

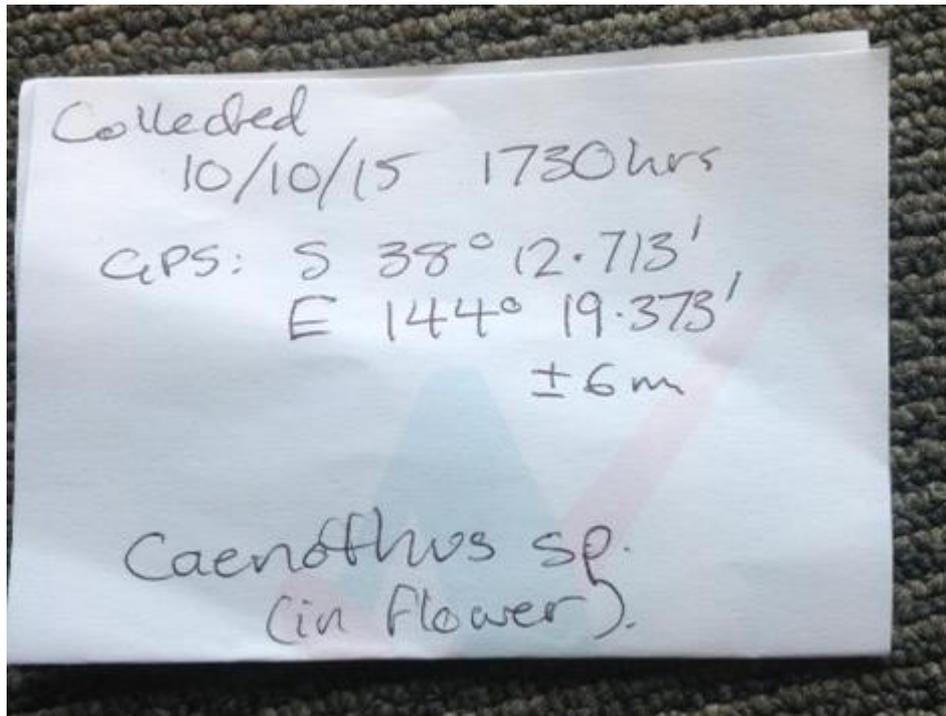


16 October 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 30.

Hi All – The excitement and discovery of Adam Edmond’s exotic, invasive South Africa mantis, *Miomantis caffra*, find continues to grow. Adam’s Mum’s backyard in Grovedale, Geelong seems to be the best known hotspot for this species. Emails have been flying around between the Victorian Chief Plant Health Officer, Dr Gabrielle Vivian-Smith, and a myriad of people in Victorian Agriculture and Canberra’s Department of Agriculture Biosecurity people. Risk analysis reports are being written based on the New Zealand experience where the species invaded in 1978. New Zealand has only 2 native species of mantis and it appears *Miomantis caffra* is out-competing the common native species, *Orthodera novaezealandiae* – the native species is now seen far less than back on 1978. The traditional Maori people recognised the native mantis as culturally significant. I read: “The distinction between the mantis and the stick-insect (known as “whe”) was of importance to the Maori; if “whe” alighted on a woman it was a sign of conception, and according to which kind of “whe” (mantis or stick-insect) it was known whether the child would be a male or a female. It is also stated that the praying mantis is the material emblem of the god Te-Ihi-o-te-Rangi.”

I’m not sure if I mentioned that for Canberra to “formally” accept that the invasive species now occurs in Australia, a specimen

must be collected, preserved and housed in a Museum or scientific collection and be identified by the recognised expert in the group. I passed on this information to Adam and he came good with a specimen. Last weekend, Adam visited his Mum's Geelong backyard and was able to locate a female specimen. Adam provided a wonderful set of associated data:



Surprisingly, Adam works at St. Vincent's hospital in Melbourne which is directly opposite to where the Museum is located. Adam emailed me on Monday to say that he had a suspected specimen and could he delivered it. I excitedly met Adam outside the front of the Museum. For me, it is always exciting to physically meet a BowerBird member. I had no idea what Adam looked like as his BowerBird profile image is of an "emu"!! What can you make from that?

