

# The CROSS-POLLINATOR

**Issue 31, Apr 2022**

**Newsletter of the  
Australian Native Bee Association**

Original articles, new information and news  
from the world of native bees

<https://ANBA.org.au/>

We acknowledge and pay respect to the past, present and future Traditional Custodians and Elders of this nation and the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.



Australian Native Bee ASSOC

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## Great Carpenter Bee (*Xylocopa (Koptortosoma)*)

According to Remko Leys most likely *X.(K.) aruana* but could be *X.(K.) lieftincki*

Read the first part of a marvellous new series on carpenter bees by Dr Katja Hogendoorn

Image: Dan Smailes,  
Fitzroy Island, Qld

**Disclaimer** The Cross-Pollinator is a forum to people to express their views and observations. The author of each article is responsible for the statements expressed within; their opinions are not necessarily those of the ANBA.

## Message from the Management Committee

Dear members,

We are currently focussed on planning our conference, to make it as informative and enjoyable as possible. Take a look at all the latest news on pages 14-15 of this issue. NB, Friday 22 April midnight is the last chance to get your discount conference registration. Be any early bee and grab it now.

Up your bee IQ by digesting a wonderful new series of articles coming your way from ones of Australia's true bee experts, Katja Hogendoorn from the University of Adelaide. The subject is carpenter bees, surely out most spectacular group of bees, and first in the series starts in this issue.

Our "Tips" section is also a beauty this month with Megan Halcroft bringing you her secrets to a successful bee hotel.

If stingless bees are more your thing, then check out the two articles from South America the first on their conservation and the second on their role in pollination.

Meet Sam Higgins, Co-chair of Sydney branch, on page 10. As our conference is being held in that fine city, he is one of our guys on the ground there.

Also in this issue is our summary of a meeting about native bee security and where that project is heading. Of course there is News from the Branches with notices of upcoming meetings.

Peter Stone is once again coordinating an application to the Gambling Community Benefit Fund for capital items such as IT and AV equipment, posters, signage and gaze-bos. Please get your branch wishlist with quotes to [treas@australiannativebee.org.au](mailto:treas@australiannativebee.org.au) by 20<sup>th</sup> May.

Warm regards from: Ian, Tim, Mark, Alex, Peter, Lachlan, Steve, Kit, Tobias, Dean, Jason, Lea, Lloyd, Mark, Josh, Sam, Diane and Monica

### Next Cross-Pollinator: Issue 32, May 2022

**Deadline** for contributions: 24 May 2022. Send your news/stories/notices/ events to the editor:  
[tim.heard@anba.org.au](mailto:tim.heard@anba.org.au)

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## FEATURE ARTICLE

Tim has asked me to write something about large carpenter bees of the genus *Xylocopa*. Why me? Probably because I have published several papers on the sociality of a carpenter bee species and their potential for greenhouse tomato pollination. In addition, my partner, Remko Leijs, did his PhD on the evolution of carpenter bees, and together we have investigated the correlation between morphology and mating behaviour of carpenter bees. With Richard Glatz, we have been leading the conservation action for the green carpenter bee on Kangaroo Island since 2014. So writing an article about this group of bees should be easy, right?

Well, not really! The problem is: there are so many interesting stories to tell that I struggle to write a single article. To solve this problem, I have decided to produce a large carpenter bee mini series for the Cross-Pollinator. This first article introduces large carpenter bees and discusses their nesting biology. Later Issues will contain articles about mating behaviour, buzz pollination and application in tomato greenhouses and the conservation status of the green carpenter bee, *Xylocopa aerata*.



Image: Adelaide Advertiser

## LARGE CARPENTER BEES

Katja Hogendoorn



Carpenter bees are stunning, large bees. This is *Xylocopa caerulea*, a common species in SE Asia (photo: <https://www.flickr.com/photos/budak/23046923953/> )

### What are large carpenter bees and where do they occur?

The subfamily of the carpenter bees (Xylocopinae), in the family of the Apidae, contains four tribes: the South American Manuliini, the allodapine bees (Allodapini), and the small (Ceratinini) and large (Xylocopini) carpenter bees. Worldwide there are 469 species of *Xylocopa*, classified into 31 subgenera, with between 1 and 196 species in each subgenus.

Large carpenter bees can have stunning colours, and with body lengths of between 13 and 30 mm, they are indeed very large. But they are also fast and noisy fliers, so despite their eye-catching colouration, they are very often heard before they are seen.



## *Xylocopa (Koptortosoma)*

Subtropical and tropical only

Photos: Tobias Smith



Photos: Tobias Smith

## *Xylocopa (Lestis)*

Eastern Australia



Leys, R. (2000) A revision of the Australian carpenter bees, genus *Xylocopa* Latreille, subgenus *Koptortosoma* Gribdo and *Lestis* Lepeletier & Serville (Hymenoptera: Apidae). *Invertebrate Taxonomy*, 14: 115-136.

Carpenter bees in Australia belong to two subgenera: *Koptortosoma* and *Lestis* (From: The Australian bee genera: An annotated, user-friendly key" by Tobias J. Smith, 2018 )

Carpenter bees are found on all continents except Antarctica, throughout tropical, subtropical, arid and Mediterranean climates. In Australia, only eight species in two subgenera are present. Six species belong to the very large subgenus *Koptortosoma*. The females of the Australian species are black, with a mat of yellow hair on their thorax. The subgenus *Koptortosoma* has a broad African - Asian distribution. The other subgenus, *Lestis* has two species and is endemic to Australia and PNG. The forebears of both subgenera arrived in Australia from the north – *Koptortosoma* around 10 MYA, but for *Lestis* the time of arrival is unknown. In Australia, *Koptortosoma* species have a (sub)tropical distribution. Of the two *Lestis* species, *X. bombylans* or the peacock carpenter bee occurs from PNG to just north of Sydney. The green carpenter bee, *X. aerata*, occurs from the North of NSW east of the Great Dividing Range, and on Kangaroo Island. We will explore the reasons for this disjunct distribution in a next article.

