

Introduction to Australian Native Bees

Third Edition — PDF eBook



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Anne Dollen

Aussie Bee & Australian Native Bee Research Centre

Introduction to Australian Native Bees

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by Dr Anne Dollin
Australian Native Bee Research Centre

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All photographs and drawings are by the author, except where otherwise acknowledged in the text.

FRONT COVER

Left: an Australian *Tetragonula* Stingless Bee.
Photograph by Peter O.

Right: an Australian Blue Banded Bee.
Photograph by Anne Dollin.

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Welcome to the Fascinating World of Australian Native Bees!

What sort of bee do you think of, when you are asked about bees? Many Australians only know about the commercial honeybees which were introduced to Australia from Europe almost 200 years ago. However, Australia has a wonderfully rich variety of 'true blue' native bees. They range from big, furry, bumblebee look-alikes, to bees so tiny you can barely see them. Most Australian native bees lead solitary lives, but one type, a stingless bee, lives in large social colonies inside hollow trees.

Back in my university days, I had never heard of native bees. I was going to do a project on the behaviour of commercial honeybees. Then my boyfriend's father suggested I study the native bush bees instead, as they do not sting. It was such a great suggestion that I married my boyfriend!

Since then, my husband, Les, and I have trekked across outback wildernesses and peered down microscopes for decades in search of Australian native bees. Then we created the Australian Native Bee Research Centre and the *Aussie Bee* website to tell all Australians about our amazing native bees.

Anne and Les Dollin on the hunt!
Photograph by Jacqui Hawes.

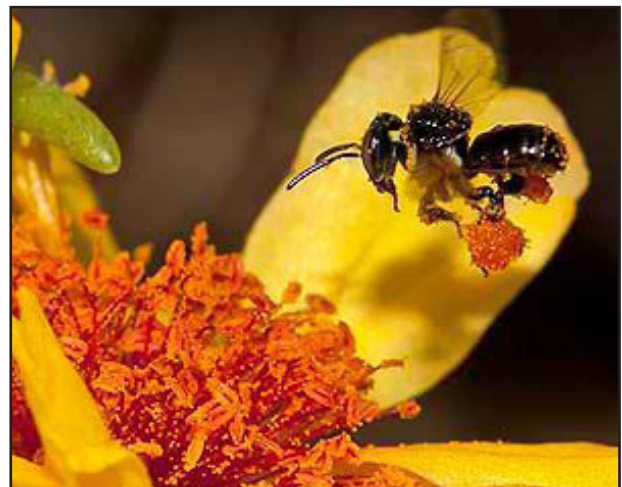


What are Native Bees?

Bees are specialised insects that gather pollen to feed their young. As they do this, they pollinate innumerable flowers and provide priceless benefits to humans.

Many agricultural crops are dependent on bee pollination — most fruits and vegetables, many fibre and forage crops, and garden flowers. Furthermore, bees are important pollinators of trees, shrubs and wildflowers in native bushland.

Just a handful of domesticated bee species, such as the commercial honeybee, some bumblebees, the orchard mason bee and the Canadian leafcutter, are used in agriculture around the world. There are, however, over 16,000 species of bees worldwide. These thousands of wild bee species are the world's native bees. The invaluable pollination service they provide for natural vegetation and for crops is rarely appreciated.



An Australian native stingless bee collecting pollen from a Portulaca blossom: one of the stunning photographs by Peter O. featured on the Aussie Bee website:
www.aussiebee.com.au

Australia's Native Bees

There are about 1,700 species of native bees in Australia. Often unnoticed, they visit flowers in gardens, roadsides, parks and bushland across Australia.

Our native bees provide a valuable pollination service for Australian agriculture and for our wilderness areas. The conservation of Australian native bees is of vital importance for Australia's future.

- A huge shiny black bee with a furry yellow waistcoat disappears into a hole in a mango bough;
- Two glossy metallic green bees perform an intricate mating dance amongst the wildflowers;
- Six fat bees with iridescent blue stripes (see photograph on right) jostle for a roost on a dry stem at dusk;
- Hundreds of tiny black stingless bees fill delicate waxy honey pots inside a hollow tree.

These are just a few of our unique Australian native bees.



Blue banded bees roosting at dusk

Two Commonly Seen Bees That are Not Australian Natives

The common commercial honeybee and the bumblebee are bees that came from overseas.

The commercial honeybee, *Apis mellifera*, seen in our gardens every day, is a European species that was first successfully imported into Australia in 1822. About eight hives were brought into New South Wales on the convict ship, *Isabella*, and were rapidly bred up to produce valuable honey and wax for the early colonists.



