The BowerBird Bugle

15 July 2016 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 44.

Hi All – This week, Melbourne received a blast of wind and rain directly from Antarctica. I looked at the BOM weather map and the lines where almost vertical from south up to Melbourne and the lines were all close together. Brrrrrrrr. This cold weather has just about stopped all insect activity around Melbourne but I was pleased see there is still some activity near the Victorian border and further north. Of course, the fungi love this type of weather ... but more about them later.

Karen Retra spotted and photographed this male *Lasioglossum lanarium* specimen in her garden on 7 July 2016 in Albury.

Karen also spotted a female *Homalictus sphecodoides* in the garden again on 7 July 2016.

And a female specimen of *Lasioglossum adustum* on 11 July 2016. This is the most southern record for this species!

All 3 photos by Karen Retra Location: Albury, NSW

These are very late, winter records for these species. I was not overly surprised to see the male record of *Lasioglossum lanarium* in July. Males tend to just “hang around” and turn up in odd places at odd times – (Doesn’t that sound like a typical male??). This male would not be provisioning a nest and by the look of the wing tips probably emerged in late summer/autumn. The tips of bee wings typically become frayed and torn as the bee ages. Fortunately, Karen posted several images of this male bee and one image beautifully shows the wing tips as completed intact and rounded – a sure sign of a relatively newly emerged bee.

Notice the untorn and complete nature of the wing tips.

By the way, there is a difference between “hatched” and “emerged” in a life cycle. Many years ago, when I was still an undergraduate student at Uni of Q, I did an experiment on the

effects of irradiation on fruit fly pupae. I had to have all of the pupae at approximately the same age which meant I had to breed hundreds of flies for the experiment. One day I was reporting my findings verbally to the Head of the Entomology Department – Professor Gordon Hooper. I mistakenly said something like: “I had 100 pupae hatch today.” Now, either he was having a bad day or I had irritated him because he yelled at me: “Eggs hatch; Pupae emerge”. Then he made me repeat that mantra 3 times. Guess what – I have never forgotten that early lesson on life cycle terminology. It must have worked as I received top marks for my fruit fly irradiation experiment write up. Ha!!

Below are the ALA temporal records for all 3 of Karen’s bees. One Victorian record for *L. lanarium* in July and none for *H. sphecodoides* in July and nothing anywhere near July for *L. adustum*. Great records indeed.

	Month	Count
☐	January	39
☐	February	39
☐	March	35
☐	April	3
☐	May	1
☐	June	2
☐	July	1
☐	August	7
☐	September	38
☐	October	52
☐	November	114
☐	December	42
☐		136

Lasioglossum lanarium

	Month	Count
☐	January	29
☐	February	18
☐	March	11
☐	April	2
☐	May	1
☐	September	7
☐	October	11
☐	November	9
☐	December	13

Homalictus sphecodoides

	Month	Count
☐	January	4
☐	February	3
☐	October	2
☐		5

Lasioglossum adustum

This shows the value of recording spatial/temporal data (where and when) for every record. Biodiversity nerds like me find them fascinating.

Further north at near the Sunshine Coast at Mapleton QLD, Dianne Clarke also recorded bee activity on 10 July 2016. Dianne's bee, *Homalictus sphecodoides*, is the same species that Karen photographed hundreds of kilometres further south at Albury.

Finally, Laurence Sanders photographed a sugarbag bee, *Tetragonula carbonaria*, being predated on by an immature Assassin bug on 9 July 2016.

Homalictus sphecodoides Location: Mapleton QLD Photo by Dianne Clarke

Tetragonula carbonaria Location: Emerald, Qld. Photo by Laurence Sanders

What the heck?

I love it when BowerBird throws up an image of an insect I have never seen before. Irene Richardson, a relatively new member, posted the below bombyliid image taken from near Kurri Kurri NSW. Now, I have seen a few bombyliids in my day but never one with copious amounts of white hair on both sides of its abdomen – truly the Donald Trump of the insect world. So, I sent the image directly to Neal Evenhuis at the Bishop Museum in Hawaii who is an expert on Pacific Bombyliidae. Neal replied it belonged to the genus *Acreotrichus* which currently has 3 Australian species.

I opened the ALA map for this genus to see which of the three species had been recorded closest to Irene's location only to find there were currently no records/images on ALA for this genus. Another first for BowerBird on ALA maps.

I congratulated Irene on her photo and she replied: "The flies seemed to favour the *Leucopogon* flowers and I wondered whether the snowy white hair matching the colour of the flowers had some kind of symbiotic association. I was pleased with the photo as the flies were constantly moving, alighting for less than a second to feed."

Irene also added: "Since the photo, the ground beneath this minor power line has been ripped to discourage plant growth. Hopefully it will all grow back again as it was a favourite patch."

Truly – I learn so much from BowerBird member posts !

Acreotrichus sp. Location: Stanford Merthyr Crown Reserve, near Kurri Kurri NSW 2327, Photographer: Irene Richardson

Irene also tracked down two description for *Acreotrichus* species done by Walter W Froggatt from about 1907.

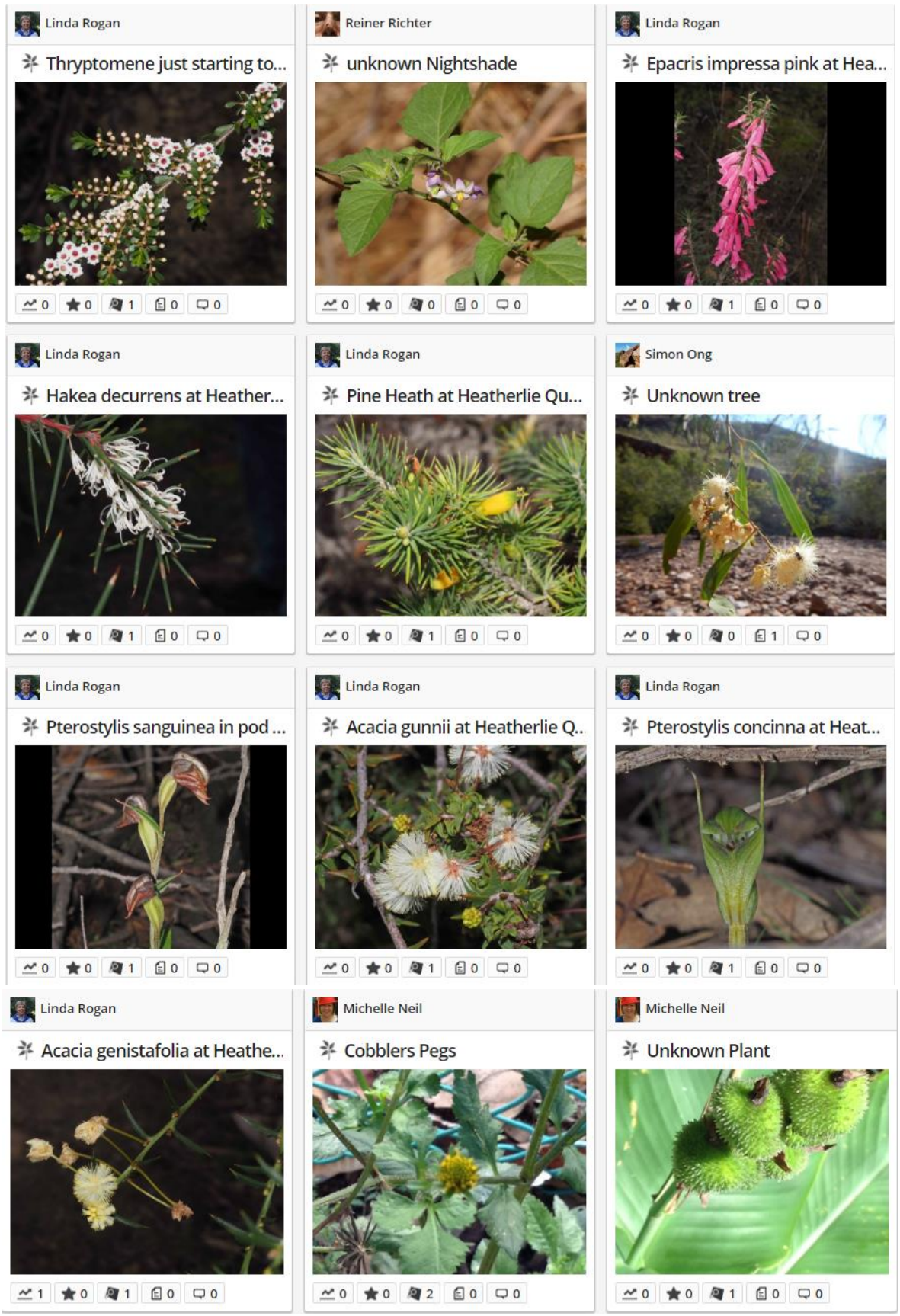
“Acreotrichus gibbicornis is a beautiful little black fly with brown eyes; not much over 1/4 of an inch long; the elongate antennae and head are clothed with tufts of black and white down; the rest of the body is enveloped in long silvery white down.

