19 June 2015 Ken Walker (kwalker@museum.vic.gov.au) Museum Victoria. Edition 13.

Hi All – BowerBird is an unusual "science" website. The norm for "science" websites is to launch full of imagery and text written by the "experts" – almost overwhelmingly … BowerBird launch on 10 May 2013 with no images and no text – an empty hollow of a website that we hoped it would be filled by people, who at the time we did not know - A bit scary when you think back. Time has now passed and almost 25,000 records have been uploaded which contain in excess of 40,000 images. So, has BowerBird reached a critical mass yet to be a useful website for a range of varied purposes?

Not to my surprise but to my pleasure, I believe it has reached a critical mass to be useful. More and more people are telling me that they first search BowerBird to look for an identification rather than using another resource such as Google Images. That was very encouraging to learn. So, armed with this knowledge of "critical mass reached", I decided to write a quasi-scientific story about **Insect Mimicry** and to see if I could illustrate the text solely using BowerBird images. Hopefully, you will agree that BowerBird served my purposes well. Part of my reason for writing such a story was to see different ways in which the now extensive resources contained within BowerBird could be used and rechannelled from their original intent.

Mimicry – the art of deception.

We mere humans have a saying that “Imitation is the sincerest form of flattery”. The insect world is full of imitation or mimicry; but in their world, mimicry it is not used for flattery but for survival – no flattery is ever intended in the natural world.

Insect mimicry comes in many shapes and forms. We categorise all forms of mimicry under two banners: Batesian and Mullerian mimicry.

Batesian mimicry: This is where a harmless species take on the shapes and colours of a harmful or distasteful species in the hope that it will fool and trick its predators into leaving them alone with the predators thinking they are attacking a harmful or distasteful. A very common and universally known warning coloration is the black and yellow stripes of many species of wasps and bees. Some harmless species of flies, and even some beetles, have developed similar black and yellow coloration to mimic the potentially dangerous wasps and bees. This type of mimicry, where a harmless animal mimics a dangerous or unpalatable animal, is called Batesian mimicry.

(As an aside, Batesian mimicry is named after Henry Walter Bates (1825 – 1892). In the 1840s and 1850s, Bates spent several decades in the Amazon and collected many species of similar looking butterflies. He was the first to put forward the theory of mimicry and so the name was given in honour of his work.)

Batesian is the most common form of mimicry and it occurs throughout the insect world.

Hoverflies (Family Syrphidae) are masters of Batesian mimicry in many forms. Some hoverflies mimic paper wasps (Vespidae). Below is *Sphaerophoria macrogaster* – a common hoverfly mimicking the striped colour pattern of a wasp.

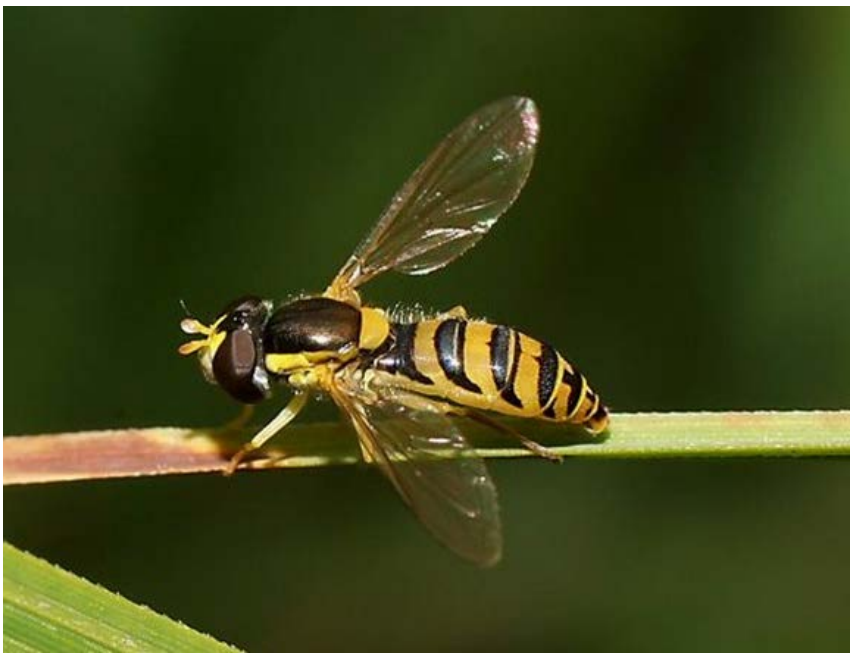


Photo Reiner Richter.

Another hoverfly also with vespid wasp like markings - *Simosyrphus grandicornis*

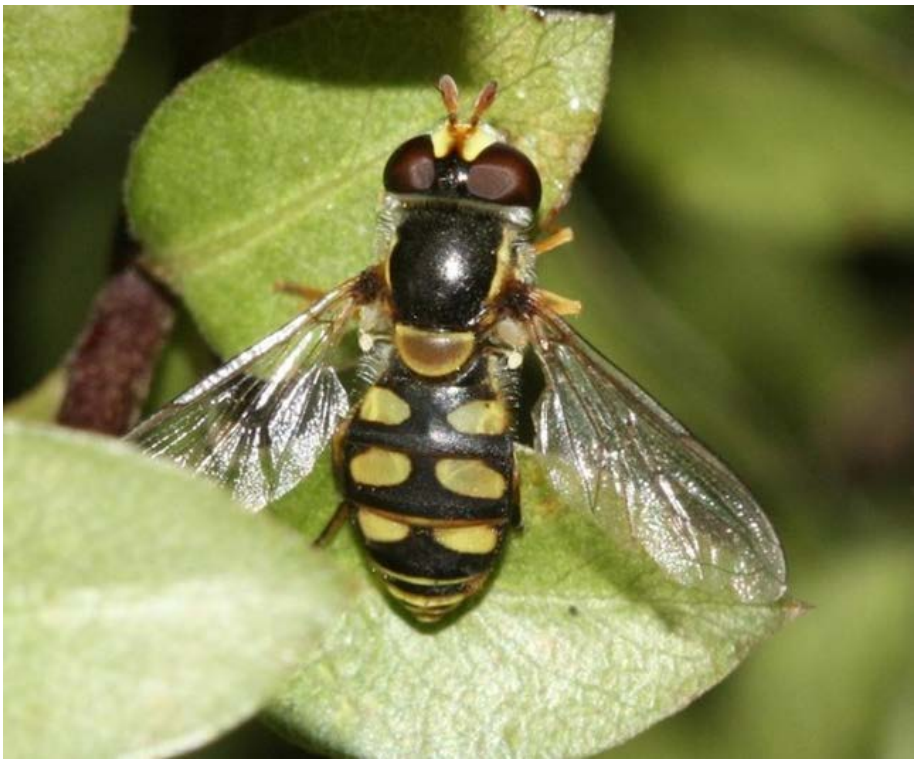
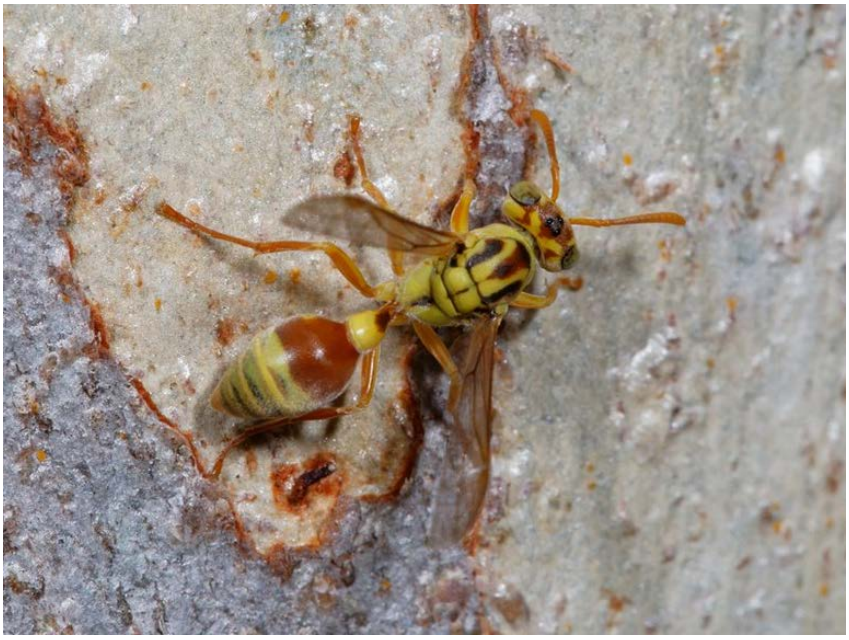
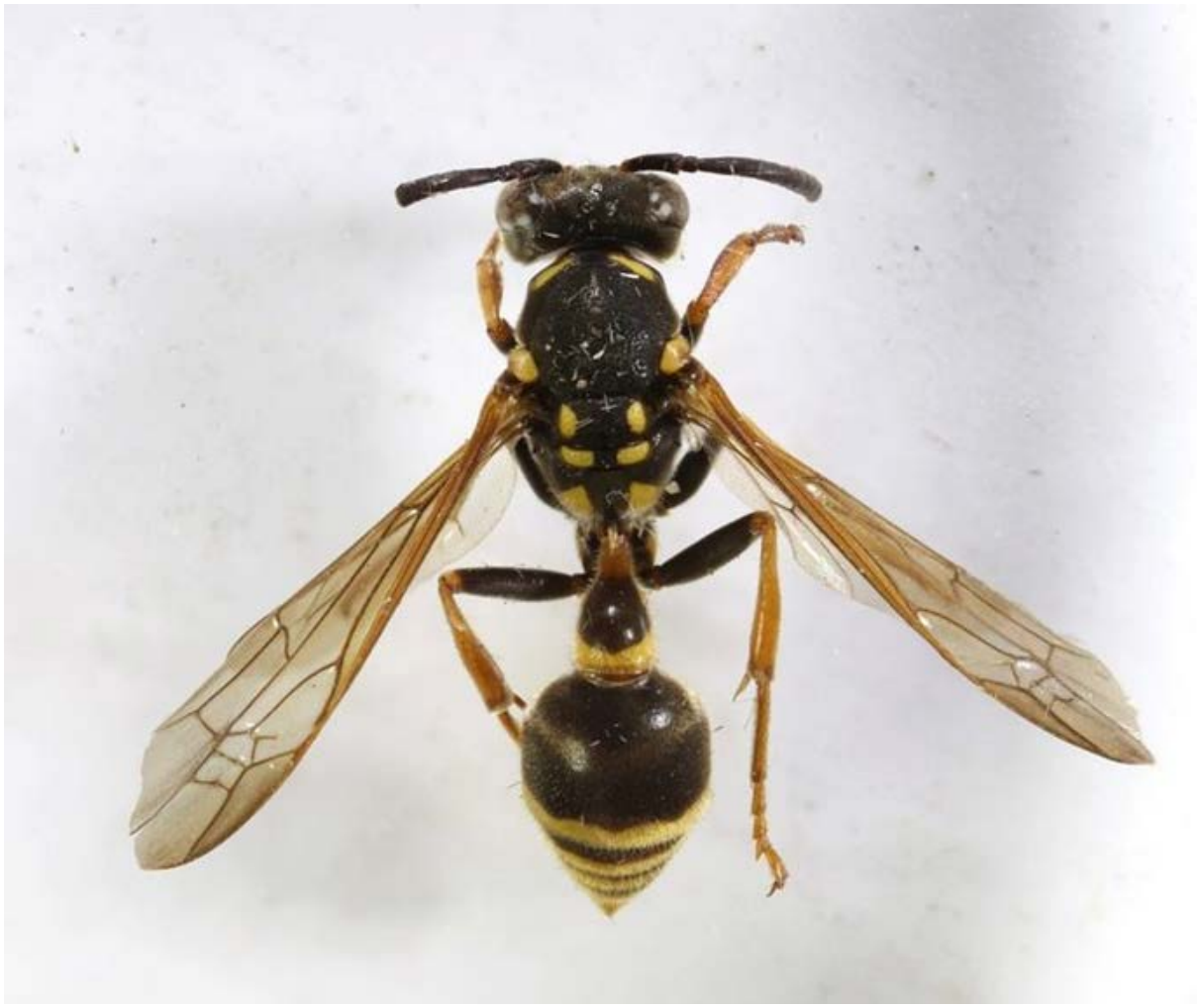


