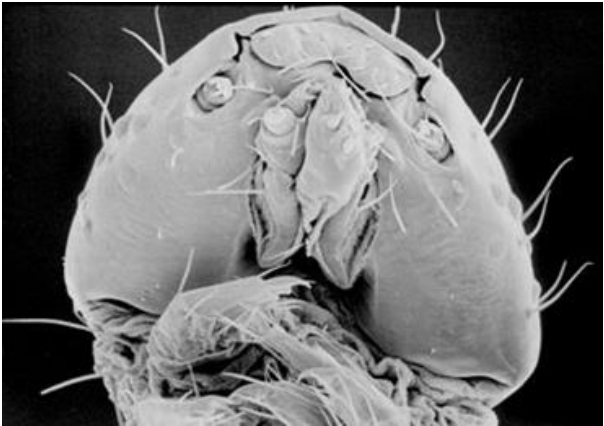


Figure 5. Close up of *Mnesampela privata* and skeletonised gum leaf.

Leaves are protected by two types of epicuticular waxes: structural and non-structural. These waxes are essential to control of water balance in plants. Structural waxes are those that are unable to be physically abraded from leaves. Non-structural waxes produce glaucous “bloom” or form a dense layer of wax tubes. While non-structural waxes often prevent adhesion by generalist herbivores, they may also provide cues for oviposition and leaf age selection for species as in the autumn gum moth, which is a specialist of juvenile blue gum leaves (Figure 5).



Figure 6. Juvenile blue gum leaves, glaucous bloom under the leaf, *Mnesampela privata* eggs on bloom.

Testing for the effect of volatile oils on insect species was rather complicated. This involved electrophysiology and inserting tiny probes in antennae (Figure 6). Also testing was carried out with psyllids utilising the Y-tube olfactory meter to test psyllid choice (Figure 7).

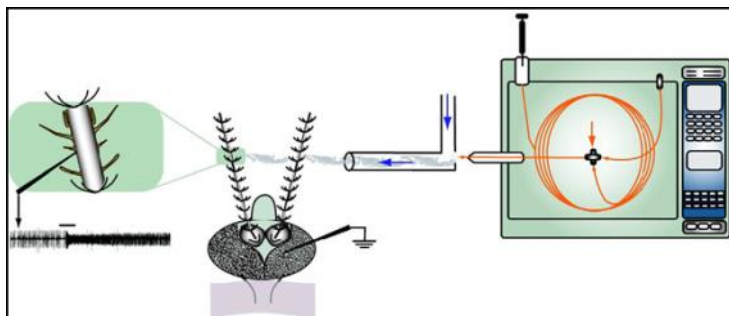


Figure 7. Testing for insect sensitivity to host plant volatiles.

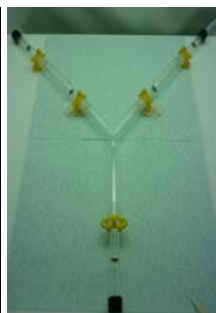


Figure 8. Y-tube olfactory meter

Results showed host plant volatiles (HPVs) provided cues for insects to find host plants and preferred leaf types; in other cases they were cues for avoidance.

Testing has also been carried out to determine insect sensitivity to age-related colour change. Although few insects appear to be red-sensitive, testing of psyllids where other cues were eliminated, proved that two species are red-sensitive while a third is green-yellow-sensitive.



Figure 9. *Cardiaspina densitexta* nymph beneath a lerp, adult psyllid and the damage to Pink gum leaves caused by feeding nymphs on Pink gum. Bottom right is a parasitoid wasp *Psyllaephagus* sp.

Martin stressed the importance of obtaining more knowledge about the herbivory of Eucalypts. He noted outbreaks of psyllids and other insect herbivores are widespread and getting worse while very little is known about the relevant ecological interactions. He noted funding tends to come, if at all, from forestry rather than conservation. The need for some sort of organisation similar to the Science Philanthropy Alliance that exists in the US is clear to Martin. <https://www.sciencephilanthropyalliance.org/>

Many thanks to Martin for this stimulating presentation.

(Notes on this talk taken by Linda Rogan with input from Martin Steinbauer).

