



21 August 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 22.

Hi All – The last vestiges of winter’s cold temperatures and short daylight hours are beginning to disappear. I got off my evening train ride home the other day and realised there was still daylight and it felt good. It has been at several weeks since I last threw a bucket of water over my car windscreen before driving off.

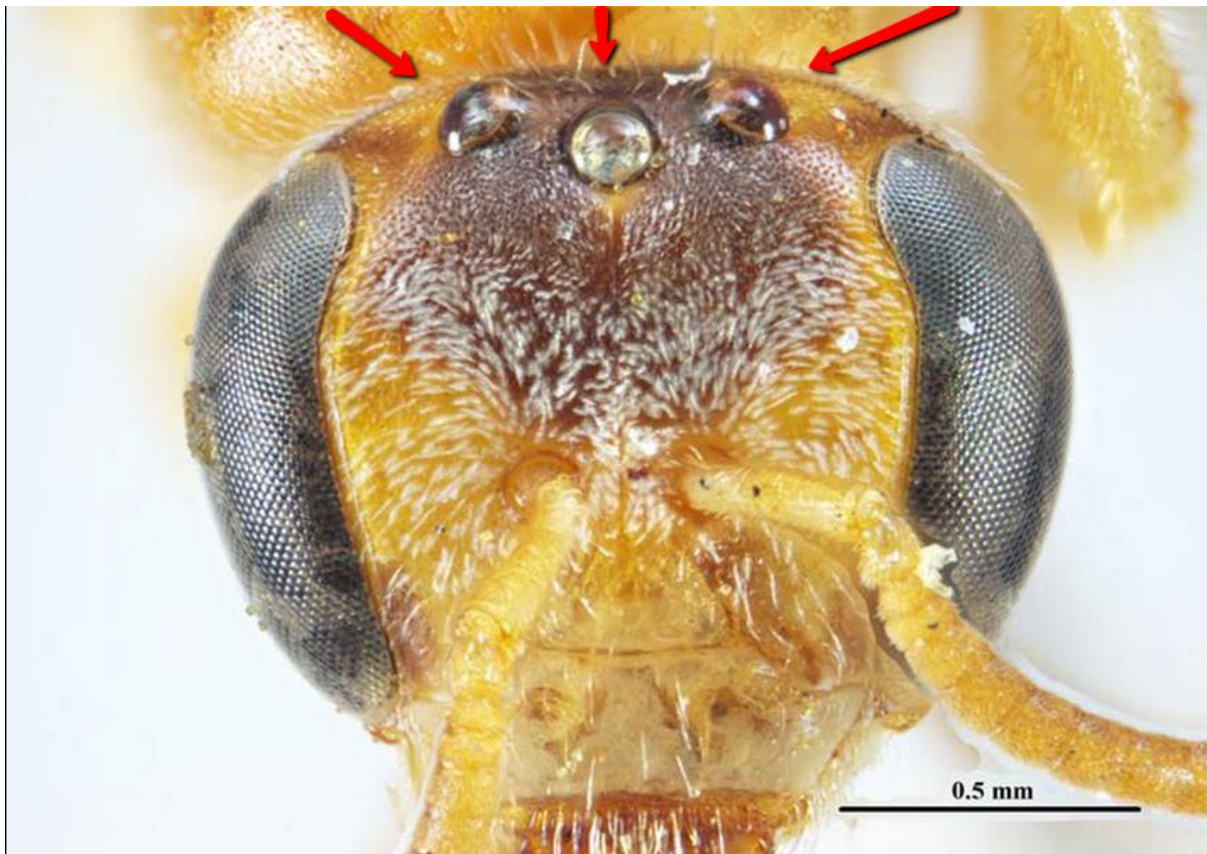
The changing of the seasons means enough of the fungi and in with the animal and flowering plant Kingdoms. I can already see such a shift in this week’s BowerBird records. It’s fun to watch the subtle changes on the website which will soon become a flood as we reach spring.