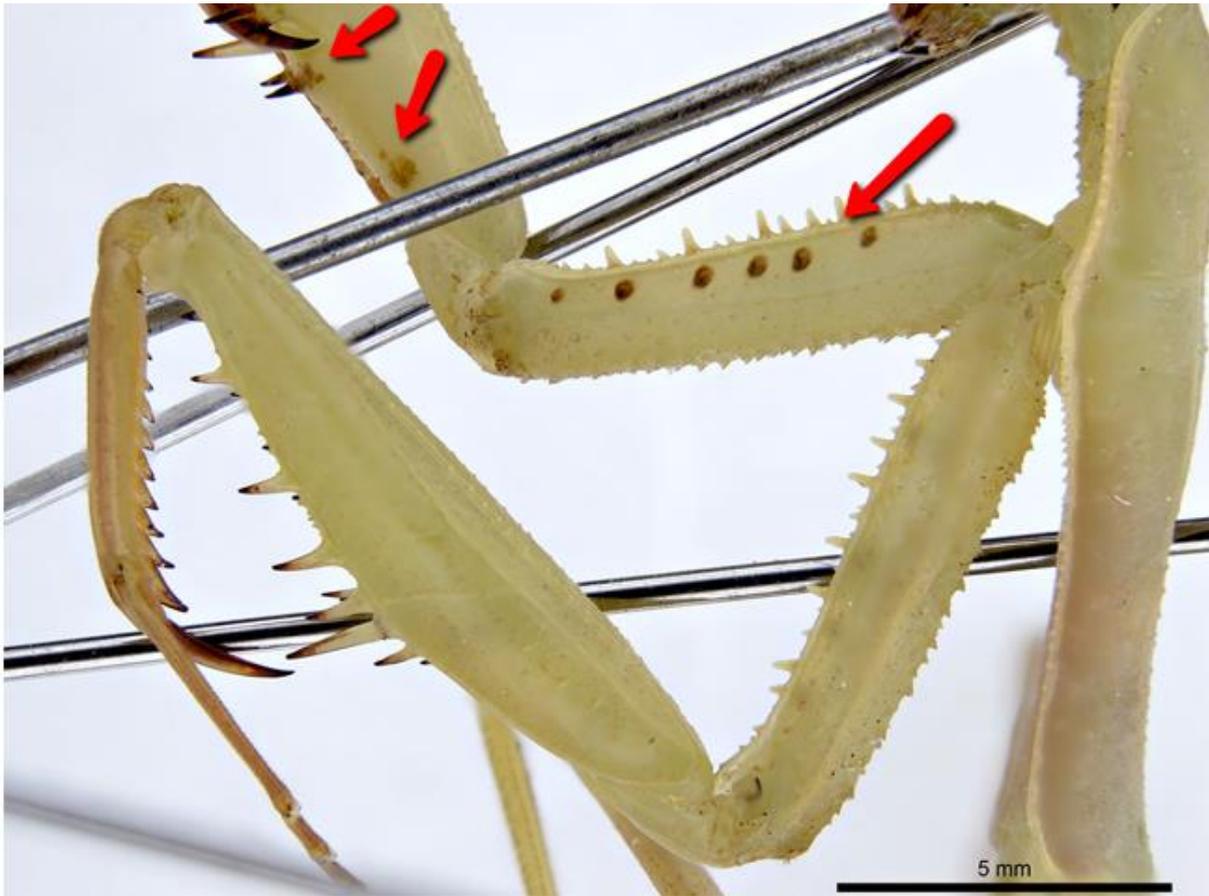


We met outside the Museum and true to form for a hospital worker, Adam presented me with the mantis in a yellow top urine specimen plastic container – what else would a person who works at a hospital use? (->!).

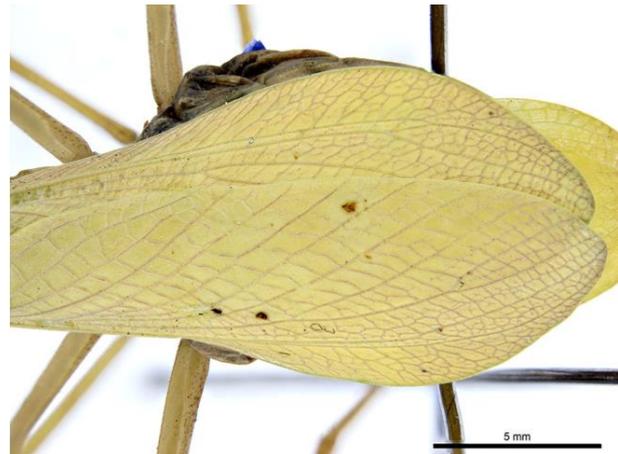
What first stuck me was the small size of the species. I had expected something much larger but the specimen easily fitted easily into the specimen tube. Finally, a specimen was in hand. I sent out emails to all concerned and there was a collective sigh of relief and many thank you messages to Adam.

There is an excellent Fauna of New Zealand 1990 report written on this species which is now available on the web at: http://www.landcareresearch.co.nz/_data/assets/pdf_file/0020/49043/FNZ19Ramsay1990150.pdf

This extensive 102 page report is a gem. It details the New Zealand mantis fauna and provides a vast amount of information on the invasive species. There is a table which lists the diagnostic features of *Miomantis caffra* which I was able to use to compare the specimen Adam had presented. Of importance, and which is only vaguely clear in Adam's original images, is a series of dark brown to black dots on the inner margin of the foreleg – 4-6 dots on the inner fore-femur and 2 dots on the fore-tibia. When I looked I found and photographed these distinctive foreleg markings.



In addition, the mid-swollen pronotum with lateral serrations is diagnostic as well the wing venation is diagnostic.



So much progress has been made in the past week. Canberra and Victorian Department of Agriculture are now involved as is the Victorian Chief Plant Health Officer.

After taking a series of images on the fresh and moveable specimen, I then prepared it for long term storage. This required me to spread and display the 2 left hand wings to fully expose their venation. In the image below, it may be difficult to see but I have placed a piece of transparent tracing paper over the wings and the pins press down the tracing paper to hold the wings in the displayed position. Due to the enlarged abdomen of the female specimen, I had to support the weight of the abdomen and then I had to raise and support the head of the specimen.

I will leave it in this position for approximately 4 weeks during which time the internal muscle tissue will dry and harden and the wings will remain in their lateral displayed position. Then I will remove the specimen from the staging block, add a label with Adam geospatial and temporal data and send the specimen to Australia's mantis expert at the Australian Museum



What thoughts an image provoke.

It is funny what thoughts an image can provoke. I often comments that for labels on insects that I have collected bring back memories of the exact location and circumstances under which I collected the specimen.