AUSTRALIAN MUSEUM

Exciting times for dull brown moths



Andrew Mitchell

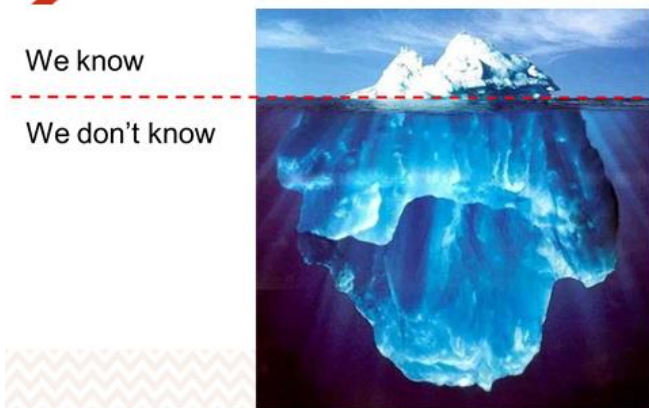


Peter Marriott explained that a lucky juxtaposition of the EntSocVic meeting date and Andrew Mitchell's plans to be at Melbourne Museum meant he was able to fit in a brief talk. This was an enthusiastic overview of his current project involving noctuid moths.

The taxonomic impediment

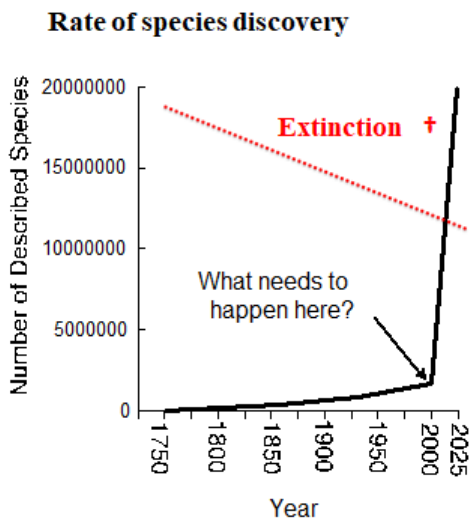
We know

We don't know

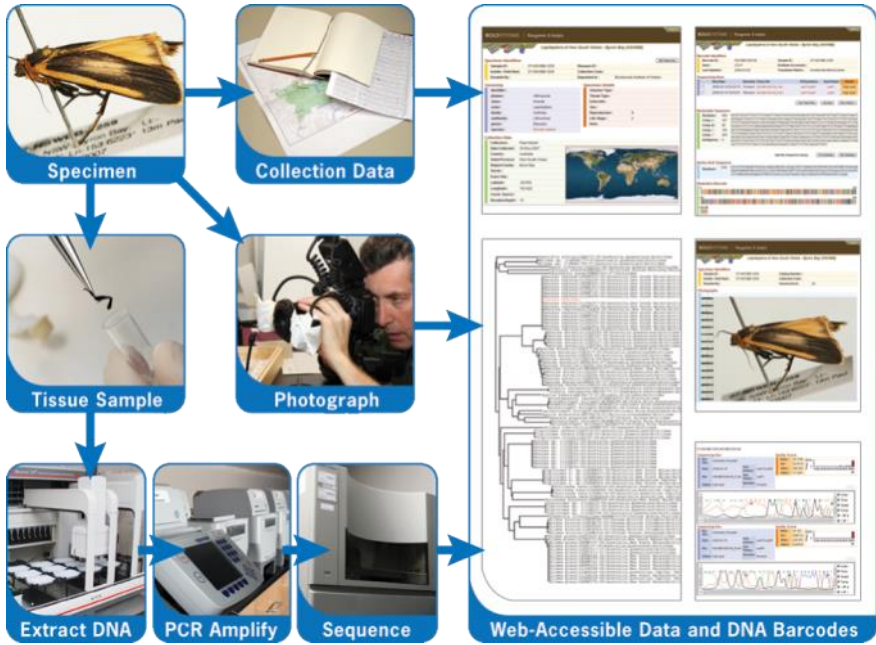


Andrew began by telling us current knowledge about the taxonomy of insects is very much just the tip of the iceberg with the vast majority of species unknown or undescribed.