Acreotrichus fuscicornis is of a rich violet black tint, a yellow line round the hind margin of the head, and a broader band round the dorsal margin of the thorax of a similar colour; the broad rounded abdomen is lightly banded with pubescence. These flies were taken in numbers hovering over the flowers of plum-trees in an orchard near Sydney.”

I need to spend more time with BowerBird plant records – it's amazing what a common plant species can inspire with close up photography. Reiner Richter recently posted these images with the title: "V is for Victory" but look at the close up of the grass flower's stamens – amazing.

Paspalum dilatatum Location: Shepparton VIC Photographer: Reiner Richter

Here is but a snapshot of the plant records recently uploaded to BowerBird – well worth a look.



Simon Ong lives in or near Kununurra, WA so his insect activity continues over almost every month of the year. I just took a look at this week's weather chart for Kununurra and although it will get down to 11C on some mornings, the highs for each day are between 24 – 33C. So, it's not surprising to see these sugarbag bees sitting at the entrance of their hive now.

Tetragonula sp. probably "*mellipes*". Location: near Kununurra Photo by Simon Ong

There is a closely related genus to *Tetragonula* called *Austroplebeia*. In November 2015, Anne Dollin, her husband Leslie and Claus Rasmussen published a revision of the sugarbag genus *Austroplebeia*. They found five valid species occur in Australia but their revision took over 20 years of Anne and Leslie travelling numerous times to northern Australia to find nests to sample the populations for specimens.

Some species of *Austroplebeia* sugarbag bees build “pipes” that extend out from the hive’s entrance. It is thought these “pipes” help to deter predators from entering the hive such as the green tree ants that like to catch and eat the sugarbag bees as they return to the hive. Anne and Les have measured the lengths of these pipes one of which measured 43 cm long – quite extraordinary considering the bees themselves are less than 5 mm in body length. Below are Anne’s images of hive pipes for *Austroplebeia cincta*. The left pipe is 17 cm long while the right pipe is a massive 43 cm whopper!

Two of the long A. cincta nest tunnels that had a gentle zig zag shape. The tunnel on the left was 17 cm long and the exceptional tunnel on the right was 43 cm long.

Image sourced (with permission) from: Aussie Bee website http://www.aussiebee.com.au/aussiebeeonline022.pdf Photos by Anne Dollin.

I am often amazed and thrilled to see images of insects for locations that I consider to be “remote”. Kununurra is remote enough for me but what about this location, Karumba, from the Base of the Gulf of Carpentaria. Frank Pierce photographed this clearwing hawkmoth, *Cephonodes picus*, in flight !

Cephonodes picus Location: Karumba, Qld Photos by Frank Pierce

Tales from the macabre world of insects!

People sometimes say to me : “Your karma will be to come back as an insect”. No thanks I say – I know something about what happens in the insect world and it’s not for me.

One such group of “weird” insects, that I like, is the wasp family Dryinidae – a group of 142 species that are specialist parasites only on leafhopper bugs – both adults and immatures. The female dryinid wasp stings the host to temporarily paralyse it. The female then lays eggs either into the thorax or more usually into the abdomen of the bug. The dryinid wasp larva is U shaped and lives on the outside of the host (ectoparasite) while its mouthparts allow it to feed on the “blood” or haemolymph of the host. The developing dryinid larva grows into a pea-shaped lump on the side of the host. If the host is an immature bug then all development of the bug stops as the dryinid wasp larva could be dislodged if the immature bug was to shed its skin.

Adults are more commonly found than larva but BowerBird now has three images/records of immature dryinid larvae – which is amazing. Watch out for them and let’s add to our very limited knowledge of this group of wasps.

Adult dryinid wasp. Location: Belgrave South VIC Photo by Lek.

Leaf hopper with dryinid larva/pupa. Location: Emerald Photo by Laurence Sanders

Leaf hopper with dryinid larva. Location: Cheltenham Photo by Andrea Ruhl

Leaf hopper with dryinid larva/pupa. Location: Randwick, NSW Photo by Dacre England

Adult dryinid wasp. Location: Hermit Park, Qld. Photo by Graeme Cocks

I love an identification challenge.... but...

Yesterday (12th July), Matt Campbell posted an image of an “animal”. I call it an animal as I currently cannot confidently place it to Class. Initially, it appears to have 8 legs but the apparent first pair of legs are more likely to be elongate antennae meaning it has only 6 legs. What is it?

The body looks mite like and immature mites have 6 legs.

Unknown animal. Location: Jeeralang Junction VIC Photo by Matt Campbell

I have sent Matt’s image to some spider, mite and cave insect specialists. I hope to report that we can at least decide the Class and hopefully, Order/Family and maybe even genus of this “animal”.

I love an ID challenge but this one is above my “pay grade” and experience.

Update on above insect/mite image – Dr David Walter (who wrote the book on Australian mites) was able to provide an ID and some information. I love our Aussie taxonomic network!

Dave said: “The mite is a *Linopodes* sp. (Prostigmata: Eupodidae). Their feeding biology is a bit obscure, so they are sometimes considered pests in mushroom culture, but given those very long legs 1, I would guess they are fishing predators like Mesostigmata with a similar body form - tap out a prey item and then lunge. Of course, they may feed on fungi too.”

The Australian Faunal Directory (AFD) lists only one Australian species - *Linopodes antennaepes*. However, Dave cautioned that several undescribed species of this genus are known so advised to leave the ID at the generic rank.

Then I checked ALA and again this record will be the first record and image on ALA. Below is another image of this mite.