### Nests in wood

The name *Xylocopa* is derived from the fact that these bees dig their own nest in dead wood: *Xylocopa* literally translates to 'She cuts wood' or 'I cut wood'<sup>1</sup>. And indeed, 450 of 469 species use dead wood as their nesting materials (some nest in the ground). However, the woody materials used differ vastly between species. Some species can only nest in relatively soft wood, or in hollow stems, while others dig their nest in structural

<sup>1</sup>Remko and I were very pleased when our son chose the name *Xylocopa* for his carpentry business!



Four active nests of *Xylocopa (Koptortosoma) pubescens* in an observation board. Brood is in various stages of development (photo: Remko Leijs)

timber and, impressively, in hard wood. The morphology of the mandibles varies with the type and hardness of the nesting substrate. But even the species that make their nest in hollow stems will cut wood, they use scrapings from the internal nest wall to make the cell closures, which consist of sawdust mixed with saliva.

Inside the nests, carpenter bees make one or more series of cells. Each cell has a pollen loaf and an egg. The contact between the pollen loaf and the cell wall is minimized as the loaf itself stands on three dainty legs. This is possibly to minimise the chance of the contents going mouldy. The females probably also add strong antifungals to the larval provisions. Some carpenter bee species, notably those nesting in existing hollows, will arrange their cells along one line, while others can dig extensive nests with many galleries. Nests are often reused over several generations, and if there is room, the galleries are often extended.

### Life cycle

Nests of most *Xylocopa* species are founded by solitary females. If a nest can be re-used, for example after winter, the overwintered females may compete for the possession of the nest. For some species, this competition to win dominance can include competition over the pollen in individual cells. One female would provision a cell and lay an egg. The next day, the other female opens the cell, eats the egg, re-works the pollen ball, lays her own egg and closes the cell. A day later, the female that laid the first egg may repeat this sequence. After a number of these egg replacements, and some fighting, one of the females will leave, and the reactivated nest becomes solitary. However, it is also possible that non-reproductive females remain present in re-activated nest.

### Overlap of generations

Large carpenter bees are long-lived bees: most species live about one year, but some species can even live two years. This longevity is probably related to the fact that the brood in the nest requires protection. The larvae and the pollen supplies are a juicy bite of protein, sought by birds, monkeys, ants and beetles. In addition, the cell closures are made of saw dust, and therefore easily demolished by intruders. So the female needs to be present to protect the nest against predators.

Furthermore, finding suitable nesting substrate can be difficult, and digging a nest can be a lot of work. There-

fore a nest is prime real estate for others of the same species, and nest owners can be usurped by other carpenter bee females. When that happens, the usurper generally demolishes all brood cells of the previous owner. So if the mother would die before her first offspring eclose, it is highly likely that the nest as a whole will fail due to either predation or take-over. This provides strong selection for the mother to remain present until her offspring eclose.

### Young adults

The presence of sawdust from the cell closures outside below the nest entrance is a give-away that one or more young adults have emerged from their cells. In addition, adult faeces is often seen hanging from the entrance at this stage. The young males and females will not leave the nest for more than a week after eclosion, and they use the nest entrance as a poop deck! The mother still forages, and upon her return she will feed her adult offspring nectar trophallactically (that is, mother regurgitates nectar that her offspring then consume). The young adults will also eat the pollen brought back by the mother. So carpenter bees care for their offspring into adulthood.



Whether a single or more than one generation can be produced depends on the climate. For example, on Kangaroo Island, the green carpenter bee (*X. aerata*) produces a single series of brood cells between mid-October and early December. Adults of the first offspring eclose around the beginning of February, and the climate doesn't allow an additional generation. The young adults will overwinter and reactivate the nest in spring. But on warm winter days, they may leave the nest to forage. The mother dies during autumn. By contrast, in Queensland, the peacock carpenter bee can produce more than one generation, and this can lead to periods of sociality.



## 'Social' nests

Unless the nests are very large, there is a single reproductive female in each nest. In climates where more than one generation can be produced, nest mates of the same and different generations may compete for the position of the reproductive dominant. During my PhD - -now longer ago than I like to remember - I studied social nesting in the species *Xylocopa (Koptortosoma) pubescens*, specifically between mothers and daughters.

During periods of competition for reproductive dominance, both mother and daughter collected pollen for a few days, after which they started to fight. The fights usually lasted one or two days, and had two possible outcomes. The first was that the mother remained the reproductive female, in which case the daughter invariably left the nest, presumably to try her luck elsewhere. The other was that the daughter took over the position of sole reproductive in the nest. In the latter case, the mother generally remained in the nest, but she was tolerated only in the nest entrance corridor. She would leave the nest once a day, presumably for a nectar flight, but she would not collect pollen or reproduce.

In effect, the mother becomes a guard bee. A guarded nest is protected against usurpers and predators, so, by

remaining as a guard, the mother protected her own brood that was still present in the nest, as well as that of her daughter. This is special, because outside of mammals, old females that have a prolonged post-reproductive period are unknown. And even within mammals, it is quite rare.

In large carpenter bees, multi-female nests can also have pre-reproductive females that remain in the nest. They probably do so because they cannot find any nesting opportunity, and cannot gain dominance in the home nest, so they are referred to as hopeful reproductives. They are probably tolerated because their presence protects the nest against predators and usurpers.

The multi-female nests are often referred to as 'social', but there is an important difference with true sociality. In the case of *Xylocopa*, the reproductive female does all the work: cleaning, digging, cell preparation, provisioning and closing of cells. All other females in the nest are just 'hangers-on'. Sociality is defined as having a cost in direct reproduction for an 'altruist', or worker. In the long-lived carpenter bees the cost of delaying reproduction may be tiny for the hopeful reproductive female, as she does not work.



The mother has relinquished reproductive dominance to her daughter and becomes a guard bee for the rest of her life mother (Photo: Katja Hogendoorn)



Large carpenter bees produce eggs that are longer than the female's abdomen (photo: Katja Hogendoorn)

### Speculations about eggs

As I am writing this article over Easter, it is appropriate to say something more about eggs. The eggs of *Xylocopa* species are extremely large – they are longer than the abdomen of the female. After sufficient pollen and nectar has been collected to provision a cell, a female of *X. pubescens* would lay on their back on the collected pollen heap for about 1-2 hours prior to making the pollen loaf. I have always speculated that this period of rest was needed to fully shape the egg. It seems inconceivable that, with an egg of that size in her abdomen, a female would be agile enough to forage.