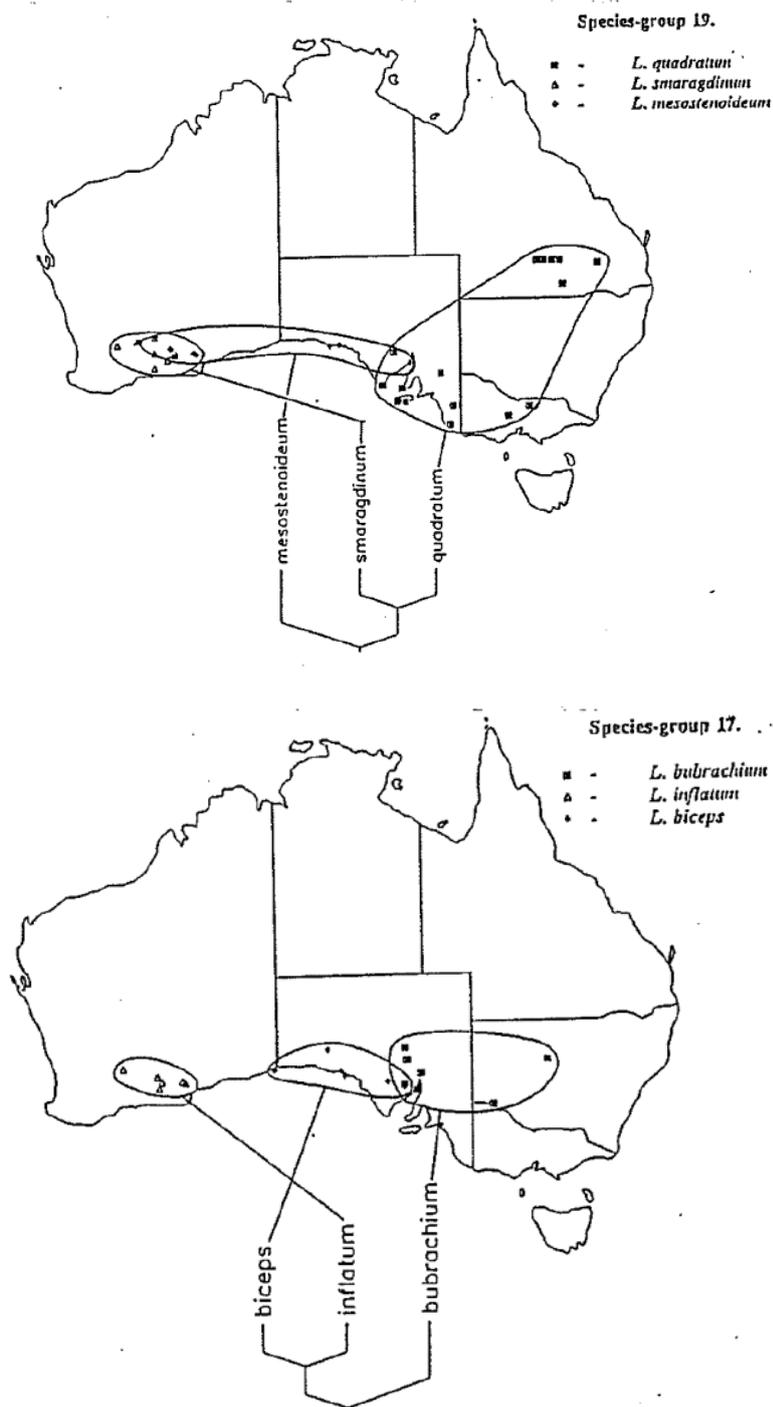
Rudie Kuite recently sent me this image of a *Diaea* crab spider feeding on a halictine bee *Lasiglossum (Chilalictus) hemichalceum*. I have given many bee talks to naturalist groups and I often get asked about the effect European honeybees have on the native bee fauna. My response is often taken with surprise and caution as my answer is that there is no effect. People say, but there must be as they compete for the same resources so there is the effect.



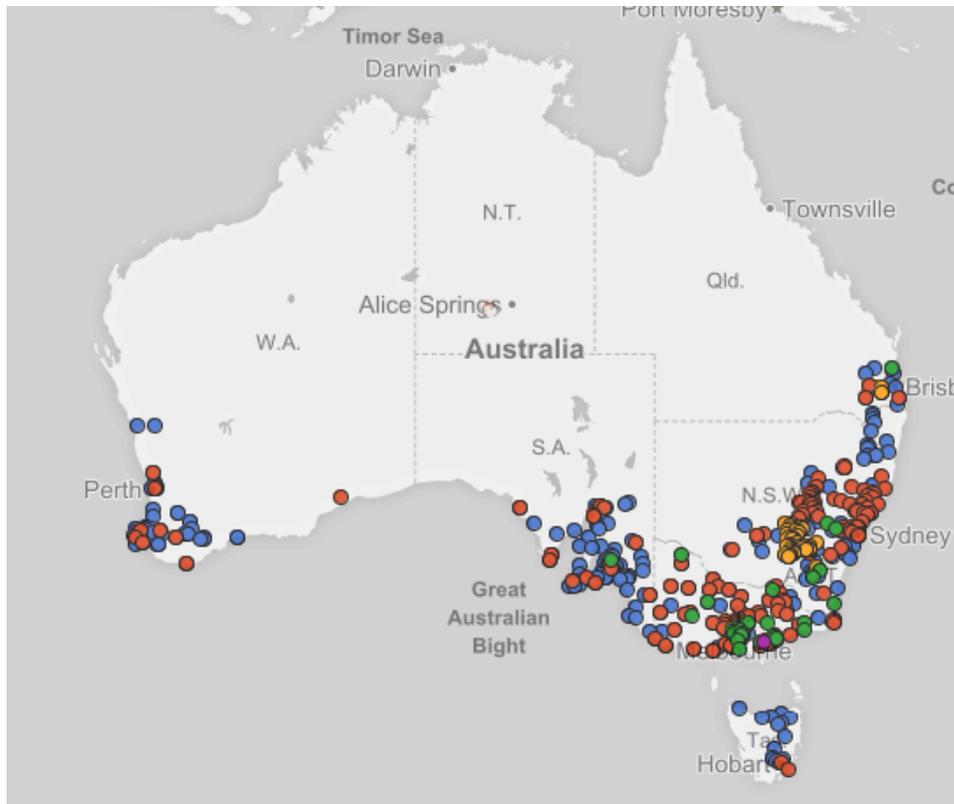
Location: Miners Rest VIC Photo by Rudie Kuiters.