Linopodes sp. Location: Jeeralang Junction VIC Photo by Matt Campbell

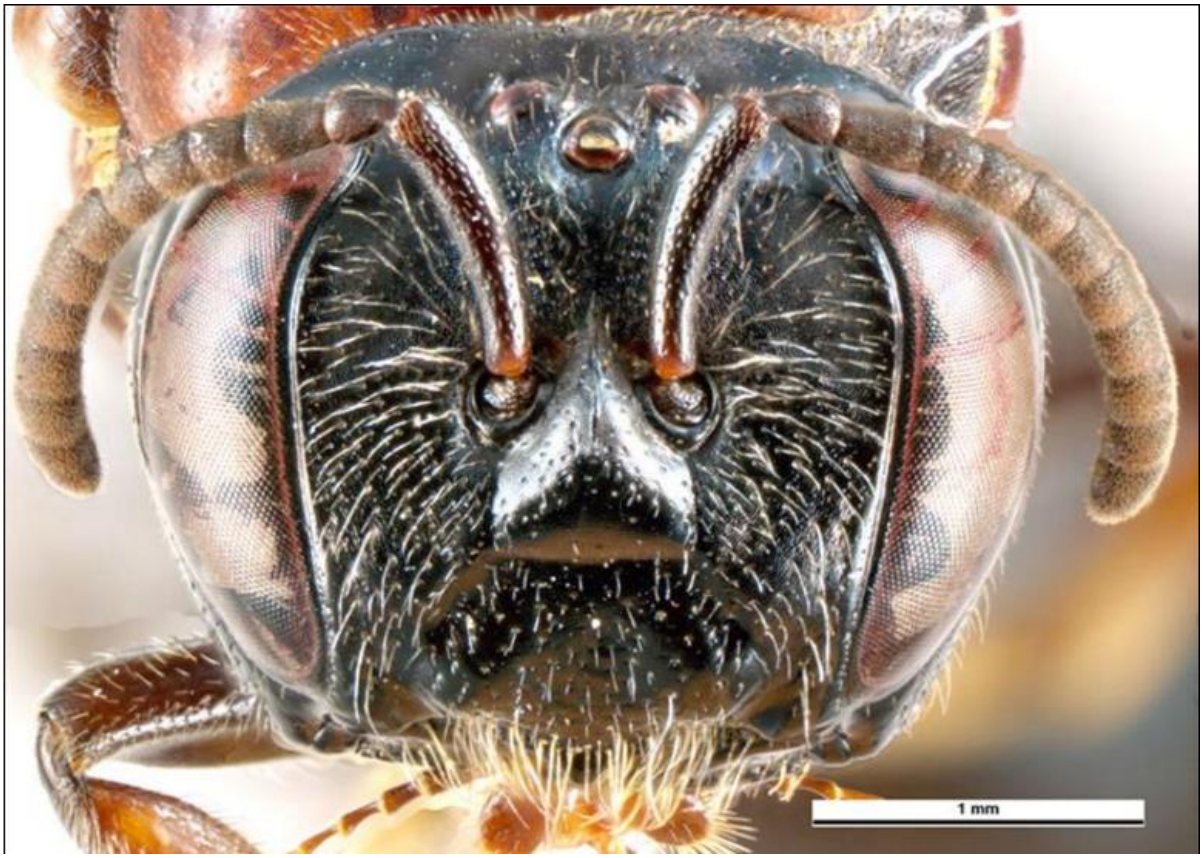
Bee Identification – Part 3.

Believe it or not, we still have not completed discussing all of the Euryglossinae genera – Phew! Perhaps you can understand why I have always been so grateful to Dr Exley for taking me on as her research assistant. I had to learn how to recognise and identify the Euryglossinae genera – three years under her guideance and three major bee collecting trips later, I finally got the hang of this major Australian bee group. We still have six genera to go as marked below. (PS. Note how I spelled three and six? In scientific writing, you write fully all numbers between 0 and 9 and then you can use numerals for every number above 9 – curious hey? Just a convention to smile at .....)

Four of the above marked genera have only one or two species each and they are relatively easily recognised.

Heterohesma – The two species in this genus are medium sized bees (about 6mm body length) apparently confined to coastal SE Australia and Tasmania. They are rarely collected - there are only 20 collection records for this genus on ALA. The defining character is the length versus breadth of the first abdominal segment which is about the same lengths whereas in other bees the first abdominal segment is much broader than long. Personally, I love and recognise the faces of these bees!

Heterohesma clypeata

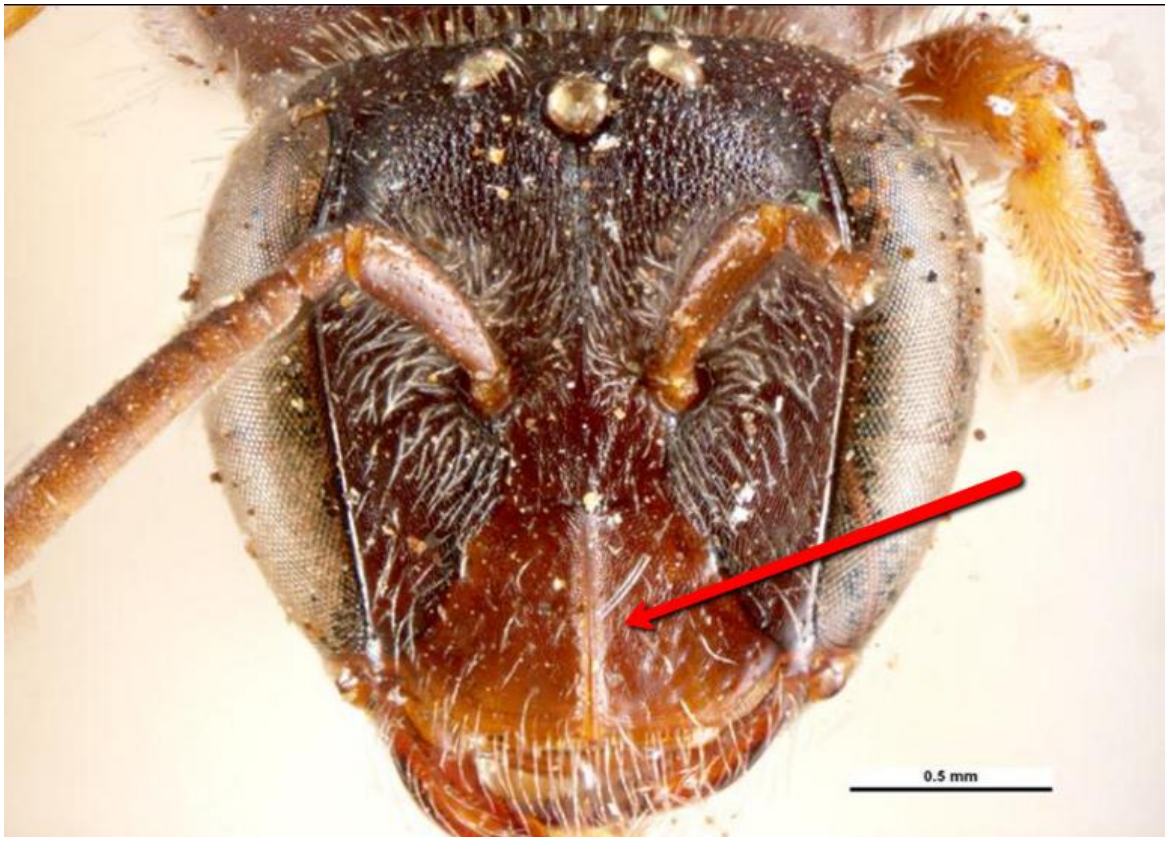


Heterohesma weiri

Heterohesma weiri

Melittosmithia – This an odd little group of bees. Currently, the genus has four listed species. However, three of these species are listed on AFD as “Known only from type location.” A much needed revision of this genus would most likely synonymise three species into the first described species in this genus. The genus is known from few records and appears to be restricted to coastal SE Australia. The genus is most easily recognised by the presence of a keel running longitudinally down the face of the clypeus (see next page for image). The species I photographed was called *Melittosmithia subtilis* Cockerell,1926; however, probably its correct name is the first described species now placed in this genus which is *Melittosmithia carinata* (Smith, 1862). Notice how Cockerell’s name is not in

brackets. That indicates that the species name “*subtilis*” was originally placed in the genus *Melittosmithia.*



Now see that Smith's name and the year of publication (1862) is placed in brackets. This indicates that when Smith described the species "carinata", he did not place it in the genus *Melittosmithia* but rather he placed the species in the genus *Scrapter* – a genus of bees now recognised as confined to the southern half of Africa. Later on after Smith's description, his species "carinata" was moved from the genus Scrapter and into the genus *Melittosmithia.* Indeed, the genus name *Melittosmithia* was not described by Schulz until 1906 so it was not available when Smith described "carinata" in 1862. The four species now placed in *Melittosmithia* were described in 1862, 1905, 1924 and 1926. If these species, as I suspect, are all the same species then deciding on which name to use relies on the rules of taxonomy published by the International Zoological Commission of Zoological Nomenclature (ICZN – the taxonomist's "bible"). When synonymising names, the "valid" name is decided by the "Principle of Priority" which states: "The valid name of a taxon is the oldest available name applied to it." In this case, the name described in 1862 by Smith would become the valid name and the remaining three species would be synonymised with the 1862 name – "carinata". I hope this rather long winded explanations helps to explain some of how taxonomy is done – at least in this case. The ICZN rules keep being changed and updated.

