

# NATURA Far South Coast

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Observing and understanding the flora and fauna of Bermagui/Wallaga Lake's forests and shorelines

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The last month of summer has provided a fantastic few weeks with almost every excursion into my garden and further afield revealing both familiar and new-to-me species as well as some fascinating insights into the often secret lives of our local fauna. Although many of the behaviours I observed were not unknown to me, to see them play out in front of me more clarity and context than merely reading about them ever could and I felt very privileged indeed to be granted these small moments of wonder and understanding.

While many other insects have been busy munching, buzzing, flying and crawling their way through our forests and gardens the cicadas have become noticeably quieter this month as their time to shine draws to a close, at least for this season. As much as I am appreciating the opportunity to now hear the quieter and more subtle sounds that fill our forests I do find myself missing the cicadas' strident songs that have accompanied my every step over the past few months, and am already looking forward to their next season. I have it on good authority that we can expect a big season for Green Grocers from September onwards. This advice was received from Professor David Emery via correspondence on iNaturalist, and fills me with the hope of finding a thus far elusive Yellow Monday morph – if not, I am more than happy to settle for the regular green variety.



At left – A dead Redeye Cicada (*Psaltoda moerens*) that I found lying on top of a fern and being consumed by small black ants. Because I found this insect in mid-February I had assumed it had come to the end of its natural adult lifespan of several weeks but David Emery was inclined to think that, based on the light colouring of the thorax and wings, it was a newly emerged late season insect that had either fallen from a tree or been knocked down by a bird shortly after its emergence from its shell. Although a professor of veterinary immunology and parasitology at Sydney Uni., David is one of Australia's most enthusiastic and knowledgeable cicada experts so I am always happy to defer to his wisdom and insight when he so generously shares it. Along with Lindsay Popple and Nathan Emery, David also co-authors

the excellent online resource **Cicada Mania** - if you have even a passing interest in cicadas you might find it worth a browse as it provides a wealth of interesting and easy-to-read information as well as lots of fantastic images. It's a resource I reference often, both for general information about cicadas and for species-specific facts.

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## BLACK FIELD CRICKETS

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As the cicadas have become quieter the crickets have stepped up their game to ensure our nights are not left silent. Along with grasshoppers and katydids, crickets belong to the insect order **Orthoptera** and, like cicadas, are well-known for their ability to produce sound. Also like cicadas, it is generally only the males that sing.

Over the past few weeks it has been the **Black Field Crickets** (*Teleogryllus commodus*) that have been particularly conspicuous, both in number and in volume. I have certainly not been the only one to notice their presence because I have been stopped in my tracks several times recently to answer .... dare I say, field? ..... questions about them. Black Field Crickets are native to Australia and are a commonly found insect in eastern and southern states. During the day they hide in cracks and burrows in the soil to avoid predation and the heat of the sun, emerging only after night have fallen to feed to leaves, stems and other plant material as well as dead insects and any invertebrate eggs or larvae they may encounter. It is also at night that the males chirrup and chirp loudly but melodiously to attract and woo the females.



Male crickets produce sounds by rubbing special structures on their forewings together. One structure, known a *file*, consists of a row of microscopic teeth located along a protruding vein on the underside of each forewing. When a male cricket wants to sing for prospective mates he raises both of his forewings and then, holding one wing slightly above the other, rubs the sharp edge of the lower wing – the *scraper* – along the file of the upper wing. This method of sound production is known as *stridulation* and is similar in both action and sound to that achieved if you run a fingernail along the teeth of a comb. **A fun fact** – If you listen very carefully you *may* be able to hear the difference in the chirps produced by crickets of varying ages. Younger male crickets who have only just begun to sing for a mate have a loud, vibrant call but older crickets, who may have spent many long hours over multiple nights chirping to attract a female, sound more raspy. This is because, with constant use, the teeth on the older cricket's file become worn down and blunt, producing a duller, but no less loud, sound.

Although Black Field Crickets look like fearsome and even possibly dangerous creatures they are not aggressive and pose no threat to humans. They can however give you a bit of a nip with the biting and chewing mandibles if caught and handled roughly. Such nips are momentarily sharp but do not break the skin. Despite the slight possibility of being bitten by a field cricket it is their back end that seems to cause the most alarm for people, and even I have to admit they look as if they would stab or sting you at their earliest convenience. Fear not dear readers because all of those sharp, pointy bits are completely harmless!