There are potential reasons for and implications of the production of large eggs. Speculatively, one of the reasons may be that the female aims to minimise the time spent provisioning the solitary nest, and that she is a hurry to have her nest protected by her young offspring. A large egg contains pre-digested protein, so that means that less food need to be collected for the larva. In addition, the large egg produces a large larva that can consume the larval food quicker. So by producing a large egg and feeding pollen to the young adults instead, the female may be curtailing the vulnerable solitary period. Some evidence in support of this hypothesis is that, after eclosion, the young females of *X. pubescens* require feeding on pollen and nectar to completely develop their wing muscles and ovaries. But this remains speculation and much more research is needed.

The large egg may also have implications for the evolution of sociality in large carpenter bees. Social behaviour can evolve when the increase in reproductive output of one female, due to the help provided, is sufficient to compensate for the loss of direct fitness incurred by the helper. It is conceivable that the large egg precludes any increases in the reproductive rate, and that therefore true sociality, with foraging non-reproductive females, has not evolved in large carpenter bees. This is also speculative, but it would be great to see that experimentally tested!

### What about the males?

So far, we have only been talking about females. In the next edition of this mini-series, males, mating behaviour and morphology – including the stunning colours of carpenter bees – will be the focus of attention.

### Further reading

For further reading about historical biogeography of *Xylocopa*, I recommend Leys et al. 2002. For an overview of sociality and for the lifecycle of the Australian green and peacock carpenter bees, please see Steen and Schwarz 2000. Papers from Garófalo (Brazil), Gerling (Israel), Watmough (South Africa) and Maeta (Japan) provide several insights in carpenter bee sociality.

Leys R, Cooper SJ, Schwarz MP, 2002. Molecular phylogeny and historical biogeography of the large carpenter bees, genus *Xylocopa* (Hymenoptera: Apidae). *Biological Journal of the Linnean Society* 77(2):249-66.

Steen Z, Schwarz MP, 2000. Nesting and life cycle of the Australian green carpenter bees *Xylocopa (Lestis) aeratus* Smith and *Xylocopa (Lestis) bombylans* (Fabricius) (Hymenoptera: Apidae: Xylocopinae). *Australian Journal of Entomology* 39(4):291-300.



Male *Xylocopa* are often spectacular. Their looks are related to their mating strategy. In a next edition, we will find out how. The photo shows a male *X. sonorina* of central and northern America.



### A new review of the current global threats to survival of the stingless bees (Meliponini)

Pollination by insects is an essential ecosystem service. In tropical regions, many native plants naturally depend heavily on stingless bees as pollinators. But human generated actions are threatening their populations. A team of Mexican scientists have just reviewed the factors impacting stingless bees. The reviewed studies provided convincing evidence that the paramount dangers are habitat loss, agrochemicals, competition for resources, climate change, and the introduction of exotic species, including pathogens.

Pesticides are the most used in the conventional agricultural, and although the lower doses evaluated in some studies did not cause direct mortality of wild bees, they did have harmful sublethal effects on both adults and larvae, such as physiological, morphological, and behavioural impairments, which may ultimately decrease their fitness. The use of botanical and synthetic pesticides in crop fields alters the flower visitation rates of pollinator bees, which could significantly affect yield. However, there are currently few studies on the levels of pesticides to which stingless bees are exposed to in their habitats; further work in this area will help to better understand the risk caused by pesticides on stingless bee population.

To prevent the extinction of native pollinators such as the stingless bees, governments need to develop initiatives to establish bio-logical corridors. Such actions could be crucial to conserving ecosystems that provide services by buffering the joint effects of habitat loss and climate change. According to different studies, protecting conserved areas and restoring disturbed areas could improve habitat connectivity and safeguard ecosystem services, which could facilitate the dispersal and establishment of wild bees during distribution shifts.

Promoting urban gardens could be an option to offer food resources for species that inhabit urban areas. This technique has been shown to promote foraging by the Australian stingless bee *Tetragonula carbonaria* even more than natural habitats and plantings, increasing resource availability and potentially enhancing bee fitness.

The authors also provide perspectives for better understanding these threats and options to address them. If we are to protect wild bee populations from extinction, it will be essential to develop policies and research related to the protection of the ecological areas of these important pollinators around the world.

Citation: TOLEDO-HERNÁNDEZ, E., PEÑA-CHORA, G., HERNÁNDEZ-VELÁZQUEZ, V.M. et al. The stingless bees (Hymenoptera: Apidae: Meliponini): a review of the current threats to their survival. *Apidologie* 53, 8 (2022).

Full article is available for free download here: <https://doi.org/10.1007/s13592-022-00913-w>

### Global threats to stingless bees

Habitat loss

Agrochemicals

Climate change

Introduction of pests and pathogens

Competition for resources



# Pollination of açai palm in the Amazon by native bees

When you next enjoy a bowl of açai (acai) in your favourite café, spare a thought for the hard-working stingless bees that are essential for production of the fruits used to make the tasty and healthy pulp. Acai fruits grow on a palm tree in estuaries and flood plains of the mighty Amazon River. Acai is a species that depends on cross-pollination between male and female flowers on different palm trees. When searching for food, insects carry pollen from male to female flowers where pollination occurs. Crucial are the abundant and diverse native bees that abound in the semi-natural farming areas. More than 90% of acai pollination is carried out by native bees both social stingless (60%) and solitary halictid (35%) bees which are more efficient in the transport of pollen than the other insects.

Giorgio Venturieri, now living in Brisbane and running Nativo stingless bee business, and colleagues showed that fruit yields could be increased by introducing hives of stingless bees, particularly in the areas close to the hives. However colonies of bees can be hard to come by, so maintaining the forest around plantations, contributing to natural pollination, is still the best option for the producer.