The latest major change was to allow authors to publish new species in journals that are only available online – no hard copies of the journal are ever printed or hard copy are printed months later. Why has this change come about? Well, as the saying goes: "The internet has changed everything." For more than a century, scientific journals have published printed papers and, libraries have had to continue to expand to accommodate new issues and indeed new journals. Unfortunately, real estate

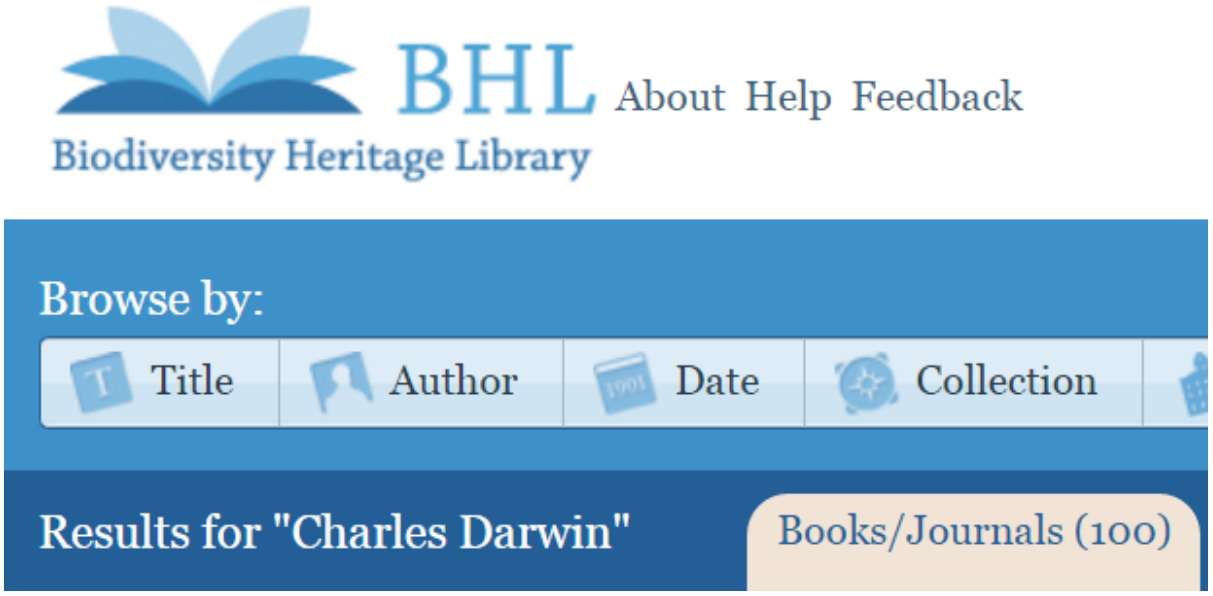
is now very expensive and libraries finally began to get full and do not have the funds to continue to expand. Following the development of the internet, more and more material, including scientific literature was being scanned and made available on the web. The advantage of scientific literature on the web over hard printed journals is like chalk and cheese. Once a paper is scanned it is passed through a process called OCR (Optical Character Recognition) which converts the scanned document into a text document. In the early days, letters like “p” and “b” were often mixed up but nowadays, the text is almost perfect. Converting a scanned document into a text document means the text can be uploaded into a database where it becomes searchable.

In 2009, a consortium of natural history and botanical libraries sought and received funding to scan and OCR the world’s entire scientific literature: both books and journals – WOW! The project/website is called BHL – Biodiversity Heritage Library (http://www.biodiversitylibrary.org/). Currently, BHL has digitized millions of pages of taxonomic literature, representing over 100,000 book titles and over 170,000 journal volumes. Previously, some of this published literature was available in only a few select libraries in the developed world – but now anyone in the world with a web connection can access this literature. What an explosion of knowledge available to the world. To try to comprehend the extend of this knowledge, BHL currently serves texts with information on over a 150 million species names – and it will only get better as time goes on.

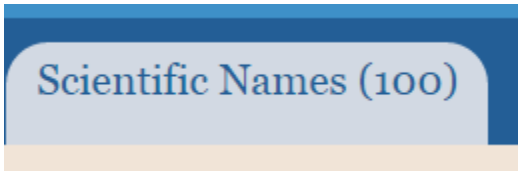
On BHL, you can search for an author or a scientific name. You can then view the returned text or download the text as a PDF – all for free. I now use BHL all the time. Instead of me assuming that I know all of the published papers about a

particular insect, I now ask BHL to show me what has been published about a particular name.

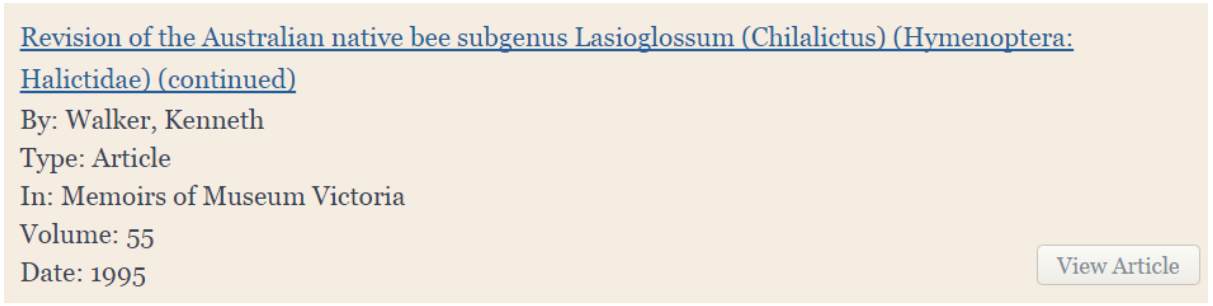
I put in the search term “Charles Darwin” into BHL and it returned over 100 books and articles written by Darwin. I can even download a copy of his seminal book – “On the Origin of a Species” which was first published on 24 November 1859.



If I do a search for the bee genus name “Lasioglossum”, I am returned literature on 100 names



Including my revision on the Australian member of this genus.



So, the world is moving to an online environment, but the ICZN rules insisted that new species names be first published in a journal that produced a hard copy of the publications. This caused several problems. One is for students or researchers. Let's say a student/researcher completes a study and wants to publish the results and then to use that publication to apply for a new funding grant. While the paper itself may get through the peer-review requirements quickly, most printed scientific journals have about a 12 month lag between acceptance and printing of a paper. That means the student or researcher would have to wait at least 12 months for their research to be published as hard copy before they could use it in a grant application. People began to resort to sending the letter from the journal saying the paper had been accepted. That's fine but until the paper is published no one can comment on the quality or value of the paper. So, students and researchers needed a rapid form of scientific publication – that is online.

Finally, the IZCN, in their slow and methodical way moved towards allowing online first or only publication of new scientific names. They introduced a few new rules that every new name had to be registered on web database called "ZooBank" which provides a unique code for each new name and that code must appear in the published paper.

The other problem libraries, museums and other scientific institutions were faced with was the enormous cost of subscribing to and receiving copies of journals. You cannot subscribe to every journal so what do you miss out on. At Museum Victoria, each year we are asked to reduce our subscriptions payed journals to reduce the budget and to stop the expansion of our library floor space.

There are now journals, such as ZooKeys, that only publish on the web. The Memoirs of Museum Victoria is now only available on the web and we saved over $15,000 per year in the cost of postage to send out the hard copy printed issues twice a year.

Oh boy – sometimes I go way off topic but I hope you found the recent changes to taxonomy of interest.

Finally, there is another twist to the story of *Melittosmithia*. Whenever a new genus is described, the author must select a single species to be nominated as the “Type species” for the genus. This attaches a species to the genus name. The problem was that when Scultz first name *Melittosmithia* in 1906, he did not nominate a type species for his new genus *Melittosmithia.* Cockerell noticed this omission and in his 1910 paper nominated the species “Scrapter carinata Smith, 1862” as the type species for *Melittosmithia.*

Taxonomy is a funny old science; the modern version of which began with Linnaeus in 1758 – it combines science, art, tradition, convention, rules and regulations and lots more. It can take a life time of practice to be able to understand and implement and then produce good taxonomic works. But, it is what helps us to understand and communicate our biodiversity which leads to better ways to conserve/protect it. .