The two long protrusions at the rear of both male and female Black Field Crickets are sensory organs known as *cerci*. This pair of highly sensitive appendages are covered in fine hairs which allow the cricket to detect low-frequency vibrations and the most miniscule of air movements so that approaching danger can be sensed from a distance, and possible capture quickly and easily avoided ... if you've ever tried to catch one of these insects for eviction from your home you'll know just how difficult it can be to sneak up on them! The protrusion lying between the pair of cerci are the Black Field Cricket's long membranous hindwings that, when folded and not in use, extend beyond the shorter hardened forewings (*elytra*) that protect them. As well as the two cerci, all female crickets have an additional spike-like appendage known as an *ovipositor* extending from the end of their abdomen. Used to lay and place eggs in a suitable location, this tube-like organ is present in many female insects, and in the case of female Black Field Crickets is particularly long and cylindrical so that the eggs can be laid 10 - 40 mm deep in the ground to keep them safe from predation and dehydration.



**AT LEFT** - A female **Black Field Cricket** (*Teleogryllus commodus*) I found deceased in my bathroom. In this photo you can clearly see the long hindwings and cerci that all Black Field Crickets have as well as the ovipositor which allows me to identify this individual as a female. If this cricket had remained outside, or not continuously eluded capture, she would have laid up to 2,000 white or yellow banana-shaped eggs which would have overwintered in the ground and then hatched in the spring.

**A fun fact** – Although Black Field Crickets feed largely on the leaves, stems and roots of plants they are omnivorous and will eat almost anything. Females in particular need a diet with a high protein content to aid in the production of eggs while male crickets require a less protein-heavy and more energy-rich diet to fuel their energetic and seemingly endlessly chirping.

**A final word about Black Field Crickets** – It seems that it is not only the NSW far south coast that is currently experiencing a boom season for Black Field Crickets because, whilst researching for my NATURA piece on these insects, I came across an online article written by Professor Ary Hoffman. This article was published on the University of Melbourne’s *Pursuit* website on Feb 27, 2024 to explain why there has been a population explosion of the insects in Melbourne over the past month or so. According to Professor Hoffman, Black Field Crickets are always present in the roots and plant matter of our lawns and emerge at certain times of the year as part of their natural cycle. The reason they have emerged in such large numbers this year is because we’ve had a warm, wet season with lots of plant growth .... and lots of plant growth means plenty of food for crickets. Professor Hoffman also comments that insects are very good at taking advantage of climatic events that favour them, with many being what he calls “boom-and-bust animals”. Currently it is the crickets that are taking advantage of a boom cycle and, although words like “plague and “invasion” are being bandied around by some people, their large number is nothing more than a natural population doing well for itself. This is the link for the article if you are interested in reading it in full - [Do you have a chorus of crickets in your backyard? Here’s why | Pursuit by The University of Melbourne \(unimelb.edu.au\)](#)

Although Professor Hoffman did not mention it in his article, I am wondering if perhaps the warm and wet season he referred to has contributed to the Black Field Crickets’ boom season in ways other than just ensuring a good food supply. Perhaps the milder winter months meant that more eggs were able to survive and successfully overwinter before hatching. Or perhaps the wetter season meant the eggs were able to absorb more of the water needed for their development, resulting not only in a larger egg size but increasing the odds of the nymphal progeny hatching. If any of you would like to correct or confirm my amateur hypothesis please do get in touch!

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## **BUTTERFLIES**

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Since March 2013 I have photographed 43 species of butterfly in the Bega Valley Shire and uploaded them to the iNaturalist data base. Some of these butterflies, such as the Splendid Ochre (*Trapezites symmommus*), Brown Ringlet (*Hypocysta metirius*) and Orchard Swallowtail (*Papilio aegaeus*), are species I observe often but others such as the Bronze Flat (*Netrocoryne repanda*) and Lesser Wanderer (*Danaus petilia*) are rare or seen only occasionally. This month I added another butterfly to my species count – the **Small Grass-Yellow** (*Eurema smilax*). Observed on the Montreal Goldfield north of Bermagui, this pretty little butterfly was not only a new species for me but for the whole of the Bega Valley Shire, with neither iNaturalist nor the Atlas of Living

Australia having any previously recorded observations of it in the area. How exciting! And yes, although I do regret being unable to get some better photos .... poor late afternoon light, a flighty, rather camera-shy insect and a photographer with minimal and questionable technical ability are not a great combination! .... I did do a little happy dance when I realised the significance of my find.

