



# A FIELD GUIDE TO THE BUGS OF THE BAROSSA BUSHGARDENS



# Acknowledgements

We acknowledge the Ngadjuri as traditional owners of this special meeting place. We also pay our respects to the Peramangk and Kaurna peoples, and their deep connection to the landscape, environment and all living creatures.

The ancestors of all three nations have walked this land for thousands of years and built a deep understanding on how to care for it. We acknowledge Elders past, present and emerging and look forward to continue building bridges and relationships for a common future.

The Barossa Bushgardens acknowledges the author, Josh Martin, for his dedication, passion and investment of many volunteer hours searching, recording, researching and photographing hundreds of insect species and compiling the information into this user friendly guide.

We also acknowledge the financial contribution from the Landcare Association of SA for the initial publication of this guide to be used for educational purposes with volunteers, students and the community.

## About the author

Josh Martin is an avid amateur naturalist and aspiring ecological researcher with a keen interest in fauna. Based in the agriculturally-focused Barossa Valley region of South Australia, he is interested in the uses of both technology and citizen science to enhance our understanding of the natural world, including the use of habitat suitability modelling and remote sensing.

Josh is keen on learning about invertebrate systematics and the better taxonomic understanding of underrepresented groups. Josh's eye for detail and the small critters of this world has led to the collaboration with the Barossa Bushgardens to develop this guide.

## About this guide

This guide has been developed to give practical tips on how to search for and record insects and other critters found in the Barossa Bushgardens. Invertebrates are split into families to make identification easier.

This guide also contains tips on how to create a bug-friendly garden which is the foundation of any ecosystem.

## Disclaimer

Please note that this guide is not exhaustive. There are still many invertebrates that have not been identified or found yet and there is a high chance for anyone looking close enough, to find more critters that are not represented in this guide.

Photos by Josh Martin except if stated otherwise.

Insects in this guide have been identified by Josh Martin and others via the iNaturalist platform.

# Contents

Acknowledgements .....	1
About the Author .....	1
About this Guide .....	1
Bugging Tips .....	1
Projects .....	1
Mites and Ticks .....	2
Earwigs .....	3
Thrips .....	3
Spiders .....	4
Cockroaches and Termites .....	6
Millipedes and Centipedes .....	7
Beetles .....	8
Flies .....	10
Slaters/Pillbugs .....	11
True Bugs .....	12
Ants, Wasps, Bees and Sawflies .....	14
Butterflies and Moths .....	16
Mantises .....	18
Snails and Slugs .....	19
Grasshoppers, Crickets and Katydid .....	20
Antlions, Lacewings and Allies .....	21
Dragonflies and Damselflies .....	21
Springtails, Bristletails and Coneheads .....	22
Scorpions and Pseudoscorpions .....	23
The importance of insects in ecosystems .....	24
What can I do to create and support a healthy ecosystem? .....	25
Resources .....	27
Glossary .....	27

# Bugging Tips

## What you will need

### Needed

- A decent-sized water bottle to keep hydrated.
- A hat and/or sunscreen if it's hot out.
- Gloves (if moving rocks or logs) and closed shoes.

### Useful

- A camera or phone to take photos.
- A notebook and pencil to take notes or draw what you see.
- A small transparent container to catch bugs in to view.
- A bug net to catch flying bugs.
- A magnifying glass to look at smaller bugs easier.
- A friend or family member to go bugging with.

## What to do

Bugging takes many forms and depends on what bug you want to look for. Some ways and places you can find bugs are:

- under rocks or logs
- on tree trunks and branches
- on leaves and flowers. Flowers especially attract many types of bugs.
- near lights at night
- at water sources such as ponds or creeks.

When you find a bug, the best thing you can do is make some sort of record. Photos are best for this, but a written record of what it looks like or a drawing can be incredibly valuable. From there, experts should be able to use your record to help you learn more about the bug you saw.

## What NOT to do

There are dangers to being in the outdoors. Try and keep all of the following cautions in mind while you're out.

Sunburns and heatstroke are no joke. Try and keep some water and sunscreen on you.

Gloves and closed shoes. Snakes and spiders can be venomous (but are important) and sometimes hard to see.

Try not to handle animals you don't understand for both you and the animal.

Keep an eye out for environmental hazards like cliffs, holes and tripping hazards.

Don't hurt animals or the environment.

Don't let this scare you - just keep it in mind.