The Australian native bee fauna consist of about 1670 named species and there are probably another 500 or more unnamed species. Out of a world bee fauna of approximately 25,000 species, Australia represents about 7% of the world fauna. However, the Australian fauna is the most unique of any other continental fauna in the world. Why? Australia drifted northwards from the large land mass Gondwana about 100 millions ago and New Zealand and New Caledonia separated from the Australian land mass about 85 million years ago. Australia then continued to drift northwards and went through a series of aridifications and wetter periods as the ice ages waxed and waned. The effects of these waxing and waning drying events were most evident across the southern of Australia. During wetter times, the flora and fauna in Victoria and southern WA were joined across the Nullarbor and at other times the two sides of Australia were separated by a dry barrier across the Nullarbor. There are several ways that evolution occurs and one of these processes is called a “Vicariant” event. That is simply an event that divides a previously single population into two or more populations. Think of a population of an animal living on a flat plain and “suddenly” a massive mountain range erupts and the population is now separated on either side of the mountain. The definition of a species is that members of a population can mate and produce viable offspring. But over time, the two populations of the single species divided by a mountain range will begin to diverge and go separate ways. Given about 1.5 million years, then the two populations on either side of the mountain will probably have diverged sufficiently so that they can no longer mate and produce viable offspring – a new species has been formed. It is fascinating to look at the speciation of closely related species across southern Australia. One day, I was at the photocopier with several bee distributions and the curator of Ornithology

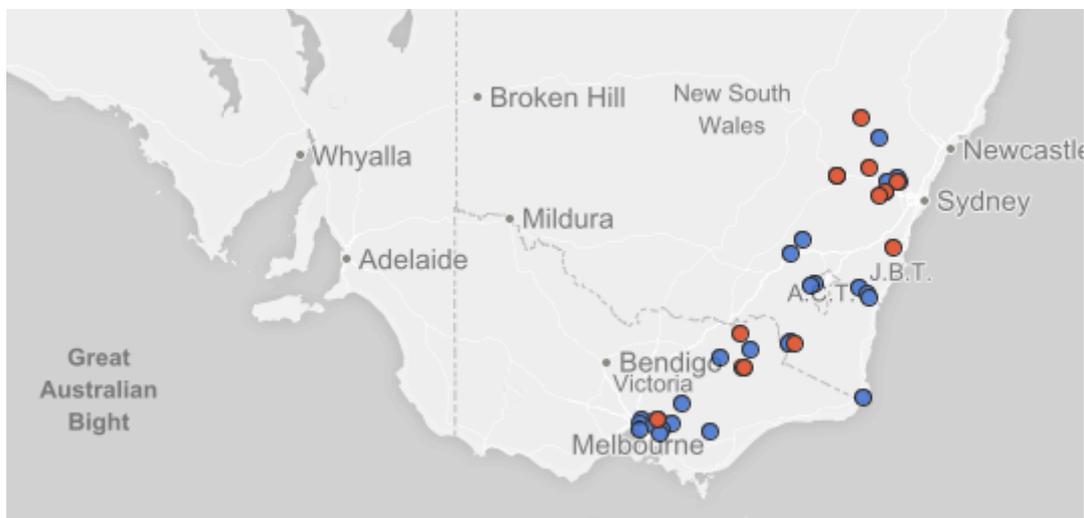
walked up to photocopy something and asked if I was photocopying bird distributions as what he saw with the bees was mirrored in the birds. We were amazed. Here are the mapped distribution of two closely related groups of bees. Look how they slightly overlap but they both must have originally been a single species. Six species which originated from two species.



Other species, like *L. lanarium* have populations of the same species that are now separated on either side of the continent due to the current dry conditions of the Nullarbor.



Distribution patterns have always fascinated me as I wonder: Why? Here is a curious bee distribution. What is the barrier that exists for this bee species to the west of Melbourne? The Great Basalt Plain may be the answer which may have altered the plant growth compared to the east of Melbourne.



Anyway, back to the non-competition between Europe honeybees and native bees in Australia only. As I mentioned, Australia has been isolated from other land masses for a long time. As there was no chance of other land masses influencing the way our flora and fauna developed – Australia went it alone and produced a most unique habitat. When you go into the Australian bush the two most common plants you see are Acacia and eucalypts (and their close relatives – the plant family Myrtaceae). Australian Acacia flowers do not produce nectar at the flower – some store this substance as a sugar packet on the seed which are picked up by ants and the seeds are then dispersed. So, that left the Myrtaceae to provide the bulk of the pollen and nectar provisions for bees. Myrtaceae is one of the most primitive groups of flowering plants and so correspondingly, the Australian bee fauna developed one of the most primitive continental faunas in the world. The bulk of the Australian bee fauna are solitary, short tongued bees – Colletidae and Halictidae. In every other continent, it is the more advanced families of long-tongue bees that dominate. Now solitary bees do not require much in the way of pollen and nectar to provision bee larval cells and nectar sugars to power their wings. Have you ever seen a flowering gum tree with just a few flowers? No, they are covered with flowers and produce way more than our primitive bees could ever use. This is why in Australia, we do not have competition between European honeybee and native bees.

Rudie's crab spider catching a native bee reminded me of an experiment done back in the 1980s down near Portland. Plots were setup where the difference between the plots were only the number of honeybee hives in the plots. The experiment showed that as you increased the number of European honeybee hives, the better off were the native bees. Why?