Alistair Campbell, Elinor Lichtenberg and colleagues have been extending our understanding of this system. Recently they studied the effects of land use change on stingless bee communities and their pollination services to acai palm in the Amazon. They compared traits of stingless bees visiting acai inflorescences across a land use intensity gradient (low to high forest cover) and



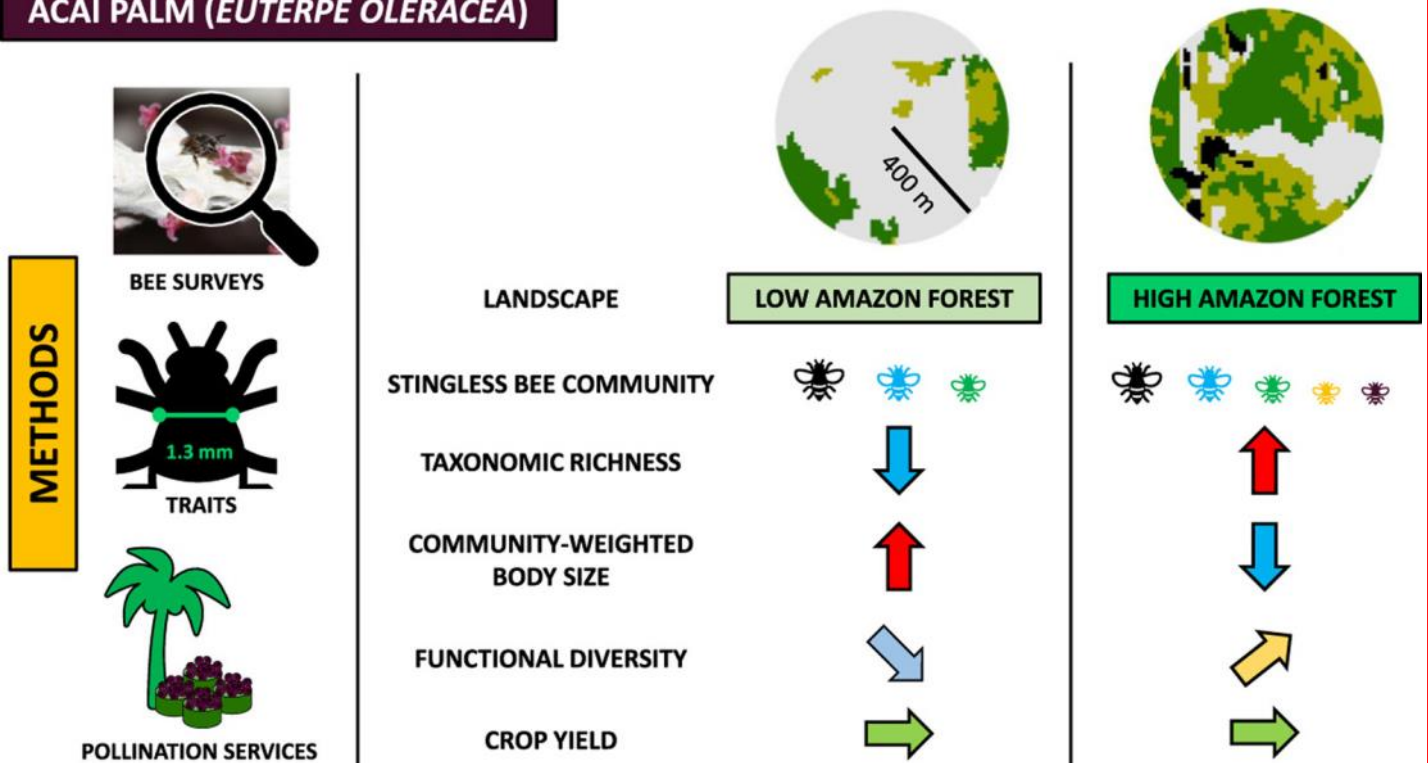
Photo: Cristiano Menezes

showed that large tracts of minimally disturbed tropical rainforest are vital for the conservation of diverse stingless bee communities.

There is high functional diversity (that is, many species fill the same ecological role of pollination) in stingless bee communities in these forests. This diversity buffers acai pollination services to loss of the sensitive bee species that do not survive disturbance. Thus, conservation strategies must focus on protecting wider biodiversity, not just ecosystem services, to guarantee conservation of native stingless bee taxa. Doing so will safeguard crop pollination services, the pollination of native plant communities, and the long-term resilience of Amazon forest ecosystems.

**Citation:** Alistair Campbell, et al. (2022) High bee functional diversity buffers crop pollination services against Amazon deforestation. *Agriculture, Ecosystems & Environment* Volume 326, 107777, <https://doi.org/10.1016/j.agee.2021.107777>

## ACAÍ PALM (*EUTERPE OLERACEA*)



# Meet the new Management Committee

**Sam Higgins, Co-chair Sydney branch and ANBA Mgt Cmt Rep**

I often joke with my friends that all Higginses are closet farmers.

So, watching Landline on a Sunday was a common, if somewhat unusual, habit for a city dweller. Indeed, it was a well-worn ritual to sit down after I'd mowed the lawn or cleaned the pool and see what was happening in the rural and regional Australia.

I still remember standing in the loungeroom on a hot summer day in Brisbane in 2006 when I saw an episode on Australian Native Stingless Bees as the basis for pollination services. But this wasn't the first time I had encountered these amazing insects...

I was only 12 years old when my family moved to Darwin. And it was there I had my first encounter with native bees when I discovered a nest within the concrete Besser blocks of our house.

The strange black stingless creatures were distinguished from the much nastier paper wasps common in the NT by a school friend with Aboriginal roots. He identified them as sugarbag or bush bees and lamented the fact that we weren't going to get the honey out of the wall.

Fast forward to 2006 and that fateful episode of Landline. My curiosity was once again ignited and I went on the hunt for information, determined to learn more.

After joining the ANBees Yahoo Email Group and "listening" to a small group of enthusiasts and experts I bought a copy of John Klumpp's fantastic book "Australian Stingless Bees: A Guide to Sugarbag Keeping".

