

20 November 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 35.

Hi All – Last weekend, I took a group of about 50 naturalists on a bush walk in Wantirna for the Knox City Council Biodiversity unit. The timing was a disaster: We missed the flowers by 2 weeks and the day was overcast and less than 18C – the predicted high for the day and we went for the walk in the morning. I knew I had my work cut out for me. My old rule is when not much is flying, start rolling logs – and they were my saviour. I found lots of material that the assembled masses enjoyed. There was an enormous scarab/Christmas beetle larva – huge. Everyone enjoyed seeing its mouthparts and I pointed out the dots along the side of the larva were its “nose” or breathing spiracles. Of course, there was the old favourite “Bess beetles” or Passalids. These are great bug black beetles which when you put in your closed hands “squeak” by rubbing their abdomen against the elytra or wing covers which have rows of pegs. As well, there were slaters and cockroaches and spiders and lots of spider webs. Thanks goodness for log rolling.

As we walked along the bush paths, I swung my net of all sorts of vegetation without much success. I caught the occasional syrphid hoverfly and I caught a baby praying mantis. I still had the scarab larva in my pocket so I went head long into a story about different life cycles. The praying mantis represents the “Hemimetabolous” life cycle which is characterised by a

miniature version of the adult hatching from the egg. As the immature grows it more and more resembles the adult form. The opposite to that is the “Holometabolous” life cycle which is characterised by egg, larva, pupa adult. Which life cycle is more successful than the other and why? Was the question I asked.

A few people had a few jabs but none got the central difference between the two life cycles which is food.

The “Hemimetabolous” life cycle results in competition for food between all stages of the life cycle. The baby mantis eats the same type of food as the adult – probably a bit smaller initially, but as it is growing it is directly competing with the adults for food. With the “Holometabolous” life cycle, there is no competition for food between the different life stages. Think of what a caterpillar eats compared to a moth or butterfly or what a maggot eats compared to an adult fly or what a bee larva eats compared to the adult. Often the mouthparts between the different life stages of Holometabolous insects are completely different between different life stages.

When there is competition for food – everyone loses out. When there is differentiation of food types between life cycles, then everyone wins.

So – the major orders of insects or the most successful orders which make up the bulk of the world’s insect biodiversity all have Holometabolous lifecycles. Think of the Flies, Beetles, Moth/Butterflies, Wasps, Bees and Ants, Fleas, Caddisflies and Scorpionflies. The only “successful” Hemimetabolous Order of insects is Hemiptera (the true bugs). Although they compete for food across their life cycles, many are sap sucking plant feeders and I presume the abundance of plants means that competition is low.

There is one other group of insects with an “in-between” life-cycle. These include the Mayflies, Dragon and Damselflies. In

these insects, the immature stages are aquatic while the adult stages are airborne terrestrial insects. Mayfly adults are extremely short lived so there is not much potential for food competition. But the adult Dragon and Damselfly adults are long lived but because of the completely different environments between the adult and immature life stages, they are never in competition between food.

I find these types of discussions useful and interesting when pondering why certain insect types are more successful and/or more numerous than other types of insects. There has to be a reason or reasons and working them out is the fun bits.

So, the next time to look at an insect try to work out:

- Does it have a “Holometabolous” or “Hemimetabolous” life cycle
- Are the different life stages in competition for food
- Are the different life stages in the same medium (water or air?)

Finally, there is one last very important attribute that Holometabolous insects have over Hemimetabolous insects. How does each life cycle survive the winter months? Insects are cold blooded so in winter they have difficulty moving about, let alone trying to find food.

The Holometabolous insects have 4 life stages: egg, larva, pupa and adult. But not all of these life stages need food. The egg and pupal stages are non-feeding life stages. Most Holometabolous insects pass the winter as an egg or pupa and they have no need to move or eat. They simply wait until the air temperatures warm up and away they go.

If your Karma is to come back as an insect, come back as a Holometabolous insect rather than a Hemimetabolous one. The odds are you will survive better.

How to be easily tricked

This week, I was emailed a series of images. Someone had spotted something with black and yellow colour in a local creek. When they picked it up and placed it in their hand, it moved. So, they emailed me a set of images and asked me what type of larva was it and what type of adult would it turn into?

Seemed simply enough. I know the aquatic insect fauna well and I can recognise their immature stages relatively easily. My mind was in the mode of recognising an aquatic insect so I was momentarily stunned when I did not recognise the first image.

What type of aquatic insect has those colour markings and shape? I was confused.



