

The BowerBird Bugle

5 June 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 11.

Hi All – What a week it has been. Sepp Blatter resigned from FIFA, Canberra had a -7C temperature start to the day and down here we mourn the passing of Victoria's first female State Premier, Joan Kirner. But as I keep saying, the cool weather seems to be no impediment to the intrepid BowerBird band of photographers – and some great entries have been added. First up this cartoon really caught my eye!

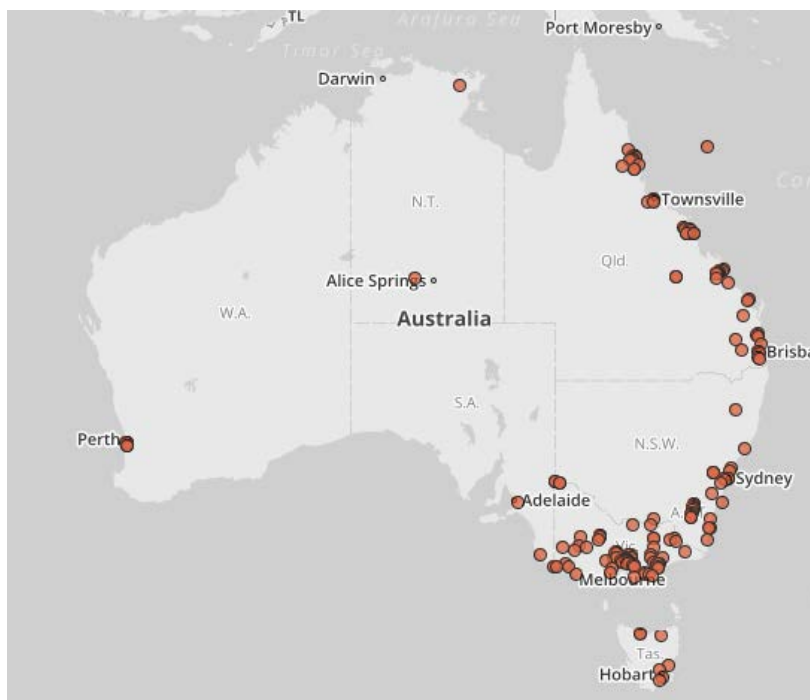


When my 3 children were much younger, one of their perennial questions was – “Which one of us do you and Mum like the best?” Remember this question yourselves? Well, being the Museum’s entomologist, I too should equally like all insects (What? More than bees?) – but, there is one group of insects I dislike .. almost pathologically .. the Odonata: Dragonflies and Damselflies. When I was a Uni undergraduate student, I had to make several insect collections. We were given instructions on where to insert the pin and how to spread their wings.

However, Odonata require two setting techniques to get “top marks” from the examiners. Before you set their wings at 90 degrees to the body, you have to “bristle” them. You can use a fancy Entomological Supplies provided bristle or just use the bristle from an old straw broom. You feed the bristle through the thorax and importantly down the entire length of the abdomen. Once you have measured the length of the thorax+abdomen, you cut the bristle just short, feed the bristle in and the push the slightly shorter bristle into the thorax with a pin to hide the fact that you have bristled the Odonata specimen. I used this technique religiously and I was proud of my efforts. But what happened when I submitted my insect collections for examination? The examiners used to always “flick off” the abdomens of the Odonata specimens to see if I had used a bristle. ARRRRRRGHHHH!! Every Odonata specimen I prepared, when returned from examination, had no abdomen – just a bare bristle sticking out its end.

Psychologically scarred I was as my specimens suffered this fate across several years of my undergraduate ento courses. Nowadays, I cannot look at an Odonata specimen without recalling my ento collection examination days. I’m glad I got that bug-bare off my chest as the feature Order for this Bugle’s edition is indeed Odonata – but I “hate ‘em” with a passion! (->! BowerBird’s head Odonata photographer is Reiner Richter.