By 2010 I had acquired my first hive from Tim at Sugarbag Bees and attended my first workshop a year later. By then I'd propagated a second hive and over the next five years would propagate numerous hives which I placed with "foster" families in exchange for shared native bee honey harvests.

After moving to Sydney in 2015, I acquired my first Zabel hive from Russell and Janine so I could continue my urban farming as a stingless beekeeper in the Inner West. I've tested hive designs from various sources including cold weather light weight designs from Alex Derrick from Spicers Hollow Native Bees.

I'm probably most fascinated by the honey of our stingless bees and was honoured to fill the previous shoes of Tobias Smith (2019) and Dan Smailes (2020) as the judge for the native classes of the National Honey Show at this year's Sydney Royal Easter Show.

I strongly believe that for professional and amateur enthusiasts alike there is much promise in our fledgling industry now and into the future.



Sam, assisted by his steward Dr Patrice Newell, judging Native Bee Honey at Sydney Royal Easter Show



# Tips on rearing bees

## Why do we install “bee hotels” in our gardens?

By Megan Halcroft

As we clear land for human developments such as houses, roads, farms and infrastructure, we remove nesting substrate that bees need to nest in and rear their offspring.

About 30% of our solitary bees nest in above ground, pre-existing cavities, such as borer holes in dead or dying trees and limbs, under bark, rotting wood and hollow stems.

To make our bee hotels (or more accurately, bee nurseries) attractive to our hard working, solitary, native bees, the structures should mimic nature.

When creating, or purchasing, a bee hotel, you should consider the following features:

- ◆ burrows should have a ‘blind’ end. Don’t drill all the way through the wood, or have a backing board to contain the materials.
- ◆ burrows should include a variety of sizes (3 – 8mm in diameter). This encourages a variety of different sized species to nest in them.
- ◆ burrows should be as deep as possible. This caters for the nesting preferences of all varieties of cavity-nesting species. Depth will be dictated by the length of drill you can buy or the natural inter-nodes of stems. Yes, you can drill out the nodes if you want.
- ◆ the edges of the burrows should be smoothed off (when drilling or with sand paper) to reduce the possibility of damaging the bees’ wings.
- ◆ the materials used should be untreated. Chemicals used to preserve wood will kill developing larvae.
- ◆ materials should be sustainable and long lasting. You’ve put a lot of thought and work into this. Plus, bees will often reuse burrows over the seasons, so if they last, the bees will use them for longer.

When positioning your bee hotel, place it in at-least morning sun. Full sun, with a little afternoon shade is ideal. This helps young bees develop more quickly and ensures the nesting adults are warmed up and raring to go and forage, first thing in the morning.

(All images by Bees Business)



*Megachile punctata*, one of the Black Resin bees, exiting a drilled burrow



One of the more elaborate designs, containing drilled hardwood, bamboo and lantana stems



Many small hotels, made from a mix of drilled hardwood and hollow stems, can be placed around the garden. Preferably in a sunny position



# Biosecurity risks and threats to Australian native bees

Australia has a diverse native bee fauna that is free from many of the pests and diseases that exist overseas. But pathways for their entry exist and we must work to keep them out. Biosecurity is the responsibility of everyone. The benefits of native bee biosecurity include:

- Healthy native bees that are more productive and better pollinators,
- Lower costs and less time spent managing pests,
- Keeping our markets and opening the door to new market opportunities,
- Reduced risks when relocating bees.

Pests can be invertebrate pests (like mites or insects) or microscopic pathogens that cause disease. They could enter the country along pathways such as:

- Import of cut flowers or live plants into Australia from overseas.
- Through honey bees, e.g. viruses of honey bees may also infect native bees.
- Interstate movement of native bees.

Plant Health Australia, in collaboration with the Australian Native Bee Association, hosted a 5-hour virtual workshop on Tue 29 March 2022 on potential environmental and biosecurity risks/threats to Australian native bees. Funded by the Office of the Australian Chief Environmental Biosecurity Officer, this workshop attracted over 100 people from a broad diversity of backgrounds. ANBA have been involved in this process from an early stage (see Cross-Pollinator Issue 14, September 2020).

To manage such a large audience, a series of polls were held during the day to gauge opinion. We thank the PHA team Rod Turner, Jenny Shanks and Kathryn Pagler who have done most of the work leading up to the workshop. Rod is retiring but Jenny and Kathryn will continue to drive this project. ANBA president Ian Driver held the floor for a few minutes to present our perspective. Trevor Weatherhead from the Honey Bee industry council also spoke.

Significant differences exist between the honey bee and native bee industries. The honey bee industry raises nearly \$1M to fund biosecurity. They have excellent biosecurity resources and contingency plans in case of incursion. Restrictions are in place for honey bees, but not for native bees. Little literature is available on stingless bee biosecurity threats, no diagnostic labs exist, and stingless bee brood cannot be easily inspected.

**To avoid legislation for native bees and to stay out of the sights of regulators, we need to self-manage, implement best practise, set up codes of conduct, spread sound advice and recommendations for management of native bees.** A lot of it is common

sense, such as good hygiene when managing your hive.

Some questions that we will need to discuss include whether we need Biosecurity code of practice. ANBA supports the development of a voluntary code. Do we need a research levy for stingless bees to support action? A small levy could be collected on sale of hives or honey. ANBA suggests a voluntary levy at this stage.

One of the tangible end products of this project will be a series of factsheets which will help interested parties to help to identify, protect against and report threats such as native bee pests and diseases. ANBA is working with PHA to produce these factsheets.

The development of a biosecurity plan aligns with two activities of the Native Bee RD&E plan (<https://www.agrifutures.com.au/product/australian-native-bee-strategic-rde-plan/>), including:

**4.4.2** Develop a national source of reliable quality information and knowledge about managed native bees.

**5.3.1** Understand biosecurity risks to native bees and develop biosecurity strategies, including ensuring against the import of exotic bees, pests and diseases, and protection from genetic material that may carry disease.