The next three images began to paint a completely different picture. I am often sent “bits” of insects to identify. I have to build an image in my mind of the whole insect to be able to identify it. Can you put together a whole insect from these bits of images?



This final image was the clincher. The arrow points to the male genitalia of the insect.



The aquatic larva was actually the abdomen of a flower wasp – Tiphidae. It must have been bitten in half by a bird and dropped into the creek just before being found and handled and moving in someone hand. Finding out what was a hoot and we all had a good laugh when I replied with the identification.



“Over hill, over dale, we will hit the dusty trail”

Rudie Kuitert sent me a wonderful series of images with a story this week. He had been up in Talbot photographing his beloved orchid pollinators when a wasp came through his personal space!

Rudie wrote:

“When waiting for orchid pollinators it is rarely boring. Yesterday at Talbot this wasp dragged this spider over my knee and I must have been sitting on her path. When she got near the hole in the ground she dropped it and dug out some more dirt and dragged it in.” Enjoy Rudie’s images:





Location: Talbot, Vic. Wasp: Crabronidae *Tachysphex* sp.

Spider: Zodariidae

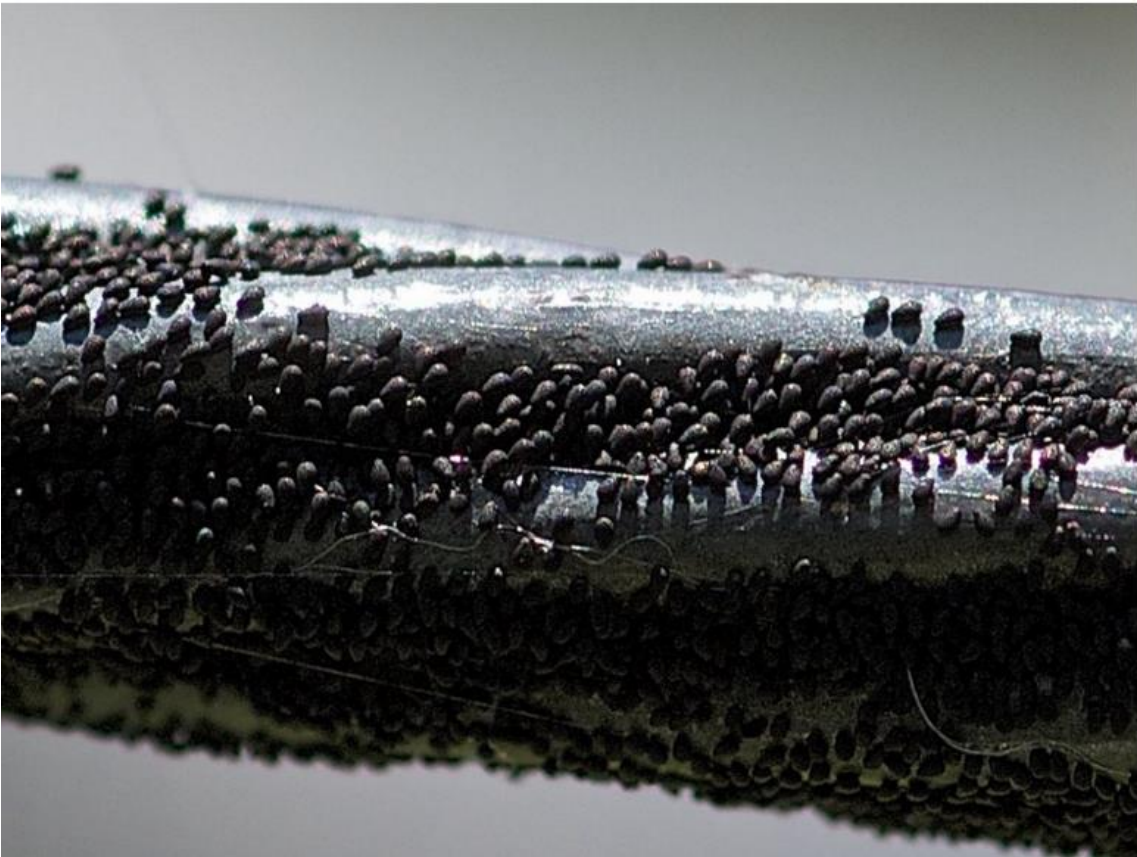
Images by Rudie Kuitert.