He then showed a series of slides that illustrated how few species of the total believed to exist have been described by science up to the present. This is summed up in the slide below where the rate of extinction is unknown but accelerating. .



What can speed up the process of species description against the threat of extinction? Part of the answer can be found in technology with DNA sequencing and barcoding. DNA barcodes are brief DNA sequences used to identify species. It is taken from the mitochondrion which is transmitted only through the egg. The process is outlined below.



In well known faunas, DNA barcoding normally is true to species in 95% of Lepidoptera. Andrew used diagrams to explain how DNA, morphology and other data are utilised in taxonomy.

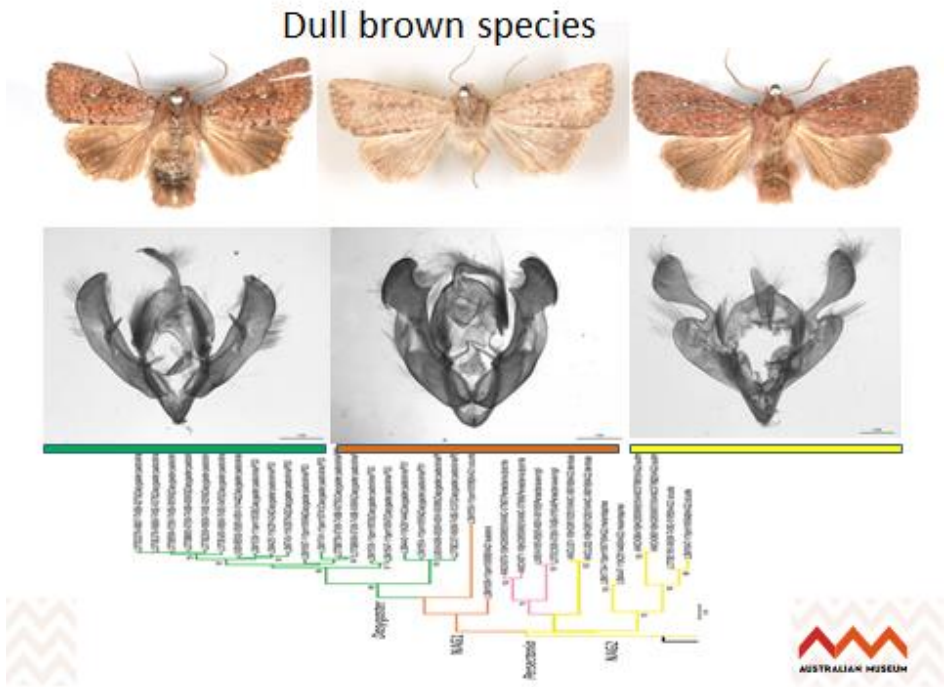
Andrew's project on the 'Southern Endemic' hadenine moths (Noctuidae), has roughly doubled the number of known species, and 14 of these new species will be described soon.



The Hadeninae subfamily includes moths with hairy eyes as shown in the photo above. This can be compared with smooth eyed moth such as *Agostis infusa* seen below.



Nuclear DNA sequence data and genitalic structure was used to define relationships among the more than 30 species.



Conclusions drawn at present:

- The Southern Endemic' group is monophyletic,
- There are 2-6 new genera and 14+ new species,
- Many unrelated brown species,
- Red/brown & black species are often sister-species,
- Many DNA barcode “singletons”,
- Host plants are currently unknown for most species.

Acknowledgements: Funded by ABRIS & AMRI (2012 – 2015)
Specimens and assistance from: Lionel Hill (DPIWE, Tas)
Ted Edwards & You Ning Su (ANIC) Bobbie Hitchcock (AM)

(Notes on this talk taken by Linda Rogan with input from Andrew Mitchell)

Many thanks to Andrew for taking time to give us some insight into these exciting additions to knowledge about these “small brown moths”.

Previous Minutes: General meeting Tuesday 19 June 2018 v. 48 no.4 p. 69 and Notes from the excursion on Tuesday 21 August v. 48 no.5 p. 89 onwards.