## What is Biosecurity for native Australian bees?

Source: Dr Jenny Shanks, Plant Health Australia

**What are native Australian bees?**

Australia has over 1,500 species of native bees which are divided into three main categories: stingless, solitary and semi-social. Native stingless bees are Australia's only truly social bees as they live in colonies comprised of a queen, male bees and worker bees. Native stingless bees produce honey (sugarbag) and can be found in tree hollows of matured trees and can also be kept in hive boxes (meliponary). Native solitary bees live alone in nests or small holes in the ground, and semi-social bees live in small groups. Both solitary and semi-social bees will use a bee hotel, whereas stingless bees will not.

**Examples of species that occur in Australia:**

- **Stingless species:** *Tetragonula* and *Austroplebia* sp.
- **Solitary bees:** Blue banded bee and Leaf cutter bees
- **Semi-social:** Reed bees, Great carpenter bees and Metallic carpenter bees

**What is Biosecurity?**

A range of day-to-day activities and practices which reduce the impact of pests and diseases on the native bee population.

- **Prevent pests entering:** stopping pests from entering your meliponary, bee hotel or nests.
- **Pick up pests early:** finding the pest quickly after it has entered the country or your meliponary, bee hotel or nests.
- **Prevent pests establishing:** putting measured in place to stop pests from establishing.
- **Prevent pests spreading:** stopping the pest from spreading beyond the initial infested area.

**Who is responsible for native bee biosecurity?**

Every beekeeper, commercial or hobbyist, whether you own one social stingless bee hive or hundreds, one bee hotel or several, museums, exhibitions, gardens, early-learning/childcare centres, schools or even businesses, everyone has a role to play in keeping Australia's native bee population healthy.

- **Beekeepers:** They are your bees and it is your industry. As a beekeeper you are in close contact with the hives, allowing you to see unusual signs early. Whether you work with one or many hives, you pose a risk of introducing pests and diseases when you work with hives. Make sure you clean yourself and equipment before entering and leaving meliponary. Also keep a look out for anything unusual.
- **Industry bodies:** The peak industry body for the Australian native bee industry (Australian Native Bee Association (ANBA)), associated branches and pollination-reliant industries promote the conservation and sustainable use of Australian native bees.
- **General public:** Everyone in the general public has a role to play, whether that be reporting something that looks unusual in social stingless bee hives or unusual looking bees in the environment, or following the appropriate directions.

planthealthaustralia.com.au

Plant Health AUSTRALIA

Australian Government Department of Agriculture, Water and the Environment



## Native Bee Workshops, events and seminars

Members of ANBA are invited to promote their events, services and products in the Cross-Pollinator.

Please send details to [comoff@australiannativebee.org.au](mailto:comoff@australiannativebee.org.au).

### Monthly live online event of the Australian Native Bee Association

#### The April meeting

Read a review of our last meeting in the Brisbane branch news page 16 of this issue.

#### Next meeting, Sunday 1st May, 1pm

#### Our guest speaker: Chris Fuller

#### Talk title: Pollination and its importance in the macadamia industry

Attend this talk to hear Chris present in his typical casual style his fantastic images, followed by a Q&A

Chris gained his interest in Australian native bees while working for over 20 years as an entomology and IPM (Integrated Pest Management) consultant to the macadamia industry on the Sunshine Coast. He currently works for Nutworks, based in Yandina, pest scouting and running a managed native bee program for their suppliers. Chris's interest now also include the education of macadamia growers in the use of stingless bees and also the safer use of agricultural chemicals when bees are 'on farm'.

Early in his career he identified how abundant the stingless bees were on certain orchards and started investigating the importance of native bees as macadamia pollinators. This, in conjunction with the decline in feral honey bees in bush surrounding the orchards, prompted him to start building and propagating hives of native stingless bees and now offers a commercial pollination service to help growers maximise crop yields.

Chris was also instrumental in sourcing bees for a New Zealand company who are developing a bioplastic through reverse engineering of the nesting material of one of the many Australian native solitary bees. Listen to this TedX talk to hear more about this project <https://youtu.be/YKj40roEX4o>.

All are welcome to attend in person at Bulimba Community Centre, 1 Barramul St, Bulimba, Brisbane. **Free for ANBA members**, \$5 for non-members. ANBA members can also attend by Zoom, a link to join will be sent by email prior to the event.

### Native Beekeeping 101 workshops by A Green Soul Native Bees

Ian Driver, at A Green Soul Native Bees runs introductory workshops in Teneriffe, Brisbane, covering both solitary and stingless bees. Workshops include presentations and information on native bees, hive splitting demonstration, honey tasting, information on building bee hotels and a kit to take home to make your very own bee hotel. Hives and other bee products available for sale on the day. For further information refer to the Workshop Brisbane website <https://classbento.com.au/native-bee-keeping-workshop-101-brisbane>.

### Native bee workshops at Uni of Qld

Dr Tobias Smith from the School of Biological Sciences is offering a range of native bee workshops for both university students and for the wider community. In these workshops, participants are introduced to native bee taxonomy and taught the techniques involved in identifying different native bee species. Save the dates, bookings available soon, <https://biological-sciences.uq.edu.au/event/native-bee-workshops>

An evening with native bees:

- 31 August 2022 5:30pm–6:30pm

Native bee identification and ecology (day workshop):

- 11 September 2022 9:30am–2:30pm
- 27 November 2022 9:30am–2:30pm



### Workshops by Sugarbag Bees

Sugarbag Bees offer seminars and workshops presented by Drs Tim Heard or Tobias Smith. If you want to learn more generally about bees, especially stingless bees and beekeeping, come along to half and full day workshops held in various venues in Qld and NSW. The workshops are a mix of photographic slideshows and practical sessions. You will learn how to divide hives and extract honey and use the bees for pollination. Attendance price varies. See here for an extensive series of educational events : <https://sugarbag.net/events>



# 3RD AUSTRALIAN Native Bee CONFERENCE

11-12 JUNE • 2022

SYDNEY • NEW SOUTH WALES

## Early bee discounts

Better be quick, early bee registrations finishes on Friday 22 April. From Saturday 23 April the registration prices go up. See all prices and register here.

<https://australiannativebee.org.au/event-4535341>.