The old “Fly on the Clothes Line” story

This week I was stunned when someone delivered me a hand written letter. I never now get letters; everything is sent by email. The hand writing was “perfect” and the writing style was as I was taught at school. The story was that this person and the neighbours had found on their clothes lines “black soot” and flies. It happened this time last year and the same scenario was repeating itself this year. What was the Mystery fly? By the way – the writers first name is “Atholie”. I have never before heard this as a first name. Does anyone know whether the person is male or female or the derivation/country of this name?

Before I even looked at the enclosed specimens, I was sure I knew what was going on. I checked on BowerBird and sure enough this behaviour had been documented several times with brilliant sets of images. I wrote back to “Atholie” what was causing this “problem” and provided a link to the BowerBird webpage with images. Since I received a letter – I wonder if Atholie has web access?

The “flies on the clothes line with black soot” is caused by flies on the family Acroceridae. They are commonly called “Small-headed flies” or “Hunchback flies” (look at the images below to see why they have these common names). Actually, these flies are reasonable rare in Museum collections so I was envious that Atholie had them in the backyard. The black soot is in fact thousands of eggs the female lays on the clothesline. They obviously like to lay eggs on a bare, rounded surface – such as a branch or twig – but their eyes must light up when presented with metres and metres of twisted metal clothes line strands. The larvae of Acroceridae are parasitic on spiders so why would the female lay eggs a metre or more above ground with no obvious prey nearby. Another mystery to ponder.



Adult and eggs. Location: Mount Macedon VIC
Ogcodes basalis Photos by David Francis

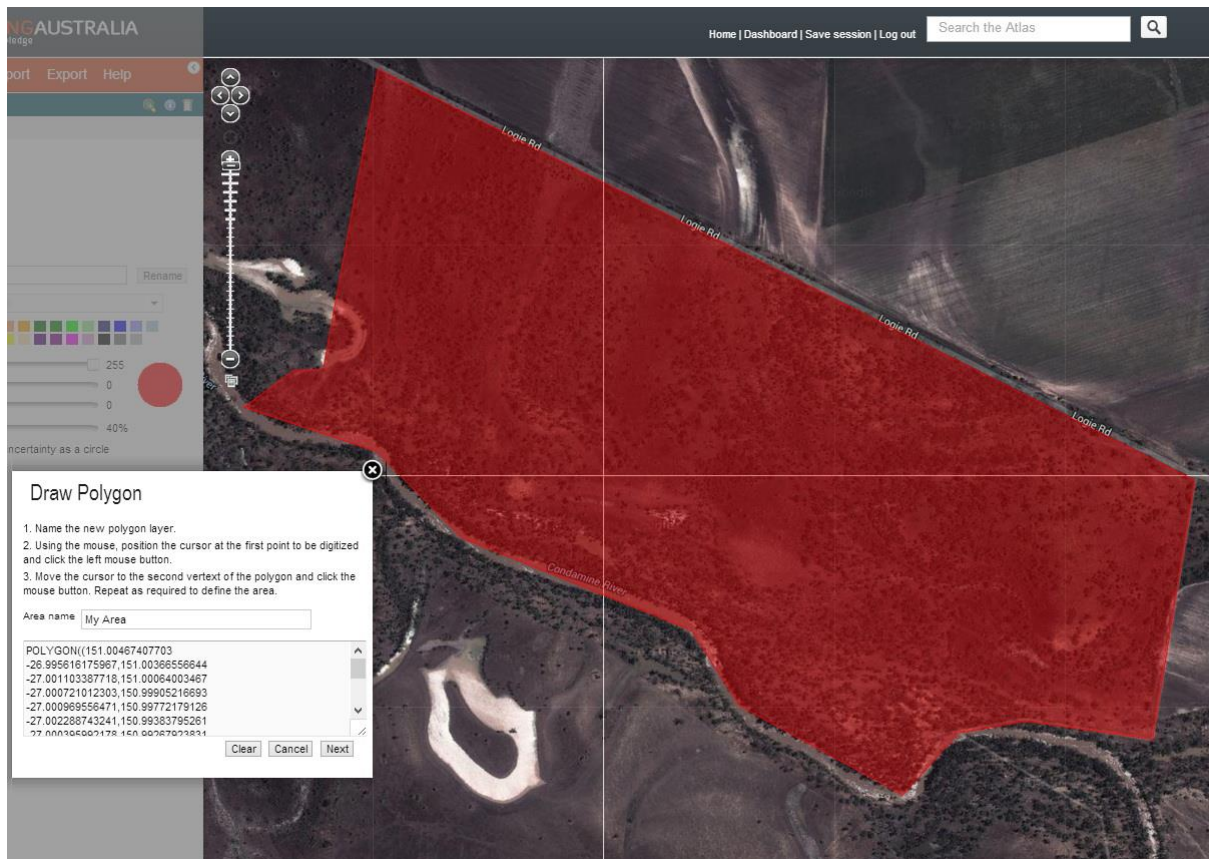
The Atlas of Living Australia's Spatial Portal – Areas