I’m about to write a paper on the “dim-light” foraging bees of Australia. These are the nocturnal (night foraging), crepuscular (late afternoon to early evening foraging) and matinal (morning only foraging) bees. This topic has been well covered for North and South American bees but nothing for Australia to date. Most bees forage with what we cheekily call “Banker’s Hours” – that is between 10am and 4pm .. the old bank opening hours. However, we believe so as to reduce competition between foraging bees and avoidance of predators, some bees have decided to abandon the usual “banker’s hours” and to forage when most other bees are not foraging. There are two types of “dim-light” foraging bees: facultative and obligate. Facultative

bees do not display any external modifications that would enhance their ability for dim-light foraging. These are the most difficult to recognise. Indeed, the only way to distinguish them is when the species has been collected at a night UV trap. Out of Australia's almost 1,700 bees only 4 have been recorded as collected at a UV light. Three species are facultative dim-light foragers (*Lasioglossum clelandi*, *L. excultum* and *L. hiltacum*) and one is an obligate dim-light forager (*Reepenia bituberculata*). Obligate dim-light foraging bees display obvious body colour and eye development designed to assist with dim-light foraging. The light regime created by the habitat in which a dim-lighted foraging bee can also determine the hours during which it feeds. Take for example the matinal foraging bee *Lasioglossum ochroma* which occurs in the deserts of central Australia. Here full sunlight strikes most parts of the land early in the morning as there is little shade. I have collected this bee on the outskirts of Alice Springs only up until about 7:30am. Notice the light yellow-brown colour of *L. ochroma* – a colour pattern repeated in many dim-lighted bees.



Importantly, notice the enlarged three ocelli on the top of the bee head. It has been shown that the enlarged ocelli of dim-lighted bees not only collect more light but they have a different focal length to the ocelli of diurnal foraging bees and the neurons coming from the light sensing cells have different connections and networks than those in diurnal bees.



Below is another matinal bee but it occurs only in the rainforests of coastal NSW (eg. Lorien). This bee has the curious habit of flying along the rainforest floor avoiding any spots of sunlight and flying up into the flower of a herb species. Indeed, I have seen this bee fly off from a flower when sunlight reached the flower. Unlike *L. ochroma* from central Australia which stops flying about 7:30am, this undescribed *Lasioglossum (Austrevylaeus)* bee flies until about 10:30am. Interestingly how flight times differ between dim-lighted bees between desert and rainforest species. Notice the dense hair cover on the bee's thorax and head and notice the enlarged

ocelli. Note also the yellow-brown colours on the head of the bee.



Once I was bee collecting in North Queensland at the base the famed Mt Lewis. I found a tree in full flower and I decided to spend the entire day collecting at this one tree to see if different bees arrived at different times. The collecting results were interesting but as I brushed my net across the flowers for the last time, I picked up for the first time that day a crepuscular bee at about 5:30pm. It was *Homalictus rowlandi*. Even though the only other specimen ever collected of this species was the Holotype collected about 1900, I recognised it immediately as I had borrowed that specimen from the British Museum. What a catch. Look at its yellow-brown body colours and look at the bees enlarged ocelli.