Moved: Ray Besserdin Seconded: Julia McCoey Carried.

Biodiversity Heritage Library: Further discussion about digitizing the Victorian Entomologist was held. The options of carrying withholding this for 10 years or alternatively 5 years were canvassed. More people favoured the 5 year option. It was moved that we agree to the digitizing the Victorian Entomologist by BHL for up to 5 years from the current issue.

M: P. Marriott S: L. Rogan Carried by a show of hands.

Meeting Closed.

Observations of *Torbia perficita*
Linda Rogan linda.rogan@optusnet.com.au



Top left: Adult female *Torbia perficita* 23/04/2018. Top right: One of three clumps of eggs laid overnight same day. Bottom left: First instar of young discovered about midday on 26/10/2018 (185 days after eggs were laid). Bottom right: second hatching on 27/10/2018 in early am just after leaving the eggs. This nymph developed the same darker colour as previous photo by midday.



**Observations of
Leptotarsus Leptotarsus imperatorius records at Round the Bend
Conservation Cooperative
Frank Pierce, jmandfp@bigpond.com**



Figure 1. *Leptotarsus Leptotarsus imperatorius* with leg caught on screen.

Introduction

Leptotarsus Leptotarsus imperatorius, one of Australia's largest Crane flies, was attracted to light, at the kitchen window, on 2017-10-17 and again on 2018-10-14.

Methods

On both occasions the specimens were photographed at the window and then later at ground level. The 2017 specimen, because its ID was unknown at the time, was temporarily retained in a container for close-up photography and then released. On both occasions, when it became obvious that the specimen was unable to take flight, it was collected and placed in a freezer for later transmission to researchers for their use.

In 2018 the specimen seemed to have a leg stuck on the fly wire when it was found and photographed at 8.32pm. (Figure 1). After using these photos to check the specimen's ID, the specimen was again checked but was no longer at the window.

Later (9.49pm) the specimen was found on its back on the ground, with one wing partially missing. (Figure 2)



Figure 2. Specimen at 21:49 with broken wing.



Figure 3. Specimen at 22:18 unable to fly.



Figure 4. Close-up of eggs from *L. L. imperatorius* 2018.



At 10.18pm the specimen was turned over, but it still couldn't take flight (Figure 3) and was soon on its back again.

At 5am the next morning it was still on its back on the ground, so it was placed in a jar in the freezer.

Figure 2 indicated that it may have released an egg, so the adjacent ground was searched and another five eggs were found. Figure 4 is a close-up of these.

Figure 5 is a head detail of the 2017 specimen.

Photos were taken with a hand-held Canon Powershot SX50-HS compact digital camera, set to macro, generally with the in-built flash on.

Figure 5. Close up of *Leptotarsus Leptotarsus imperatorius* specimen in 2017.

TABLE 1

SPECIMEN	2017	2018
Wing Length	32	36
Body length, Head to Abdomen (inclusive)	28	32
Abdomen width	9	11
Fore-leg Length	64	72
Middle-leg Length	64	67
Hind-leg Length	69	78

Results

The specimens were measured and the details are listed in Table 1, (all measurements are in mm.)

Discussion

Wing lengths were within the 26 – 37mm range given in Dobrotworsky 1972.

Other measurements are recorded to give an appreciation of the impressive size of the species (Table 1).

More than ten other species of Crane-fly have been recorded at the site.

There are three previous Victorian records of this species on ALA, however Dobrotworsky 1972 shows five records in Victoria, none of which are on ALA.

A later thought was that the eggs could have been collected and placed in moist soil near the local creek, but unfortunately by this time they were unavailable for collection, presumably dispersed by strong winds.

Thanks to Zac Billingham for identification assistance and for supplying reference material.

Round the Bend Conservation Cooperative is located in the Bend of Islands, a 'biodiversity hotspot', 33km ne of Melbourne. With its unique Planning Zone for Residential Conservation, many residents feel it is like 'living in a National Park'.