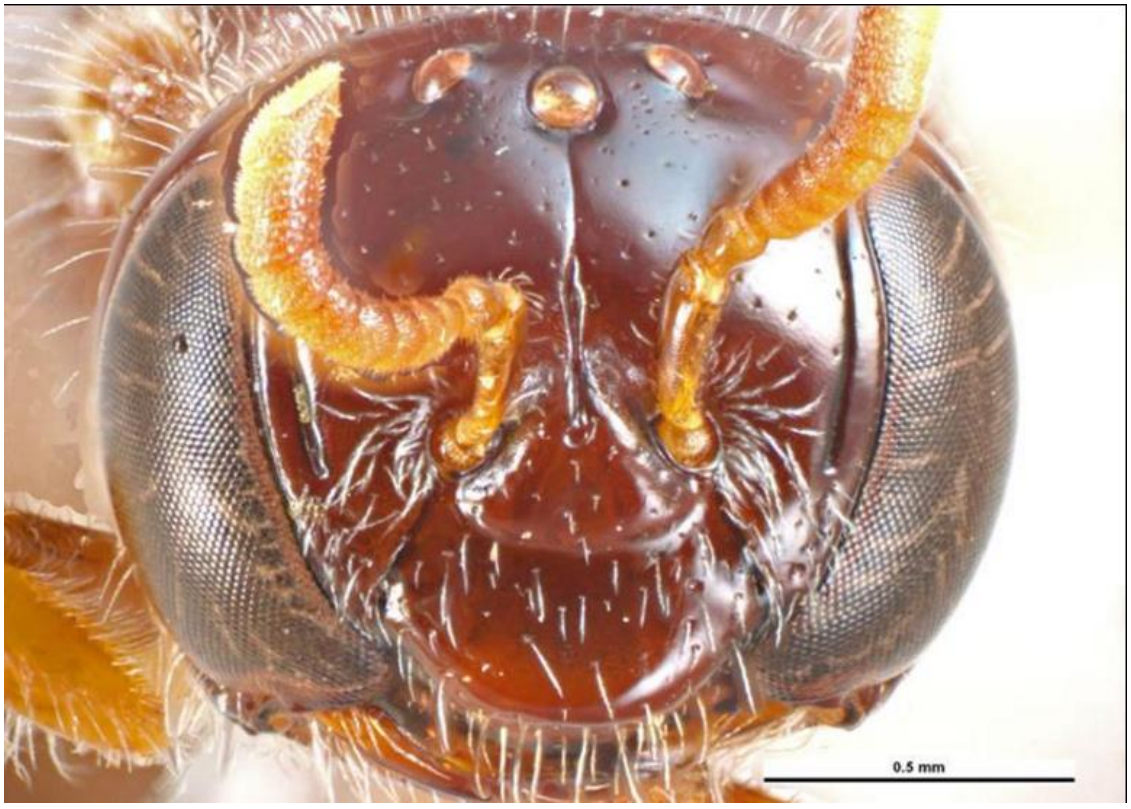
Sericogaster – This is another monotypic (ie. has only one species) genus - *Sericogaster fasciata*. This species was described by Westwood way back in 1835. The species is restricted to eastern Australia with records from SE Queensland down to eastern Victoria. This species is immediately recognisable by the enormous vertex on the back of the head behind the eyes (top arrow). No other species has anything like such a top of head development. The “official”

character is that the medium ocellus (left arrow) is closer to the antennal insertion point on the face of the head than to the margin at the back of the head.

As well, the head is extremely broad in front view. Notice the eyes are wider at the bottom than the top – very unusual.

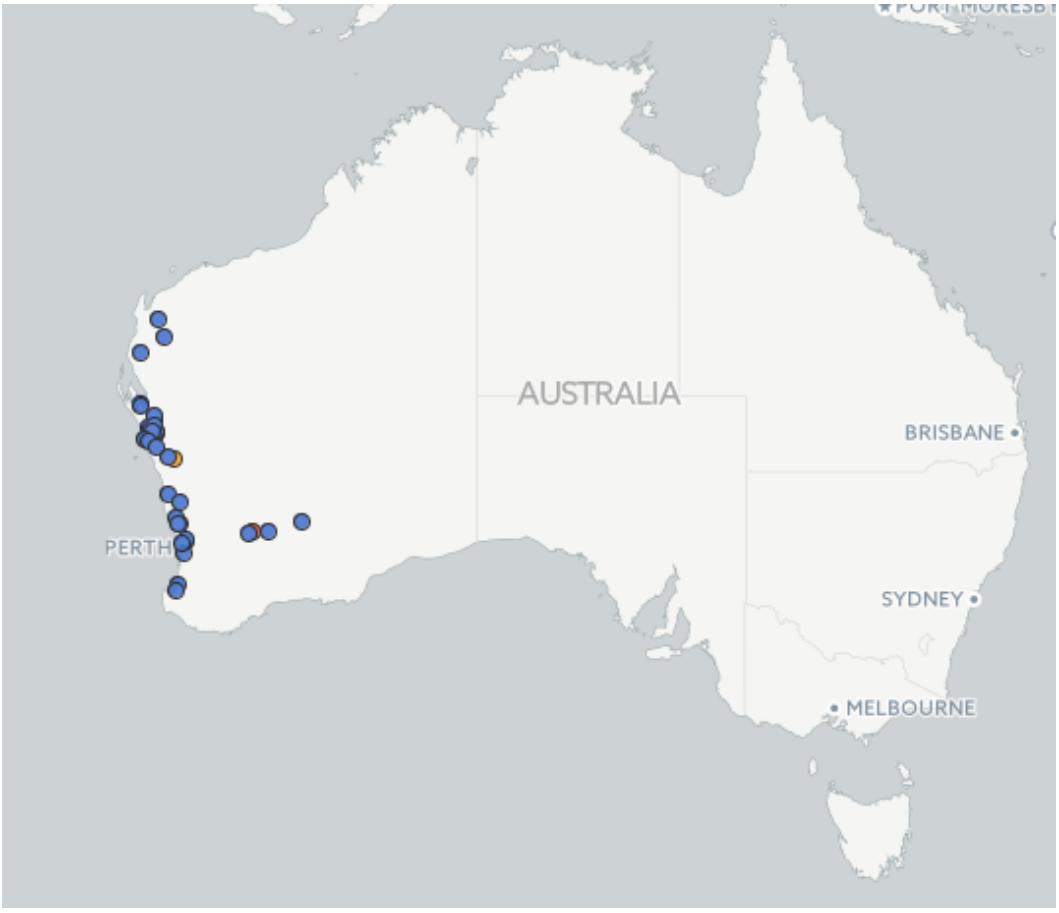
Stenohesma – Yet another medium to large sized colletid monotypic genus – *Stenohesma nomadiformis* with both the genus and species described by Michener in 1965. The genus name “Stenohesma” has the Greek root of “stenos” or “stenygros” meaning narrow which refers to the general shape of the body of this bee. This species has extensive yellow colouration which reminded Michener of the northern hemisphere “*Nomada*” (Apidae) bees hence the species name.

Tumidihesma – From the tens of thousands bees Dr Elizabeth Exley collected, she found 34 specimens that represented a new genus and two very rare new species. I have only ever collected one specimen of this genus in Lock, SA in 1990. The genus name is from the Latin word “tumidus” which means “swollen” and refers to the swollen eyes found in females of both known species. The lateral fovea are parallel rather than curving in towards the ocellus and one of the species has the unusual character in bees of having a tridentate mandible – three teeth!