Today hundreds of thousands of hives of commercial honeybees are kept by Australian beekeepers. These European honeybees play a vital role in Australian agriculture. They produce our world-famous honey and are crucial pollinators for our food crops.

Unfortunately, though, swarms of commercial honeybees escape every year from managed hives. They build feral nests inside hollow trees and wall cavities and they have become widespread in the Australian bush.

Feral nests harbour pests and diseases that threaten our managed commercial honeybee hives. Feral honeybees also compete with our native birds and bees for food and nest sites. So if you find a feral honeybee nest in your yard or house, it is best to call an apiarist or a professional pest controller and have the nest removed.



Commercial honeybees, *Apis mellifera*, are about 12 mm long and are yellow brown, or dark brown to black in colour. They are social bees with a queen, males (called drones) and thousands of workers in each nest, and they can sting.

They build creamy-white vertical combs of hexagonal cells for their brood and food stores. Feral colonies of commercial honeybees usually build their combs inside a hollow tree or in a wall cavity.

Top: a commercial honeybee, Apis mellifera. Wikimedia Commons photograph by Richard Bartz. Above: a feral nest of commercial honeybees hanging from a tree branch. Photograph by David Ritchie.

However, sometimes a nest may be built in the open, under a fence or a tree branch.

When commercial honeybees want to start a new nest, the mature queen bee and hundreds of worker bees leave the nest in a large swarm. As scout bees search for a new nest site, the swarm may settle in a large cluster hanging from a branch or other support. None of the Australian native bee species forms clusters as large as this.

The bumblebee, the fat, furry bee featured in children's story-books, is not an Australian species either. In fact, Australia has no native species of bumblebees. However, feral colonies of a European species of bumblebee, *Bombus terrestris*, are now found right across Tasmania. This population is believed to have started when a single bumblebee queen slipped through quarantine into Hobart back in 1992.

Fortunately the Tasmanian feral bumblebee population has not spread to the Australian mainland. The Department of Primary Industries in each state and our quarantine services are actively trying to keep the Australian mainland bumblebee-free. For more details visit:

www.aussiebee.com.au/bumblebeesightings.html

Bombus terrestris bumblebees are large, fat, furry bees. They are black with yellow bands and a whitish tip on the end of the abdomen. The worker bees are 8 to 22 mm long, whilst the queen bees are up to about 25 mm long. Bumblebees are social bees, living in wax nests built in holes in the ground and they can sting.



A European bumblebee (Bombus terrestris).

*Photograph by Vera Buhl
Wikimedia Commons.*

Overseas, bumblebees have proven to be excellent pollinators of some crops. So in 2004 Australian horticulturalists applied to import European bumblebees for greenhouse crop pollination. However, the Federal Government rejected their application in 2008 because the proposal posed a serious risk to the Australian environment. The risk of bumblebees escaping into the environment was too great. Feral bumblebees would spread agricultural weeds and compete with native birds and insects for food. For more details visit: www.aussiebee.com.au/bumblebeedebate.html

Researchers at Adelaide University have made substantial progress in developing the native blue banded bee as a safe alternative pollinator of greenhouse crops for Australian horticulturalists. For more details visit:

www.aussiebee.com.au/blue-banded-bee-option.html

Australia's Solitary, Semi-Social and Social Native Bees

European honeybees live in large social nests with an egg-laying queen, males and thousands of sterile worker bees. However, most of Australia's native bee species live solitary lives.

Solitary native bees do not have queens or workers. Instead each female bee builds a nest by herself. They are important pollinators but they do not store honey in their tiny nests.

Solitary bees usually nest in small burrows in soil or wood, or in isolated crevices. Each female builds her own nest, stocking a cell with pollen and nectar and then laying an egg in it. The mother usually dies before the young emerge.

Whilst each solitary bee female builds her own individual nest, hundreds of females may build their nests close together at a particular nest site, in an arrangement rather like a human village. Also when a particularly-favoured flower, such as *Eucalyptus*, is in bloom, hundreds of solitary native bees may be seen together foraging on the same food source.



A solitary leafcutter bee arranging the leaf pieces inside her nest that is in a small hole in a clay brick

Some Australian solitary bees are large and furry, whilst others are small and look nearly hairless. Many species are very tiny. In fact, one of Australia's solitary bees, the 2 mm long *Quasihesma*, is claimed to be the smallest bee in the world.