Lee Belbin

One of the most powerful aspects of the Atlas of Living Australia's Spatial Portal (SP: <http://spatial.ala.org.au>) is its ability to define areas. There are currently 15 ways an area can be defined and another few new ones in the pipeline. Why so many options? I hope you will find out below.

The area options can be found from the menu item **Add to Map | Areas**. The options are grouped according to how the areas are generated. The first group support interactions with the map window: They work best if you zoom and pan the map to the area of interest. The first option is the simplest: Draw bounding box. Go to the point on the map that defines one of the vertices of the box and hold the left mouse button and drag to the opposite corner. A new area layer named "My area" will be created. You can use the menu to rename this area to whatever you want.

Draw polygon is similar but you click on each of the vertices and when done, double click on the last one and the polygon will be created. Below is an example of the polygon option that a farmer used to find out what species were on his property. Note that the coordinates of the boundaries are reported in a simple format called **WKT** which stands for Well Known Text. These coordinates can be saved for future use by copying and pasting or via Export | Area from the menu.

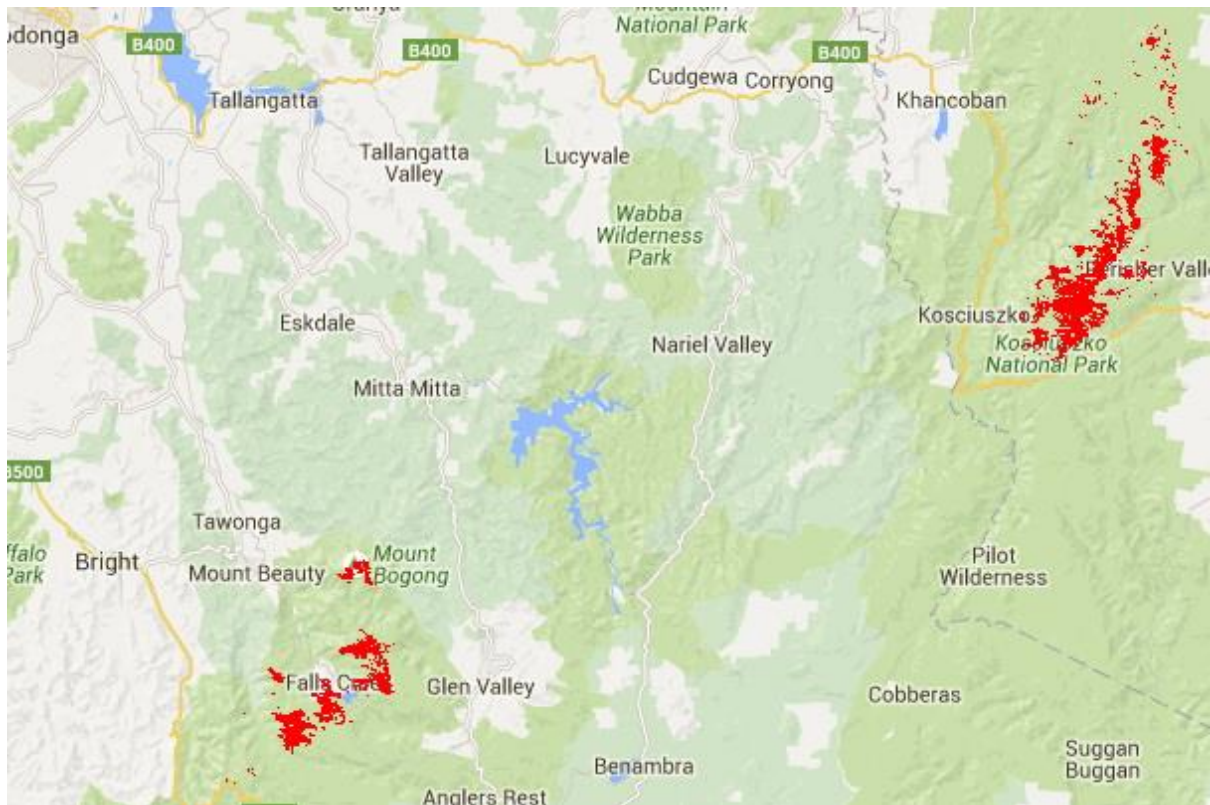


Draw point and radius works by left-clicking at the centre of the circle and dragging out a radius (the length of which is dynamically shown on the map), when you release the mouse button, the area is created.