A native-focused garden can bring in lots of birds and other wildlife such as bugs and reptiles. Talk to your family about the possibility of starting to plant natives.



## Projects



A mothing light is a UV light (purchasable at hardware stores) set up near a white drop sheet or cloth at night. This attracts many nocturnal bugs such as moths and some beetles along with many others. Take care not to stand around it - UV is bad for your skin.

Coordinated bug hunts with friends and family can be super rewarding! Getting other people involved lets you head to more places and gives you more eyes - and the more eyes you have, the more bugs you will see. You can share knowledge and have fun!



# Mites and Ticks (Acari)

## Overview

Mites and ticks are some of the smallest bugs you will likely spot. Mites tend to be smaller than ticks as ticks generally drink blood and engorge, becoming bigger.

Ticks are not all that often seen in the gardens, likely due to their attachment to other animals.

Mites are often small, reddish and move quite often. Mites can also attach to other animals but many free-roam.

## Identification

Mites and ticks are quite obvious. The only thing you might mistake them for is very small round beetles. A giveaway is that mites and ticks never have a distinct head. Their head is a part of their body.

## Where to look

Mites can be found nearly anywhere. Under rocks, on tree trunks and on bark are all good spots to look. The key is watching for reddish or whitish coloured spots moving as they can be tiny. Ticks are often found on their host, attached to their body, or in long grass.

## Fun Facts

Mites are some of the smallest bugs in this book that can be found in the gardens, with most being easily under 1-2mm long. Mites are more related to spiders and scorpions than other common bugs, as they aren't insects, but arachnids.

Sometimes hundreds of mites or ticks can be found on one host. Ticks often have venom and can paralyse their hosts. Mites usually don't have this venom. Most mites and ticks prefer a single host species or group.



**True Velvet Mite (Trombidiidae)**

2-4 mm long  
Found under rock  
Native



**Beetle Mites (Oribatida)**

Beetle Mites (Oribatida)  
<1 mm long individually  
Found on tree trunk  
Native



**Red-legged Earth Mite (Halotydeus destructor)**

<1 mm long  
Found on bark on the ground  
Introduced  
Photographed by P. D. Amara



**Prostig (Tydeoidea)**

<0.5 mm long  
Found on a leaf  
Native



**Prostig (Eupodidae)**

Prostig (Eupodidae)  
<1 mm long  
Found on bark on the ground  
Native



**Velvet Mite (Paratrombium sp.)**

<1 mm long  
Found on the ground  
Native

## Earwigs (Dermaptera)

### Overview

Earwigs are incredibly common bugs in the gardens. They have long pincers coming off the end of their body which look somewhat like two tails but are much harder and evolved to protect from attackers. They are mostly nocturnal and seen more at night than during the day. They mostly feed on dead plant matter.

### Identification

Earwigs are usually identified by their two pincers coming off the tail end of their body and general elongated shape.

### Where to look

Generally, earwigs can be found under rocks or bark on the ground. However, they have been seen climbing trees and are often found on low bushes and on flowers at night.



**Native Earwig**  
(*Carcinophora occidentalis*)

<2 cm long  
Found under rock  
Native



**European Earwig**  
(*Forficula dentata*)

<2 cm long  
Found under rock with eggs  
Introduced

### Fun Facts

So far, only the two above species are known from the gardens but two other species have been seen nearby. Keep an eye out and you might be the one to add them to the garden's life list! Despite the name and superstition, they don't crawl into your ear! While earwigs do tend to have wings, most can't fly well at all.

## Thrips (Thysanoptera)

### Overview

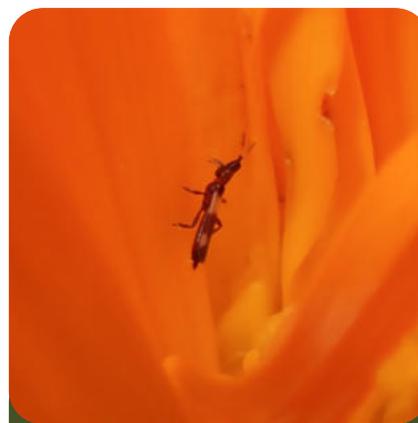
Thrips are also quite common in the gardens. They are exceptionally small and are relatively long for their size. They are the bugs you often find crawling on your arms after playing in grass and are harmless. They tend to feed on plants.

### Identification

Thrips can be identified due to their unusual long shape and incredibly small size. They sort of look like incredibly small pens, sometimes with wings.