Photo by Adam Edmonds.

Many species of Vespid or paper wasps have similar yellow and black markings.



Paper wasp *Ropalidia romandi* – Photo by Lek.



Vespidae Paper wasp – Eumeninae. Photo by Graeme Cocks.

Then there are hoverflies that look like European honeybees. *Eristalis tenax,* commonly known as the bee-fly, has been introduced to Australia from Europe. A close up look will show it's a fly as it has only 2 wings rather than 4 wings on a bee and the antennae are only 3 segments rather than 12 segmented in the bee. Otherwise … a close match to a honeybee.

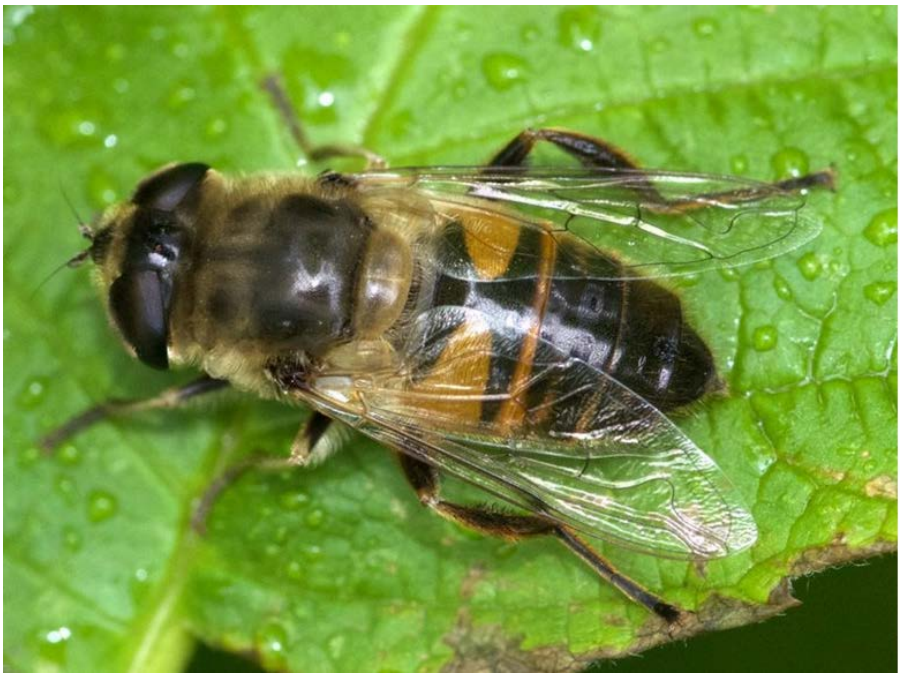
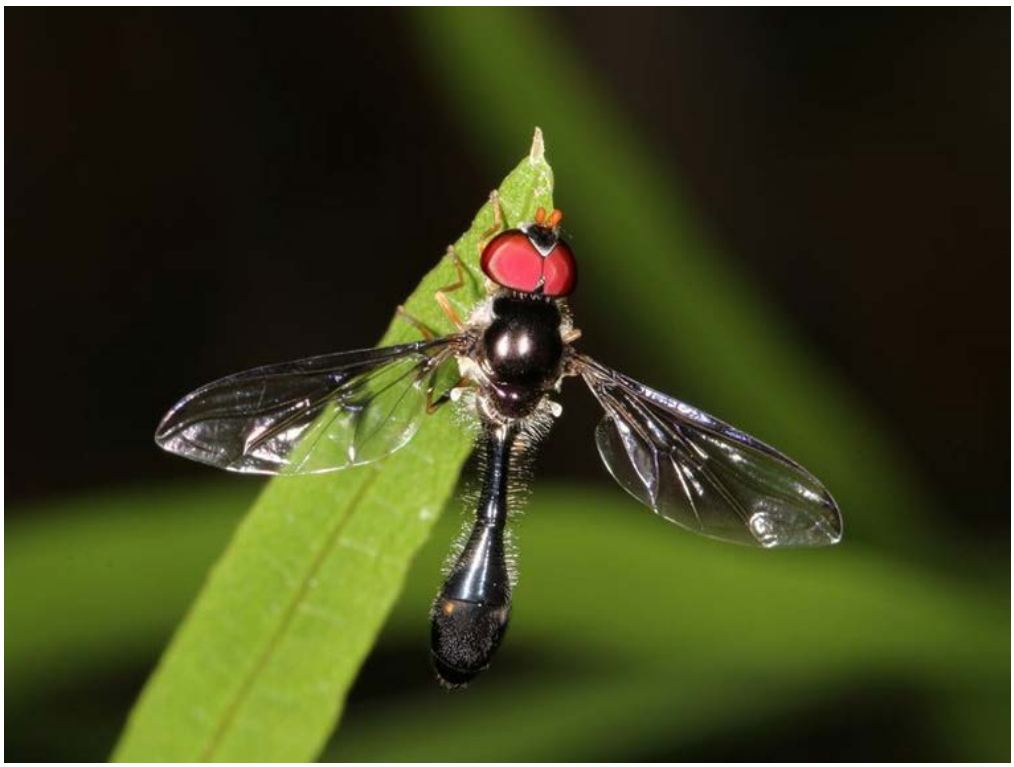


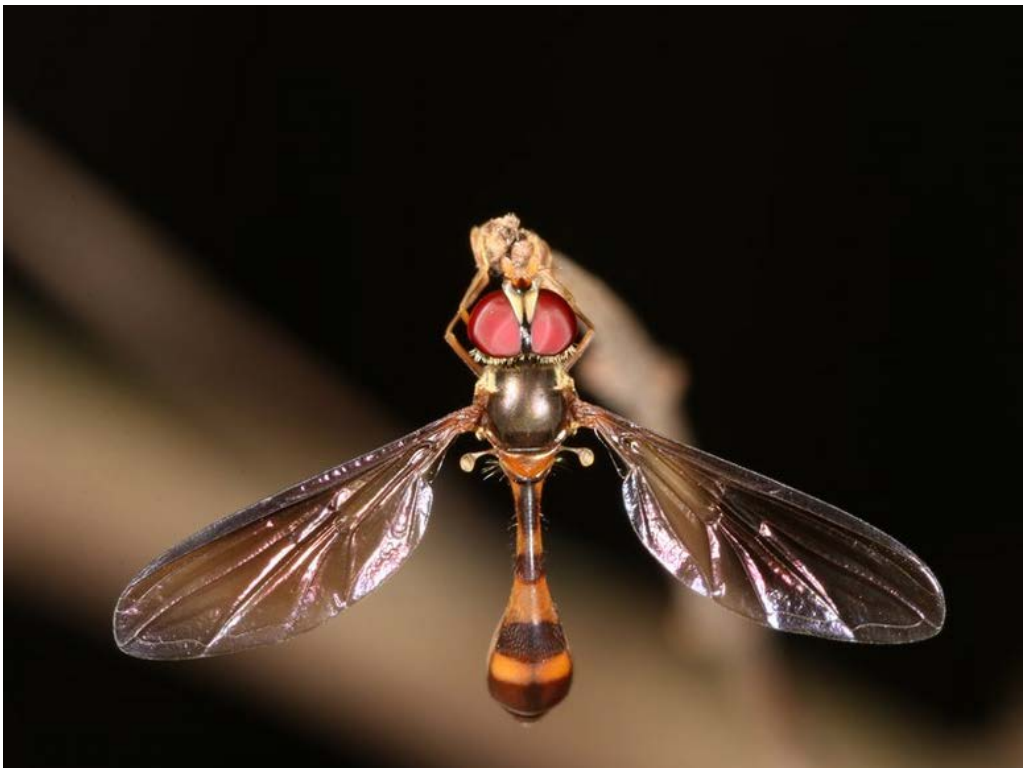
Photo by David Francis.