**AT RIGHT** - The **Small Grass-Yellow** (*Eurema smilax*) belongs to the butterfly family **Pieridae**, a group of insects that are commonly referred to as the Whites and Yellows and, in Australia, includes not only native and endemic species but also the very common introduced butterfly, the Cabbage White (*Pieris rapae*).



As a native species, the Small Grass-Yellow has a widespread distribution across much of Australia and has also been found in India, Indonesia and Niger, and on Lord Howe Island. The species has a wingspan of about 30 mm with the females slightly larger than the males and, as I observed, flies close to the ground in a slow and somewhat erratic manner. Small Grass-Yellows displays two distinct seasonal forms. The wet-season form flies in the warmer months and has pale yellow wings that have black or dark brown tips on the upper forewing surface and few or no brown markings on the underwings. The dry-season form flies in the cooler months and has wings that are a brighter yellow in colour, has distinct brown markings on the undersides of the wings and lacks dark brown tips on the upper forewing. The larvae feed mostly on *Senna* and *Neptunia*



species, neither of which have been recorded on or in the area surrounding Montreal Goldfield. As both a migratory and vagrant species, and given that the individual I observed was the first of its kind in the Bega Valley Shire, it seems likely this butterfly was merely passing through, and that it may be some time before I see another.

**AT LEFT** - In this second photo of the Small Yellow-Grass you can see, thanks to some nicks in the forewing, a glimpse of the dark brown tips on the hidden upper surface of the forewing. Along with the insect's location and the date of observation (Feb 15, 2024), this helps to confirm that this is the wet-season form of the species.

Because I mentioned earlier that the Small Grass-Yellow belongs to the same butterfly family (Pieridae) as the Cabbage White, and because the Cabbage White is one of the butterflies with which many of you would be most familiar, I am going to take this opportunity to give you a bit of information about them. Unlike the Small Grass-Yellow which is a native species, the **Cabbage White** (*Pieris rapae*) is an introduced species which appears to have originated in Europe and then spread across the globe, eventually reaching Melbourne by 1929 and Perth by 1943. Today, the Cabbage White is a common and widespread species that is found across much of Australia. In temperate zones where populations of the butterfly are largest up to 5 generations are completed annually with adults flying from late winter or early spring to late autumn or early winter.

Although the preferred habitats of Cabbage White butterflies are suburban gardens and farmlands they also frequent areas of disturbed ground where introduced species of larval host plants such as Wild Radish (*Raphanys raphanistrum*) grow. The butterflies can also often be seen flying and feeding in native bushland.

Thankfully, these forested areas do not have a sufficient supply of suitable plants on which the larvae can feed so the butterflies rarely breed here. They may, however, breed in coastal dunes where searockets such as the **European Searocket** (*Cakile maritima*), shown at right and photographed growing in a substantial stand along the Wallaga Lake foreshore near Murunna Point, have established themselves.



Cabbage White butterflies have white wings with faint black markings and hind underwings that are a pale, creamy yellow. Although the male and female butterflies are similar in size and appearance the species is sexually dimorphic, and the two sexes can be easily distinguished with a bit of practise. The photo at left shows a female Cabbage White with two black spots on



each forewing. If this insect was a male it would have just a single spot on each wing. **A fun fact** - Because I'm getting older and my recall of mentally stored information isn't always as immediate or reliable as I would like I often found myself struggling to remember whether it was the male or the female Cabbage Whites that had 2 spots. Necessity being the mother of invention I came up with this handy-dandy method for quickly and easily jogging my memory .... female = 2 syllables = 2 dots while male = 1 syllable = 1 spot. Laugh if you will but it works for me.