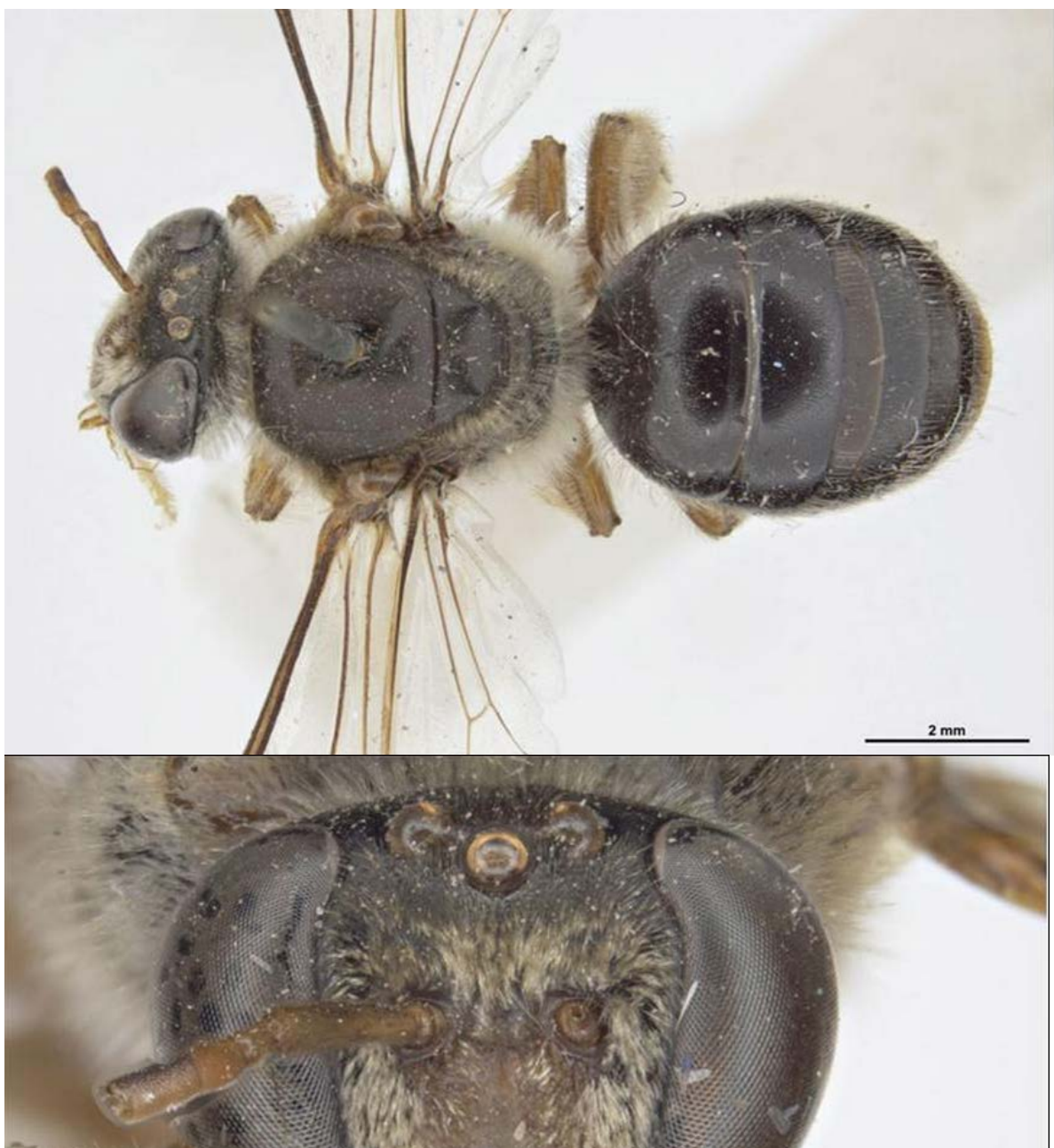


Another presumed matinal bee is *Lasioglossum tooloomensis* which occurs in rainforest patches in northern NSW. I have never collected this species myself but collection records show it is matinal. Look at the yellow-brown body colours and enlarged ocelli.



Australia's only nocturnal bee is a halictid bee – *Reepenia bituberculata*. It occurs in North Queensland and into Cape York Peninsula. Almost every specimen in collections has been collected at a UV light at night. It is a large sized bee. The females are predominately a dark brown/black colour while the males are predominantly a yellow brown colour. Both sexes have enlarged eyes and ocelli – more so in the male which has enormous eyes at almost meet above.

Female dorsal and head views



Male dorsal and head views



All photos above by Ken Walker.

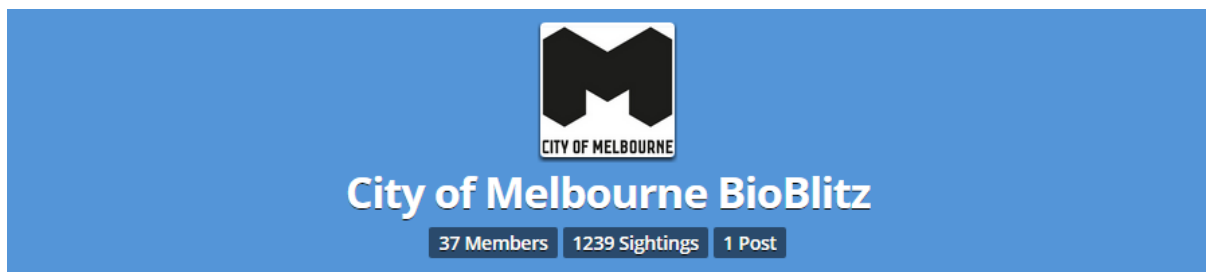
Males of this nocturnal bee often roost in large numbers only on palm fronds. When seen in large numbers and due to the yellow-brown male body colour, these roosting males are often mis-diagnosed as the Asian Honeybee – *Apis cerana*. If I had \$1 dollar for every time I have corrected a mis-identification of this species



Photos by Queensland Department of Primary Industries.

Look in your own backyard – You’ll be surprised!

