



24 September 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 27.

Hi All – I have had a work experience student working with me all this week. Nicholas is a year 10 student from the Penleigh & Essendon Grammar school here in Melbourne. He is currently 15 years old. I had forgotten they make them this young! I am a relatively tall person (just on 6ft in the old measurement) and yet Nicholas is taller than me. I met Nicholas earlier this year on one of our public open days where I give guided tours of the behind the scenes in the insect collection. He so inspired me with the questions he asked and answered that I invited him to spend a week here on work experience.

A few years ago, the Museum was in a funding black hole and 53 staff were trenched. One of these people we lost was our work experience coordinator. When she left we stopped accepting work experience students. So now, it is only through a personal invitation that school students get to work here. Their pay rate is \$5 per day! but because we no longer officially take work experience students, I make the \$25 payment from my own pocket. So what!

What really took Nicholas' attention during his first visit was our \$100,000 Leica digital microscope equipment. With this setup, we take high quality, montaged (ie. 3D) images of insects. And, because this microscope has an amazing magnification, we can take whole body images as well as photographing just the

hairs on the top of the head or hind leg etc. So, Monday morning I sat Nicholas down and I went through the image capture and montaging techniques just once. Then I sat with Nicholas while he repeated my steps himself. Then I threw him in the deep end and walked away. We have just had a Calliphoridae fly expert donate her time to sort out our blowfly collection. Arianna did a great job and now our entire collection is renamed correctly, correctly labelled and entire registered. What better place to put Nicholas to work than to image capture our recently revised blow fly collection. Each night, Nicholas has taken home the images he has taken during day to show his parents. “What did you do today at the Museum Son?” – “Oh Dad – photographed blowflies!” But Nicholas has had a wonderful time venturing, for the first time, into the world under the microscope. He had never before used a binocular microscope so he began by closing one eye and looking down one eye-piece with his other eye. I taught him how to adjust the eye-pieces and he soon got the hang of our equipment. Nicholas has revelled in the micro-world and has spent hours looking and photographing our blowfly collection. Initially, he made a few teething errors but by the end of the first day he had worked out what to do. On his first day, I gave him old almost worthless specimens to use. On his second day, I felt he was ready to tackle the collection image capture program so I brought out a drawer of blow flies from the collection. About 10 minutes later, he came into my room apologising and red faced. Somehow, he lent forward, hit his head on the microscope eye-pieces and dropped his first fly. It literally fell apart when it hit the flaw. But – as he noted : He had photographed it before the accident. He was so sorry. Fortunately, we had other specimens of this species so it was not as though it was our only specimen. For the rest of the week, Nicholas has been accident free and thoroughly enjoyed the experience. Today, I

took him into the collection and invited him to spend an hour or so just pulling out drawers and seeing what our collection has to offer. Talk about a kid in a lolly shop. Below are two of the 200+ high quality images has taken this week. Thanks Nick!



A lovely beetle but one that makes me go weak at the knees!

This is the ubiquitous, exotic dermestid beetle – *Anthrenus verbasci* commonly known as the carpet beetle. We museum folk give it a different name of Museum beetle. This species is why we go to elaborate and expensive ways to protect the collection. The larvae of this beetle feeds on dead organic matter so organic fibre carpets, tapestries, clothes, blankets are often targeted. Museum insect collections must be like a shopping mall for these insects – I'll take EVERYTHING. The adult females are frequently found on flowers where they eat pollen to obtain a protein meal to mature their eggs. A great way to learn if you have carpet beetle in your house is to semi-regularly in spring examine the base of windows or the carpet underneath windows. When an insect tries to escape, it will always move towards the brightest light source, which are your windows. If the insect cannot escape, then it will die on or under your window sills.



Location: Adelaide. Photo by Richard Flesfadar

I always get a shiver around this time of year when we see *Anthrenus* at the windows in our buildings.

Back in the 1950s and 1960s, museums used a chemical crystal called paradichlorobenzene as a deterrent for museum beetle. Each drawer in an insect collection has a half centimetre space around all 4 sides of the drawer. This is where we would place chemical deterrents to insects. We initially used paradichlorobenzene but we found it had two problems: 1 – It has a benzene ring which can cause cancer; 2 – paradichlorobenzene outcompetes oxygen on our blood cells. Curators from the 1950-60s, told me they would come to work on a Monday and feel tired and listless yet on the weekends, they felt fine. The male readers of this BB who use public urinals will see off-white block of paradichlorobenzene in the urinal trough. So, we stopped using paradichlorobenzene in the 1970s and replaced it with naphthalene (moth balls).