Select area from polygonal layer, assumes that you have mapped a suitable layer (Add to Map | Layer). Examples of such layers could include CAPAD (parks and reserves), NRM regions, land cover, land use etc. When you have the mapped the layer, again zoom and pan to the area of interest and click on the desired polygon and that polygon will form the new area layer. As you may imagine, this option is handy when you want to find out what species occur in park, NRM region, land use type etc.

The next group of options have search as their common function. **Radius centred on street address** uses Google's excellent database. You can get quite fancy here, as for

example, entering “Carlton Gardens, VIC” and pressing search will get you a hit. You can nominate the radius of the circular area in kilometres and you can use decimal places as in .250 for 250m. **Create radius from point** works well if you know the latitude and longitude of a point. This option can be handy if someone sent you details of a sighting and you want to see where it is. For this type of issue, you could also use the dynamic readout in the bottom-right of the SP. **Gazetteer polygon** is a very powerful area creating option. We have loaded the complete (~370,000!) Australian placenames (gazetteer 2012: Geoscience Australia) into the SP. You can use this option to map any geographic feature such as a town, river, hill etc. In addition, we have added to the gazetteer, all the named polygons and classes of all the relevant layers in the SP. For example, entering “Goulburn Broken” will show the NRM region north of Melbourne. Similarly, entering “Open alpine” will find the polygons from the dynamic land cover layer “Primarily Vegetated Natural & Semi-Natural Terrestrial Vegetation Herbaceous Graminoids **Open Alpine**”) – see below. These areas marked in red below define a new area layer.



As I hope you can see, these options make it easy to define areas that can then be used for subsequent analyses, for example in **Area Reports** (Add to Map | Tools) that we will cover in a future post. There are still some neat area options to be discussed in my next post.

Thanks Lee for your continuing contributions. Lee travels Australia giving workshop on how to use the ALA's spatial portal so we are privileged to get this tuition on our homes.

The fly finally got a name

You may remember a few weeks back, I posted an amazing image of a fly with a springtail (Collembola) attached to its mouthparts.

Had the springtail accidentally got stuck or was the fly actually eating the springtail? I sent the image to a fly specialist who has just recently returned from overseas and he named the fly as *Neurigona signata* – Dolichopodidae.

Long-legged flies (Dolichopodidae) are predacious so this fly was indeed eating the springtail.

Another mystery solved.



Location: Randwick, NSW. Photos by Dacre England

“Just image what a difference it would make if we in Australia built one fewer submarine and spent the saved money on taxonomy??!!”

These were the final words in discussion I had today with a senior taxonomist. This morning, an agricultural consultant sent me an image of a beetle attacking a macadamia tree near where the fruit develops. The damage caused by the beetle will cause the fruit to be dropped and at over \$30 per kilo that is a loss of profit for the farmer and Australia.

Apparently, the scientists have known about this undescribed beetle species since 1996 but have not been able to secure funding to do the taxonomy required to formally name and describe this new species. Until it is named it is difficult to secure funding to control/manage it. A vicious circle indeed.



BowerBird is the place to record such behaviours

Daniel Heald posted a series of images showing hundreds of beetles dead and washed up on a beach south of Perth. I have seen this type of occurrence on the east coast of Australia when mass migrations of ladybeetle fly out to sea, die and get washed back up onto shore.

These beetle look to be a scarab chafer beetle which must have recently had a mass emergence and migration flight sending them out to sea.

It's great see BowerBird being used to record such behaviours.



Location: Coolup WA. Photos by Daniel Heald.

Magic Photos



Megachile ferox male roost. Location: Chiltern Photo by Nora Peters



Location: Herberton QLD Photo by Graham Winterflood



Leioproctus launcestonensis Location: Warrandyte VIC



Giant mealybug female *Monophlebus* Location:
Warrandyte, Vic Photos by Linda Rogan

BowerBird resource page.

Many thanks to those who sent me some of the resource webpages that they use regularly. Our list continue to grow – please keep sending me URLs.