European Honeybee – Apis mellifera Photo by Reiner Richter.

Then there are hoverflies that mimic the shape and colours of a wasp to help gain protection from its predators.



Photos by Jenny Thynne.



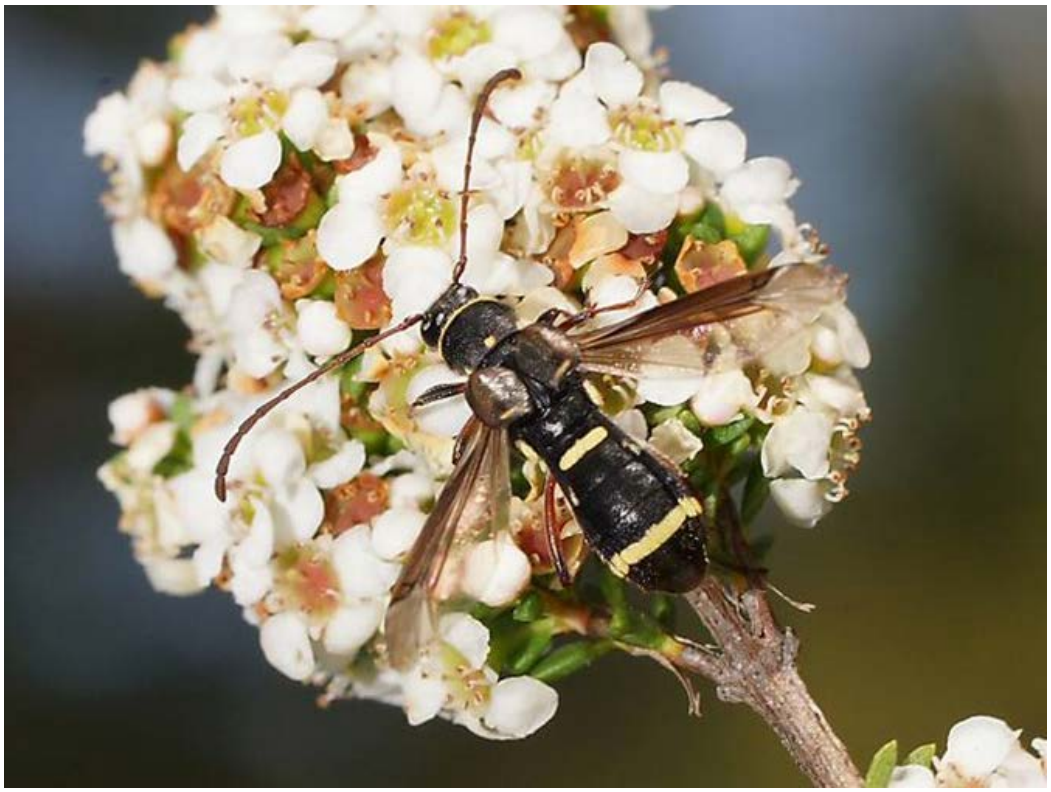
Photos by Jenny Thynne.

Or how close does this hoverfly resemble these wasps?

Photo by Graeme Cocks

Photo by Ken Walker

A Long-horned beetle (Cerambycidae) mimics a wasp. The beetle is the MIMIC and …



Photos by Reiner Richter.

The wasp, *Australozethus tasmaniensis*, is the MODEL:

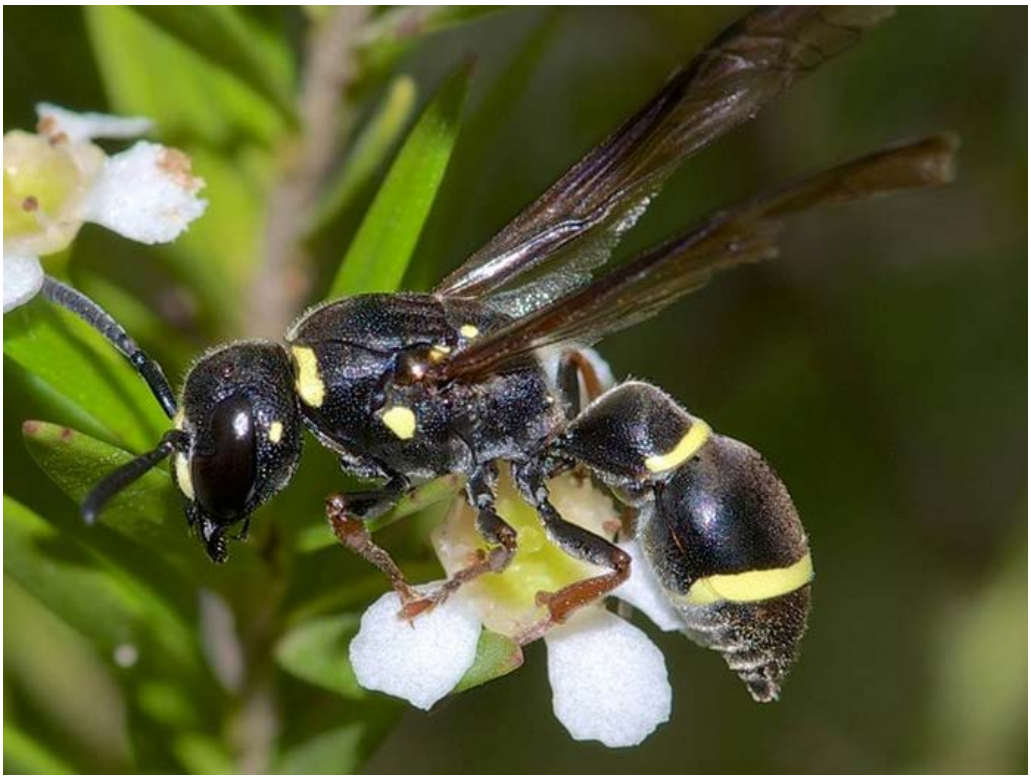
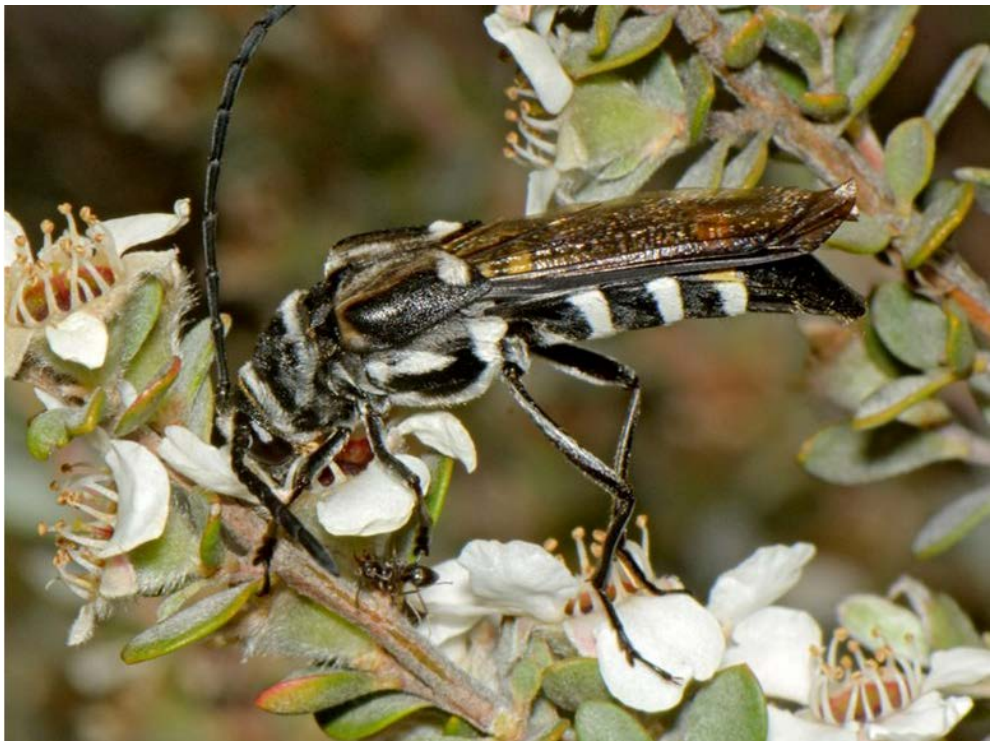


Photo by David Francis.

Many long-horn beetles mimic wasps or ants:



Wasp mimicking long-horn beetle, *Hesthesis angulatus*. Photo by Rudie Kuiter.

An ant mimicking cerambycid beetle - *Zoedia divisa*. Photo by Martin Lagerwey

Some Robber flies (Family Asilidae) mimic parasitic wasps.