Reiner created the “Australian Dragonflies and Damselflies” project on BowerBird which has attracted 49 members and 268 sightings from mainly the eastern side of Australia.



Separately, Reiner has contributed directly to ALA and measures in the top 4 Odonata contributors to ALA – impressive.

Refine your search ×

	Dataset	Count
<input type="checkbox"/>	Australian National Insect Collection	16533
<input type="checkbox"/>	Australian Museum provider for OZCAM	6009
<input type="checkbox"/>	Sustainable Rivers Audit	5606
<input type="checkbox"/>	Reiner Richter Odonata	5403



Photos by Harvey Jenkins



Photos by Erica Siegel



Photos by Erica Siegel



Photos by Linda Rogan



Photos by Marlis Schoeb



Photos by Daniel Heald

Actually, that last image from Daniel is a classic. Daniel wrote that he was preparing to photograph a bee when a Damselfly flew in and began to eat the bee. “When in Rome do as the Romans” so Daniel photographed the Damselfly instead!!

NOW do you see why I dislike Odonata! Fancy eating a bee ...

And, it was a halictid bee ... One of mine Gees ...

(:->!



Ok – so they are photogenic ... doesn't mean I have to like 'em



Photos by Reiner Richter



Interestingly, Reiner labelled the below image as “First Dragonfly” with anticipation of many more to come.



First Dragonfly

0 votes	★ 0 favourites
+ -	
🔍 1 Identify	📄 0 Describe

Sighted 12 Aug 2014



Mt Bealiba

Projects



Photos by Reiner Richter

Thanks must also go to Reiner who has identified many of BowerBird's Odonata records –



Reiner Richter
28 April 2015



Austrolestes analis
(species)

Taxonomy: Animalia: Arthropoda: Insecta: Odonata: Lestidae: Austrolestes: analis

Common Names: Dragonflies, Damselflies, Slender Ringtail

Let's move on from Odonata ... Phew ...

I did laugh when I saw the record title "BUB" which when expanded means ...

BUB (Bat Under Bridge)



Photo by Reiner Richter

Sighted 2 Jun 2015



Waterfall Way, Fernmount NSW 2454, Australia

I do enjoy seeing BowerBird records when there are multiple images showing other life stages of the insect. Such this beautiful wasp image and the paper wasp nest:



Photos by Lek

I also enjoy seeing rare records on BowerBird. There is a little known Vespid wasp genus called *Rhynchium* with up to 5 species from the Australian region. They are strikingly coloured and large wasps yet so little is known about them. Jean and Fred Hort posted the first BowerBird image from WA:



Photo by Jean and Fred Hort

And, this week Lek posted a second image for this genus from Townsville, Qld. It could be *Rhynchium australense* Perkins – the first record since its initial 1914 description.