Insects of Townsville – Butterfly and Moth Families

<http://gvcocks.homeip.net/Lepidoptera/lepidoptera.htm>

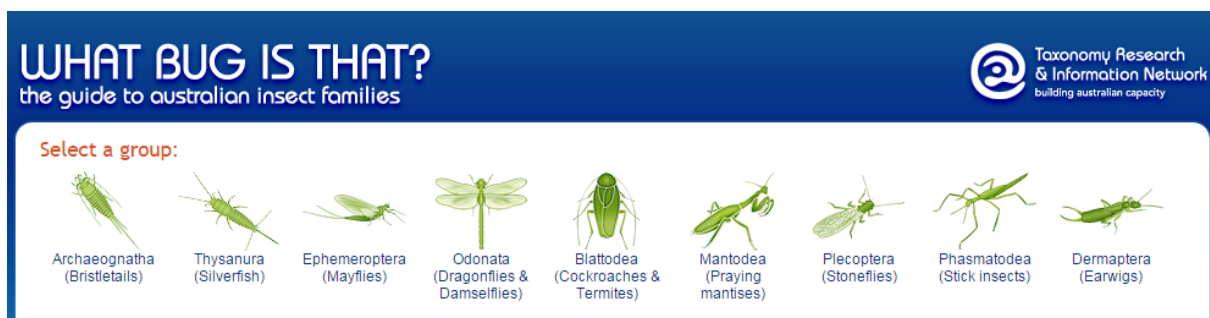
Moths of Australia

<http://lepidoptera.butterflyhouse.com.au/moths-imago.html>

Moth Identification (North Queensland)

http://www.leapfrogz.com.au/LeapFrogOz/Moth_Identification.html










Someone asked for an identification guide to families of Australian insects. I checked on Australian Faunal Directory (AFD - <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home>) and there are 706 Australian Families of insects. However, the best resource I have found for this task is <http://anic.ento.csiro.au/insectfamilies/>



WHAT BUG IS THAT?
the guide to australian insect families

Taxonomy Research & Information Network
building australian capacity

Select a group:

								
Archaeognatha (Bristletails)	Thysanura (Silverfish)	Ephemeroptera (Mayflies)	Odonata (Dragonflies & Damselflies)	Blattodea (Cockroaches & Termites)	Mantodea (Praying mantises)	Plecoptera (Stoneflies)	Phasmatodea (Stick insects)	Dermaptera (Earwigs)

Frogs of Australia

<http://frogs.org.au/>

It takes dedication

I reckon it takes dedication to be digging up your garden, turn up a couple of large spiders, nip inside to get the camera, take 5 photos and then post them onto BowerBird to ask for an identification. What do you think?

Well that's what Linda Rogan did today! What a hoot!

These are called the Melbourne Trapdoor spiders – *Stanwellia grisea*. If I had just \$1 for ever phone call or email I have received over the past 35 years saying someone has found Sydney funnel-web spiders in their Melbourne gardens – then I would be a very rich person indeed. Quite a placid spider that likes to dig a burrow in disturbed earth – such as a garden. Harmless but common. Eats insects – mainly beetles.



Location: Briar Hill VIC Photo by Linda Rogan

“Yellow and black face peeking out of red gum hole. Colour makes me think *Hylaeus* but I've been wrong before.”

Linda also posted an image of the head only of a wasp/bee sticking out of a hole in wood. Remember, I said earlier about only getting to see a part of an insect and you have to build an insect in your mind to secure an identification.

Linda suggests this could be a bee and in particular a masked bee belonging to the genus *Hylaeus*.



The heads of *Hylaeus* bees often have lots of yellow/white stripes but these stripes are always in large amounts across the face or as line vertical lines as seen in these photos:



Hylaeus sp. Location: Maffra VIC Photo by Mitch Smith



Hylaeus sp. Location: Churchill, Vic Photo by Matt Campbell

However, Linda's insect face markings are neither across the face nor in vertical lines.

The other character to note in Linda's image is the roughness of the sculpture on top of the face above antennal insertion points.