Here is the MIMIC: Robber fly *Cabasa pulchella* (Family Asilidae)

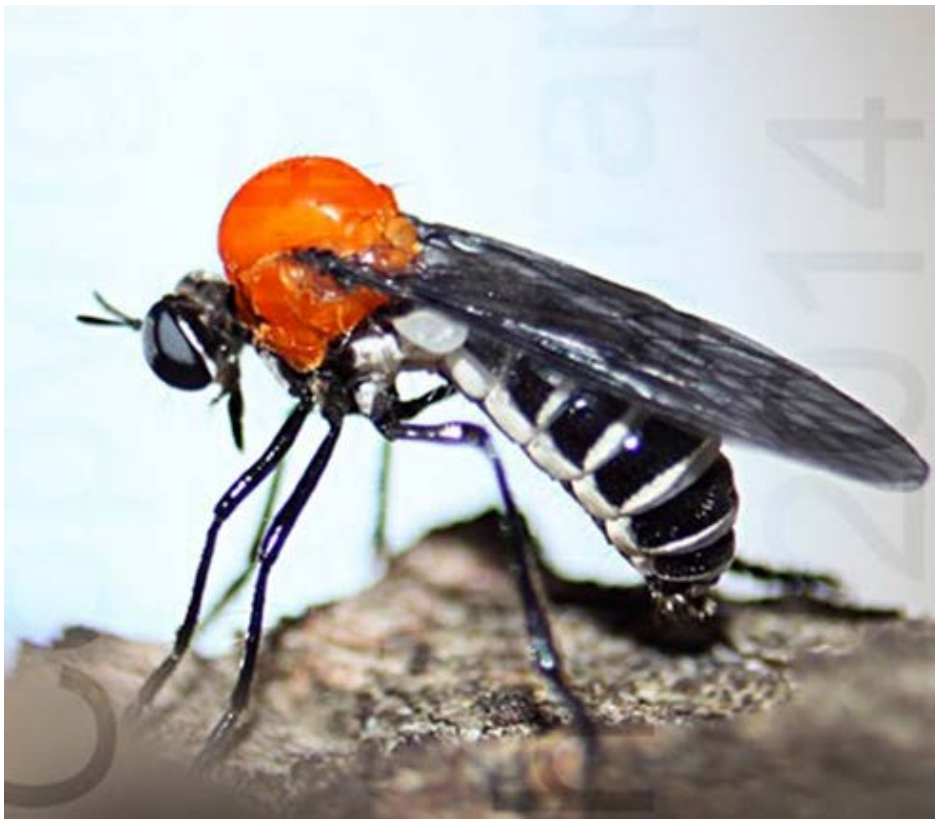


Photo by Hermit.

Here is the MODEL – *Callibracon* sp. wasp (Family Braconidae)

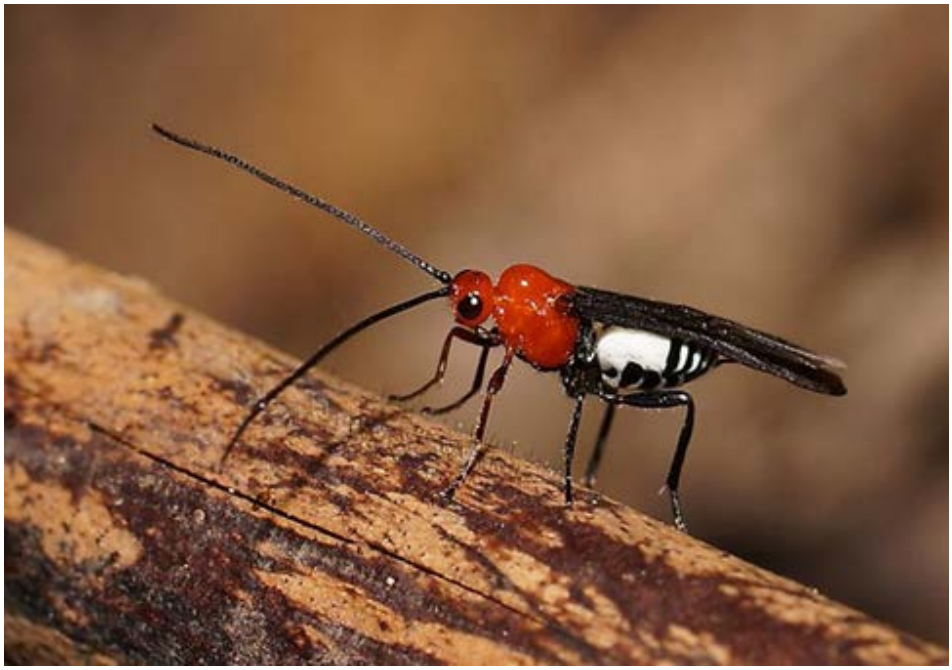


Photo by Reiner Richter

Yet another case of a fly mimicking a wasp –

Here is the MIMIC: Bibionid fly *Bibio* sp. (Family Bibionidae)

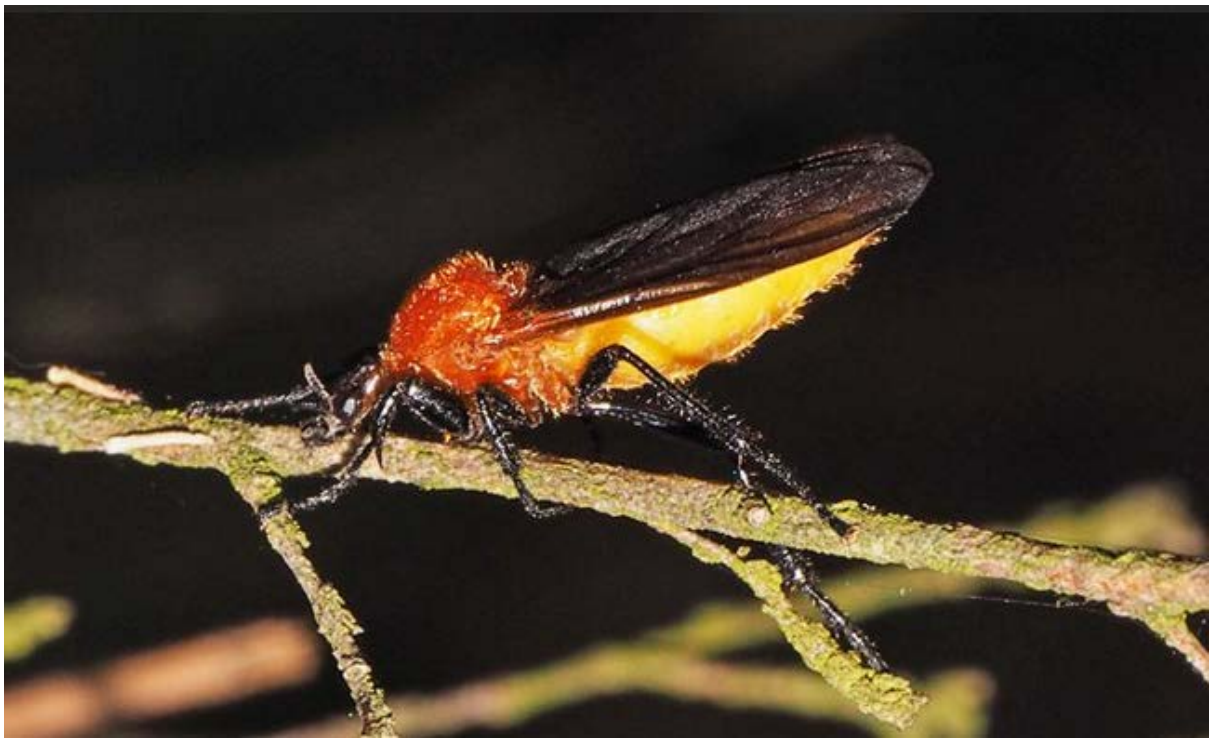


Photo by Linda Rogan

Here is the MODEL – *Callibracon* sp. wasp (Family Braconidae)

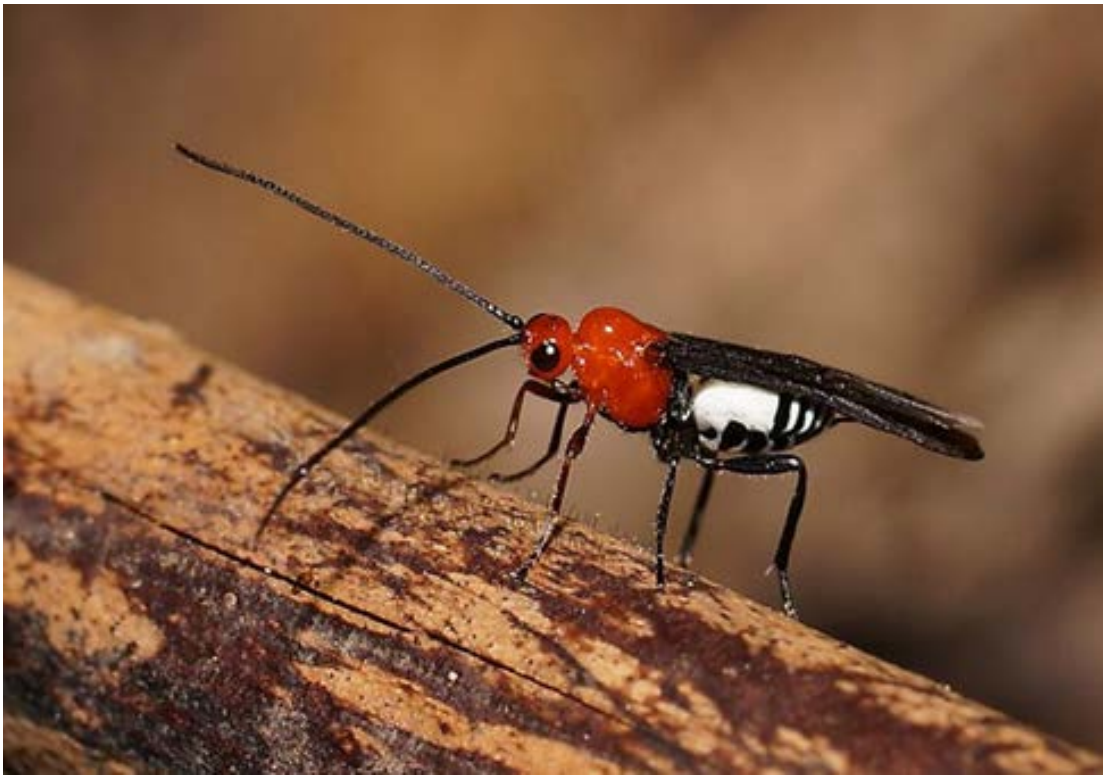


Photo by Reiner Richter

Mimicry can sometimes work in the opposite direction such as with Jumping spiders where they want to be able to get close to their prey without being discovered as a spider.