For more information refer to <https://www.roundthebend.org.au/>

References

Dobrotworsky, N.V.1972: THE TIPULIDAE (DIPTERA) OF AUSTRALIA V11* THE GENUS *LEPTOTARSUS* GUERIN; THE SUBGENERA *LEPTOTARSUS* SSTR. AND *PSEUDOLEPTOTARSUS* ALEXANDER * Part VI, Aust. J. Zool., Suppl. Ser., Suppl. No. 1.6, pp. 1-9.

Observations

Interactions between male and female *Megachile erythropyga* October 2018

Linda Rogan linda.rogan@optusnet.com.au

Background

In 2015 three old red gum posts were installed in my garden. They had been drilled with holes varying in diameter from 3 mm to 8 mm and as deep as possible. By the end of the 2015/2016 summer I had several species of *Megachile* nesting in the cavities. Eventually, using postings on BowerBird, I have identified: *Megachile ferox*, *M. oblonga*, *M. lucidiventris* and *M. erythropyga*. I have observed *M. ferox* males roosting nearby and *Hylaeus* males roosting in the posts. Some *Exoneura* species were also apparently nesting. Up until October 2018 I had not observed any mating activities on the posts.

This changed on October 8th, an unusually hot day for that month, and I watched male resin bees chasing each other around the columns. Occasionally one would quickly strike against the post bouncing off the apparently empty holes. Perhaps they could see or smell something I could not. Sometimes two bees collided like aerial dodgem cars.

A female bee arrived and tried to duck directly into one of the holes. The male's timing was perfect and he secured the female on the post. Amazingly I was ready to capture a photo of mating native resin bees. Subsequently, the photos and videos showed details I could not have seen otherwise. The following photos were taken on 8th, 14th, and 30th October.



Figure 1. *M. erythropyga* at 11:06 on 8 October. Only the female's mid legs contact the post.



Figure 2. *M. erythropyga* at 11:14 on 8 October. Male's wings braced at right angle to body dorsal and partial lateral views.

Mating interactions

Two complete mating sequences were observed, ie. clasping of male and female to separation, only one was fully recorded on video. This sequence lasted about 40 seconds.

8 October 2018

On this day the BOM site recorded the temperature at 9:00 as 15.5°C; at 15:00 as 28.6°C. Three convincing mating interactions were observed:

11:06 for approximately 60 seconds (Figure 1)

11:14 already in progress and observed for further 15 seconds (Figure 2)

15:45 full sequence was observed and took less than 60 seconds. On this occasion the male clasped the female as she was entering the hole and a series of photos show the adjusting of positions (Figure 3).

14 October 2018

The BOM site Watsonia temperature was recorded at 9:00 as 19.8° C; at 15:00, 24.9°C.

One convincing mating interaction was observed at 12:37. A full sequence from capture to separation was caught on video taking approximately 40 seconds. Also observed was a male or males continuing to attempt to capture a female carrying pollen that was entering and leaving the same hole for half an hour after the mating was witnessed. Although I can't be certain this was the same female, she was utilising the same hole from which the mated female had emerged.

There were several occasions where the male intercepted the female and the pair fell into the grass emerging separately almost immediately.

30 October 2018

The BOM site Watsonia temperature at 9:00 as 13.5° C; at 15:00, 25.2° C.



Figure 3. *M. erythropyga* at 15:45 on 8 October. Left: Male captures the female as she is entering the hole. Right: Male and female in mating position.



Figure 4. *M. erythropyga* at 16:21 on 30 October.

Two convincing matings were observed:

16:21 Male grasped female on the post and both fell into the grass where it appeared mating to take place (Figure 4).

16:26 Mating was in progress at first photo and continued during 4 seconds of video (Figure 5).

Summary

Six couplings were observed and photographed or videoed on three warm days in October 2018.

In general, the male (about 10mm) is significantly smaller than the female (about 15mm). He appears to grip the back of her neck with his mandibles. In every case her forelegs and her mid-legs were directed upwards toward the male and only the middle pair of legs was in contact with the post keeping the couple from falling. The male's wings were spread at right angles until just before separation. After 41 seconds of video the male folded his wings and flew away. Within moment after, the female would tuck her legs down and fly away or re-enter her nesting-hole.



Figure 5. *M. erythropyga* at 14:26 on 30 October.