Simple – there were more insects in the air and available to predators with lots of honeybees available than in plots where there were less honeybees. Rudie’s photo made me think that had that spider first caught a honeybee, then it would not have captured the native bee.

Ecological relationships and species distributions are absorbing subjects to study and observe. They usually go the opposite way to the original thinking before the research is done. These examples have taught me to keep an open mind when delving into these areas.

Unknown Bee

Tony Daley from Tasmania just posted a challenge for me with a record entitled “Unknown Bee”. Look at the massive amount of black hair on the face of this bee. It is a male reed bee – *Exoneura robusta*. There are only 7 species of *Exoneura* recorded from Tasmania so these are special bees.



Location: Ridgeway TAS Photo by Tony Daley

Piece from an Invited Author

Lee Belbin has been cutting computer code for more years than either of us would like to admit to. My co-worker at the Museum is a biometrician who works on analysing species patterns. For example, he will look at the freshwater aquatic invertebrate fauna pre and post building an upstream dam. Richard always spoke highly of Lee's 1980s computer analysis program called PATN. Lee was the senior programmer ALA (Atlas of Living Australia) contracted to build their sophisticated Spatial Portal. With more and more BowerBird data being uploaded to ALA, Lee offered to write and explain something about the ALA Spatial Portal and how to use it. Thanks Lee.

The ALA's Spatial (Research) Portal: Part 1 – Using the Legend by Lee Belbin.

Every time I run a training session for ecologists in the use of the Spatial Portal (SP) of the Atlas of Living Australia (<http://spatial.ala.org.au>) everyone says how surprised they were about how little they knew of its capabilities. Hopefully, some brief ideas on how it can be used will encourage you to give it a try? Let's start with a basic feature of most Geographic Information Systems, of what the SP is a web-based example.

There are basically three types of map 'layers' that are used in the SP - points, polygons and grids. The map legend is different for each type. Species (or a genus, family etc.) are usually mapped as points. Let's map a species Ken mention in BBB-29, *Hyphesma atromicans*. In the SP do **Add to Map | Species** and enter "***Hyphesma atromicans***" into the search box and the SP should find a name match and say that it has 1590 occurrence records. Then select **World** extent on the next step

and the locations of the observations will be mapped as a set of points.

If you want a different colour, just click on the colour on the legend. You can also change the opacity (the intensity) of the colour and the size of the points by using the slider bars on the legend. You can even select “Display as density grid” instead of points if that better suits, but note that there is less functionality when interacting with gridded data.

Let’s assume you have the points mapped. Select the drop down menu to the right of ‘Facet’ in the legend and you will see a subset of all the variables that are associated with the points. Like the facet on a gemstone, facets in the SP allow you to see your data displayed in different ways. These facet variables come from a subset of the terms in the world’s standard for exchange of biological observations – Darwin Core (see <http://rs.tdwg.org/dwc/terms/>) and the categories of a subset of the SP’s polygonal layers. Let’s see how handy this can be.

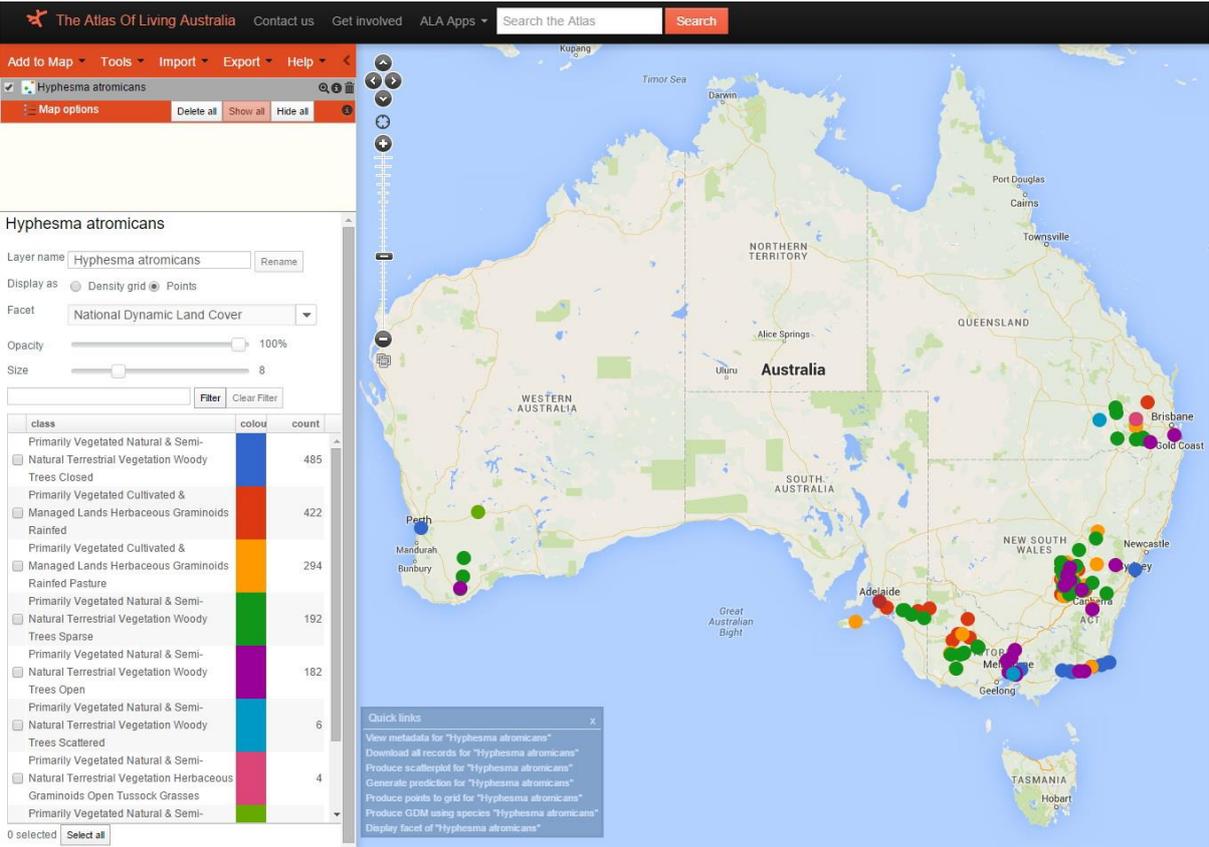
Scroll down the list of facet variables and select “**Dataset**” and you will see the colours of the points now reflect the datasets these records came from. At the top of the list is “Museum Victoria provider for OZCAM”. Click on the box next to “GBIF records” and all the records from GBIF are now highlighted by a red circle around the points on the map. If you wanted to, you could select other “Datasets” and/or click on “Create layer” and then a **new** point layer of *Hyphesma atromicans* that comes only from the selected datasets would be created. You could then uncheck the original layer and just work with the new layer if you wished. You could export that data, model the distribution and many other options we will discuss in later posts.