Naphthalene seemed to solve our problems – apart from people who worked in insect collections smelling like your grandmothers underwear drawer! The World Health Organisation (WHO) produced safety levels for exposure to naphthalene and in the 1980s and 1990s we tested our collection and we were nowhere near these upper safety levels. But in early 2000s, someone found a link between naphthalene and haemolytic anemia. Apparently, if you had a genetic defect called GDB6, then any exposure to naphthalene could lead to haemolytic anemia. So, WHO ruled any exposure to naphthalene was potentially dangerous and we had to remove our naphthalene insect deterrent. What to do to protect collections? IPM (Integrated Pest Management) was introduced which involved several combined methods to protect the collection. The first thing we did was to lower the temperature inside the collection from the mid 20sC down to about 17C. Insects are cold blooded so their generation turnaround time is entirely dependent on the surrounding air temperature. At 25C, an insect life cycle may take 4 weeks from egg to adult. Imagine one female, lays 100 eggs. In 4 weeks approximately 50 females will again 100 eggs – that's 5000 individuals. Then 2,500 females lays another 100 eggs – that's 250,000 beetles within 12 weeks from a start of just one female. If you lower the air temperature to about 17C the life cycle time will extend from 4 weeks to about 6 months. Far fewer beetles in the collection and hopefully giving us more time to find an infestation. The second approach to IPM is to consider the insect collection room as a quarantine room. If you do not need to work in the collection then do not enter it. People used to work in the collection room and eat food in there. Crumbs are another source of food for pests – cockroaches for example. So, apart from very short visits, no one works in the collection room. We take the drawers out to

our laboratory outside the collection room. Another technique we introduced was positive air pressure inside the collection room. The air pressure inside the collection room is higher than out in the corridor. This means air is always pushing out under the doors which makes it impossible for an insect to walk underneath the doors and into the collection.

The “funny” thing about all of this was that Museum Victoria moved into a new museum building in 2000 – we had been in the same building since opened in 1856. Prior to the move, we hired lots of temporary staff to prepare the collections for the move. One of the activities we put the extra staff to in the entomology collection was to complete re-naphthalise all of our 5,500 drawers in the collection. It took a whole year to vacuum out the old naphthalene and insert new naphthalene into all four sides of every drawer. Two years after we moved into the new building, we spent another entire year removing all of the naphthalene from all 5,500 drawers – but we did not have any extra staff to help us. To say it was frustrating would undersell how we felt. Still, if there is no good reason to work in a chemical filled environment every day, then simply don't. Actually, I feel pretty safe from my 30+ years of exposure to naphthalene. Both of the previous museum insect curators lived into their 90s so I reckon that I am “well-pickled” as they were!

We found that not long after working with naphthalene, you could no longer smell it. I usually found that only after I had been out on a field trip for several weeks, that when I returned to the collection room that I could smell the naphthalene for a few days – it was a “familiar” smell so we thought nothing of it at the time. Apart from the known GDB6 genetic deficit effects, we used to find when some visitors we first exposed to naphthalene their eyes would water and some reported a mild headache following their initial exposure. I do not miss the stuff.

Mimicry – the ultimate compliment!

There is a commonly seen braconid parasitic wasp called *Callibracon* which has been photographed and uploaded to BowerBird on numerous occasions. A lovely wasp indeed.



Photo by Rob Dean



Photo by Tamara Leitch

This week, Michael Bedingfield uploaded these images taken from near Queanbeyan, NSW. The insect in these images is not even a wasp but rather a *Callibracon* wasp mimic. It's actually a mirid bug *Rayjeria basifer*. Amazing!



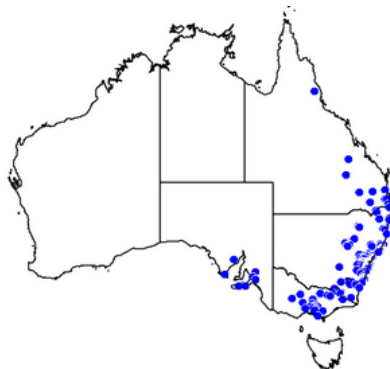
My favourite weevil

My favourite weevil is the Botany Bay weevil – *Chrysolopus spectabilis*. It is also known as the sapphire weevil. Its claim to fame is that it was discovered during James Cook's first voyage and became the first insect to be described from Australia.



Location near Queanbeyan, NSW. Photo by Michael Bedingfield.

It primarily occurs in SE Australia and feed on Acacia.



A beetle with radar antennae.

Colin Prickett recently uploaded images of a scarab beetle with the most elaborate antennae from a location was NE of Perth.