Spiders exhibit and amazing array of shapes and colours and some spiders specialise in mimicking ants. The MIMIC -- Ant mimicking Jumping spider - *Myrmarachne rubra*

Photo by Martin Lagerwey.

The MODEL – Sugar ant *Camponotus*

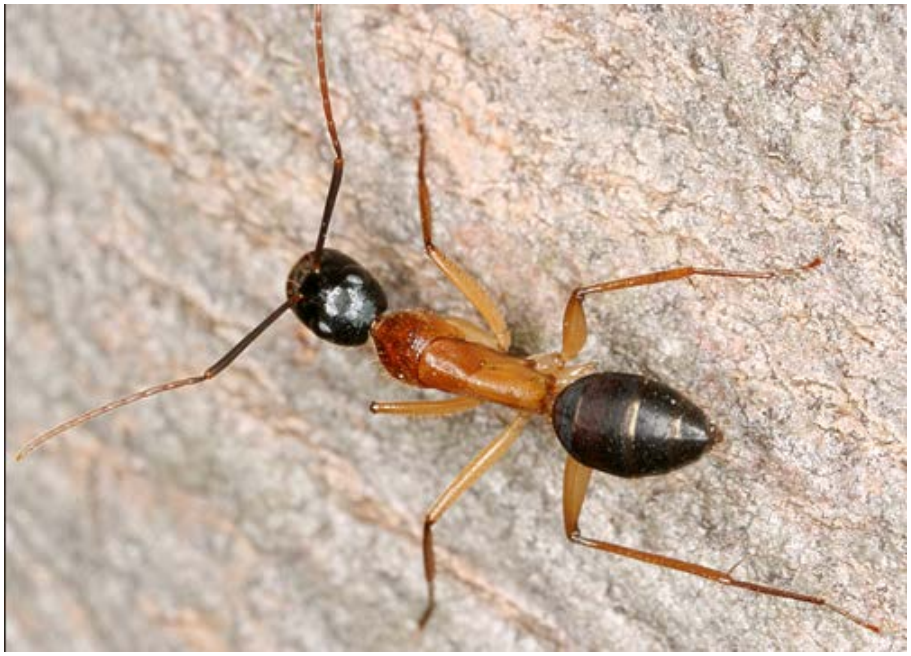
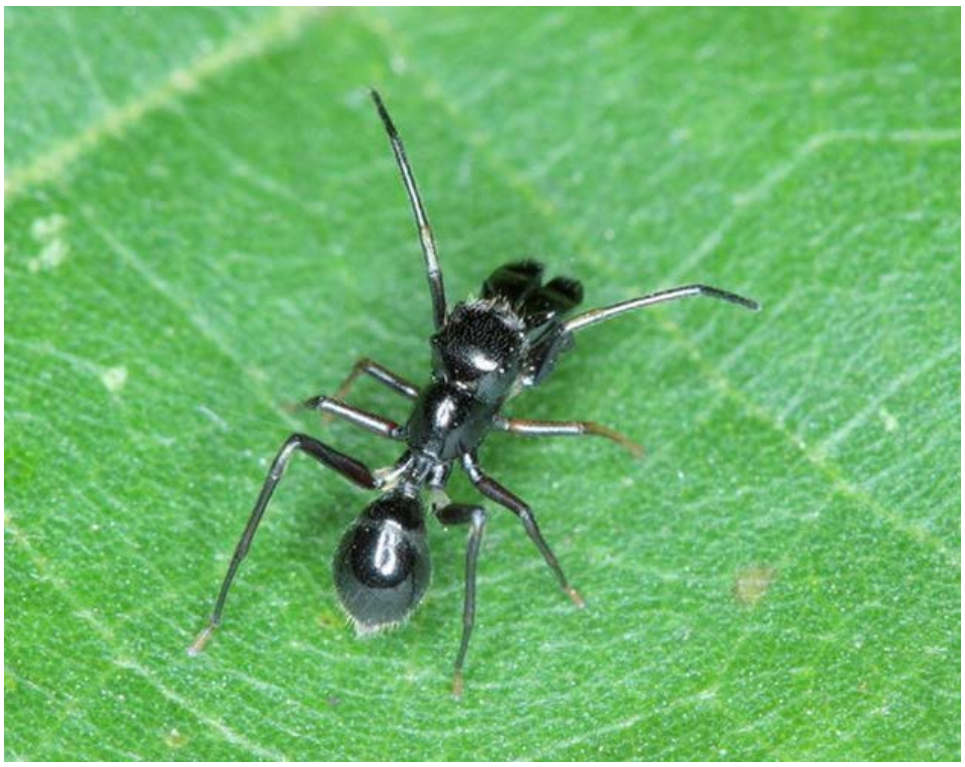
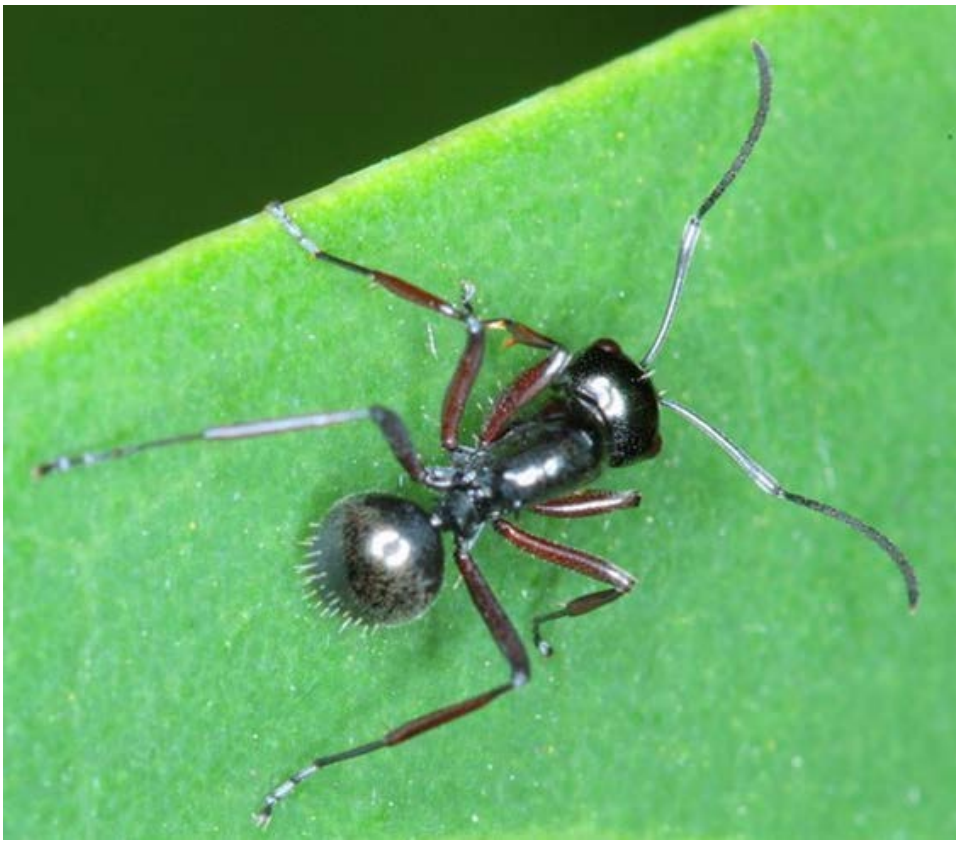


Photo by Benoit Guenard with permission.

Here is another Ant mimicking *Myrmarachne* jumping spider. Notice how the spider uses its front pair of legs to resemble the ant's antennae.



Mimicking a *Polyrhachis* ant.



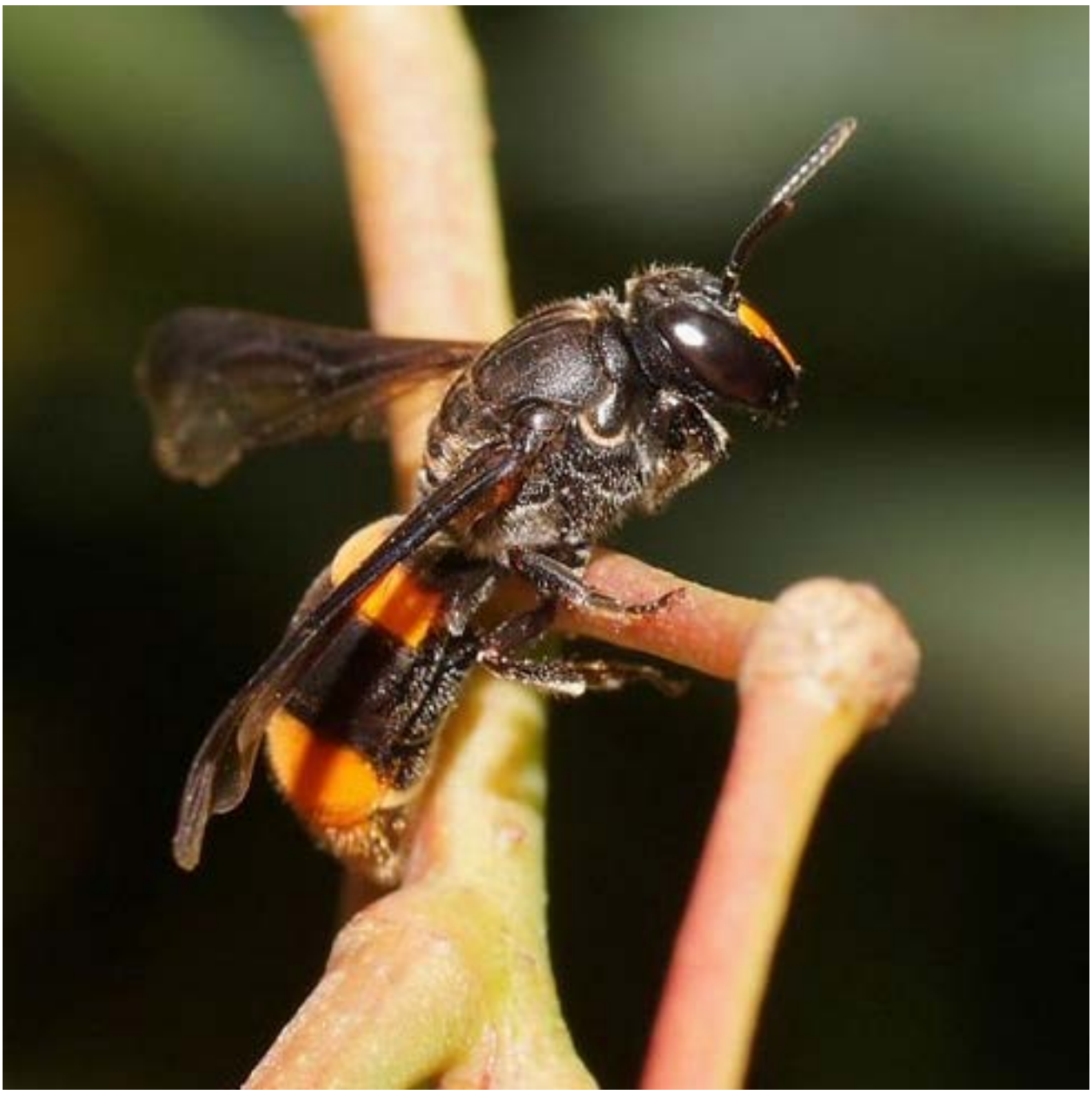
Photos by Martin Lagerwey.