In October – November, 2014 Museum Victoria participated in the first BioBlitz for the CBD of Melbourne, Victoria. Museum staff ran two full day workshops in the Fitzroy Gardens and Westgate Park. However, the greatest success story came from the support of the BowerBird City of Melbourne BioBlitz Project which recorded 1,200 uploaded records. The council had heavily prompted the website and I gave demos and talks which all paid off well. Many records confirmed first reports for many species in the Melbourne CBD.



Buoyed by this success story, the Melbourne City Council funded a 12 month biodiversity study for the CBD to be done by Luis Mata from RMIT. Luis has been a regular BowerBird contributor uploading many insects he has found during his survey. On Tuesday this week, Luis “presented” me with several boxes of unidentified insects as well as several tubs of specimens in glass vials in 70% alcohol. I have some sorting and naming to do. However, the first cab off the rank was two vials containing three small specimens that Luis could not identify. I took a look and I too could not immediately place the insects to Order. Yes – not to Order. Specimens in alcohol always look different. They float and they often lose their natural resting position so you need to get past these obstacles and build a picture in your mind of character based identification and how the animal would look when alive. The specimens had been collected at Princes Park in Carlton North

in January 2015. These insects intrigued me so I took a series of montaged (3D) images so that I could create an image table where I could view all various aspects of the species and think.

Clearly, the insect had 2 pairs of wings which ruled out the large Order Diptera (flies). No elytra so not a Coleoptera (beetles) and clearly not a Hymenoptera (wasps) – so, I could quickly rule out over 80% of the Australian insect fauna. But, Australia has 27 Orders of insects and I had only eliminated 3 !

The obvious characters in this side view were:

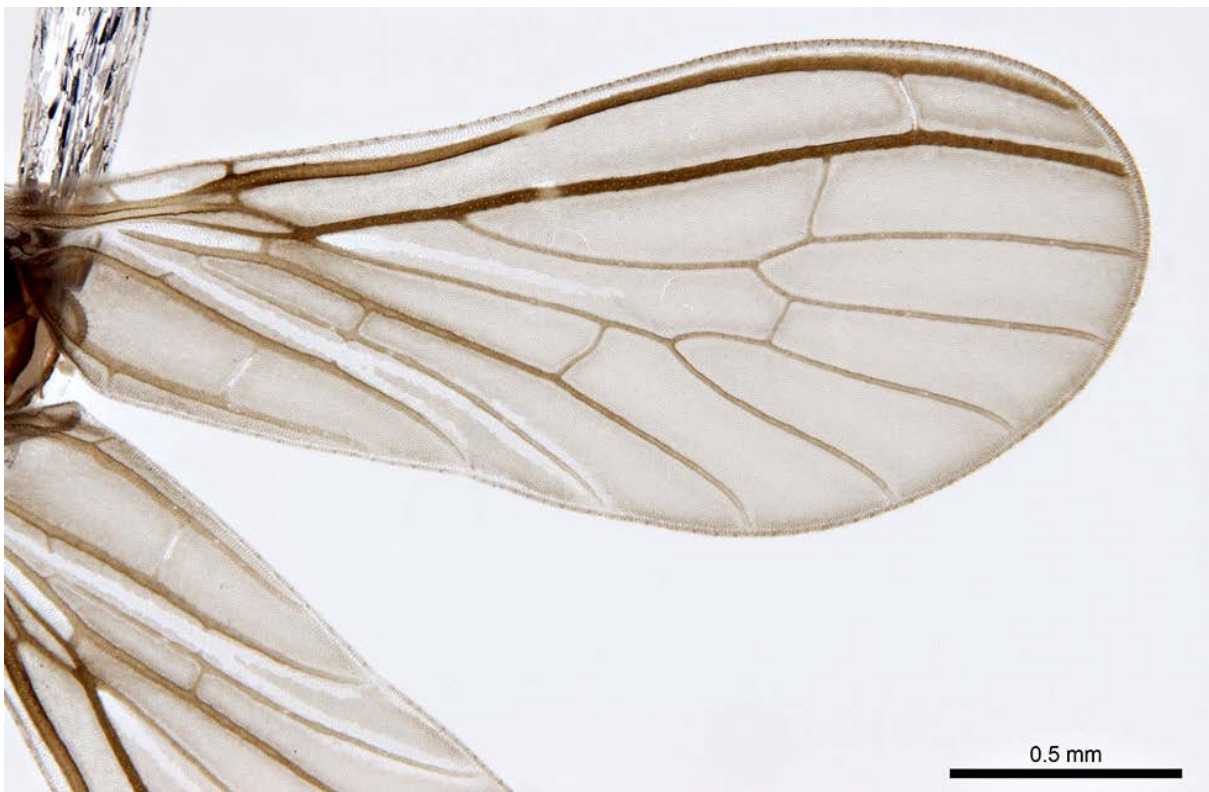
- Elongate and filiform (bead-like) antennae
- Enlarged basal antennal segments
- Elongate lateral thorax/leg segment
- Elongate mouthparts (palps)
- What I cannot see is how the wings are held naturally at rest. That would have helped me enormously !