### Note to those attending the Honey Bee congress

Although our events overlap on Sat 11 June, we welcome you to grab a day registration to our event on Sun 12 June. Get up to date on the latest native stingless bee research and practice.

## Program

The call for papers was a runaway success; we received a stack of high-quality proposals. We now have a full program. Below is the timetable of scheduled events, including the seven sessions of speakers, each delivering a 10-minute speech <https://www.anba.org.au/anba-conference-program/>.

The speakers promise to inform and entertain you on this weekend of bee learning.

### Fri 10 June

1800 Register, meet and eat at Rydges Hotel

### Sat 11 June

900	Welcome to country, welcome to conference	
930	BEE BIOLOGY & CONSERVATION	Keynote followed by talks
1100	Morning break	
1145	BEE BEHAVIOUR	Series of talks
1300	Lunch	
1415	COMMUNITY ENGAGEMENT	Series of talks
1530	Afternoon break	
1615	STINGLESS BEE PRODUCTS	Series of talks
1710	Photographic exhibition	
1730	Finish	
1900	Conference Dinner	

### Sun 12 June

900	STINGLESS BEE BIOLOGY	Keynote followed by talks
1030	Morning break	
1115	CROP POLLINATION	Series of talks
1245	Lunch	
1345	STINGLESS BEE MANAGEMENT	Series of talks
1445	Afternoon break	
1530	Q&A stingless beekeeping	Chance for all to participate
1615	Hive exhibition / open bar	Outdoor event
1730	Finish	
1800	Unwind with a drink and eats at Rydges Hotel	





## Conference dinner

Most of the conference registrants currently booked are attending the dinner, so relish this chance to meet new and old friends and colleagues.

## Social mixers (Friday and Sunday evenings)

We invite all delegates and their partners to a social mixer on the evening of Friday 10th June. Join us from 6 pm at the Post bar at Rydges hotel Parramatta, 116-118 James Ruse Drive, Rosehill, just over the road from the conference venue. We will have a registration desk open there so you can get that formality done, then buy yourself dinner and drinks.

We will also book a space after the end of events on Sunday evening to celebrate, chill, and say farewell to friends and colleagues, old and new.

## Photographic exhibition

Details coming soon. For the moment start digging up your best photos to enter this free competition.

## Hive exhibition

To show-case and promote the diversity and ingenuity of our native bee keepers, we are once again finishing our conference with this popular, friendly but gently competitive event. Please consider entering your hive, accessory or bee hotel. Fame and fortune await the winners. Anyone is allowed to enter and it's free; just turn up with your exhibit with a sign to describe it and builder name and contact. Also be prepared to describe it verbally to the crowd. Sales on the day are welcome.

### The Rules are:

- Hives must be able to house native bees, but can be any shape or design, and made of any material
- Hives can be empty or preferably stocked with bees, ideally you have one of each.
- Hives can be standard hives which are painted/ decorated. Fire up your creative side!
- There is no limit to the number of individual entries.

### The Categories are:

- People's choice (secret ballot),
- Judges Choice,
- Best Paint Job,
- Best Native Bee/ Insect Hotel,
- Best tool, device or accessory.

The hives stocked with bees can be delivered on Saturday morning and left opened for the weekend of the conference. Otherwise just bring them along closed for the Sunday. Conditions are likely to be cool in June in Sydney, which should reduce stress on the hives.

## Q&A stingless beekeeping

Following the session on Stingless bee management, consisting of a series of talks, we offer you access to a panel of experienced practitioners ready to answer your questions. This is also an opportunity to present to the audience your own observations, discoveries and breakthroughs.

## Accommodation

If you're going to Sydney and need accommodation, then we recommend you start looking soon. Many of the hotels around the venue are getting heavily booked for the Australian Honeybee Congress which overlaps with ours, in both time and place. So far, we have been able to get a discount on just one hotel, APX Parramatta, <https://www.apxhotelsapartments.com/parramatta/>.

Go ahead and book with Crystal directly by email, [sales@apxhotelsapartments.com](mailto:sales@apxhotelsapartments.com), or phone 02 9291 1988 / 0401 115 174. Mention our conference and get a discount.

## Trade Tables

A few tradeshow tables are still available. Join the nine exhibitors already booked in, including commercial operators, educational institutes and one from the joint Brisbane / Sydney ANBA branches. The tables are situated in the catering space where all breaks will be held. Take advantage of this opportunity to pitch to a large representation of the Australian native bee community. Get more info here: <https://www.anba.org.au/anba-conference-sponsors/>

## Sponsorships

We have already signed up five sponsors but welcome more. We sincerely thank the following for their generous financial support, Agrifutures Australia, Aussie Bee, Bush Bees, Tabulam Real Honey and University of Queensland. You could be the next <https://www.anba.org.au/anba-conference-sponsors/>



### Brisbane Branch News

#### Report of April meeting

We were treated to an excellent talk from our guest speaker Dr Ros Gloag from the BEE Lab, University of Sydney. If her name sounds familiar, it's because she was the author of the Feature article in the last issue of the Cross-Pollinator (Issue 30 March 2022)

[“Olfactory eavesdropping in Aussie stingless bees”](#). There you can read a biography of her and enjoy one another of her recent studies on stingless bees.

We managed to recruit Ros to speak as she was in town with two students conducting a series of studies on stingless bees. Hopefully these students will be the next in line after Francisco. Some of you will have met Francisco Garcia BB while he was in Australia. Francisco studied under the supervision of Ros. He was, in fact, her first PhD student. Francisco will be back in Australia for his graduation ceremony (and hopefully also to attend and present at the Australian Native Bee Conference, in June.

Ros and students are using their high-level genetic skills to investigate several questions, including the reproductive isolation of *Tetragonula* (why don't the closely related *T. carbonaria* and *T. hockingsi* interbreed to form hybrids). She is also starting work on some of the pests, including the parasite *Syntretus* (that some of you may have observed emerging hideously from the back end of living stingless bee adults).