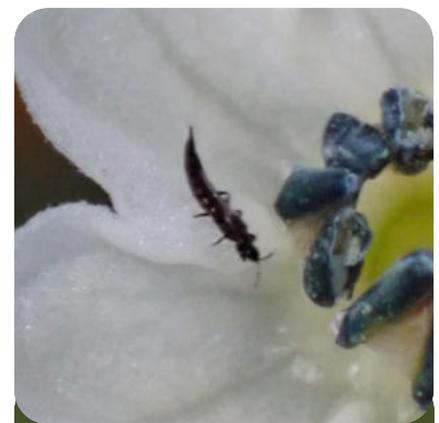
### Where to look

Thrips are often found in flowers, moving amongst the petals. While present in grass, they are often hard, or nearly impossible, to find in the grass itself.



**Banded Thrip** (*Desmothrips* sp.)

<2 mm long  
Found in the petals of a flower  
Native



**Thrip** (Thysanoptera)

<2 mm long  
Found in the petals of a flower  
Native (likely)

### Fun Facts

Due to their small size, thrips can be very hard to identify to species and often, unless you have a microscope, this identification can't be done. More bug scientists are needed to work out what species we have around! When thrips bite and/or sting, it's rarely very painful and usually just causes an itch.

# Spiders (Araneae)

## Overview

Spiders are some of the easiest bugs to find due to their often larger size and web-making. Some are also brightly-coloured. While some are venomous, most are harmless but caution should be used when dealing with them.

They are also incredibly diverse with many different body types, forms and web shapes, along with many different ways of living (e.g. in the trees, ground, even in water!).

## Identification

Spiders can often be identified by their eight legs. Note that spiders have an extra pair of appendages at the front of their body called palps. These can be quite big in males.

## Where to look

Spiders can be found anywhere depending on the species. They tend to be easiest to find at night while they're out hunting but can be found easily during the day too. On trees, in between leaves and branches, and in the bark of the trunk are good spots to look. Some spiders make burrows too! Look out for their webs!

## Fun Facts

While all spiders make silk out of their abdomen, not all spiders use it to make permanent webs to hunt. Wolf spiders, for example, hunt by moving around.

Some species of spider can fly by using ballooning. This is where the young spider lets out a string of silk that it stays attached to. This then gets caught by the wind and brings it new areas.

There hasn't been a recorded death to a spider bite in Australia since 1979. Before that, only two of our ~3000 species had caused deaths.



**Variable Wolf Spider**  
(*Venator spenceri*)

13-18 mm long  
Found on ground at night  
Native



**Ant-eating Spider**  
(*Habronestes* sp.)

5 mm long individually  
Found under rock  
Native



**Live Leaf-curling Spider**  
(*Deliochus* sp.)

~11 mm long  
Found on web in air between branches  
Native



**Wolf Spider** (*Portacosa* sp.)

~2.5 cm long  
Found in lidded burrow in the ground  
Native



**Stealthy Ground Spider**  
(*Gnaphosidae*)

~7 mm long  
Found on the underside of a log  
Native



**Australasian Pirate Spider**  
(*Australomimetes* sp.)

2-3 mm long  
Found on a branch at night  
Native



**Grey Striped Bark Jumper  
(*Cytaea aspera*)**

~8 mm long  
Found on branch at night  
Native



**Speckled Orbweaver  
(*Araneus circulissparsus*)**

5-12 mm long  
Found on leaf with slight web  
over it  
Native



**Wrap-around Spider  
(*Dolophones* sp.)**

1-2 mm long  
Found on branch at night  
Native



**Cinnamon Huntsman  
(*Isopedella leai*)**

~8 cm long  
Found on tree trunk at night  
Native



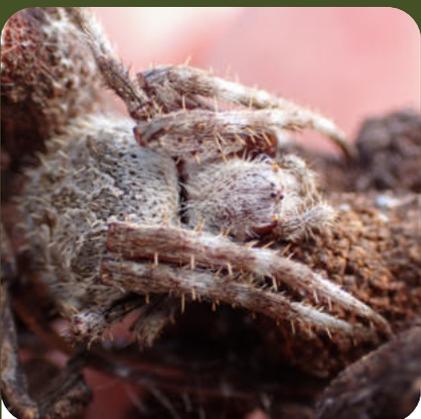
**Fishing Spider  
(*Dolomedes instabilis*)**

1-2 cm long  
Found on pond water near rocks  
at night  
Native



**Garden Jumping Spider  
(*Opisthoncus* sp.)**

~1 cm long  
Found on a leaf during day  
Native



**Outback Orb-weaver  
(*Backobourkia* sp.)**

1-2 cm long  
Found on branch during day  
Native



**Jovial Jumping Spider  
(*Apricia jovialis*)**

~1 cm long  
Found on the tree trunk during  
day  
Native



**Social Huntsman Spider  
(*Delena cancerides*)**

~13 cm long  
Found on a tree trunk at night  
Native

# Cockroaches and Termites (Blattodea)

## Overview

At first glance, cockroaches and termites don't appear to have much in common but fall under the same order. Originally, termites were in a separate order.