Photos by Colin Prickett

This one had me confused. I checked our collection and I could not find anything resembling this species – not too surprising as it is a WA beetle. I could not decide whether it belonged to the Dynastinae or Cetoniinae subfamilies. So, I contacted my friend Dr Terry Houston, recently retired curator of entomology at the Western Australian Museum. He thought he knew what it was but consulted another colleague in the WA Department of Agriculture for a second opinion. Finally, there was consensus that it was *Prochelyna heterodoxa*. I was stunned when I learnt this species belongs to the subfamily Melolonthinae. I have never seen a melolonthine beetle with this antennal type. So, I looked on ALA and it seems this species has a very restricted distribution and currently known from only 5 records. Colin's record is a welcome addition to defining this species and provided the first set of images for the species on ALA.

This shows the lengths it can take to get an identification.



While over in the west

I recently noticed some spectacular bee images taken by Linda Rogan from her recent WA trip. Enjoy these: This is a male *Ctenocolletes albomarginatus* patrolling a *Ptilotus* plant “non-stop” new Tom Price. What wonderful inflight images!





Leioproctus sp. Shackleton WA Photo Linda Rogan



Trichocolletes chrysostomus Paynes Find WA Linda Rogan.

As a child, I used to see these on the beach and wonder what they were.

If you picked one up, it rolled about in your hand like a jelly and it seems to have no internal structure at all. They were a mystery to me during my beachcomber holidays at the beach.

Then I learnt they were casing for eggs but eggs of what? Daniel has solved the mystery by identifying this image as “Moon snail eggs” Animalia: Mollusca: Gastropoda: Hypsogastropoda: Naticidae: *Polinices* sp.






Photo by Daniel Heald.

Daniel added a comment that one of their common names is simply “shark poop”! I’d believe that as well !!

Our Paropsine man – Martin Lagerwey

There are many ways to determine that it is springtime – look out my window, enjoy the profusions of flowers in my garden, bloody birds with their dawn chorus waking me up at 5:30am! But a clear and obvious sign is that Martin Lagerwey is not visiting me here at the Museum and that BowerBird is getting lots of paropsine leaf eating Chrysomelid beetle uploads.

<p>Martin Lagerwey</p> <p>Peltoschema tetraspilota, co...</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Paropsis delittlei (a Tasmani...</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Peltoschema nr suturalis</p>  <p>1 0 1 0 0</p>
<p>Martin Lagerwey</p> <p>Paropsis geographica</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Paropsisterna octisignata</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Paropsisterna erudita</p>  <p>0 0 1 0 0</p>
<p>Martin Lagerwey</p> <p>Calomela ioptera</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Paropsisterna (Ch11 deLittle)</p>  <p>0 0 1 0 0</p>	<p>Martin Lagerwey</p> <p>Peltoschema dryope</p>  <p>0 0 1 0 0</p>

Martin Lagerwey

Calomela ioptera



0 0 1 0 0

Martin Lagerwey

Paropsisterna (Ch11 deLittle)



0 0 1 0 0

Martin Lagerwey

Paropsisterna decolorata



0 0 1 0 0

Martin Lagerwey

Calomela sp.



0 0 1 0 0

Martin Lagerwey

Peltoschema dryope



0 0 1 0 0

Martin Lagerwey

Paropsisterna Pss5



0 0 1 0 0

Martin Lagerwey

Peltoschema suturalis



0 0 1 0 0

Martin Lagerwey

Calomela sp.



0 1 1 0 0

Martin Lagerwey

Paropsisterna varicollis (blac...



0 0 1 0 0

Martin Lagerwey

Trachymela sp



0 0 1 0 0

Martin Lagerwey

Paropsis atomatia



0 0 1 0 0

Martin Lagerwey

Ditropidus sp. Cryptocephali...



0 0 1 0 0

Martin and his photographic buddy, Geoff Walker, has a nigh on obsessive passion to learn and discover Australia's paropsine beetle fauna. I think I have mentioned this before. They have tackled an inordinately different group to study and document as the taxonomy of this group is a mess. Several people before them have followed this pathway and over time have fallen by the wayside. However, Martin and Geoff have been and are going through thick and thin to bring these often rarely seen beetles to our attention.

These colourful beetles have a hidden secret. Once killed, labelled and placed in a Museum reference collection – they turn brown and lose their brilliant colours .. making them even more difficult to identify colour photos against museum reference specimens.

Martin's pioneering work on documenting live images of these beetles will become the definitive work for these beetles.

And, the more Martin delves into the intricacies of taxonomy, the more he learns about the daily difficulties of nomenclature I deal with each day. This week Martin learnt about the ICZN (International Commission of Zoological Nomenclature) Article 34.2 which is all about the archaic necessity for species names to agree with the gender of the genus name, unless they have been described as "nouns in apposition" in which case this rule does not apply. So, you need to know the gender of specific Latin words else you will make a mistake or someone will change the ending of a species name without you being able to have a say in the change. Martin now knows all about ICZN Art. 34.2 and he doesn't like it much.

Welcome to my world Martin. Confucius once said- "The beginning of wisdom comes by calling things by their correct name". Getting that "correct name" ain't easy!