Minutes of the Entomological Society of Victoria Council Meeting Tuesday 20 November 2018 Melbourne Museum

Attendance: Peter Marriott, Maik Fiedel, Sharon Mason, Peter Carwardine, Linda Rogan

Apologies: Julia McCoe, Ray Besserdin

Previous Minutes: Minutes of EntSocVic Council 18 September 2018 as printed in VE 48 no.5 p. 107-108.

M: Peter Carwardine

S: Linda Rogan

Treasurer's Report: None

New members: Ms Caitlin Selleck from Coburg, with interests in Insects, spiders, most animals, plants (especially natives).

M: Joshua Grubb

S: Linda Rogan

Editor's report:

The author's index is included in December Bulletin. I strongly encourage members to contribute articles and observations to add to the interest and diversity of the *Victorian Entomologist*. In particular, each Council member is requested to prepare something brief that can be utilised in the Bulletin as space allows over 2019.

General Business:

Future meetings: See back cover for the 2019 schedule so far. There are several possibilities being considered for the unscheduled dates but we encourage members to make suggestions of what they would like to hear and what excursions they would be interested in.

Organ Pipes excursion 1 December: Linda is organising general details and bookings with assistance from Julia. Peter Marriott is organising light sheets. Reminder email is to be sent by Peter Marriott.

EBSCO Contract was discussed and several points need to be clarified or changed before signing.

Goodwill wine: No action taken until discussion with Ray Besserdin.

New members' letters: A draft has been written and Linda and Joshua will work out details of how this will be implemented after members have been approved.

New webmaster: To be discussed with Steve Curle.

Communications with members: an email is to be sent out to members:

- Details of December 1st excursion including BYO evening meal,
- Request for input from members with ideas for the 2019 winter excursion (usually indoors), the end of year excursion (usually in association with a Friends group) and asking members to consider whether they could make a presentation at a meeting or write something for the Bulletin.
- Members will also be reminded that we require additional regular Council members and are will require a President, Vice-president and Secretary for 2019.

Meeting closed.

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Thanks to Ray Besserdin, Carol Page and Ian Endersby for assistance in producing the *Victorian Entomologist*.

CONTRIBUTIONS TO THE VICTORIAN ENTOMOLOGIST

The Society welcomes contributions of articles, papers or notes pertaining to any aspect of entomology for publication in this Bulletin. Contributions are not restricted to members but are invited from all who have an interest. Material submitted should be responsible and original. The Editor reserves the right to have articles refereed. Statements and opinions expressed are the responsibility of the respective authors and do not necessarily reflect the policies of the Society.

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Contributions may *preferably* be E-mailed to Internet address: editor@entsocvic.org.au or posted to the Hon. editor in **Microsoft Word for Windows** with an enclosed hard copy. Tables should fit an A5 page with 1 cm borders i.e. 12.5cm width x 18cm height as a maximum size and complex tables should be in .pdf format. Preference will be given to articles with 5 or fewer pages of solid text and articles longer than this will be returned to the author for reconsideration. The main text of the news bulletin is prepared in 9 pt font Source Sans Pro (please do not use fixed point paragraph spacing). The deadline for each issue is the third Friday of each odd month.

Notice to contributors to ESV Bulletin regarding the EBSCO database. All Bulletins backdated to 2010 will be listed in the EBSCO database. Also future Bulletins when they reach sufficient age. If for reasons unforeseen, in part or in full, any contribution does not meet an author's approval for inclusion, please notify council so we may block your work from appearing in the EBSCO database.

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DIARY OF COMING EVENTS

Next Meeting Presentations by Post Grad students
19 February 2019

Note 7:45 pm start

General Meetings:

Month	Date	Planned event
April	16	AGM and special speaker: Ross Fields The Monarch in the Americas
June	18	Member's Presentations night
August	20	TBA
October	15	TBA

End of year event in late November or early December to be announced.

Council Meetings are held at the Museum Victoria at 5:15 pm
on the following Tuesdays in 2019
19 January, 19 March, 21 May, 16 July,
17 September and 19 November



The Society's Home Page on the World Wide Web is
located at:
www.entsocvic.org.au

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