Here is a close up of the head and antennae. Notice the two enlarged basal segments of the antennae, it is filiform in nature as well as having well-developed mouthpart palps.



This next image is a dorsal view of the head showing in detail the enlarged basal antennal segments and for the first time, the flanged, posterior margins of the head. Also note the lack of ocelli on the head, the narrow to almost absent pronotum and the V shaped thorax. All great species characters but I was still struggling to place the beast to Order, then I could begin the hunt for genus and species. First things first ! Remember I mentioned in a previous Bugle edition that to be a taxonomist is like being a detective. You gather evidence and the present a case naming your “suspect”!!



Forewing image

The forewing venation is relatively simple and interestingly is mirrored on the hindwings. That's unusual in insects as usually the hindwing venation is much reduced. The character of fore and hind wing with similar venation suggests a primitive group of insects. But in this case, that character turned out red-herring that for a while derailed my identification efforts to even place the insect to Order. I went looking at the primitive insect Orders whereas I finally found it in the advanced Orders.

Things ain't always as they seem and you always need to take caution placing too much emphasis on a single character. It's the balance of the suite of characters that wins the day.



Hindwing image.

Finally, I opened the second vial which contained a single specimen collected at the same location but eight days later than the specimens in the first vial I examined. This specimen appeared to have its wings set in the natural resting position and then I began to form an image in my mind and all of the characters that I had in my head began to make sense ... eventually – It's a bit embarrassing when the Curator of Insects cannot easily place an insect to Order.

Has anyone realised what Order or Family or Genus this insects belongs?



It's a lacewing – Order Neuroptera and belongs in the Family Coniopterygidae but is unusual within that Family as the only genus with reduced wing venation - *Neosemidalis* is the genus. Dr Tim New (Australia's Neuroptera expert) named it as the species *N. globiceps* which was previously known from only the two type specimens collected in 1963 at Lakes Entrance, Victoria. It's amazing what you can find in your own backyard. FINALLY – QED !! Next specimen ????

Our new word for this week: “Resupinate”

The definition for the word “Resupinate” is: A botanical word meaning inverted or appearing as if upside down.

Leuba Ridgway used this word in the title to her recent record: “Resupinate blue fungus”.



Leuba identified the fungus and wrote: “Fungi: Basidiomycota: Thelephoraceae: *Amaurodon viridis*. Small velvety patches and veins of crust fungus in beautiful shades of blue in a tree hollow. The surface was covered with beads of moisture. Spotted on a eucalyptus trunk -damp eucalypt forest.”

Leuba’s images made me think as an opal miner in Cobber Pedy finding a rich vein of opal in amongst the rock.

What a find !! Thanks Leuba for our “word of the week” and your amazing images.



Location Belgrave, Vic. Photos by Leuba Ridgway.

Birth of a Psyllid bug

Dacre England from Sydney captured these remarkable images of a Moreton Bay Fig psyllid (*Mycopsylla fici*) bug emerging from its pupal case. Note the wings have not yet expanded.



Photos by Dacre England

The Kurrajong star psyllid

Dacre also captured the curiously shaped structures of the Kurrajong star psyllid - *Protyora sterculiae* from Sydney.



Photos by Dacre England

More curious psyllid homes

Dacre photographed the Spotted gum psyllid (*Eucalyptolyma maiden*) with its elaborate distinctive homes and adults.



Photos by Dacre England

Psyllids on Callistemon

Dacre's documentation of psyllid's host, pupal case and adult are so valuable. Here is a Callistemon psyllid pupal case and adult (*Trioza* sp.)



Photos by Dacre England

Finally, the Lillypilly Psyllid

Dacre again from the Sydney region with *Trioza eugeniae*.