I am always amazed what the human eye spots!

This image, by Reiner Richter, caught my eye as it obviously caught his eye as well. It looks like a mess of fly legs all tangled together but it is actually a pair of entangled stiletto flies – Family Therevidae. The most likely scenario is that following successful mating, the female decided to eat the male. In the invertebrate world this is not uncommon. Think about what the male is trying to achieve – to pass on HIS DNA to the next generation. The best way he can do that is to ensure that the eggs he fertilised successfully mature, are laid and hatch. If the female has not eaten recently, then there is a low likelihood that her eggs will mature. What better way to ensure the mating leads to successful offspring than to provide yourself as a protein meal to the female. BON APPETIT. I don't want to come back as a male invertebrate – please



Ledcourt VIC Photo by Reiner Richter,

“Just because it's pretty”

This was Geoff Lotton's good enough reason to photograph this bug and upload it to BowerBird – and why not!

The bug is the very colourful Cotton Harlequin Bug, *Tectocoris diophthalmus* from Rockhampton, QLD.



It is a coastal species often associated with *Hibiscus* plants.



From Facebook to BowerBird

I am member of the Facebook group “Amateur Entomology”. I know – when is enough of insects already????? Anyway, from time to time, something really interesting gets posted. This week, images of a Potter wasp that use resin rather than mud appeared and it caught my eye. I commented on the Facebook page and Rebecca uploaded images of these resin nests to BowerBird. There are only two Australian eumenid wasp species that use resin rather than mud. They both belong to the genus *Pseudepipona*. This one is the species *Pseudepipona chartergiformis*.



Location: Helensvale, Qld. Photo by Rebecca Ladner.

Jenny Thynne is the only other person to record these nests.



Sunnybank QLD Photos by Jenny Thynne.

This is our final Fungal Fix for now



Mount Dryden VIC . Reiner Richter.



Entoloma sp. Belgrave South VIC Reiner Richter



Lichenomphalia sp. Morwell National Park Photos by Matt Campbell.



Good things come to fungal hunters for those who wait!

I do enjoy records where the author shares with us the excitement of finally finding something of importance to them.



Locations: Jeeralang Junction VIC Photo by Matt Campbell

Cordyceps menesteridis

Matt Campbell wrote:

“With 'fungi season' all but over, I had my highlight find of the year yesterday as far as our own property goes. I knew these existed in the area, having seen them in Morwell National Park but yesterday, when I was almost back at the car having searched the ground for 2 hours, I found this pair beside a rotting log. All the other *Cordyceps* species I've found parasitise caterpillars but these little guys are found on beetle larvae. Whilst I've seen *Cordyceps menesteridis* in the past reach around 30mm in height, the tallest of this pair was only 15mm.”

Our resident fungal guru Teresa commented back:

“WOW; Lucky you. What a find. Fungi season may be officially over, more to up later this week, but I'm still finding some amazing stuff out there. I've never found this one before. You said it was on beetle larvae, did you dig it up a get a pic? I'd love to see it. Great shots, thank you. T”

Matt replied:

“Thanks Teresa. I was quite excited to find them on my 'home patch'. If you know where to look in the Park, they are reasonably common though they hardly stand out. Having said that, it was Tamara that first found them last year but after that initial find, we both found quite a lot of them. I didn't dig these up as I want to show a few other people but I know someone who has and they told us they were on beetle larvae. At the time I didn't own a copy of Fuhrer either but of course I do now and he mentions the beetle larvae in there as well :)”

For me, I find this kind of social interaction one of the main strengths of BowerBird. It build relationships and assistance networks.

And more fungal excitement.

During the week, Teresa contacted me full of excitement as she had participated in the discovery of new species of myxomycetes called *Alwisia morula*. Congrats for all.



Photos by Teresa Van Der heul

Another series from Mark Berkery's post.

Bees, what would we do without them. I have heard people use feather dusters in some places where the bees have died out, to pollinate the crop.

These are a healthy lot too, looking strong and well groomed. Lion-like with their big manes – is what they remind me of.

That they are feral, gone wild in a local forest, might be significant to their health. Having nobody exploiting them.

No doubt they have their difficulties but they can always be seen to take clean water from near the flow.

Never doubting their common purpose or function, as bees.

Being free of our questionable chemistry.







Water, one of life's simple pleasures. The sense, or essence, of it ...

Now – I have a lot of fun writing the Bugle each week and I would like to share that fun. If anyone has a BowerBird related story they would like to tell, please send me your story and I will include it in the next Bugle.

As always from BowerBird .. that's your lot for this week.

Haveagoodweekend all Happy photographing ...

Cheers – Ken

(If you wish to leave this email list, please contact me directly at kwalker@museum.vic.gov.au – else share with your friends)