Some common types of solitary Australian native bees (described in more detail below) are:

- masked bees
- leafcutter bees
- [resin bees](#)
- [blue banded bees](#)
- [teddy bear bees](#)
- [cuckoo bees](#)

Other types of Australian native bees are **semi-social**. In these species, two or more females live together in each nest and may cooperate to excavate and guard the nest and rear the young. Our semi-social native bees include the tiny slender reed bees that nest inside pithy stems and the spectacular carpenter bees that are Australia's largest bees ([see pages 7 – 8](#)).

Finally, we have eleven species of **social native bees** (see [pages 8](#) and [10–13](#)). These are our own true Australian honeybees! They live in colonies with a queen, males and hundreds of workers, mainly inside hollow trees. Our social native bees produce delicious flavoursome honey. Best of all: unlike the imported commercial honeybees, our social native bees are stingless!

Masked Bees

The masked bees (e.g. genus *Hylaeus*) are slender black bees with bright yellow markings on the face and often on the back. They build solitary nests in narrow cavities in timber or rock.

Masked bees secrete a cellophane-like material to build cells for their young inside their nests. They apply this cellophane-like material with their tongues. They have very little hair and carry their pollen back to their nests by swallowing it.

Masked bees are found throughout Australia. Most masked bees are less than 10 mm long



A masked bee with yellow markings on the face and back; one of the beautiful photographs by Erica Siegel featured on the Aussie Bee website.

Leafcutter Bees

Leafcutter bees (genus *Megachile*) are solitary bees that use pieces of leaf to build their nests inside small holes or crevices. The leafcutter female cuts a neat semicircular piece from a soft leaf and flies back to her nest with the piece of leaf held between her legs. She glues the leaf pieces into a beautiful woven capsule for her young. She stocks the capsule with a little nectar and pollen. Then she adds an egg and seals the capsule with a final plug of leaf circles.

You can be sure that you have leafcutter bees in your garden if you see the rows of neat uniform holes they make on the edge of soft leaves as they cut their leaf pieces. Leaves



A leafcutter bee cutting a piece of leaf to make cells in her nest. Photograph by Peter O.

Can Any Native Bees Sting?

Our social native bees are stingless. However, the females of almost all of our solitary and semi-social bees can sting.

Fortunately, most of these species are too small to deliver an effective sting to humans and none of our native bee species is aggressive.

Nevertheless, native bee stings can cause an allergic reaction in some people. So native bees should always be treated with respect.

favoured by the leafcutter bees include the rose, baubinia, wisteria and buddleja.

Another distinctive feature of leafcutter bees is the way they carry their pollen. They pack it in a thick pad onto an array of stiff bristles underneath the abdomen (or tail section).

Leafcutter bees are found throughout Australia but are more common in coastal areas. They range from about 6 to 15 mm long.

Resin Bees

Resin bees (genus *Megachile*) collect resin, mud or pebbles to construct their solitary nests inside little crevices. A resin bee species with a bright orange abdomen is often seen around the nests of the stingless social bees, foraging for resin for her nest building.

In Cooktown, one resin bee built her resinous nest between two books in a bookcase! Artificial nest blocks can be made for resin bees. Read how to do this in a free article on the Aussie Bee website: Aussie Bee Online Article 26 — www.aussiebee.com.au/abol-current.html

Resin bees carry pollen underneath their abdomen in the same way that leafcutter bees do.

Resin bees are found throughout Australia. They range from about 8 to 14 mm long.



A resin bee sealing her nest entrance

Blue Banded Bees

Blue banded bees (genus *Amegilla*) typically have reddish fur on their thorax, with bands of iridescent blue fur on their black abdomen. However, some may have green, reddish or white fur bands on the abdomen.

Blue banded bees nest in individual burrows in the ground or eroded clay banks. In urban areas they may nest in old soft mortar or in mud brick buildings. Artificial nest blocks can be made for blue banded bees. Read how to do this in a free article on the Aussie Bee website: Aussie Bee Online Article 8 — www.aussiebee.com.au/abol-current.html

At night groups of blue banded bees may be seen clinging to a twig or grass stem. Amazingly, they attach themselves by their jaws alone, curling their legs beneath them.

Blue banded bees are skilled at a special type of pollination called *buzz pollination* ([see box on page 6](#)). Substantial progress has been made in domesticating the blue banded bee for greenhouse tomato pollination, as an alternative to introducing European bumblebees for this purpose. See www.aussiebee.com.au/blue-banded-bee-option.html



*A blue banded bee sleeping on a stem.
Photograph by Erica Siegel.*

Blue banded bees are found in every state and territory of Australia except Tasmania. They range from about 8 to 18 mm long.