I have to admit I have a love-hate relationship with Cabbage White butterflies. Showing a preference for purple, blue and yellow flowers, the adult butterflies feed on nectar and are excellent pollinators as they move constantly between flowers. For this reason they are a very welcome addition to the biodiversity in my garden. The larvae, however, are a pest in both backyard and commercial vegetable plots and can decimate a crop of brassicas in a surprisingly short period of time, especially when their numbers are high.

Because the velvety green caterpillars of the Cabbage White butterfly are ravenous little beasties and will merrily chomp their way through any plant belonging to the Brassicaceae family they are one of the most pervasively damaging pests on crops around the world. The Brassicaceae family, commonly known as the Mustard Family or more simply the brassicas, contains some of our favourite and most economically valuable crops including cabbages, cauliflowers, broccoli, kale, rocket, turnips and bok choy. Why are the caterpillars so obsessed with eating these vegetables? Because the larvae seem to need food plants that contain mustard oil and may, in fact, even be addicted to it. Since the plants in the Brassicaceae family all have a high mustard oil content female Cabbage White butterflies heavily favour these plants as egg-laying sites so their progeny can thrive when they hatch. Before moving on to devour the leaves of the host plant the newly hatched larvae consume their own eggshell as a first meal. After that, it's very much a case of "Lock up your caulies people .... the caterpillars are coming!"

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## HOW TO AVOID A BRASSICA MASSACRE

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The simplest and most effective way to control Cabbage White caterpillars, and indeed many other pests that may want to take advantage of your labours in the vegie patch, is to deny them access in the first place by installing insect-proof netting. It can also be helpful to provide a "sacrificial" plant somewhere in the garden away from your vegie plot. In the case of Cabbage Whites this could be an unprotected broccoli plant or two, or a small bed of bok choy that is easily accessible to the female butterflies when it comes time for them to lay their eggs. It's also worth noting that both the Cabbage White butterflies and their caterpillars like nasturtiums, an

easy-to-grow flowering plant that, like many of the vegies you are trying to protect, belongs to the Brassicaceae family. I have found in the past that by companion planting nasturtiums near my vegie patch crop loss is reduced to some extent even when the vegies aren't netted. It can also help if you don't plant all your brassicas together. Mixing up your vegies, herbs and companion plants makes it more difficult for the butterflies to locate the plants on which they want lay their eggs, and also stops the caterpillars from moving freely from one food plant to another.

It's also worth noting that, as caterpillar numbers increase, beneficial predators and insect parasitoids will be attracted into the garden to either feed directly on the butterfly larvae or lay their eggs on them. Parasitoids are primarily wasps and can be very beneficial biocontrol agents because their larvae hatch inside the host caterpillar and feed on the bodily fluids or internal organs, eventually killing the caterpillar. Whilst parasitoid wasps won't actually stop the caterpillars from feeding on your vegies they *will* stop that caterpillar from pupating and becoming one of the next generation's butterflies. The demise of the caterpillar before pupation means that, had it been destined to emerge as a female butterfly, there will now be up to 800 fewer eggs laid to continue the viscous cycle over the coming months. If 10 female butterflies fail to emerge that's a whopping 7 or 8 thousand fewer caterpillars that will be munching and crunching their way through your brassicas ..... it doesn't pay to underestimate the might and worth of even just one tiny little wasp!

To make it easier for predators and parasitoids to find the caterpillars you'd so dearly love to vanquish from your vegie patch here's another thing to keep in mind .... caterpillars that are actively feeding are 100 times more likely to fall prey to predators and parasitoids than caterpillars that are hiding. Research has shown that caterpillars feed for longer on plants that have lower nitrogen levels so, while you can certainly go ahead and fertilize your vegies as much as like to get a good yield, *don't* fertilize any of your sacrificial plants – they may not grow as well but they'll be much more appealing to the Cabbage Whites. Interestingly, this piece of advice is applicable to many of the caterpillar species that may become problematic in both your edible and ornamental garden beds.