Now, go back to the Facet dropdown and select “**National Dynamic Land Cover**” – a polygonal layer. The colours will

show a breakdown of the observations by classified land cover types (see <http://www.ga.gov.au/scientific-topics/earth-obs/landcover>). You can see now that most of the observations are in the class “Primarily Vegetated Natural & Semi-Natural Terrestrial Vegetation Woody Trees Closed” and so on, listed by decreasing number of occurrences.

Let’s look at one of the most important facets - “Record issues”. The ALA’s runs ~100 tests on each data record and anything ‘iffy’ or just plain wrong is flagged with an ‘assertion’. What you are seeing here is a summary of the issues noted against all the *Hyphesma atromican* records. Some of these assertions are not too dramatic; “Country inferred by coordinates” means that the original record did not have the Darwin Core field “country” filled in but the coordinates were in Australia. Many of the other assertions should however get you thinking if you plan to use the data. “inferredDuplicateRecord” (580) for example suggests that a subset of these records are likely to be duplicates. “detectedOutlier” states that 5 records are outside the expected environmental envelope (conditions) of that species, that is, the environment that you would anticipate from observations that this species seems to like. Those 5 observations may or may not have problems. I have pushed hard to ensure that the ALA provides warnings wherever possible issues are detected. It is better to warn of potential problems than fail to do so. It is also important to note that the ALA’s automatic checks cannot detect all record issues. If for example, the collector misnamed the species, and that species has a similar environmental profile, then it will be up to a human expert to detect a problem (see <http://zookeys.pensoft.net/articles.php?id=3161>).

That is about 1% of the Spatial Portal.



BowerBird at its best.

I very much enjoy seeing BowerBird used as an identification source. Richard Flesfadar photographed this insect on 10 October 2015 in Adelaide, SA. He uploaded his image to BowerBird and added the title of “Unknown Insect”.

What a great close up photo of an impressive looking fly. My first thought was a Bibionidae fly – in the USA they are sometimes called “lovebugs” but they are not a true Hemipteran (bug) so the name is confusing. I do not know of any Australian common name for these flies.

I thought that Family level identification was not enough for this good looking fly so I forwarded the image to Dipterist friend of mine at the Australian Museum – Dr Dan Bickel. Within an hour, Dan has replied – Bibionidae: *Plecia dimidiata*. Through BowerBird, the interface between citizen science and professional entomologists is alive and well.



Photo by Richard Flesfadar

Guess who's got new macro lens??

I have been in contact with a relatively new BowerBird member, Kerrie Brailsford who lives near Southport, Qld. Kerrie often spots and photographs insects that fly into her study – I can only imagine some kind of bush plot outside her window. Kerrie uploaded and correctly identified this beautiful Drain fly – Psychodidae. Kerrie told me how she has recently purchased a new macro lens – which I called her new “toy”. Then we conversed about a flash unit and she purchased the same one that I had purchased. Today, I posted to Kerrie some special graph paper that I use to diffuse the light coming from our flash unit. This is a very small fly done proud by Kerrie's new “toy”.



Clogmia albipunctata Location: Tallai QLD Photo by Kerrie Brailsford

Here are some more macro photography by Kerrie:



Theclinessthes onycha Location: Tallai QLD Photo by Kerrie Brailsford

The entrance to a Sugar bag bee nest



Tetragonula carbonaria Location: Toowong QLD Kerrie Brailsford



Chrysosoma leucopogon Location: Toowong QLD Kerrie Brailsford

Caterpillars can be most difficult to identify.

There are less than 400 species of Australian butterflies but something like 10,000 species of Australian moths. When I am sent a “grub” for identification, unless it is one of the common species, I usually groan, then look through my moth books and then the web, then throw my hands up and seek help. As I did with this beautiful caterpillar. Eileen Collins spotted it during a bush walk and sent it to me. Before it reached me, Eileen has tried Don Herbison (the Guru of moth caterpillars), Mike Halsey and Peter Marriot – all had agreed it was looper (ie. Geometridae) in the genus *Capusa*. The Guru for Victorian looper moths is Marilyn Hewish so I will ask her on Monday when she comes in here as a volunteer.



Location: Chiltern, Vic. Photo by Eileen Collins

Nice to get in some odd bugs!

Tony Daley, one of our prolific Tasmania BowerBird members, recently uploaded image of a magnificent bug.



Hemiptera: Rhyparochromidae: *Daerlac cephalotes*

Location: Ridgeway TAS Photo by Tony D.

Speaking of odd bugs ..