Buzz Pollination

Some plants conserve their pollen by hiding it inside tiny capsules in the flower. Some solitary and semi-social native bees can use a special technique called *buzz pollination* to collect this pollen and pollinate the flower.

The bee grasps the flower and vigorously vibrates her flight muscles, making a loud 'buzz'. The pollen spurts out of the capsules in a fine cloud. Plants that hide their pollen in this special way include native wildflowers (*Solanum*, *Senna*, *Hibbertia* and *Dianella*) and food crops (tomato, capsicum, eggplant and chilli peppers).

Teddy bear bees, blue banded bees and carpenter bees are experts at buzz pollination. However, many other species such as the native stingless bees and the commercial honeybees cannot perform this trick.



A blue banded bee buzz pollinating a tomato flower

Teddy Bear Bees

Teddy bear bees (*Amegilla*) have thick coats of golden brown fur, like miniature teddy bears. They look rather like bumblebees but they are actually solitary bees that nest in shallow burrows in clay soils. Many of their natural nest sites have been destroyed through land clearing, so some teddy bear bees make use of sheltered soil banks underneath houses for their nests.

Teddy bear bees are also excellent buzz pollinators. A loud hum heralds the arrival of a teddy bear bee back from her foraging. They are large and curious bees and may fly around a person in their flight path for a few seconds. However, they are not aggressive. Whilst they are capable of stinging if they are grabbed or trodden upon, they are industrious bees that just want to get back to their nest building.



A teddy bear bee sleeping at night on a stem

Teddy bear bees are found in every state of Australia except Tasmania. Most are about 15 mm long, though they can range from 7 to 20 mm.

Cuckoo Bees

The cuckoo bees (*Thyreus*) are amongst the most eye catching of the Australian native bees. These are bold black bees with polka dots! The Domino Cuckoo Bee (*Thyreus lugubris*) has white fur polka dots, the Chequered Cuckoo Bee (*Thyreus caeruleopunctatus*) has patches of pale blue fur and the stunning Neon Cuckoo Bee (*Thyreus nitidulus*) has patches of iridescent metallic blue fur.

*A spectacular Neon Cuckoo Bee roosting on a stem.
Photograph by Peter O.*



The cuckoo bee's habits resemble those of cuckoo birds that lay their eggs in other birds' nests. Cuckoo bees seek out the nests of teddy bear bees and blue banded bees. They wait until the nest builder has flown off to forage, then they enter the nest and lay their eggs. The cuckoo bee's young hatch and develop to maturity inside the nest, eating the food collected for the teddy bear bee or blue banded bee young.

If you have teddy bear bees or blue banded bees in your area, keep an eye out for these stunningly beautiful cuckoo bees. They are part of the natural balance of life for our native bees and create a vivid splash, not to be missed, in your garden.

Cuckoo bees are found in every state and territory of Australia except Tasmania. They are about 10 to 14 mm long.

Reed Bees

Reed bees (eg genus *Exoneura*) are examples of our semi-social native bee species. These small slender bees cut tiny nest burrows in the pithy centres of dry stems such as the flower stalks of grass trees (*Xanthorrhoea*) and the leaf stems of tree ferns.

Reed Bees will also nest in pruned or broken canes of exotic plants, including the rose, hydrangea, *Lantana* and blackberry. If you are removing infestations of *Lantana* from bushland or farms, try not to destroy populations of native reed bees that may be nesting in it. Canes containing reed bee nests can be easily cut out and relocated to other areas – see box below.

Reed bees are found throughout Australia. They are just 4 to 8 mm long.



A slender reed bee

Rescuing a Reed Bee Nest

To rescue a reed bee nest from a clump of *Lantana*, cover the entrance hole with a plug of cotton wool or tissue late in the afternoon. Cut off the cane about 50 cm from the end to make sure you get the whole nest.

Take the nest to a safe new garden location and attach the nest to a shrub using plant ties, wire or string. The entrance should jut out of the shrub but the rest of the cane should be firmly attached to the branch. Try to protect the nest from ant attack whilst they are settling in.



Left: the entrance of a reed bee nest in a Lantana cane, blocked by the abdomen of a guarding bee. To identify a nest, look for a neat round hole, 1–2 mm wide, cut in the pithy centre of the stem. You may also be able to spot the red or black abdomen of the guarding bee in the hole.

Right: two reed bees on a nest that has been opened up to show the narrow cavity excavated by the bees in the pithy stem.