Tumidihesma tridentata Exley, 1996

Dasyhesma – Finally, the last of the Euryglossinae genera.. and a very interesting group. The generic name come from the Greek root of Dasys meaning “hairy” – which is unusual for Euryglossinae bees as they carry pollen in the crop (first part of the stomach) and do not have pollen carrying hairs on the outside of the body. There are 21 species in this genus and all are restricted to a limited area of WA with most species being coastal only in distribution. How restrictive is that? I wonder why?



Bees are divided into two major behavioural pollen collecting groups - either oligolectic or polylectic. These terms describe the exclusive or inclusive range of plants from which the bees gather floral resources. Australian bees collect either nectar or pollen from plants (some overseas bees also collect oils from plants but that behaviour does not occur in Australia) but the “lectic” terms refer only to their pollen collecting preferences.

Pollen grains come in all different shapes and sizes and some bees have adapted to a particular type of pollen grain (oligolectic) while other bees will collect from almost any kind of pollen grain (polylectic). There is a lot of science behind these collecting behaviour which I will brush over that science to concentrate on the effects certain pollen collecting behaviour has on speciation (or evolution) of a group of bees.

The above distribution map for *Dasyhesma* does ask the question why. There must be one or more environmental or behavioural reasons for 21 species of *Dasyhesma* to be restricted to such a small area. What caused the genus to radiate into 21 species in such a small area? One of the main ways that evolution occurs is due to what is called a “vicariant event” that divides a population of the same species. The “classic” example of a major vicariant event is the rise of a mountain range or river that divides a once continuous population of a species. Over time, the split populations will diverge and given enough time (estimated at least 1.2 million years), the two populations will no longer be able to mate and produce viable offspring – the definition of a species. So, a new species evolves from a once single population.

So, where are the 21 mountain ranges or rivers in coastal WA that caused the radiation of 21 species in such a small area?

Vicariant events can be subtle as we all learnt in the mid-1970s when Elmo Hardy began splitting the Hawaiian fruit fly fauna into a range of new species. Elmo found that while the flies were morphologically similar, he observed that in one species the sexes met on a rotting log in the morning while in a similar looking species, the sexes only met on the rotting log in the afternoon. The vicariant event was not physical like a mountain range but was behavioural and based on the time of day mating

occurred. I still remember the fascination Elmo's work created – it was a shame Elmo did not have access to DNA analysis to assist with his studies. How much it would have assisted.

So what vicariant event could be happening in coastal WA? While most bees fit nicely into oligolectic or polylectic groups, *Dasyhesma* bees fit into a rarely seen "monolectic" group of bees – that is, bees that visit only one species of plant (extremely rare). Most Euryglossinae bees are oligolectic on the plant family Myrtaceae which has hundreds of species in Australia – the eucalypts alone have about 800 species. So to find bee species restricted to one species of plant is amazing. Monolectic pollen collection was the vicariant event that caused the radiation of 21 *Dasyhesma* species in such a small area.

Here is a list of *Dasyhesma* species and their obligate monolectic plant feeding species collaboration: We do not have plant species data for Beackea feeding bees but we do have species and in some cases var and subspecies plant data for *Dasyhesma* bees visiting *Verticordia* plants (Family Myrtaceae). Each species of *Dasyhesma* feeds on a different species of *Verticordia* or Beackea or other plant.

Dasyhesma abnormis visits *Beackea*

Dasyhesma albula visits *Beackea*

Dasyhesma areola visits *Verticordia oculata*

Dasyhesma argentea visits Verticordia argentea

Dasyhesma aurea visits *Beackea*

Dasyhesma brevipalpa visits *Beackea*

Dasyhesma clypeata visits *Chamelaucium oenanthum*

Dasyhesma forestii visits *Verticordia forrestii*

Dasyhesma galbina visits *Verticordia dichroma syntoma*

Dasyhesma lepidophyllae visits *Verticordia lepidophylla var quantula*

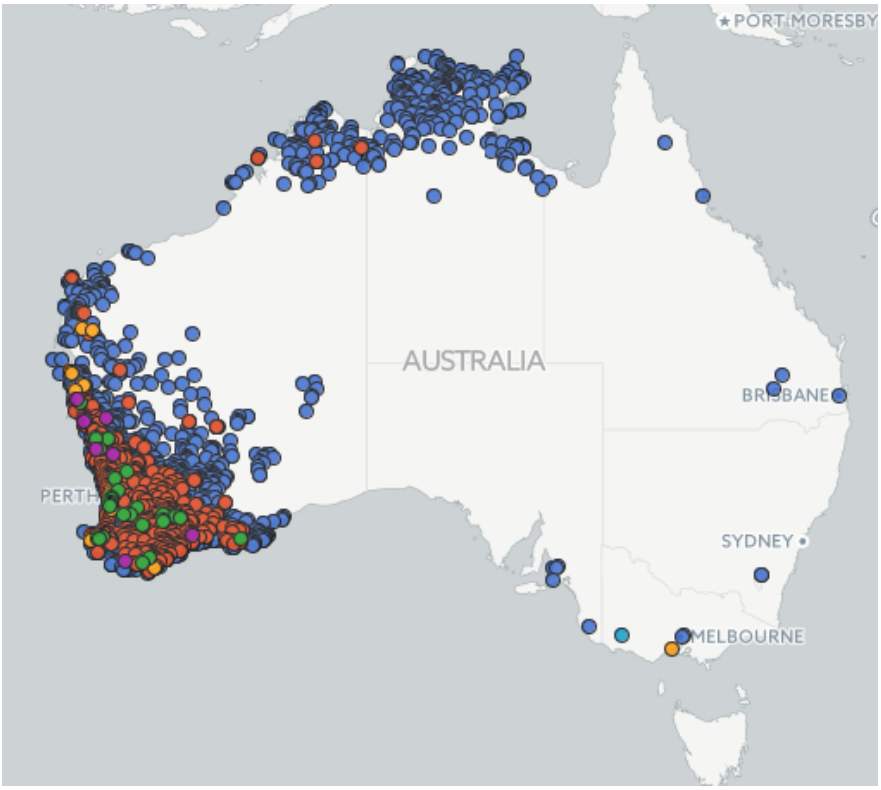
Dasyhesma muelleriana visits *Verticordia muelleriana muelleriana*

Dasyhesma scholtziae visits *Scholtzia*

Dasyhesma syntoma visits *Verticordia dichroma syntoma*

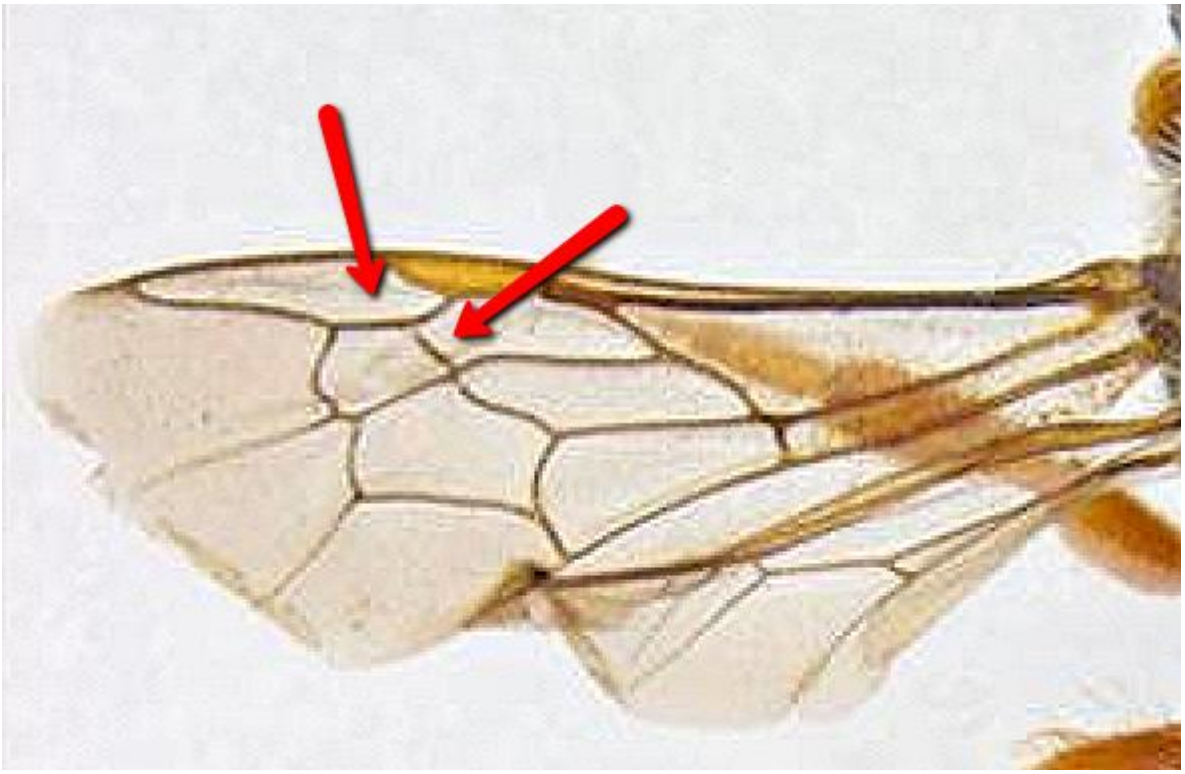
It is clear the vicariant event for *Dasyhesma* speciation is the different species of *Verticordia* and *Beackea* each species visits.