**AT LEFT** - The velvety-looking green caterpillar of a Cabbage White butterfly. This one is on a cabbage growing in my vegie patch and has been parasitised by an unidentified braconid wasp, possibly *Cotesia glomerata* which was introduced into Australia by the CSIRO in 1942 as a biological control agent. Both native and introduced species of braconid wasps lay their eggs in insect larvae, including the caterpillars of many pest species. So why did the CSIRO feel the need to introduce a non-native wasp species to combat the introduced Cabbage Whites?

Because most braconid wasp species are very selective about the hosts they choose for their eggs and larvae, and will often only target a single species. This necessitated the introduction of a European wasp to help control the larvae of an introduced European butterfly species because none of our native wasps had evolved to recognise and parasitise the offending foreigner. But fear not! Unlike the introduction of other biocontrol agents that have gone horribly awry (did somebody just say CANE TOADS!??) the braconid wasps brought in to control the Cabbage White caterpillars pose no risk to our ecosystems, do not compete with our native insect species for food and hosts and are definitely "good guys" that should be celebrated rather than vilified.

And finally, pesticides. I am of the firm belief that pesticides should only be used as a last resort, and as sparingly as possible, when all other methods of pest control have failed. While I certainly can't refute the fact

that pesticide use can be a “quick fix” for a problem, I believe the negative long-term effects can potentially far outweigh the immediate benefits due to the collateral loss of beneficial insects. These beneficial insects – wasps (including the braconids that naturally control Cabbage White populations), ladybirds and lacewings to name just a few – are working hard every day, and often unseen, to maintain the overall health of your garden and plants. By using pesticides you may rid your veggie patch of the caterpillars, but without the beneficial insects to control their populations all sorts of other unwelcome nasties will thrive. Personally, I’d much rather have to deal with a few dozen caterpillars that I can see and manually remove if necessary than a myriad of aphids, scales, thrips and mites running amok because I sprayed and killed all their natural predators.

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## LEAF BEETLES

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Leaf Beetles are quite possibly my favourite group of beetles. Belonging to the one of the largest beetle families – **Chrysomelidae** - leaf beetles are generally small (typically between 5 and 15 mm in length although some are smaller and a few are larger), and are often brightly coloured. As of 2017, and according to Dr Chris Reid (NSW Principal Research Scientist of Entomology at the Australian Museum), Australia has approximately 2,300 described species of leaf beetle with up to 700 more still sitting in collections and repositories around the country awaiting classification. As their common name suggests, both the beetles and their larvae typically feed on the leaves of a variety of plants.



**ABOVE** (from left to right) • *Paropsis maculata* (**Eucalypt Leaf Beetle**) - this attractive leaf beetle is approximately 10 mm in length and is one of the leaf beetle species I most frequently encounter in our forests. As the common name suggests, both the beetle and its larvae feed on the leaves of *Eucalyptus* species. Like all species in the *Paropsis* genus this beetle and its larvae are extremely poisonous, and the adult beetles often have peck marks on their elytra where birds have tried to eat them but then rejected them after tasting the bitter toxins • *Paropsisterna nigerrima* (no common name) - this leaf beetle species is highly variable in appearance but is basically black and may or may not have red markings. When present, the red markings may be large spots, thin stripes (as seen on this beetle) or a combination of spots and stripes. This individual is only the second of its kind that I have encountered, and is a particularly handsome example. This beetle feeds on the leaves of Eucalyptus trees and has a length of approximately 12 mm • *Paropsisterna nobilitata* (**Noble Eucalyptus Leaf Beetle**) - this leaf beetle was a new species for me this month, and what a little beauty he or she is! Although only 5 mm in length this is one of the most exquisitely and flamboyantly coloured beetles I have ever seen, and it was an absolute delight to have this one turn up on my front verandah. Online literature regarding the species is scant but it seems to be more common in Tasmania than in the mainland states, and my observation of it on the Montreal Goldfield is only the third record of the species in the Bega Valley Shire.