Carpenter Bees

The large and magnificent carpenter bees (*Xylocopa*) are another type of Australian semi-social native bees. Like blue banded bees and teddy bear bees, carpenter bees are skilled buzz pollinators. There are two types of carpenter bees in Australia:

- the beautiful metallic green carpenter bees; and
- the bold yellow and black carpenter bees that are the largest bees in Australia.

These spectacular bees are called carpenter bees because they cut burrows for their nests into pieces of dry pithy wood. Favourite nest sites are the flower spikes of the grass tree (*Xanthorrhoea*) or dead branches of trees like *Banksia*, *Leptospermum* or mango. In the nest burrow, each egg is laid on a little mound of nectar and pollen, then sealed into a separate cell with a plug of chewed wood particles. Quite a few bees, both male and female, may share the one nest burrow.

The metallic green carpenter bees were once found in many areas of eastern Australia from Cape York to Victoria and parts of South Australia. Sadly, land clearing and the destruction of their grass tree nest sites have now greatly reduced their range. They have not been recorded in mainland South Australia or Victoria since 1938. They are about 16 mm long.

The yellow and black carpenter bees are found in northern areas of Australia — in Queensland, the Northern Territory and in northern parts of NSW and Western Australia. They are up to 24 mm long.



Top: a shiny metallic green carpenter bee.
Above: a yellow and black carpenter bee. Photograph by Peter O.

The Stingless Social Native Bees

Finally, we have eleven species of tiny black stingless bees (genera *Tetragonula* and *Austroplebeia*) in Australia. These are social bees, living in colonies with a queen, males and hundreds of workers, mainly inside hollow trees.

Aboriginal people have prized the nests of these social native bees for centuries, using the honey as an important food and medical remedy, and the nest resins as a glue for making tools and weapons.

Our social native bees are important pollinators in the Australian bush and they are also used as pollinators for some commercial crops. Their delicious honey comes in an array of tangy flavours and has been shown to have significant antibacterial properties.

A nest or hive of our social native bees makes a great addition to the backyard garden because these bees are stingless, easy to handle and fascinating to watch.

Our Australian stingless bees are tropical species so they are mainly found in hot northern areas of the country and along the east coast. They are just 3 to 4 mm long.



A stingless social native bee, *Tetragonula carbonaria*, in flight, bringing in two large balls of pollen.
Photograph by Peter O.

Creating a Garden for Australian Native Bees

You can support all of your local Australian native bees by planting a bee-friendly garden. Australian native bees need to collect pollen and nectar for their food, as well as building materials for their nests. They can thrive on a wide variety of native and exotic plants. You may even be lucky enough to have native bees nesting in your garden. Many species build tiny nests in burrows in the ground or in small holes in timber.

Food Resources

Australian native bees often enjoy the pollen and nectar of native flowers such as *Xanthorrhoea* (grasstree), *Grevillea*, *Brachycome*, *Callistemon* (bottlebrush), *Leptospermum* (tea tree), *Eucalyptus* and *Ceratopetalum* (Christmas bush). However, many are also keen visitors to exotic flowers, such as daisies (including *Osteospermum*), sweet Alice (*Alyssum*), abelia (*Abelia grandiflora*) and pig face (*Mesembryanthemum* or *Lampranthus*).

Blue banded bees, teddy bear bees, leafcutters and carpenter bees are particularly attracted to the flowers of lavender (*Lavendula*), salvia and butterfly bush (*Buddleja davidii*)*.

If you would like to watch the carpenter bees, blue banded bees and teddy bear bees performing their special buzz pollination technique (see box on page 6), try planting *Solanum rantonnetii* or *Senna* sp.



A teddy bear bee buzz pollinating a Solanum flower

In the garden, the introduced commercial honeybees generally co-exist peacefully with our native bees. We have never seen honeybees fighting with native bees when they are foraging in the garden. However, the commercial honeybee is a powerful forager — able to fly much further and earlier in the morning than most of our native bee species. So if nectar and pollen resources are limited and commercial honeybees are plentiful, the native bees could find it difficult to find enough food.

Nesting Materials

A bee-friendly garden can also help supply nesting materials for your local native bees:

— Resin bees collect resins, mainly from trees, to construct and seal their nests. Alternatively some species chew up pieces of leaf material and use this to seal their nest entrances.

— Leafcutter bees cut neat disks from the edges of soft leaves for their nest building. Favourite plants that leafcutters use include roses and the butterfly bush (*Buddleja davidii*)*.

— The social stingless bees also have to collect substantial amounts of tree resin for nest construction. In Sydney, turpentine tree (*Syncarpia glomulifera*) sap is a strong favourite.