It is interesting to look where the bulk of *Verticordia* occur in Australia. Not surprisingly, the plant genus occurs primarily in WA as shown on the map below. No species of *Dasyhesma* has been recorded from the Northern Territory or other states.



Distribution of *Verticordia* in Australia

Now, one of the diagnostic characters for the genus *Dasyhesma* is, of course, wing venation. The top arrow shows that the second submarginal cell is narrowed apically while the right arrow shows that the second submarginal cell cross vein is at 45 degrees to the above and below wing veins.



Dasyhesma forewing venation.

The female bees themselves have a black head and thorax and light red-brown metasoma.

Native argentea euryglossine *Dasyhesma argentea*

Native aurea euryglossine *Dasyhesma aurea*

Native baeckea euryglossine *Dasyhesma baeckea*

The head shape is similar across all species in being elongate and narrowed – which must have something to do with accessing the pollinia of *Verticordia.*

Dasyhesma areola Exley, 2004

The only other euryglossine bee that I can recall being monolectic is *Euhesma acantha*. This bee occurs only in central Australia around Alice Springs and it feeds only on the plant *Dicrastylis* (Dicrastylidaceae). In 1995, I conducted an extensive survey in central Australia to determine which species of *Dicrastylis* were visited by *Euhesma acantha*. Fortunately, I found several species of *Dicrastylis* in flower in central Australia at the same time but *Euhesma acantha* was only ever collected on one species - *Dicrastylis lewellinii*.

Of course, the next logical question is – How does a monolectic bee know when its obligate food plant is in flower? We presume the bees nest in the soil amongst the roots of the plant. The bees most likely enter a diapause at the pupal (non-feeding) stage and remain in statis until the plant releases a

hormone/pheromone when coming into flower which stimulates the bee pupal bees to emerge (remember, NOT HATCH!).

I remember in 1996 revisiting some of the central Australian sites where the previous year I had found *Dicrastylis lewellinii* in flower and collected specimens of *Euhesma acantha* from these flowers. None of the 1995 site had flowering *Dicrastylis lewellinii*. I collected on surrounding flowering trees but I did not collect a single specimen of *Euhesma acantha* in 1996.

Euhesma acantha dorsal and head views

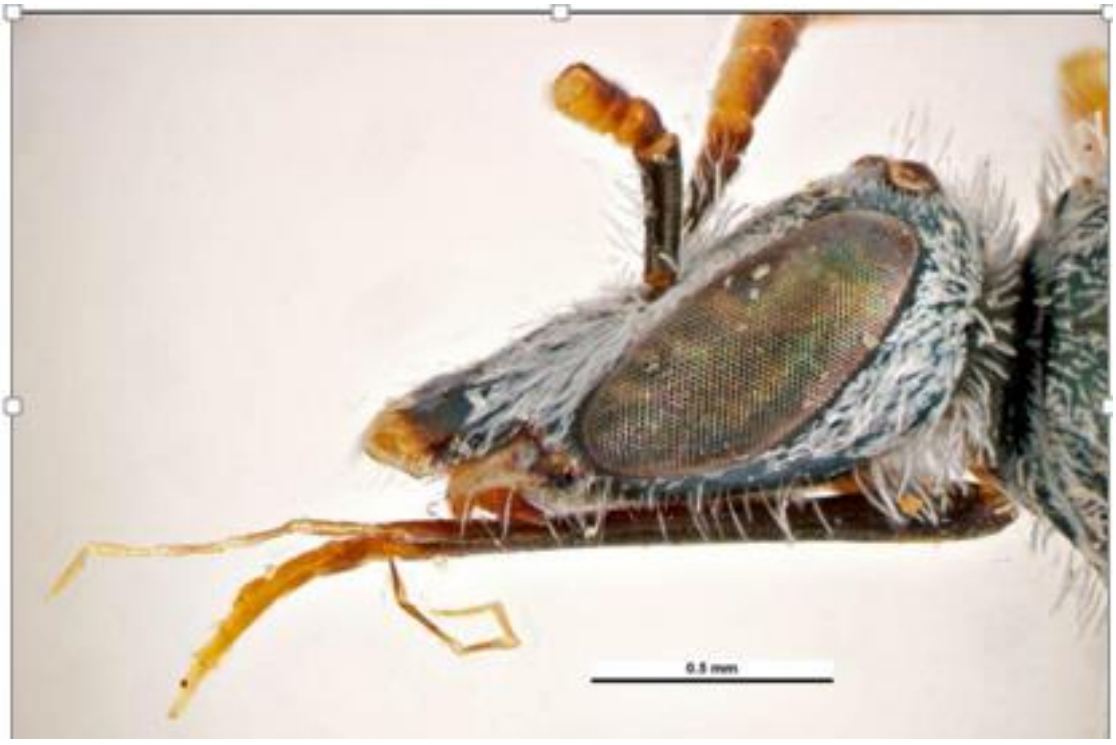
Speaking on monoletic bees – to my knowledge, there is only one Australian Halictidae bee that is monolectic. I first encountered this bee as an undescribed specimen that had been labelled “deformed”. Its head was enormously extended through the elongation of the clypeus – see arrowed below.

In various collections, I found a few other specimens that showed the same “deformity” so I began to suspect that this was a real species with a deliberate and unusual head design required to access some type of difficult to reach floral nectar resources. And, that obviously it was a new species.