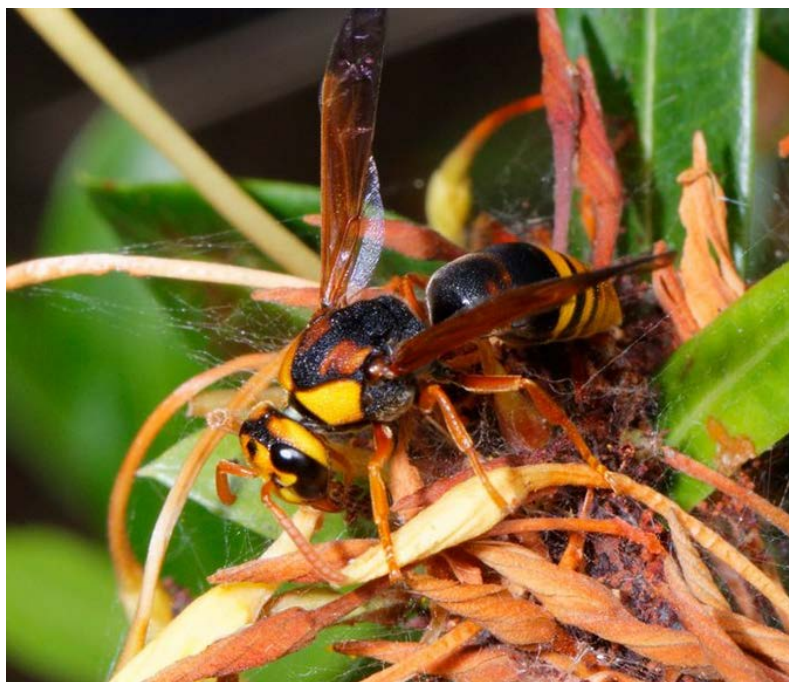


Photo by Lek

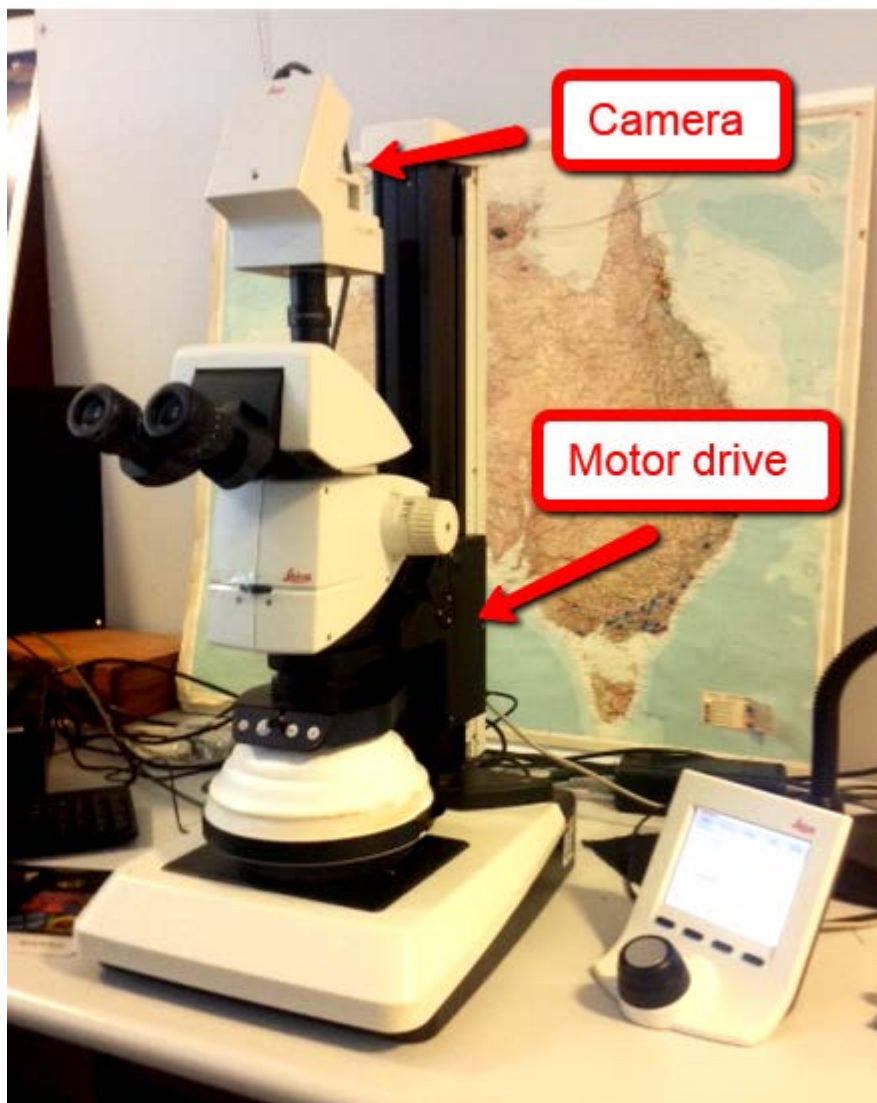
Here is a tale from my working week this week. A Melbourne University genetics PhD student approached me asking for identification help. He is working on the Vinegar fly, *Drosophila melanogaster*. Have you ever seen tiny insects flying around your fruit bowl or above slightly overripe fruit in a compost container. Those are Vinegar flies (sometimes incorrectly called Fruit flies which are in a completely different family and genus of fly). Genetists love Vinegar flies because their egg to adult life cycle is about 10-14 days so they can do lots of genetic experiments inside a single year. And, they are prolific breeders. I once read that if you began with a single pair of Vinegar flies and let them breed and all of their subsequent generation also breed for one year and you then put all of the bodies end to end, the line of flies would extend from the Earth to the Moon. That's not bad for an adult insect that measure less than 3 mm in body length.