A resin bee collecting soft red gum exuding from a tree

* *Buddleja* can behave as a serious weeds in some climates and should not be planted in those areas.

Nest Sites and Bee Hotels for Native Bees

Finally, you may also be able to provide good safe nest sites for your local native bees in your bee-friendly garden.

Many species of native bees nest in burrows in the ground. The nests may be difficult to spot, perhaps just marked by a small mound of loose soil around the entrance hole. These bees often are very seasonal, only flying for a couple of months during the warm part of the year.

Leafcutter and resin bees may build their tiny nests inside hollow stems and reed bees like to nest in the pithy canes of some garden plants such as the abelia and the butterfly bush*.

You can also make simple artificial nest sites, known as Bee Hotels, that will provide homes for resin bees, leafcutters and other solitary native bees in your garden:

- Take a block of hardwood and drill holes in it ranging from 4 mm to 9 mm wide and at least 150 mm deep. Smooth off any rough edges.
- Alternatively, tie a handful of bamboo canes (about 30 cm long) into a bundle.

Set these artificial nests up in a location sheltered from the rain. You may like to place them on a window sill so that you can watch your native bee visitors coming and going, from the comfort of your own arm chair.



A resin bee inspecting one of the nest holes drilled into this hardwood block

Read Aussie Bee's complete guide to making Bee Hotels: www.aussiebee.com.au/bee-hotel-aussie-bee-guide.html

Great caution should be taken with the use of insecticides in your garden. Many garden sprays are toxic to bees but small native bee species are often particularly sensitive because of their low body weight. If the use of insecticides cannot be avoided, use them in the evening when all the bees have stopped flying and do not spray them directly on blossoms.

* See footnote on page 9

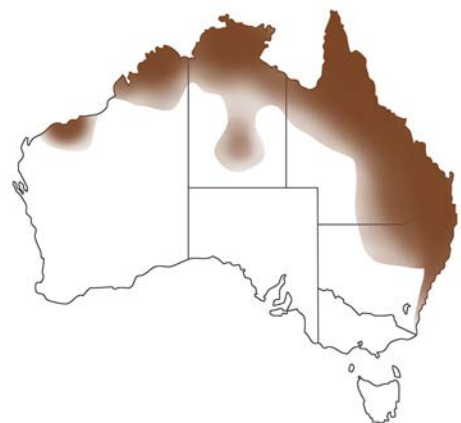
Our Australian Stingless Social Bees

Of our 1,700 species of Australian native bees, the best known are our stingless social bees. These attractive, harmless bees are kept in logs or hives in hundreds of backyards in warm areas across Australia. They are fascinating to watch for young and old. They can pollinate your vegetable garden and may even provide some delicious tangy honey to savour.

To finish off this *Introduction to Australian Native Bees* ebook, we will take a closer look at our stingless social bees.

Much more comprehensive information about the Australian stingless bees can be found in the remaining ebooks in this series (see page 14):

- *Nests of Australian Stingless Bees*
- *Behaviour of Australian Stingless Bees*
- *How to Recognise the Different Types of Australian Stingless Bees*
- *Keeping Australian Stingless Bees in a Log or Box*
- *Boxing and Splitting Hives*



Areas of Australia where the social stingless native bees are found

Australian Stingless Bee Species

Our Australian species of stingless social bees are divided into two groups or genera: *Tetragonula* and *Austroplebeia*.

The three most common species in Australia are:

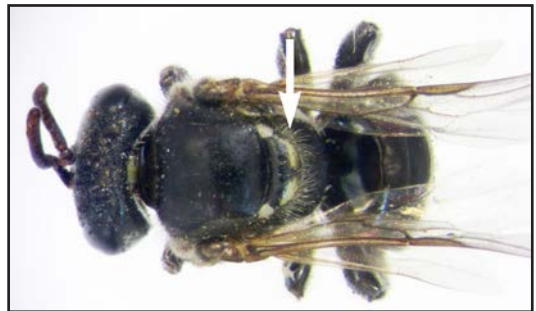
Tetragonula carbonaria, mainly found from Bundaberg in Queensland down to Bega in southern NSW. Of all the species of stingless bees in the world, *T. carbonaria* has the most southern distribution. The worker bee is black with a coating of white hair on its face and sides. It is 4 mm long.

Tetragonula hockingsi, common in northern and eastern parts of Queensland. The worker bee is also black with white hair but it is a fraction larger than *T. carbonaria*.