Another piece of work that Ros is engaged in was the title of her talk:

[“Queensland's \*Tetragonula\*: How many species are there and what can they tell us about how new species arise?”](#)

There are five *Tetragonula* species on Australia's East Coast (*T. carbonaria*, *T. davenporti*, *T. hockingsi*, *T. sapiens* and *T. clypearis*) but the precise distributions of some of these species have been difficult to confirm due to their cryptic morphology. New evidence shows strong genetic structure in some species and suggests we need to reassess exactly how many species occur and where. Moreover, the surprisingly cryptic genetic diversity of our Aussie stingless bees suggests that they have a lot to teach us about the process of speciation itself. What general lessons can we learn about how new species arise? She explained a new project underway, funded by The Australian Research Council, that will use stingless bees to reveal secrets about how natural selection produces new species, and the important ways in which keepers and lovers of our stingless bees can contribute to this research.





### Brisbane Branch News (continued)

**After the talk and questions, we dealt with some branch matters., including the next Hive exhibition**

We encourage attendees to exhibit their hives at the Sydney conference. Don't miss this chance to show your hive for a large and eager audience. Sugarbag Bees are planning for a vehicle to drive from Brisbane to Sydney to take hive exhibits. We can take a limited number of hives for other exhibitors. The hives will need to be delivered to a central point probably West End by morning of 9<sup>th</sup> June (address and date to be confirmed). Exhibits could be stocked or empty hives. We will be transporting our own stocked hives and we can also deliver living hives for others. Those who wish to exhibit hives designed for internal observation, should especially consider entering stocked hives. We are also happy to take empty hives which will of course be much simpler to transport. The hives will be opened for the weekend of the conference then closed and returned the following week. Conditions are likely to be cool, especially in Sydney, which should reduce stress on the hives.

### Next meeting—May

Our next meeting will be held on Sunday 1st May 1pm, at Bulimba Community Centre, 1 Barramul St, Bulimba. Chris Fuller will be speaking. See page 13 of this issue for full details.

Free for members, \$5 for non-members. ANBA members can attend by Zoom, a link to join will be sent by email prior to the event.

For more info on branch activities, visit our Facebook page **Brisbane Branch, Australian Native Bee Association**, <https://www.facebook.com/bnbeec>.

### Rockhampton Branch News

ANBA Rockhampton Branch next meeting is planned for the 14<sup>th</sup> of May starting at 9am. At Dave Goodall's Residence. Further details on the meeting will be sent to our local members.

ANBA Rockhampton Branch has been invited by the Fitzroy Regional Beekeepers Association Inc. to take part in their bee keeping display at this years Rockhampton Agricultural Show. 8-10 June 2022. A great chance to fly the flag for the ANBA and also display some native bee products.

*From Lloyd Younger*



### Wide Bay branch news

Wide Bay branch held a successful Native Bee Workshop on Sat 26th March. The branch executive members, shown here from left, Josh, Adam, Stephan and Brendan organised everything including a transfer of a *T. hocking-si* colony into a hive box, see the healthy brood comb in the image on the right.



For more info on branch activities, visit our Facebook page, <https://www.facebook.com/Australian-native-bee-association-Wide-bay-branch-112512193439742>





### Gladstone branch

Our planned meeting / workshop for Saturday 26<sup>th</sup> March went ahead at Tannum Sands with a strong attendance of 18 members. An informal meeting started with a very tasty morning tea followed by a very brief meeting to bring members up to date with what has been happening in the bee world.

A lot of healthy debate was held around management of the water meter rescues from Gladstone Regional Council and President Mark is going to put together a proposed management procedure. Based on his own experience, Doug Stephan is also going to put together some points on how to prepare a new box before introducing a colony to improve chances of success.

With the meeting closed, it was now down to the fun part that most came along for and that was to demonstrate some practical bee keeping.



**TH Hive Split** First up was a very informative hive split demonstration that Michael Mann had brought along. By Michael's own admission, he had no idea what it might be like inside. Once opened it was obvious that it was very full and could certainly be split successfully. The only problem we noticed straight away was the support bars were made of very thin ply and over time had basically rotted away and not providing any support. After some honey tasting the split proceeded without any other problems apart from removing some of the rotted support bars and cleaning up.





## Gladstone branch (continued)

**AA hive Split:** This *Austroplebeia australis* hive had not been opened since it was rescued and first set up in Sep 2019. An earlier attempt was made at education of another hive but after some time the bees created an alternative entrance and ceased going into the education hive. Once opened, it was noted that it had a lot of vacant space in the box and it was decided not to split

**Trap Hive:** After these two activities I then took the members on a tour of my small property showing them some of my hives and providing them with some background information about where they were rescued from and how they were managed. One hive of particular interest was a trap hive I have recently set up as a trial. It happened by accident when I decided to relocate one of my hives a short distance of about 6m only to find the following day there was a lot of bees remaining at the original location looking for home and obviously disoriented. I had a failed hive with some structure still in it which I placed in the location and within 5 minutes all the disoriented bees were making their way into the new box. It is still early days but after 4 weeks the bees are still using the new box so watch this space. By the way the original relocated box is also still very strong.



*Austroplebeia australis* AA Hive not ready for splitting

From Ian Anderson

For more info on branch activities, visit our Facebook page **ANBA Gladstone Branch**, <https://www.facebook.com/groups/480678232538075>

Trap hive with relocated hive in background





### Cassowary Coast branch

**This month, instead of holding a meeting, the CCNBA manned a stall at the annual Cassowary Coast Feast of The Senses festival.**

The week long festival aims to showcase the region's impressive range of rare and exotic fruits and produce, and events are held throughout the week of the festival. The festival culminates in a market day with a variety of stalls, including our native bee stall.

The CCNBA stall had a lot going on throughout the day and was a great success. The stall had a variety of hives on display and a hive relocation and a honey extraction were conducted. Lots of people stopped by the stall to talk to members about hives in their houses, native bees as pollinators and the keeping of bees.

Keep an eye on the Cassowary Coast Native Bee Association Facebook page or your emails for confirmation of the date and address for the next meeting.

<https://www.facebook.com/groups/1703605019824793/>

*Kind Regards, Liz Lang, Secretary*





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