Mullerian mimicry is where many species of distasteful or harmful species all take on the same shapes and colours. Here there is a “herd immunity” effect. If a predator attacks any one of the harmful species and gets stung or eats a distasteful insect, then all species that look similar will all be ignored by that predator. In other words, one individual dies but many others gain immunity.

The classic Mullerian example is for a group of almost 100 species butterflies (The *Heliconius* butterflies from South America) all have the same shape and colours. All butterfly species are distasteful and so they help each other deter predators.

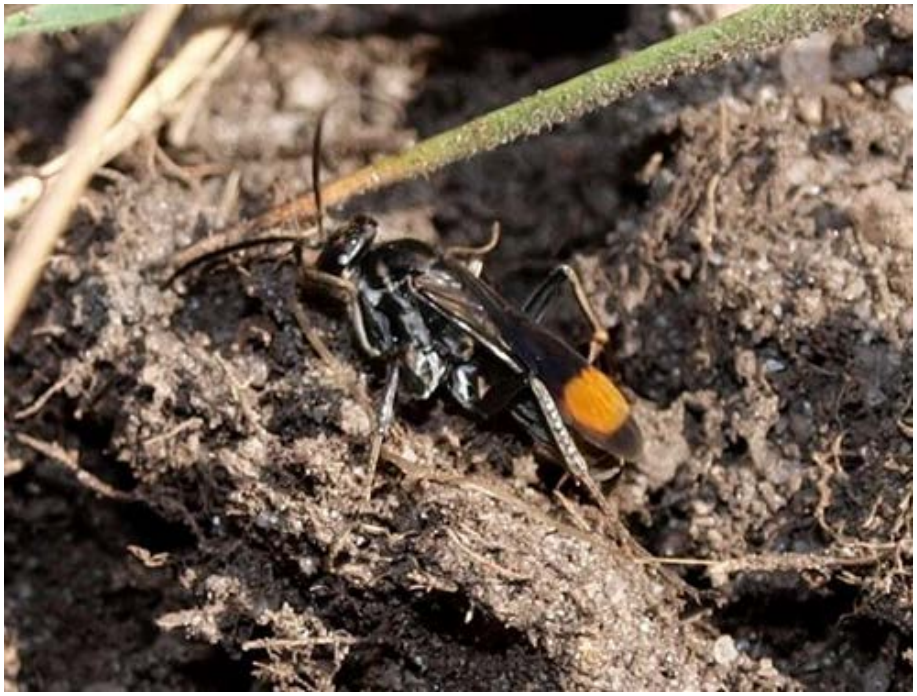
Australia has few good Mullerian examples, although one is commonly cited.

The colletid bee (*Hyleoides conicinna*) orange-yellow abdominal stripe pattern is repeated in many other wasps:



Hyleoides conicinna – Photo by Reiner Richter

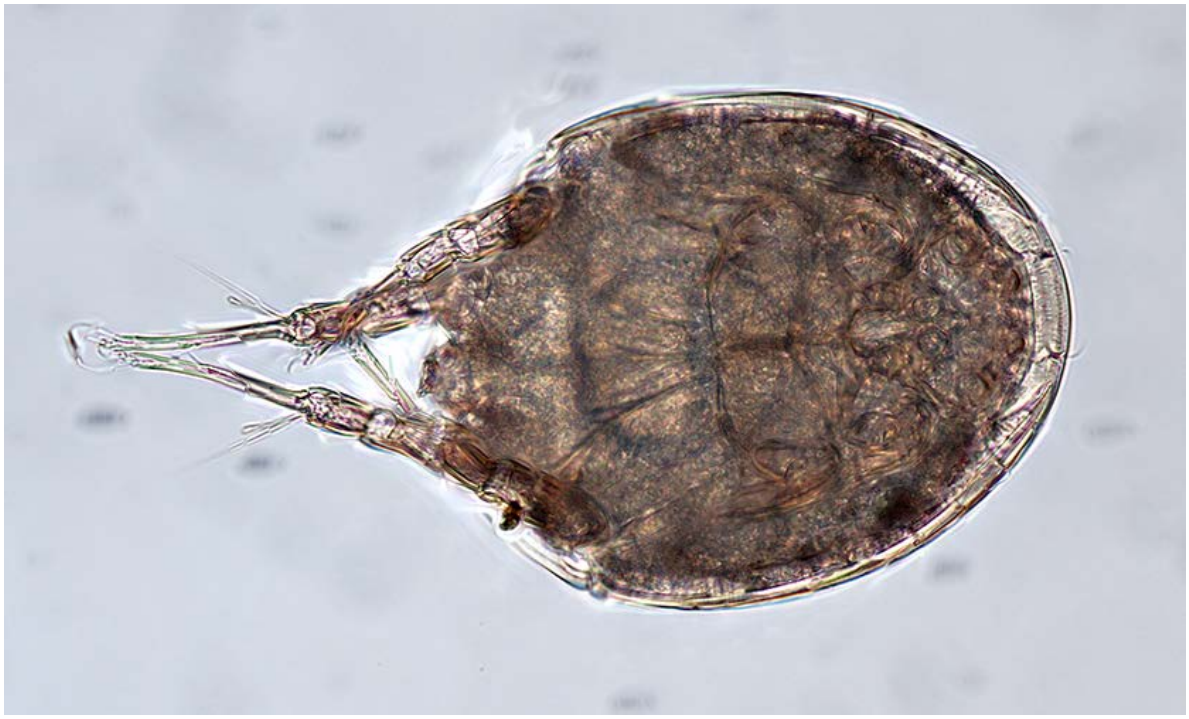
Pompilid wasp (*Cryptocheilus bicolor*) – Photo by Graeme Cocks



A pompilid wasp - Photo by Tamar Leitch

Mite Update

You may remember last week that we found a different kind of mite associated with the parasitic wasps of vinegar flies (*Drosophila melanogaster*). Well, what are they and are the phoretic or parasitic on the wasps?

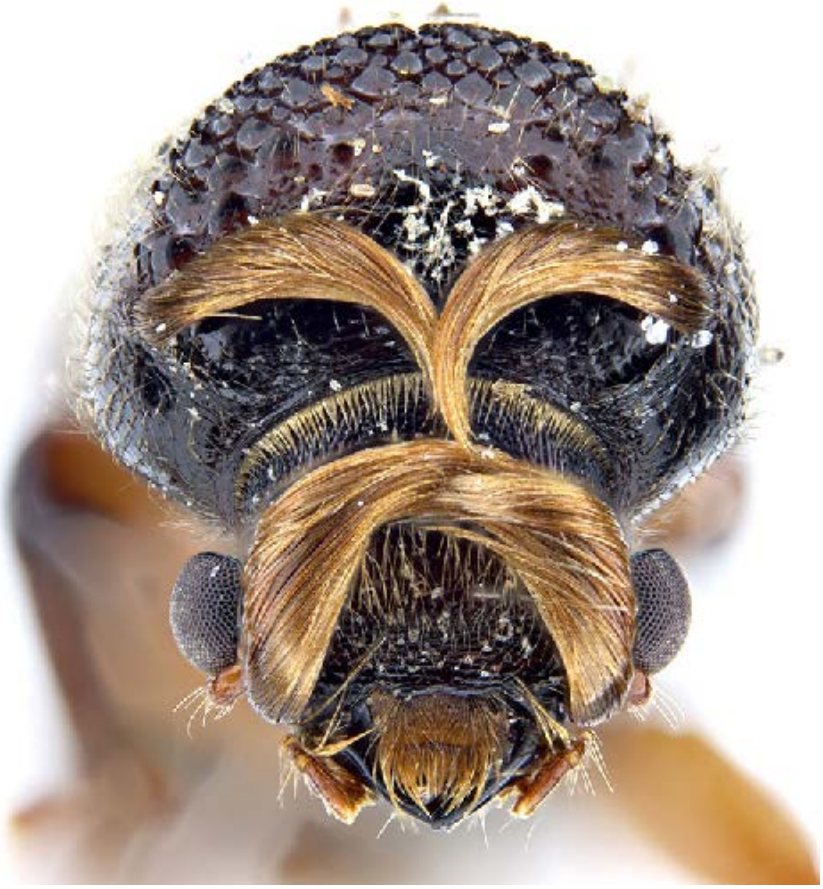


My resident and now retired mite expert, Dr Bruce Halliday, provided me with this information:

“This one’s easy. It’s a second-instar nymph (deutonymph) from some species in the family Histiostomatidae (aka Anoetidae). Legs III and IV fold forward in a very distinctive way in this family. The deutonymph is a specialised non-feeding morph called a hypopus, which attaches to a host insect for dispersal. There are no mouthparts, but at the posterior end there’s a series of suckers used for attachment. It’s not a parasite. The adults are microbial filter-feeders in the insect’s larval substrate.” Thanks Bruce! That all makes perfect sense!