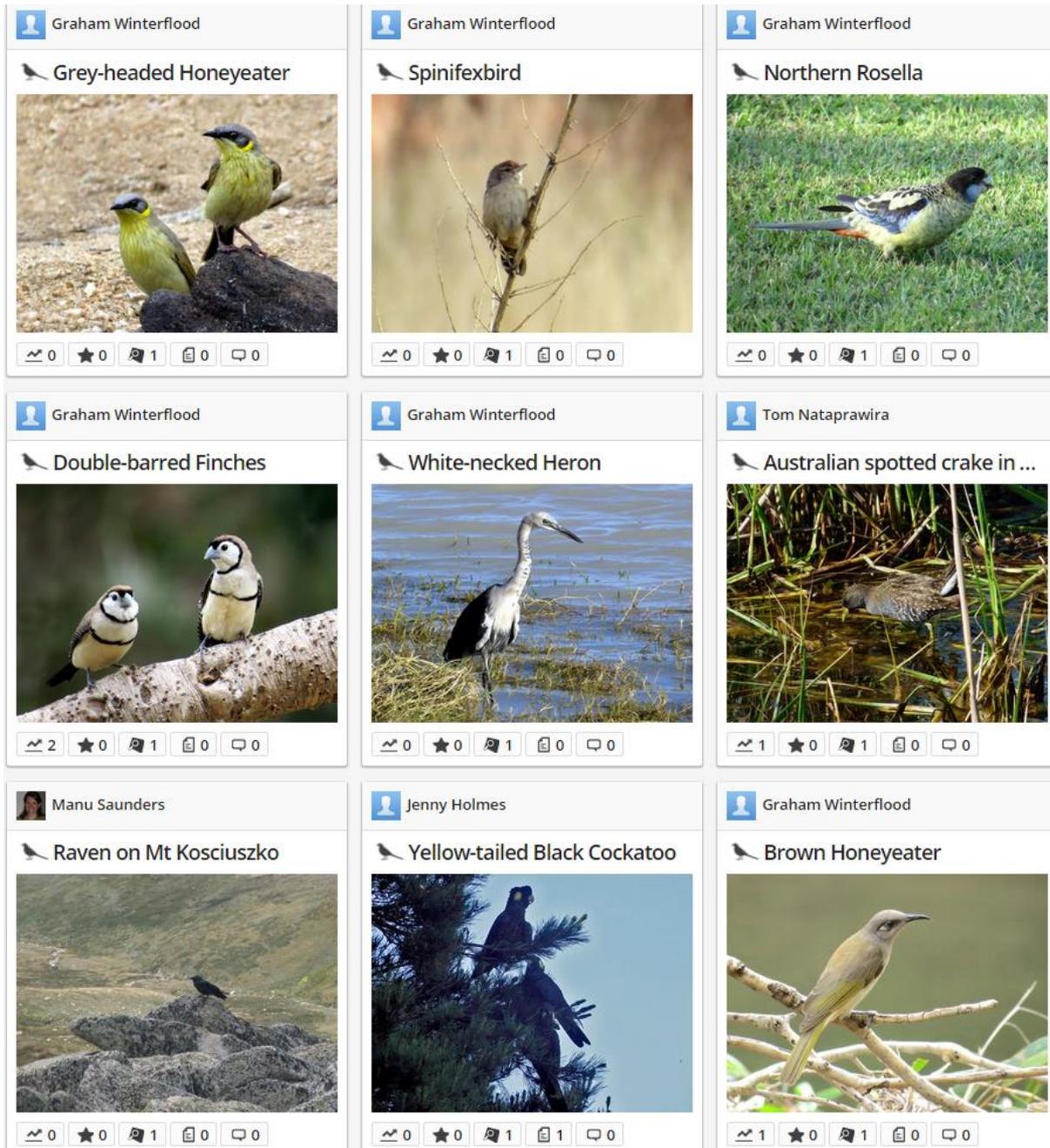
At first glance, I assumed I was looking at a Green Tree ant from north Queensland. I got the location correct but everything else incorrect. These are in fact Green Tree ant mimicking bugs - Hemiptera: Alydidae: *Riptortus serripes*. Amazingly, the top image is the immature bug ant mimic while the bottom and completely different looking insect is the adult.



Location: Holloways Beach QLD Photos by Lek.

Lek commented: "The group was right next to a busy colony of green tree ants (*Oecophylla smaragdina*)."

Birds have been flavour of the week



You can see that Graham Winterflood has contributed a number of these images. Graham contacted me during the week and I just loved his email address - twooldducks@ His emails were always from "Graham & Chris". Great email address. Reminds me that I saw a very flashy expensive car the other day with the licence plate: "4MyEgo". Enough said hey!

My favourite birds of the week were



Double-barred Finch *Taeniopygia bichenovii* Gregory QLD



White-breasted Woodswallow *Artamus leucorhynchus* Kanimbla
QLD Photos Graham Winterflood



White-plumed Honeyeater *Lichenostomus penicillatus* Telfer
WA Photo Graham Winterflood



Silvereye *Zosterops lateralis* Location: Jeeralang Junction VIC
Photo by Matt Campbell

Like peas in a pod !

Martin Lagerwey uploaded images of two similar looking leaf eating chrysomelid beetles – both magnificently coloured !!