Now I'm not a genetist but the PhD student had been collecting Vinegar fly larvae and pupae from the wild to breed them out and occasionally a parasitic wasp would emerge instead of a fly. He wanted my assistance to identify these parasitic wasps.

Identification of parasitic Hymenoptera is not for the faint-hearted or the uninitiated. They are very small so characters are difficult to see. Body parts have fused making it difficult to decide which body part is which. The CSIRO keys to families are long and difficult and where written by someone who obviously liked to torment taxonomic Hymenoptists (ie. wasp specialist like me). Anyway, many hours later, I had a selection of names and I decided to photograph these wasps to help other with similar Vinegar fly wasp identification requests. I will add the images to BowerBird and these images will be picked up by Google Images and made available on the web for all to use.

At work, I have a wonderful \$80,000 Leica microscope with a \$20,000 digital camera. I received this microscope (plus one more!) through a contract with Chevron. Chevron received a \$50 billion contract to deliver Liquid Natural Gas (LNG) to China and this gas was to come from Barrow Island, a Class A reserve off the north west of WA. Barrow Island was made famous by Harry Butler – one of Australia's first natural history-conservation TV presenters and many of his programs came from Barrow Island. The WA and Federal Governments imposed strict environmental condition with the approval to extract LNG. The major condition was to ensure that no exotic species were to be introduced to Barrow Island. Most of us thought this condition would relate to only the vertebrates, of which there are only 15 species native to the island, but the condition included invertebrates! No one had any clue what invertebrates occurred on Barrow Island so how can you ensure nothing exotic is introduced to the island until you already know what is on the island? So, Chevron contracted Curtin University to conduct a 3 year survey of the Barrow Island invertebrate fauna. Approximately, 16,000 specimens were collected which were sent to specialists around the world who identified 2,100 species of which less than 50% had been formally described. The Barrow Island invertebrate specimens are lodged in 3 Perth Institutions – WA Museum, Depart of Agriculture and Curtin Uni. The problem that arose was how would someone on Barrow Island be able to identify a specimen when all of the reference material was in Perth – thousands of kilometres south? It would take weeks to get and ID from Perth. One day, they found a rat on a helicopter. It took six weeks to confirm the rat was endemic Barrow Island and the helicopter was grounded for six weeks. So, I was given a Chevron contract to image capture all 2,100 species and load them into my Biosecurity website called PaDIL (Pests and

Diseases Image Library). Once on the web, they became instantaneously accessible to all. To do this task, Chevron purchased two of the top Leica binocular microscopes and digital cameras and gave me 2 fulltime staff for 3 years. We did the job. This is the only time where an entire island's invertebrate fauna is now on the web. Here is a picture of the Leica M205c binocular microscope with the digital camera on top. The special feature of this microscope is that it has a computer controlled motor drive. The motor drive moves the microscope and camera up and down so we can pre-determine where and when the camera takes a picture.