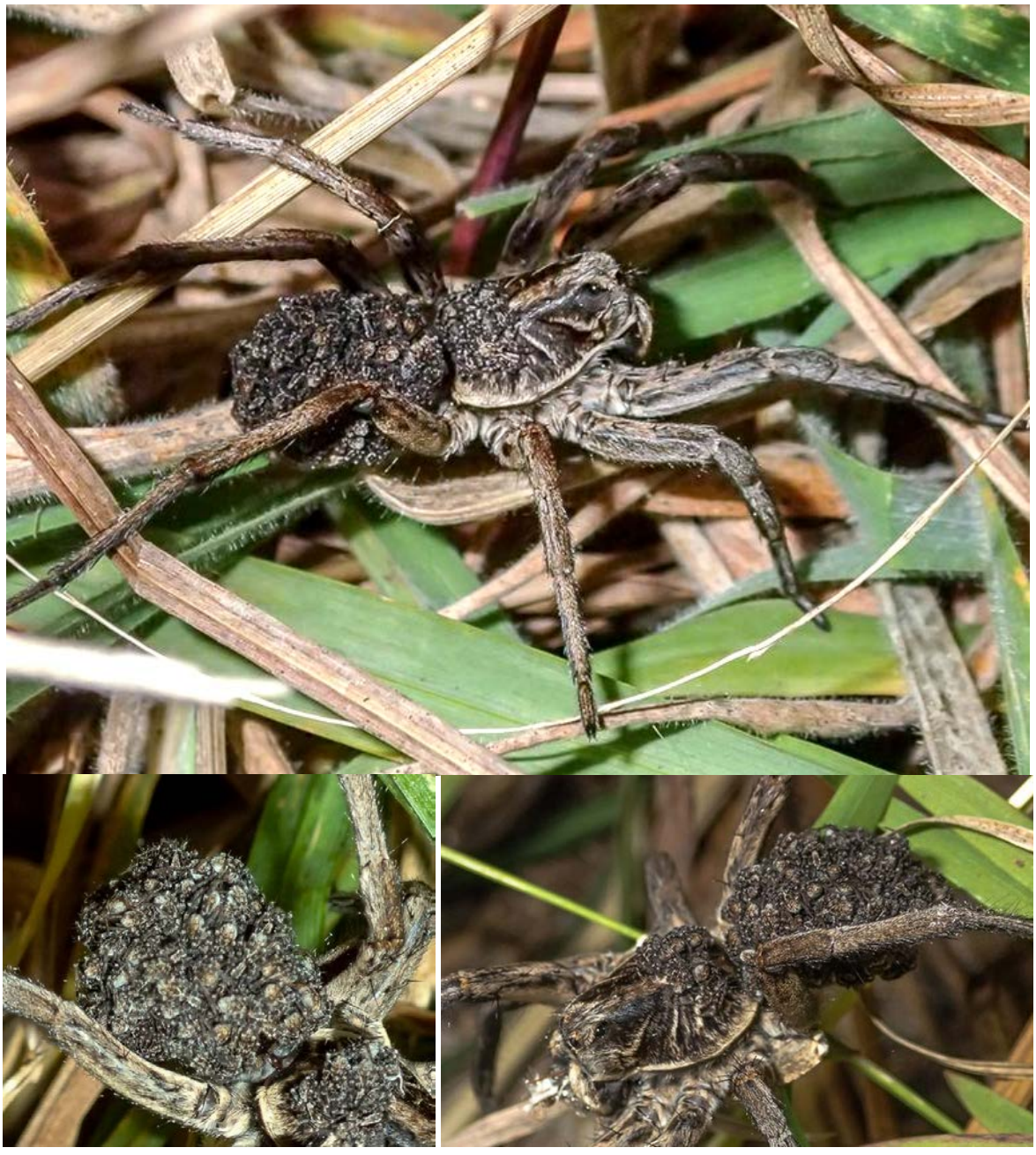
I wonder if this beetle ever has a bad hair day.

A Bostrichidae (*Xylobosca* sp. nr *hirticollis*) beetle from Central Australia (Ormiston, NT) with highly modified head setae.



Favourite Image of the week.

I remember once receiving a public phone enquiry from a person who described a spider with an abdomen “covered in warts”. Well, the “warts” were indeed spiderlings and only wolf spiders carry their young on their back – interestingly, scorpions have the same behaviour.

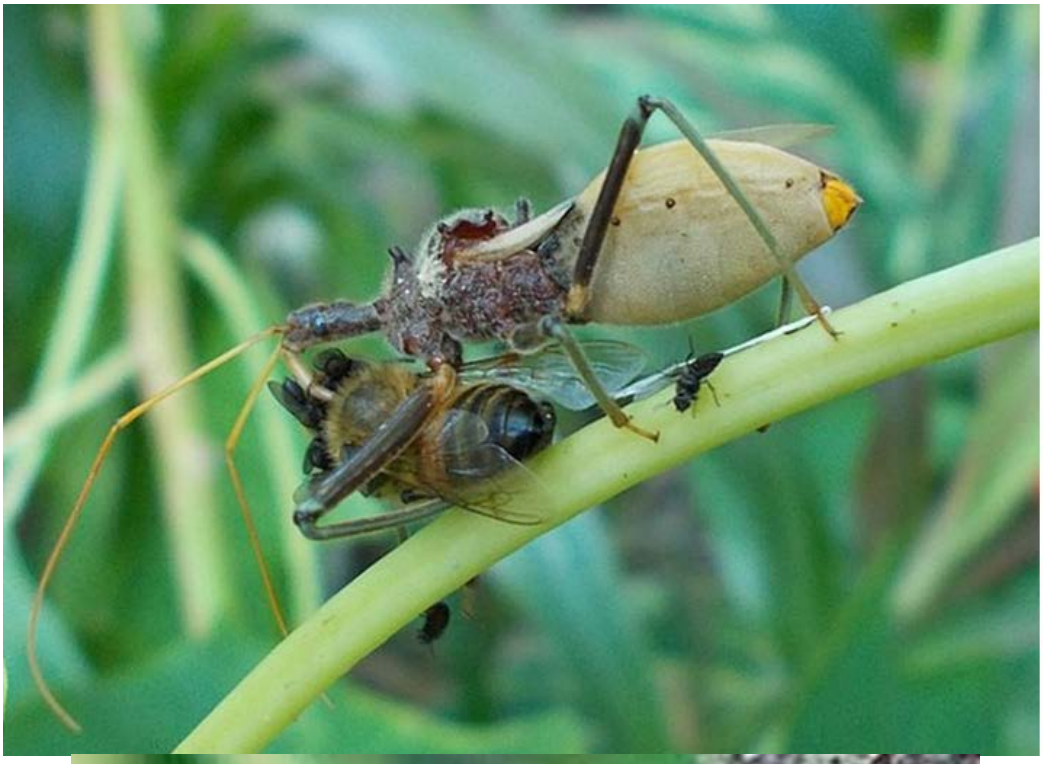


Photos by David Akers

“Cool” record of the week.

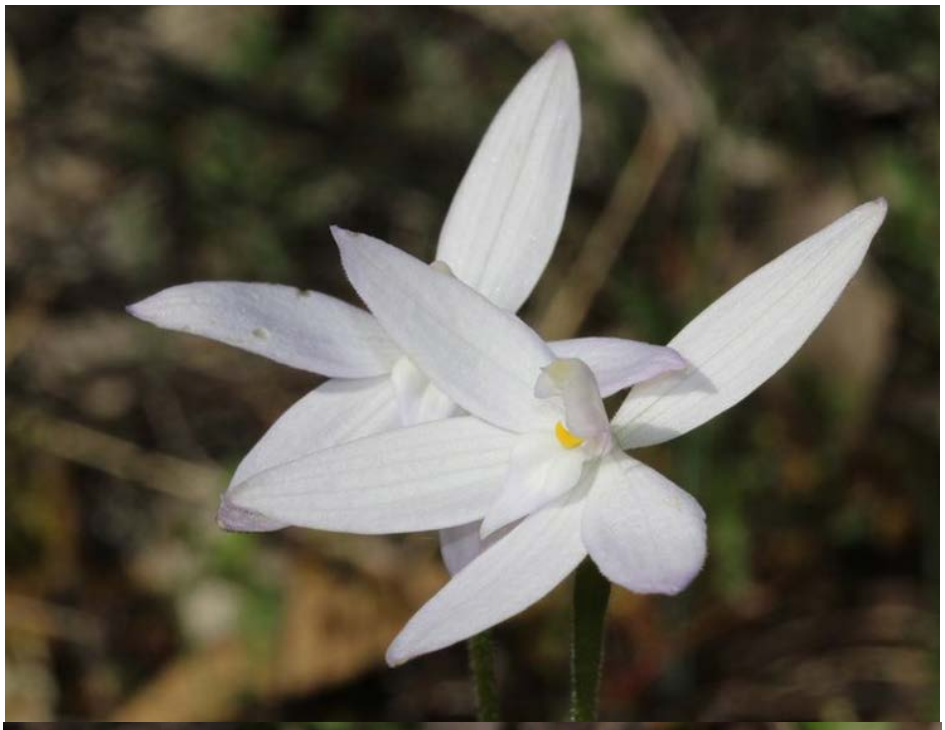
Photos by Rosie Benz and story by Daniel Heald