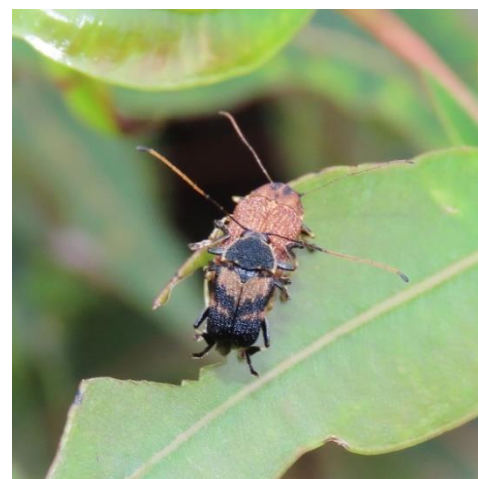


When compared to the leaf beetles shown above, the pair of beetles at left may seem rather plain and unexciting but this observation was probably the most important one I made this month, and may well be the most significant and valuable observation I have ever added to the iNaturalist data base.

This photo shows a mating pair of *Cadmus luctuosus* (no common name), a species of Case-bearing Leaf Beetle, and it is clearly evident just how much difference there is between the two sexes in both size and appearance. In fact, the degree of sexual dimorphism displayed in these two beetles is so extreme that, had I seen them separately, I would have assumed they were individuals representing two different species .... and in the mid 1870's that's *exactly* what happened!

The female of this beetle was first described by Chapuis, a French entomologist who made significant contributions to the field of coleopterology (the scientific study of beetles). Much of his work focused on beetles within in the Chrysomelidae family, including the species shown here. Having named the female as *maculicollis* in 1875, Chapuis then described and named the male beetle as *luctuosus* in the same year. In other words, because of the sexual dimorphism between the two sexes, Chapuis failed to recognise that the specimens he was studying were individuals of the one species. I haven't been able to ascertain when the male and female beetles were recognised as the same species but I do know that, as far as I can tell and as far as anyone has been able to confirm, this is the first visual documentation of a mating pair. Exciting stuff, and a perfect example of why I love what I do! It's also a perfect example of why citizen science matters regardless of how amateur and lacking in a scientific background the observer is.

When I uploaded my observation of this beetle to iNaturalist on Feb 16, 2024 it was the first record of the species in not only the Bega Valley Shire but in the whole of NSW. Rather coincidentally, 6 days later on Feb 22 Thomas Mesaglio (aka thebeachcomber, and iNaturalist extraordinaire) also uploaded an observation of the beetle – a male that he had photographed at Agnes Banks, 53 km north-west of Sydney – so NSW went from zero observations of the species to 2 in just 6 days. As a final word on *Cadmus luctuosus* I'd like to acknowledge and thank Boris Büche, an iNaturalist curator living in Berlin, Germany who not only identified the beetles for me but also supplied much of the information relating to Chapuis and the taxonomy of *Cadmus luctuosus*. This is definitely not the first time I've benefitted from Boris's wisdom or been grateful for his assistance. I'd also like to share a small portion of the reply I sent to Boris regarding these beetles - *I wish I could have got more photos, but the pair hurled themselves rather dramatically off the leaf as soon as they became aware of my presence .... I guess they weren't keen to have an audience!*



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## SPIDERS IN THE BEDROOM

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I have been fascinated by spiders for many years because, as a group, I find them incredibly diverse in both appearance and behaviour. During my countless hours spent observing them I have been granted incredible



insights into many aspects of their complex lives and this month, for the first time ever, I was able to watch a pair of spiders share one of the most private and intimate moments in their lives .... the act of copulation.

Like most of my observations this one was made possible purely by chance, and was thanks to two of the many Daddy Long-legs Spiders with which I share my home. The two spiders in question inhabit my guest bedroom and I could very easily have missed their coupling except for the fact that I happened to glimpse the 2 spiders together as I walked past the doorway. My initial impression, when viewed from a distance, was that there was some same-species cannibalism going on. This seemed rather unusual behaviour for Daddy Long-legs because I have always found them rather amicable and happy to co-exist, and definitely warranted a closer look. It also warranted grabbing my camera because I had no idea what I was going to be faced with when I reached the pair of spiders .... with so many missed opportunities in the past I've learnt the hard way that it's better to be safe than sorry when confronted with a potentially significant observation!