Austroplebeia australis, found in northern NSW and in Queensland, with varieties also found in the Northern Territory and Western Australia. This is a black bee with tiny cream marks on the back edge of the middle body segment. The worker bee is 4 mm long. This species usually builds a 10 mm wide nest entrance tunnel. Every night the bees close up their nest entrance against predators with a lacy resin curtain.

Top: a Tetragonula carbonaria bee.

Right: an Austroplebeia australis bee, with the cream markings on its back indicated with an arrow.



Nests of the Australian Social Bees

As these bees are stingless, they defend themselves by securely sealing their nests inside enclosed cavities — usually in hollow trees. In tropical areas, they are also found inside rock walls, termite mounds or even inside doors, wall cavities or flower pots! The nest is constructed from cerumen, a mixture of wax and resin. The wax is secreted by the workers and the resins are collected from trees.

The worker bees also collect nectar and pollen from flowers. They thicken the nectar to make honey. The honey is a carbohydrate food and the pollen is a protein food for the immature and adult bees. Honey and pollen are stored in irregular clusters of round, 10 mm wide pots in the nest.



A nest of the stingless bee, Tetragonula carbonaria, showing the spiral brood comb (on the left) and clusters of honey and pollen pots (on the right)

In the centre of the nest, there is a brood consisting of hundreds of 3 mm wide brood cells. Workers place a mixture of honey and pollen in each brood cell, then the queen bee lays an egg in it and the cell is sealed. The immature bee develops through the larva and pupa stages, and then becomes an adult and emerges from the cell.

During the past forty years, efficient techniques have been developed to keep the Australian stingless bees in wooden hives and to propagate the colonies using a splitting technique.

Obtaining a Nest or Hive of Australian Stingless Bees

Nests of stingless bees can be easily maintained in the home garden in warm areas of Australia. In their natural logs, these nests can be very stable and have been known to survive in the garden for over 50 years.

However, nests can be difficult to find in the bush. Remember that it is illegal to remove nests from national parks and reserves. Log nests can sometimes be obtained from local timbercutters or firewood collectors.

Boxed hives of stingless bees can now be purchased from many beekeepers, especially in Queensland. These nests were often rescued from landclearing areas, then propagated by splitting.

A list of people who sell stingless bee hives can be found on the Aussie Bee website:

www.aussiebee.com.au/buy-stingless-bees.html



A typical hive box used for keeping the stingless native bees in Australia

Important Notes:

— **ACT, SA, VIC, TAS and cooler areas of NSW:** It is too cold to keep the social stingless bees in these areas. Stingless bees are tropical and low temperatures can easily kill a colony. This is especially a problem with colonies in hive boxes because the hive box provides far less insulation than a natural log does.

— **Southern areas of WA:** Stingless bees should not be taken into this area. WA has an unique array of native bees that are adapted to pollinate its wildflowers and the stingless bees only occur naturally in the northern areas of the state. Importing stingless bees would disrupt the delicate ecological balance of the native bees in southern WA.

— **Northern areas of WA and NT:** It is best to source bees locally in these areas because the species there differ from the commercially available Queensland species.

Rescuing a Damaged Stingless Bee Nest

If you come across a damaged stingless bee nest in a fallen tree, the first priority is to reseal the nest, to protect it against attack by ants or honeybees. All breaks or cuts in the timber surrounding the nest (other than the entrance hole) must be filled or covered using plastic bags, masking tape, clay or any available material.

If you need to move the nest, try to wait until dusk so that as many as possible of the flying bees have re-entered the nest. Then lightly cover the nest entrance hole during transport, so that the bees cannot get out but they can continue to ventilate the nest. Use a thin layer of gauze or netting, secured on the edges with tape.

When the log nest is set up in its new location, the top and bottom of the log should be sealed more permanently with caps of timber or metal to keep water and insect pests out of the log.

A log nest of stingless native bees protected against rain and insect pests with metal caps and set up in a garden



Keeping Australian Stingless Bees in Your Garden

Stingless bee nests do best in sites that receive morning sun and afternoon shade. If possible face the nest entrance between north and east.

Temperatures above 40°C can kill stingless bees and cause nest structures in boxed hives to melt. On extremely hot days, protect the hive from afternoon sun and cool the hive, if necessary, with wet towels. Ideally, cover the hive entrance with gauze the night before and bring the hive into an air conditioned room for the day.

Stingless bees prefer to forage within about 500 m. So a good variety of flowering plants needs to be available within that distance.