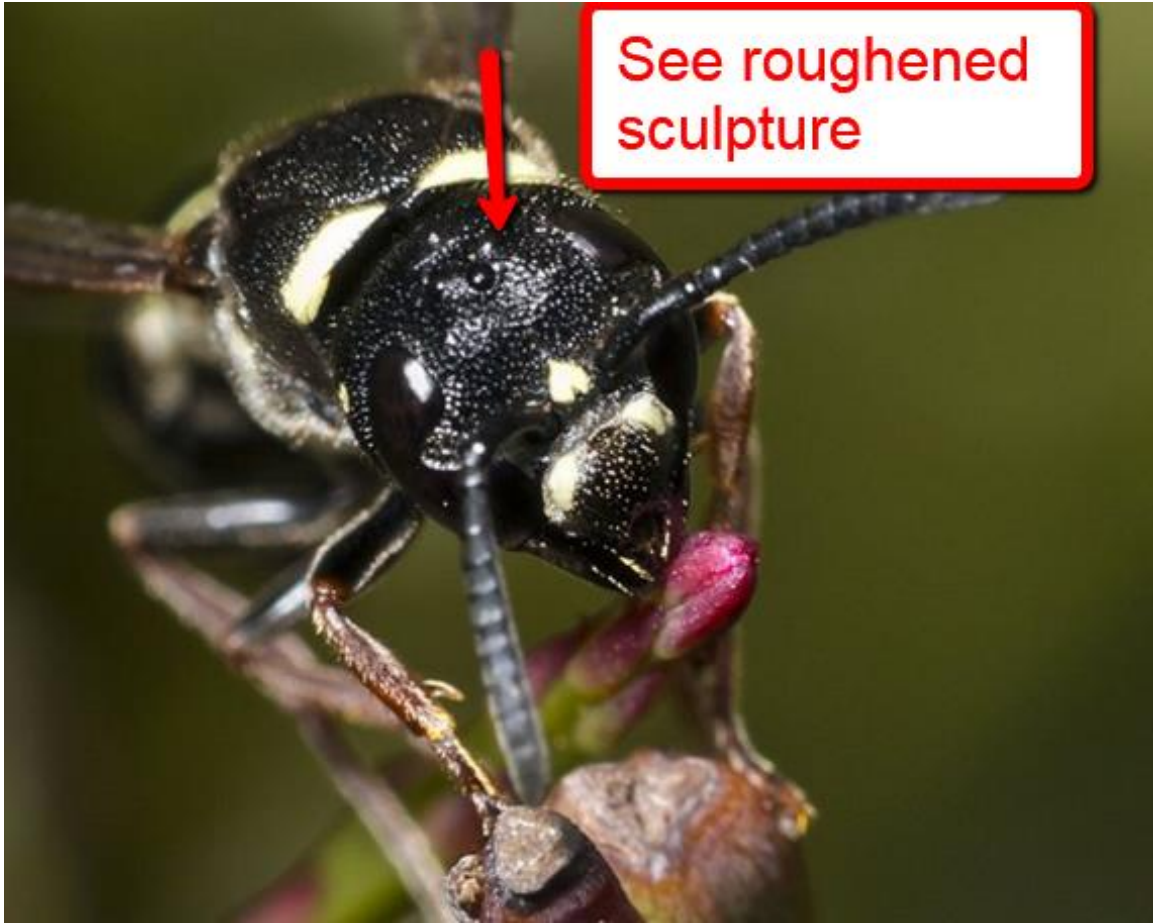
No bee has such a rough sculpture – so, it's must be a wasp.



Location: Briar Hill, Vic Photo by Linda Rogan

Have you built a mental image for the full body of this wasp yet? Come on – it's a relatively common genus with all species having somewhat similar markings on the head and body.

And below are some lovely images by Tony showing the head and full body of this Vespid *Paralastor* mud wasp.



Location: Buckland TAS Photos by Tony D.

After I had written the piece about Linda's head only image, she has now posted images of the entire wasp outside of the hole in wood. It's certainly a *Paralastor*.



Some do it tough

Martin Lagerwey posted this beetle (Chrysomelidae: *Chalcolampra pustulata*) and look at the number of mites feeding from the beetle.

Amazing.



Location: Fernshaw VIC Photo by Martin Lagerwey

Wild Pollinator Count



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This is an annual Wild Pollinator Count that lots of fun and a great way to get out in our garden for at least 10 minutes.

You will only have one day left, but it is still worth the effort.

This years' count is between 15-22 November, 2015.