What I witnessed over the next hour was astonishing! Although I had missed most of the male spider's cautious approach and courtship of the female (heaven forbid that he should rush in and be mistaken for an afternoon snack!) I did see him gently tapping and stroking her belly as he prepared to mount for the consummation of their brief love affair. After positioning himself under the female's *epigyne* (the external genital structure of a female spider) the male gently pulled the female towards him and then inserted part of his *palpal bulb* (the copulatory organs of a male spider) into her genital cavity so that his sperm could be transferred. The two spiders remained locked together in this way, motionless and with the female spider's legs extended well forward, for just over half an hour before separating and retreating to their respective corners of the room.

**BELOW** – The Daddy Long-legs spiders I rather voyeuristically watched and unashamedly photographed during their intimate coupling. **From left the right** – the pair as I first spied them when I thought a savage act of cannibalism was being played out in my spare room • A close up of the pair during copulation - in this photo you can clearly see the female's *epigym*, and the male's enlarged *palpal bulbs*, the ends of which are inserted into the female's genital cavity so that sperm can be transferred • Now that she has mated, this female Daddy Long-legs will soon lay her eggs. As seen in the photo here of a female I observed in my lounge room last year, the newly-mated female will wrap her eggs in silk and carry them around in her *chelicerae* (jaws) for about 3 weeks until they hatch. I always think how very pretty and rather raspberry-like these delicate bundles of eggs are. A clutch of eggs like this may contain more than 50 eggs, with females laying a total of up to 400 eggs during her 3 year lifespan.



I was very interested to read that female Daddy Long-legs spiders will mate with several males before laying her eggs, but that it is only the first male that is allowed a long period of copulation extending to sometimes more than hour. Subsequent males, although welcomed and allowed to mate, may only be granted a few

minutes of the female's time before he is chased away, and he will need to be quick if he wants a chance to contribute to the paternity of offspring. In light of this, and given that a female Daddy Long Legs spider may lay up to 8 clutches of eggs during her lifetime, it seems that the girl in my spare room, while possibly not a virgin, was mating for the first time this season and may soon mate again.

It's also worth noting that, although both male and female spiders have a pair of sensory appendages known as *pedipalps* located at the front of their cephalothorax, it is only males that have *palpal bulbs* on the last segment. Although used to transfer sperm, the palpal bulbs do not actually produce spermatozoa. Instead, the male spider exudes sperm from a genital opening on his abdomen and deposits it on the top surface of a small, specially constructed "sperm web". The sperm is then taken up from the web and into the sperm ducts of the palpal bulbs so it can be released into the female's genital cavity via the *embolus*, the end-most segment of the palpal bulb which is inserted during copulation. This snippet of information is applicable not only to Daddy Long-legs but to the majority of other spider species. Now that I know what's going on under my roof when the spiders think I'm not watching I will definitely be keeping an eye out for the pre-coitus preparations of male spiders!

Daddy Long-legs Spiders belong to the spider family **Pholcidae**. The most common spider in the family, and the one most people think of when a Daddy Long-legs is mentioned, is *Pholcus phalangioides*, a cosmopolitan spider that is found in houses around the world, including Australia. Although this introduced species is the most commonly encountered Daddy Long-legs Spider, Australia is home to about 60 described native species but, unlike the house-loving *Pholcus phalangioides*, these native species usually only occur in natural environments. For this reason it is more likely than not that the Daddy Long-legs living up in the corner of your kitchen and leaving messy, dusty banners of web hanging everywhere is an introduced *Pholcus phalangioides*. It is also likely that the spiders in the photos above are *Pholcus phalangioides* but, due to similarities between this and the 4 native *Pholcus* species found in Australia, a definitive identification is difficult based solely on these images.