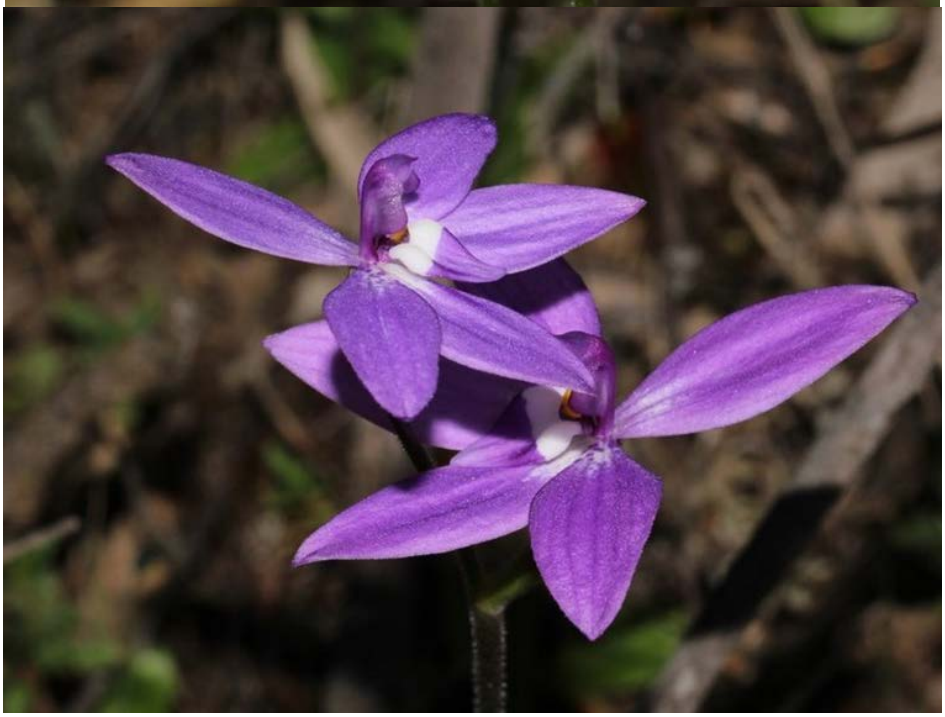
Jackalflies! (Insecta: Diptera: Milichiidae) Often found associated with crab spiders, assassin bugs, and anything else that catches honeybees. Apparently they're attracted by the death pheromones a honeybee releases.”



Some plants are popping up on BowerBird – good to see!

I love the common names: “Orchid family, Wax-lip Orchid, Waxlip Orchid, Parson-in-the-Pulpit”



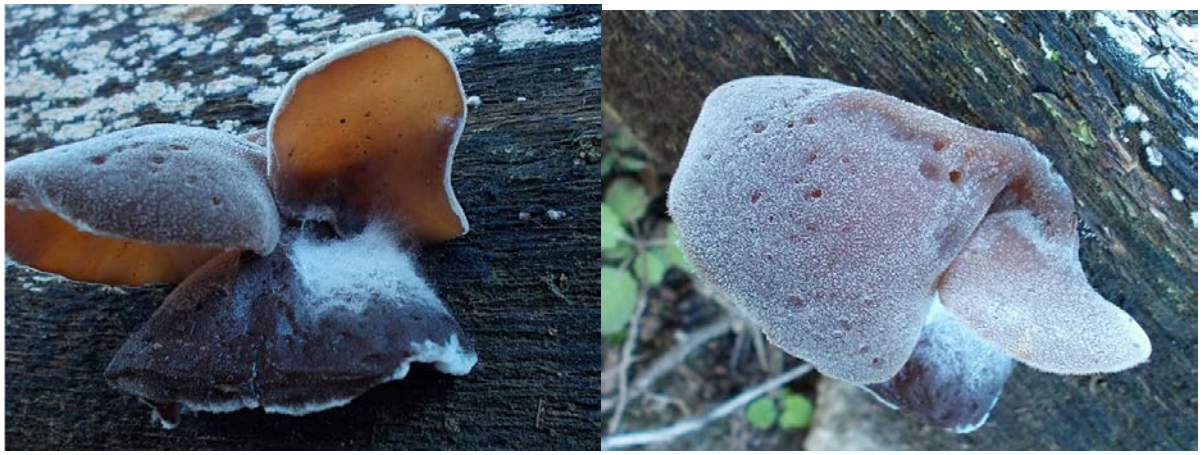


Photos by Russell Stanley

Come and get your “fungal fill” for the week!

Mycena sp. Photos by Rosie Benz

Lysurus mokusin? Photos by Rosie Benz



Auricularia auricula-judae – Photos by Rosie Benz

Ramaria subaurantiaca – Photo by Robin Corringham

Dacryopinax spathularia – Photo by Robin Corringham

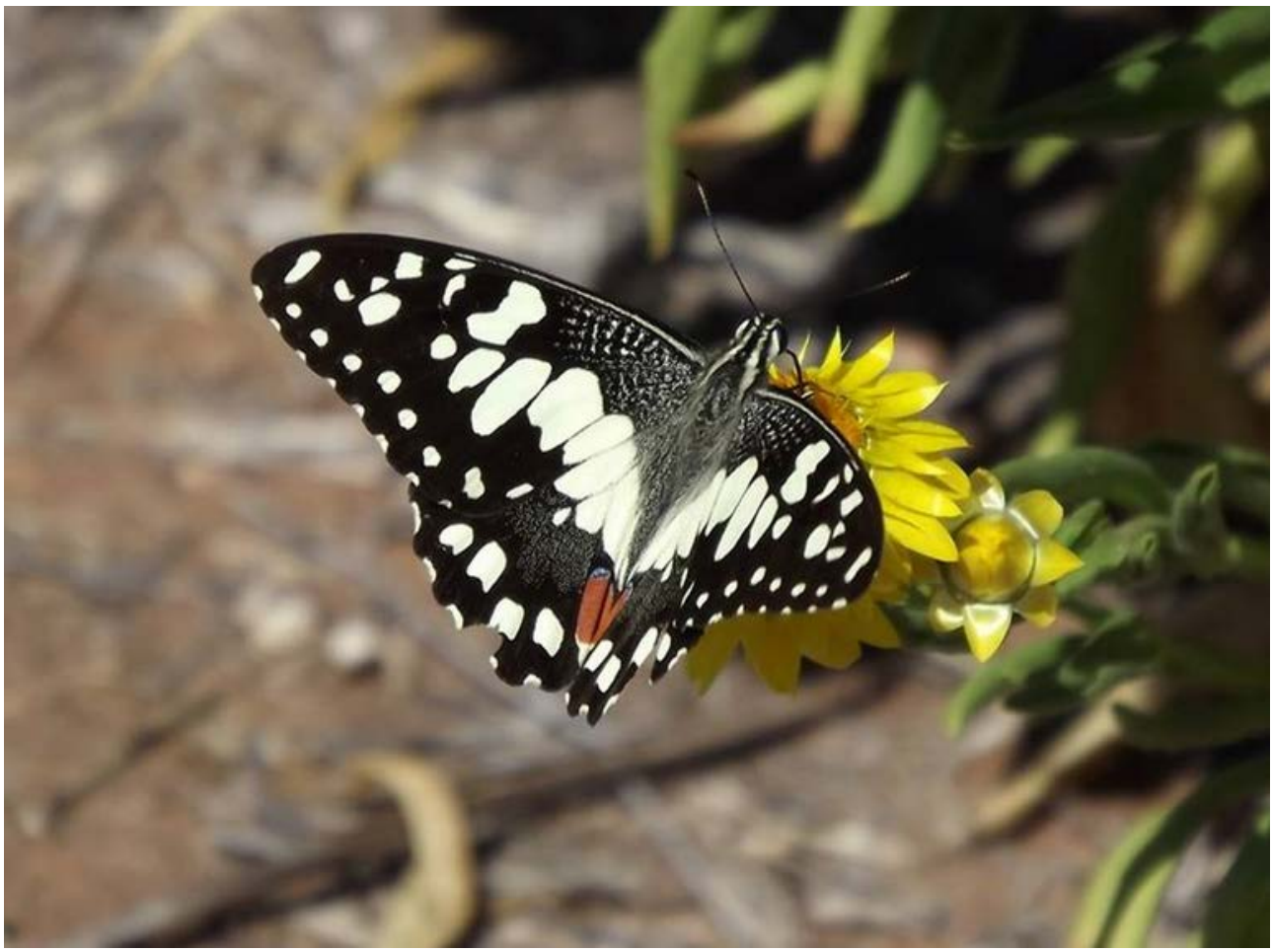
Entoloma virescens - Photo by Robin Corringham

Byssonectria fusispora – Photo by Matt Campbell

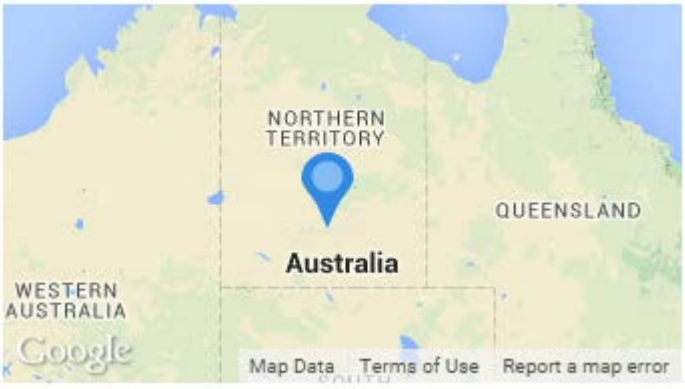
WoW – This is late in the season!

Sighted YESTERDAY! Near Alice Springs.

Chequered Swallowtail butterfly - *Papilio Princeps demoleus sthenelus*



Sighted 18 Jun 2015



Herbert Heritage Drive, Stuart NT 0870, Australia

Photo by Ethan Beaver

As always …….. from BowerBird ……..

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)