I love this little fella – looks like he/she is full of Christmas pudding with extras!



Photo by Dacre England.

What do scientists do when they find one of these?



Tony D. from Tasmania photographed these tiny animals at Franklin, Tas but was not able to name them. I sent off the images to Australia's millipede expert, Dr Bob Mesibov who replied: "It looks like a very, very juvenile polyzoniidan (Diplopoda: Polyzoniida) - the kind of thing you find when sorting berlesate trap material and quietly put back, because there's no way you can ID it." That's a "Science Trade Secret"!!

More of the confusing non-insect fauna.

Last week, I showed an image of a symphylan. Well in the same vein this week two small diplurans were posted:



Photos by Tony D.

These pale, eyeless hexapods, the largest of which grow to around 12 mm in length, can be recognised by the two long, many-segmented cerci at the end of the abdomen. Around 200 species are known.

A “leggy” mite

Tony D. also uploaded this amazingly long legged mite from Franklin, Tasmania in the family Eupodidae.



Photos by Tony D.

Photographic and taxonomic skills.

Tony D. from Tasmania is a specialist in photography and fly identification. Admire the beauty of these recent images:





Lauxaniidae: *Rhagadolyra magnicornis* Photos Tony D.

I am always amazed at the detail BowerBird members capture.

Gio Fitzpatrick recently uploaded an image he took in March 2015 on the Elsternwick Golf Course, Melbourne. It was of a wasp sitting on an egg sac of the Bird dropping spider - *Celaenia excavata*. Gio had observed the wasp injecting its eggs into the spider egg sac. Australia's leading expert in wasp parasitoid – spider relationships is Prof. Andy Austin at Uni. of Adelaide. In 1985, Andy wrote a paper documenting all known cases of wasps parasitising spider egg sacs. Only one genus of wasp has been recorded parasitising this spider's egg case. That was the Ichneumonidae genus *Paraphylax* sp.



Photo by Gio Fitzpatrick

My vanity or just good science?

Almost every time I identify a record on BowerBird, I do a check on ALA (Atlas of Living Australia) to see whether the species or genus has been previously recorded near where the record I am identifying was photographed. When I checked this record, I found ALA had only one previous record – also from BowerBird and found nearby!!



Photo by Michael Bedingfield

A beautiful Pompilidae Spider-hunting wasp, *Ferreola handschini*, photographed from Mt Tennant, in Namadgi NP, NSW (just south of Queanbeyan). Michael has created a new Project: “Canberra Insects and Spiders” (<http://www.bowerbird.org.au/projects/5793>). I recommend you join and watch this project grow.

Mark Berkery's Nature Posts





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What did the first European settlers think of our fauna?

I do sometimes wonder whether the first European settlers to Australia could believe what animals they saw. Animals that hopped, another one that looked like someone had sown a duck beak onto the head of a mammal and of course the echidna with its elongate beak and spine covered body.

What did they think?



Photo by Matt Campbell at Jeeralang Junction VIC

I am sometimes asked this question.

Is it Ok to upload images I took some time ago or should I only upload recent images. Biodiversity is all about tracking species in time and space. That's why BowerBird insists when you create a new record that you must add the where and when (spatial / temporal) data for the record. Temporal data has always been an important data component but nowadays with so many climate change studies, "windows to the past" are the records of most interest. Where did a species occur ten, twenty or even a hundred years ago compared to now? Changes in distribution may be due to the effects of urbanisation or agriculture or the introduction of DDT in the 1950s or climate change effects. Here are some examples of past records:



Glengarry Vic 9 photographed Oct 2014 posted 20 Aug 2015.

Photo by David Akers



Forrest, Vic photographed 14 Dec 2006 Posted 7 August 2015



Forrest, Vic photographed 14 Feb 2010 Posted 17 August 2015

Photos by Wilma McNabb

Your fungal fix for the week.

Matt Campbell stunned me with this beautiful series of Candlesnuff Fungus (*Xylaria* sp.)



Location: Morwell National Park. Fosters Gully Track. Photos by Matt Campbell



Location: Frenchs Forest NSW *Hygrocybe* sp.

Photo by Judy & Rob Peters



Schizophyllum commune. Garigal National Park, Cascades Track, Belrose NSW.

Photo by Judy & Rob Peter



Geoglossum sp. (Earth Tongue). Jumbuk Road, Jeeralang Junction VIC

Photo by Matt Campbell.

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)