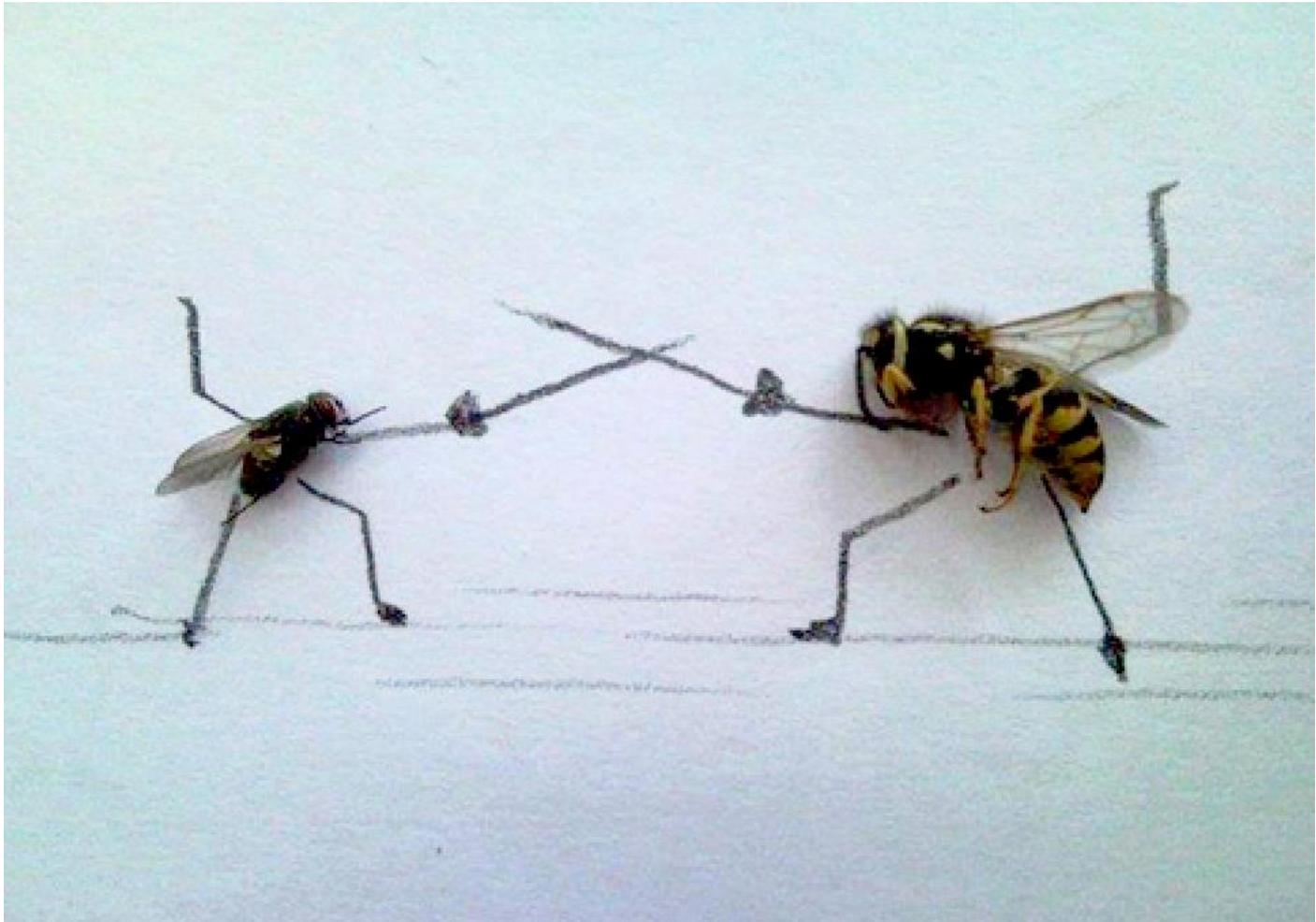
Paropsisterna gloriosa Location: Longford, Vic



Paropsisterna nobilitata Location: Longford, Vic Photos by Martin Lagerwey

Entomological humour

I put pins through them Others make humour with them ...



Mark Berkery's Nature's Place

The new Butterfly Bush, six of them, are coming along nicely. One has been flowering for a week and the scent is divine, the colours dark and rich. That's to me, who knows what the little people see and smell. Probably the same in their way.

I got the plants early in the year off ebay, grown in Victoria, and put them straight in the ground a couple months ago, with space for them to expand, and they are all doing well. I'll have to do a post on just the flowers, with their different and wonderful colours and scents they deserve it.

For now though I want to introduce you to the Drone Fly, lover of the flower's nectar. A female I'm sure, with clearly separated eyes, who dropped by and surprised me one day as I was checking for infestations – I have been getting hoppers congregating and mating on new stems of the two golden flowered bushes and I don't want them destroyed.

What I do is grasp two or three hoppers at a time, sidelong between thumb and forefinger, carefully as they have some microscopic thorny growth, and throw them away with any wind to ensure they don't directly return. As I watch them disappear against the sky they take wing and change direction, like tiny helicopters, usually toward the big palm tree nearby. Then, a day or so after, I do it again ...

It's a necessary process to keep the plants healthy as they grow. I can't use insecticide that would be silly since I want to photograph bugs, unnecessarily criminal even. Well, it would be if we valued the little people as we should. I enjoy going around the garden anyway, and everything I do there is of value, in a sense. We should value them because they do enormous work, but we don't because we don't see it, and that will cost us ... If ever there was a case for the need of faith insects are it. Have faith they are necessary, even vital, and enjoy their presence that is often delightful, when time is taken to observe them at play.

Giving them space, not too much to the destroyers – our nature has been unbalanced by our interference, and anything else they need for their well-being, and they will entertain all day long without robbing the larder.

They love nothing better than to show off their colours, form and flying skills, and other not so unusual but often surprising behaviour ...

Faith, all is as it should be ... And if something needs changing, change it will – where there is willing, or not.



© Mark Berkey

8 seems like a lot but I couldn't leave out any more.



© Mark Berkey









© Mark Berkery

Tough little creatures these Hoppers, careful handling required.

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)