Binocular microscopes have an extremely shallow depth of field in the viewing mode. This made a microscope images almost useless and not much of the specimen was in focus in the image. However, the motor drive allows me to tell the digital camera where the top and bottom is of the specimen and to pre-set how many images to take between these two points – usually between 50 and 80 images. This creates what is called an image stack with the multiple photos. About 10 years ago, a software company called Syncroscopy brought out a new montaging software package called Auto-montage. This allowed you to input multiple images from an image stack through the software which would then create a new, fully in-focus single image using only in-focus pixels from each of the multiple images. The more images you took the more in-focus pixels it had to work with. The software was magic and became a cheap alternative to Scanning Electron Microscopes (cost about \$1 million) which previously was the only way of getting an in focus 3D image of a small insect. A decade ago, the cost to purchase the Syncroscopy software license was \$7,000. Today newer and better products are on the market for about \$200. I use HeliconFocus for my montage software.

To show you how this system works, I have taken an image stack comprising 80 individual 16MB TIFF images through the entire focal length of an adult Vinegar fly. Below are selected images from throughout the image stack:

Image 1. Notice how only the tip of the left wing facing us is in focus



Image 20. More of the wing is in focus



Image 40. The left wing is now out of focus and more focus on the body.



Image 60. More focus on the body.

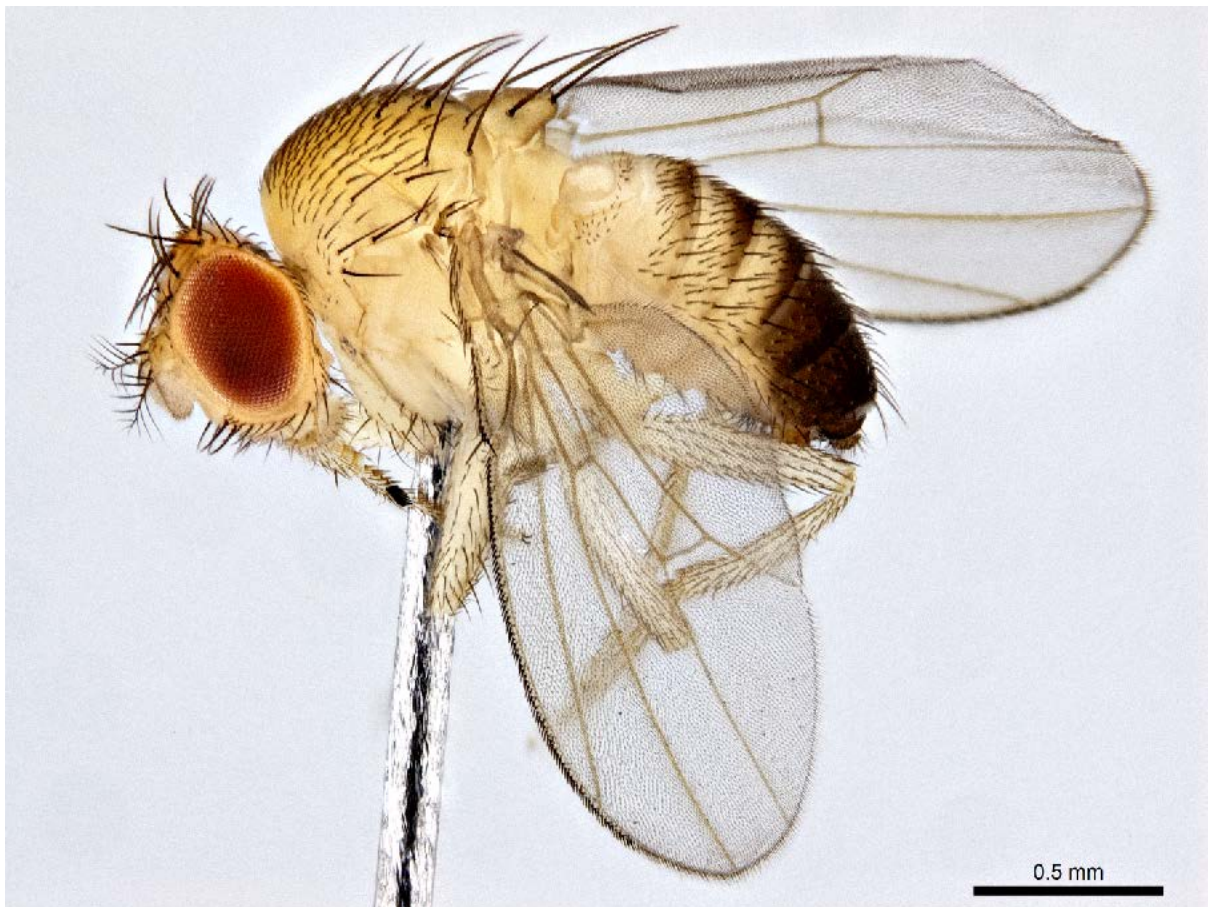


Image 80. Finally, the back right wing is in focus and the left wing is now completely out of focus when it was in focus in the first image.



Here finally is the Montaged image, with scale bar added, which is a combination of only the in-focus pixels from the 80 original “slices” from the stack images:

Magic isn't it. Notice the scale bar of 0.5mm. That makes the body length of this specimen about 2mm.



This final montage image is a high resolution 16MB TIFF which can be used to print in a book. You can also reduce the resolution of this image down from 300 DPI down to 96 DPI and save it as a JPEG image to publish on the web.

However, as this a high resolution TIFF image, I can enlarge it to see all sorts of minute features.

Here I have enlarged the lower head and wing area. I can see (and count) the individual macrotrichia (hairs) on the wing, the large black setae on the leading edge of the wing and the 12 toothed comb on the foreleg tarsal segment.



Examine the wing in detail:



Examine the upper thorax:



Or, how about the head where I can see and count all of the head setae, the plumose arista (feather like hairs coming off the antennae) and I can count the individual ommatidia or eye facets that make up the compound eye.



And so, to the parasitic wasps which parasitised these Vinegar flies. Braconidae: Alysiinae: *Asobara persimilis*



And, its wing:



Diapriidae: Diapriinae: *Trichopria* sp.



And its wing:



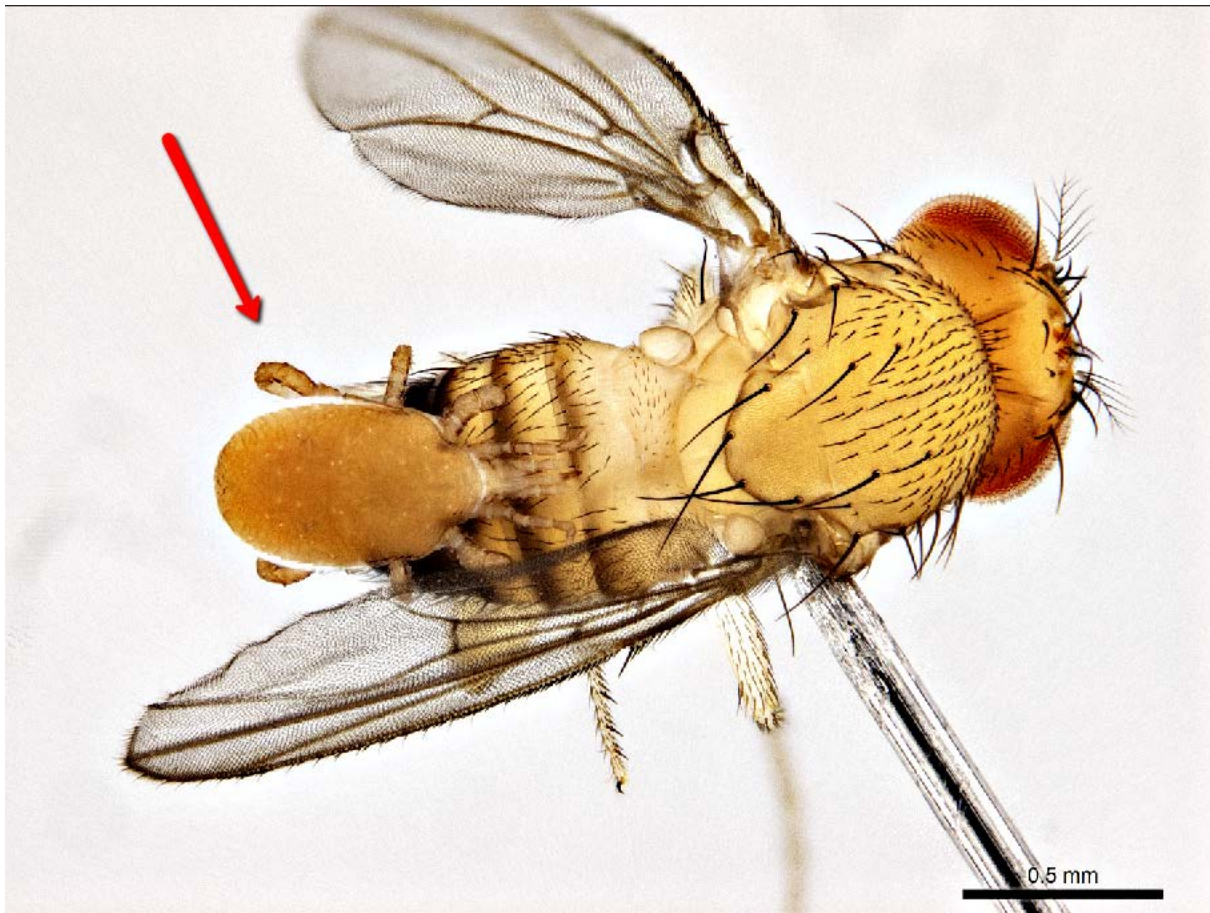
Figitidae, *Ganaspis* sp.



Pteromalidae



But, what surprised me was to learn that the Vinegar fly adults are attacked by a predacious mite – *Proctolaelaps* sp.



Favourite Image of the week ...

Mitch Smith has uploaded a wonderful set of Membracidae tree hopper images:



Photos by Mitch Smith

Record I enjoyed for this week ...



Photo and story by Tamara Leitch

“A serpentine 'ladder' of silky strands (each 'step' composed of several strands of silk 1cm long, and about 1cm from the next one) stuck to the side of an outdoor glass window, extending for about 1 metre up the window and along the frame. I'm wondering if it could be where a Saunders' Case Moth has climbed up? For a few weeks there has been one nearby, but I haven't seen it attach to the glass during this time.”

Gotta look at Fungal Image for this week ...



Velvet Foot - *Flammulina velutipes* Photo by Tamara Leitch.



Green Hygrocybe - *Hygrocybe stevensoniae*

Photo and these comments by Reiner Richter:

“I was shown these special mushrooms today by John van der Heul (after having walked right past them). This is a rare fungus with only a few records on the ALA from mainland Australia (this is the first known record from south coast). This is the first year I have seen any of the green Hygrocybe species and this one now means I've seen all three in Bruce Fuhrer's book. Teresa van der Heul forced me to put in on Bowerbird. :) “



Coprinus sp. Photo by Tamara Leitch.



Mycena sp. Photo by Jenny Holmes.



Dictyopanus pusillus -Photo by Peter Kerr



Amanita muscaria - Tamara Leitch

Finally, Vale Joan Kirner – Victoria’s first and only Premier.

After she lost the election to Jeff Kennett, she was convinced to go onto an ABC Late Show and perform a song wearing leathers and with David White on lead guitar. Here is a photo from that performance and can you spot the young “groover” dancing in the background ?? (:->!

Oh the memories ...



Photo by Fay Pirotta.

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)