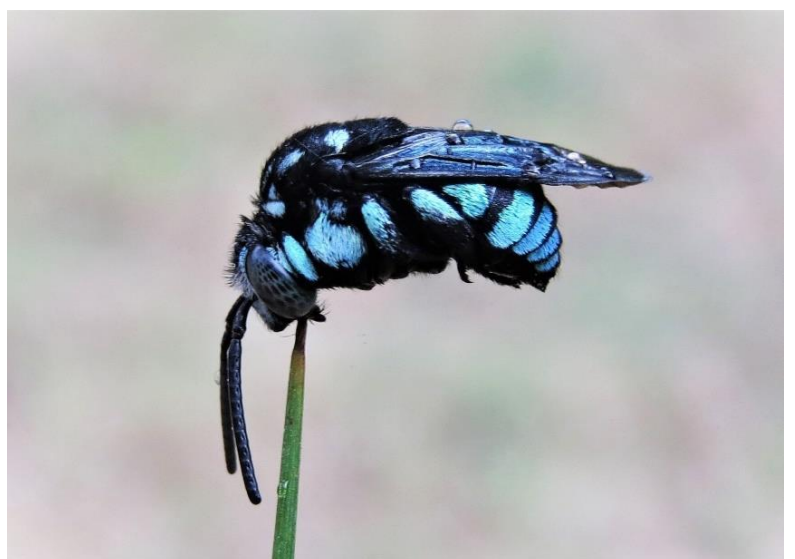
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## NEON CUCKOO BEES

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A **Neon Cuckoo Bee** (*Thyreus nitidulis*) is a strikingly beautiful insect but despite its hard-to-miss electric blue and black colouring can be surprisingly hard to find. It can also be incredible difficult to photograph unless, as I did in Wandella on several occasions, you happen to catch one napping.

**AT RIGHT** – I photographed this **Neon Cuckoo Bee** (*Thyreus nitidulis*) in Wandella on a cool damp afternoon in December 2016. Cuckoo bees are also known as Cloak-and-dagger bees, a term that probably refers to the female insect's stealthy habit of laying her eggs in the nests of other bees. **A fun fact** - The specific epithet *nitidulis* in this insect's scientific name is derived from the diminutive of the Latin adjective "nitidus" and means "little shiny one".



None of the 4 Australian cuckoo bee species in the genus *Thyreus* build their own nests. Like cuckoo birds that get another species to raise their young, female cuckoo bees lay their eggs in the nests of other bees, and actively seek out the burrows that female blue-banded bees are preparing for their own young. When such a nest burrow is found, the cuckoo bee will enter while the blue-banded bee is away and lay an egg. The young cuckoo bee when it hatches will eat the larder store of nectar and pollen intended for the nest-owner's larvae and then spin a cocoon and pupate. By the time the young blue-banded bee hatches, the larder is empty and it will starve to death.

This month Joy Georgeson and myself were thrilled when we not only *saw* a Neon Cuckoo Bee but quickly realised that it was a female, and that she was trying to find a blue-banded bee nest in which she could lay an egg. While I was aware that this was very much the habit of cuckoo bees I had never observed the behaviour before, and was surprised at how low, methodical and almost grid-like the cuckoo bee's flight was as she moved backwards and forwards across the ground. On two occasions the cuckoo bee landed to inspect a burrow but did not enter either. Her inspection of the burrows not only gave great insight into the behaviour of cuckoo bees but also helped me understand where blue-banded bees nest, the type of ground they typically select and how to identify the nest sites for myself. Although I have spent much time over the past few weeks practising my bee burrow seek-and-find skills I fear I am a long off reaching the level of expertise displayed by the Neon Cuckoo Bee.



**AT LEFT** - An absolutely rubbish photo I took of the Neon Cuckoo Bee as she sought out the nests of blue-banded bees. In case you're unsure of what you're looking at, the cuckoo bee is that bright blue blob on the left-hand side of the photo. On the right-hand side of the photo you can see the entrance to a blue-banded bee's nest burrow and the mound of loose soil that she excavated with her jaws to construct the cells in which she will lay her eggs. It may not be up to National Geographic standard but I think this photo tells a great story.

And that, my friends, is the end of NATURA for this month. I hope you have found it an interesting read because, with nearly 250 observations made during February, I found it difficult to decide which ones I should include and which ones I could leave out. In the end, I opted for a mix of some species that you were likely to encounter and some other less common or even rare species. I had the same problem when selecting the information I should include for each featured creature, especially the crickets, Cabbage White butterflies and Daddy Long-legs because all three can be considered as pests and are often killed. It's my hope that a greater understanding of these insects and spiders lets you see them in new light and appreciate the benefits they bring to our homes, gardens and wilderness areas. Despite the age-old adage, ignorance is NOT bliss when it comes to biodiversity and the environment and I encourage you all to embrace and celebrate the bugs in your own backyard.

Until next month be kind to each other and the environment,

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