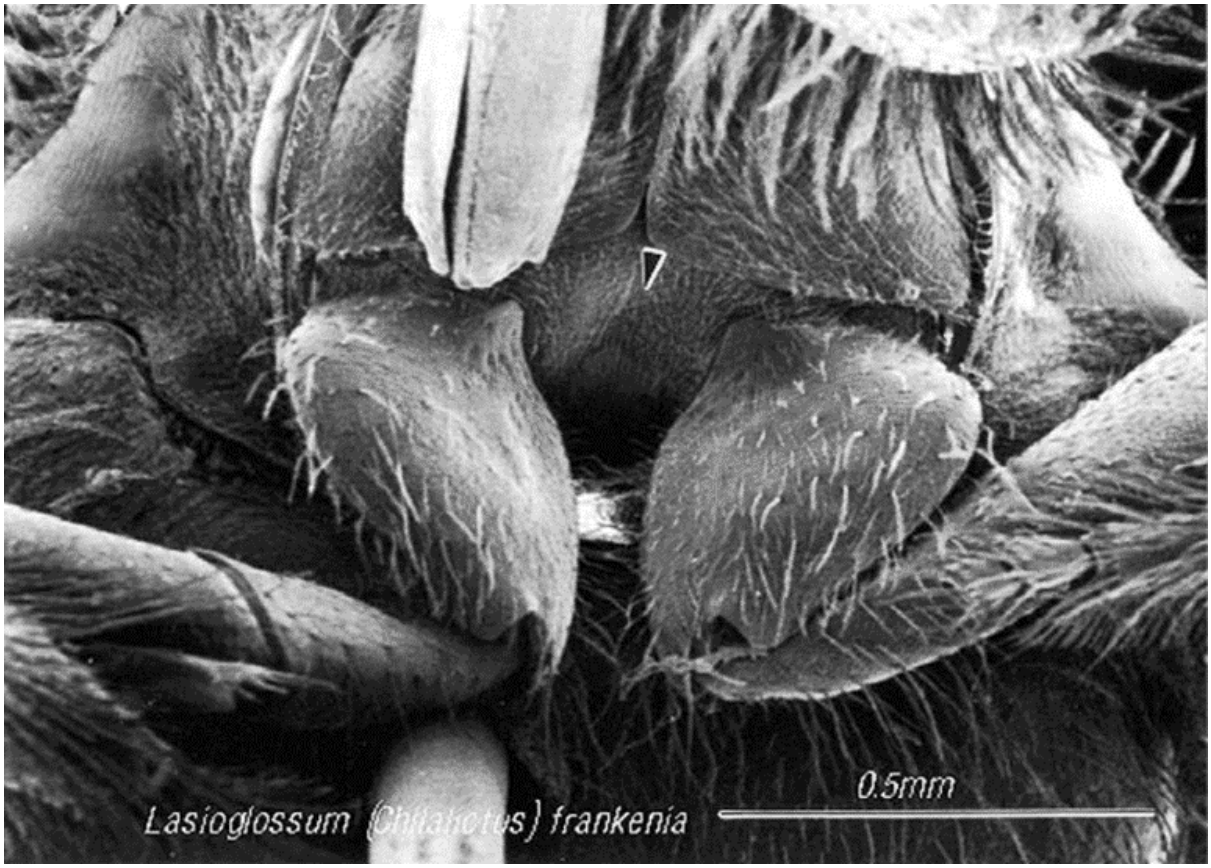
Distribution map of Lasioglossum (Chilalictus) frankenia.

The few specimens I found were all located in dry South Australia and all were female – I needed a male and to find what plant this bee visited.

The elongated clypeus was there to support an elongation of the mouthparts as seen in the image below.



The mouthparts are so enormously elongated that *Lasioglossum frankenia* is the only halictid (possibly the only Australian bee) in which the fore coxa of the front legs are noticeably separated. In all other bees, the fore coxal inner surfaces touch each other – not in this bee they don't!



The fore coxal separation allows the bee to place the elongate mouthparts between the fore coxa when at rest. Very cool.

One of locations were the bee had been previously collected was Blanche Cup Springs in SA which is one of the mound springs near the remote William Creek (this a "town" where the only building is the pub). Mound springs develop where hot, highly saline water bubbles to the ground surface. The bubbling water brings up soil/sand which gradually builds a mound around the bubbling water hole. I visited Blanche Cup Springs on a very hot (45+C in the shade) and windy day on 28 October 1990. The bare salt flats seemed to radiate the heat and

sunlight reflected off the salt crusts making the conditions oppressive and difficult in which to collect. I remember feeling very heat stressed and thinking “Why am I here?”

To my surprise, the sides only of each of mound springs were covered in a species of salt tolerant plant – a small, spindly shrubby plant called *Frankenia filiosa* - which fortunately at the times was densely covered with small and delicate pink flowers. As I watched carefully, I began to see bees flying in and out of the flowers – the world was good again and I had a purpose to be there.

The structure of the *Frankenia* flower is one of densely packed stamens protecting the nectar resources at the bottom of the flower. I watched the bee approach the flower and move to the side of the petals. The bee then pushed her elongated mouthparts down the inside of petal and presumably into the nectaries. Obviously, it would have been impossible to push mouthparts directly through the middle of packed stamens, so the bee went down the side of the petals with elongated mouthparts. I hypothesised that the head elongate with elongate mouthparts provided “a battering ram” apparatus required to force mouthparts into a densely packed space – albeit down the sides of the flower.

I collected male bees flying above or near the *Frankenia* flowers so now with both sexes and a series of specimens, I described the new species calling is *Lasioglossum (Chilalictus) frankenia*.

From “deformity” to “new species” and monolectic. .....

What’s not to like about bees??

When is a moth not a moth – When it is a moth fly!

Reiner posted this lovely image of a Psychodidae commonly known as a moth fly. It belongs to the Order Diptera.

Moth flies (sometimes called “Bathroom” flies) breed in highly nitrogenous soil. If you see large numbers of these flies inside or around a public toilet block, it generally indicates that a sewerage pipe has broken and waste products have been seeping into the soil which attracts these flies to lay eggs.

Psychodidae Location: Edgar Track, Montrose VIC Photo by Reiner Richter

Reiner commented: “Several of these (perhaps 10-25) were perched on the walls of the concrete bridge at this pristine creek flowing through native forest.”

Perhaps, an animal had died nearby and the decomposed body matter had leached into the soil providing a perfect place for Psychodidae to breed.

Get ready for your Fungal Forays .....

What a start from Jenny Holmes at Great Western, Victoria. Jenny commented: “They were a surprise find. Almost at my back door!”

Crucibulum leave Location: Great Western, Vic. Photo by Jenny Holmes

Another of Jenny’s “home grown” fungi on display.

Lichenomphalia umbellifera Location: Great Western, Vic. Photo by Jenny Holmes.

Leucogloea compressa Location: Kianga NSW Photo by Teresa and John

Clavaria amoena Location: Kianga NSW Photo by Teresa and John

Anthrocobia sp. Location: Belair SA Photo by Ernst

Hygrocybe graminicolor Location: Kianga NSW Photo by Teresa and John

Laccaria sp. Location: Kianga NSW Photo by Teresa and John

Stereum hirsutum Location: Great Western Photo by Jenny Holmes

Brown Bracket fungus Location: Swan Reach SA Photo by Ellura Sanctuary

Red Rasberry Slime Mold (*Tubifera ferruginosa*) Location: Lobethal SA By Ellura Sanctuary

Clitocybe semiocculta Location: Sandy Beach NSW Photo by Steve Young

Trichoglossum hirsutum Location: Kianga NSW Photo by Teresa and John

Magic Mushrooms (*Psilocybe subaeruginosa*) Location: Jeeralang Junction VIC Photo by Matt Campbell

Matt commented: “Not going to say too much here other than they went blue when bruised, a sure sign that this is *Psilocybe subaeruginosa*.”

If you want to spend a wonderful hour or two, I recommend you go on a fungal foray through the 2016 BowerBird fungus records – just wonderful and thanks to all. Click here:

http://www.bowerbird.org.au/home/sightings?category=Fungi%20%26%20Lichens

And finally, what's a Bugle without Mark Berkery's

Nature Place

Life On A Lemon

These little things, about a centimetre long, are living out their lives on an ageing lemon in the garden, on a bamboo stake.

They are attracted to something about the decaying fruit, mold, fungus or/and other qualities not discernible to me.

They live on similarly decaying oranges, and the occasional banana – I have a veritable orchard staked in the garden, all good fun – just to attract the faeries from the bottom of the garden.

Did you know the faeries are insects? Yes, that's the form they take. And some take no sensible form, preferring the fleetness and relative safety of the insubstantial. Each has its advantages.

The point is though, these creatures of story are in your garden too, if only you look to see, and not to judge. No need for any psychic nonsense either, they are detectable by the senses.

And the wonder of it is sense makes more sense, no nonsense.

Him – with the longest front legs, on a lemon.

*Click the pictures for a bigger version.

Her, on an orange.

It on my finger. Every time I tried from the side it turned away.

She is actually laying beneath the skin here. He appears to be guarding, attending her.

It got crowded on the lemon after a while.

Alone at last.

Oh, oh ... here comes trouble.

Two males fighting over a female, antennae and legs flailing. Not the best but the only shot.

For a change, she appears to seek him out.

Now – I have a lot of fun writing the Bugle each month 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)