Care must also be taken to keep the bees away from any insecticides being sprayed within their flight range in the garden. Due to their small body size the stingless bees are particularly vulnerable to insecticides. If you know that insecticides are about to be sprayed nearby, it is a good idea to prevent the bees from flying by covering the nest entrance with some gauze the evening before.



Stingless bees foraging in a garden

Honey of the Australian Stingless Bees

The honey of Australian stingless bees can vary in colour from clear pale yellow to a deep red-brown. It is slightly more runny than the honey made by commercial honeybees but it is highly prized for its rich tangy flavours. It tastes delicious drizzled over ice cream. Stingless bee honey is called *Sugarbag*.

Unfortunately, the quantities of honey produced by each nest are very small (generally less than 1 kg per year) and, especially in cooler areas, much of that is required for the bees' own use. However, using special hive designs, honey harvesting is possible in warm northern areas of Australia — see [The Australian Native Bee Book by Tim Heard](#) for more details.



Pots full of Sugarbag honey in a stingless bee hive

The Australian Stingless Bee Industry

An infant industry is developing in Queensland and northern NSW, using our native stingless bees for crop pollination and honey production. Some beekeepers now have hundreds of boxed hives of the Australian stingless bees.

The small size and foraging behaviour of the stingless bees makes them good pollinators of some Australian crops (e.g. macadamias, lychees, watermelons, strawberries, mangos and avocados). Furthermore, stingless bees can adapt to living in enclosed spaces, so they show good potential as pollinators of some greenhouse crops. Research on their use as commercial pollinators is in progress.



Stingless bees belonging to Tom Carter, pollinating a watermelon crop. Photograph by Tom Carter.

Conclusion

Australia has a wealth of native bee species, from robust, hairy ones to nearly microscopic forms. Our solitary and semi-social native bees are creatures of astonishing variety. Our social native bees (or stingless bees) live intriguing, complex lives that are only just becoming understood.

Enthusiasts in their backyard can make valuable observations to help us understand our Australian native bees much better. Welcome to the fascinating world of Australian native bees!

Glossary

Abdomen — A bee's body has three segments, the head, the thorax and the abdomen. The abdomen is the third or tail segment of a bee.

Pollinate — Transfer pollen from a flower of one plant to a flower of another plant of the same species. This helps the plant grow fruits and seeds.

Queen — In a social bee nest there are three types of bees: a queen, workers and males. The queen is the fertile female bee that normally lays all the eggs in a nest.

Semi-Social — Bees that live in a small group in a nest with some sharing of duties within the nest.

Social — Bees that live in large colonies with a queen, males and workers.

Solitary — A bee that lives alone in its nest.

Thorax — A bee's body has three segments, the head, the thorax and the abdomen. The thorax is second segment, corresponding with the chest.

Worker — In a social bee nest there are three types of bees: a queen, workers and males. The workers are the sterile female bees that do most of the work in the nest.

Further Reading

Other eBooks Available from Aussie Bee Website: www.aussiebee.com.au/abshop.html

Native Bees of the Sydney Region: A Field Guide. By A Dollin, M Batley, M Robinson and B Faulkner. (PDF ebook) This practical, colour guide helps wildlife enthusiasts, gardeners, beekeepers and students identify Sydney's dazzling solitary, semi-social and social native bees. Includes over 20 species also found in Queensland and Victoria.

Other eBooks in the *Native Bees of Australia Series*:

- *Nests of Australian Stingless Bees*
- *Behaviour of Australian Stingless Bees*
- *How to Recognise the Different Types of Australian Stingless Bees*
- *Keeping Australian Stingless Bees in a Log or Box*
- *Boxing and Splitting Hives: A Complete Do-It-Yourself Guide*

Other Resources on Aussie Bee Website

- Aussie Bee's Native Bee Photo Gallery: www.aussiebee.com.au/gallery.html
- Aussie Bee's Native Bee ID Guide: www.aussiebee.com.au/native-bee-identification.html
- Why are our *Trigona* stingless bees now called *Tetragonula*? www.aussiebee.com.au/tetragonula-name-change.html
- Meet the *Austroplebeia* stingless bee species: www.aussiebee.com.au/abol-current.html

Aussie Bee's Facebook Page: www.facebook.com/aussiebeewebsite

Hardcopy Books Available from Other Websites

The Australian Native Bee Book by Tim Heard. Visit: nativebeebook.com.au

Australian Native Bees — NSW AgGuide. Visit: [NSW Tocal website](http://NSW.Tocal.website).

A Guide to Native Bees of Australia by Terry Houston. Visit: [CSIRO Publishing](http://CSIRO.Publishing).