If you want to learn more about this activity, then here is the Wild Pollinators Count URL:

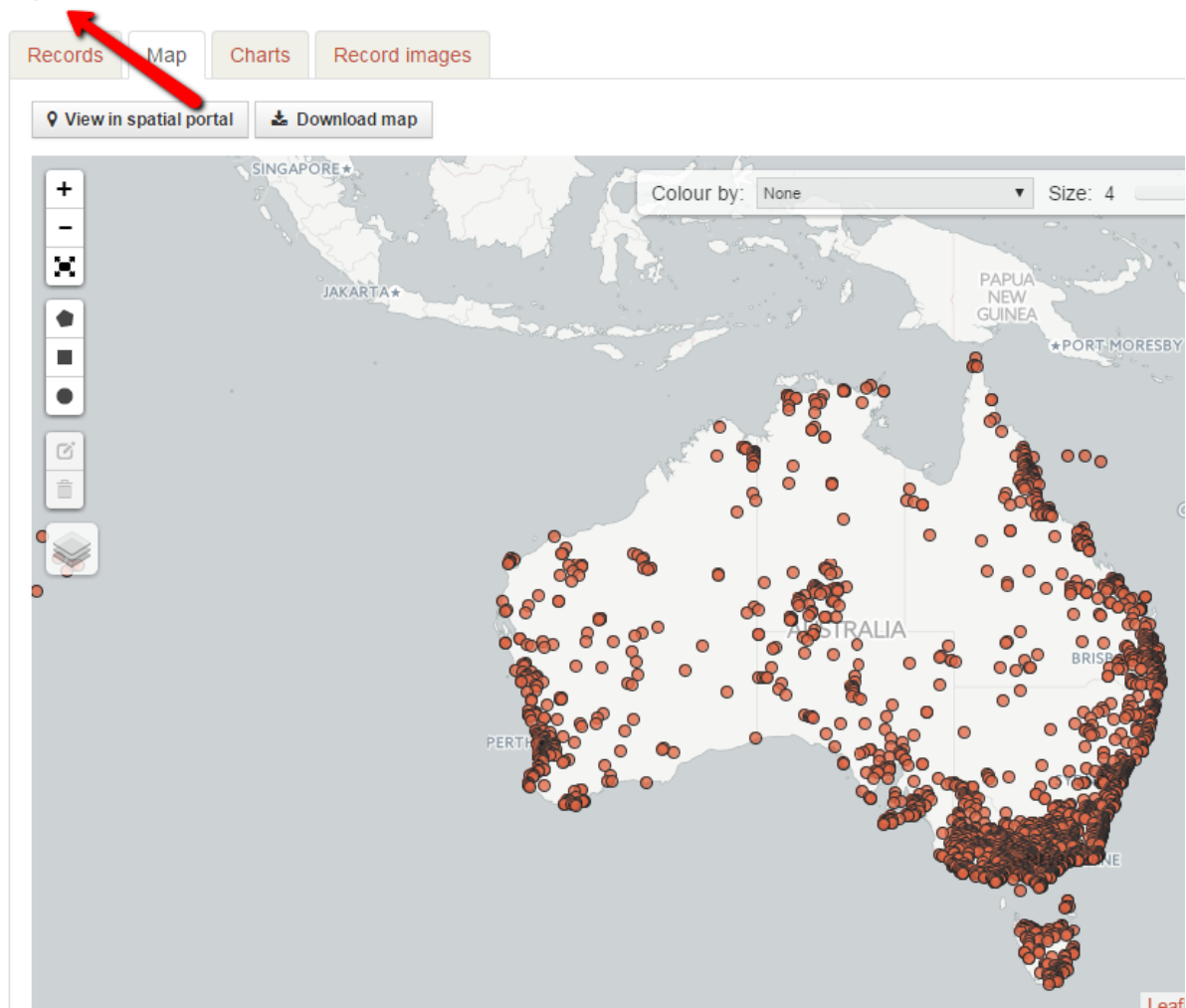
<http://wildpollinatorcount.com/count-pollinators/>

One more sleep or week to reach the 30,000 BowerBird record mark on ALA.

We should reach the mark on Sunday afternoon.

Thanks everyone.

29,871 results for Data resource: BowerBird



Mark Berkery's Nature's Place

A Sleepy Dragon

It's all ... a gift, or a curse, depends on how you look at it. But the fact is whatever it is today is gone tomorrow, so there's no point fretting it – whatever 'it' is. Making it less a curse, or a gift, and more simply what it is.

I know, easy to say. But it can also be 'done' if done enough. Letting go is the key, not holding on to what's inside – though it may appear outside – by thinking too much or getting emotional about 'it'. Whatever it is.

This sleepy dragon doesn't give a ... Lying there, resting in the hot afternoon sun, takes no notice of me – as long as I am careful, considerate of its sensibilities, discernible as what my own would be if ...

... I were a dragon.



Mark Berkery



Mark Berkery



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)