However genetic evidence points to them being related and similarities do appear within the group. Both species do have a tendency to group but termites take this to an extreme and form colonies.

## Identification

Cockroaches of some types can be hard to distinguish from some beetles. Beetles have hardened forewings called elytra that meet down the middle of their back whereas cockroaches don't. Termites can be distinguished from ants by being generally more pale, having completely straight antennae and having no obvious waist.

## Where to look

Both are found on the ground or in trees. Termites tend to prefer decaying logs while cockroaches tend to be found under bark and rocks.

## Fun Facts

Not all termites eat hardwood, despite what is commonly thought - some eat plant matter or can only eat softwood. Termites pop up in large swarms at certain times of the year and perform a 'nuptial' flight, where winged termites leave to start new colonies.

Some cockroaches can live up to a week without their heads - but many insects also can. Other than to each other, cockroaches and termites are most related to mantises.



**Higher Termites (Termitidae)**

~1 mm long individually  
Found under rock in nest  
Native



**Shining Cockroach (Drymaplaneta sp.)**

~3 cm long  
Found on tree trunk at night  
Native



**Subterranean Termite (Coptotermes sp.)**

Found on underside of log in nest  
Native



**Bark Cockroach (Laxta sp.)**

~3-4 cm long  
Found on tree trunk at night  
Native



**Native Cockroach (Ellipsidion sp.)**

~5 mm long  
Found on leaves during the day  
Native



**Burrowing Cockroach (Calolampra sp.)**

~2-3 cm long  
Found in ground litter at night  
Native

# Millipedes and Centipedes (Myriapoda)

## Overview

Myriapods consist of four classes; Chilopoda, Diplopoda, Symphyla and Pauropoda. Centipedes (Chilopoda) and millipedes (Diplopoda) are the two classes that are easily found in the gardens and while the other two likely can be too, they have yet to be seen there. Myriapods tend to have many segments and many legs and are often noted to be 'snake-like.'

## Identification

Myriapods are usually easy to identify. The many segments along with more than eight legs immediately allows identification. Identifying between centipedes and millipedes is a bit harder but still not too difficult. Millipedes have two pairs of legs per body part and their legs are under their bodies, while centipedes have one pair and have them on the side. Centipedes also have a pair of 'fangs.'

## Where to look

Both can be found primarily under rocks and logs or in leaf litter.

## Fun Facts

The word 'millipede' means 'thousand feet'. Despite this, the first millipede with 1000 legs or more was only found in 2020.

Millipedes are nearly always herbivorous or scavengers while centipedes are carnivorous.

There was a prehistoric genus of myriapods called *Arthropleura* which grew up to around 2-2.5 metres long.



**Stone Centipede**  
(*Lithobiomorpha*)

~2 cm long individually  
Found under log  
Native



**Common Centipede**  
(*Cormocephalus* sp.)

~10 cm long  
Found under log  
Native



**Paradoxical Keeled Millipede**  
(*Somethus* sp.)

~1 cm long  
Found under log  
Native



**Paradoxical Keeled Millipede**  
(*Paradoxosomatidae*)

~2 cm long  
Found under log in leaf litter  
Native



**Portuguese Millipede**  
(*Ommatoiulus moreleti*)

~2-4.5 cm long  
Found under log  
Introduced



**Orange-footed Centipede**  
(*Cormocephalus aurantiipes*)

~10 cm long  
Found under log  
Native

# Beetles

## (Coleoptera)

### Overview

Beetles are an incredibly varied group and also live in a variety of places from the trees to the ground to underwater. Beetles metamorphize, meaning that they take multiple forms throughout their life. Their early stages are known as larvae (which are wormlike) and then instars (which are more beetle-like).

Most beetles are capable of flight but aren't particularly fast or powerful flyers, which is why they tend to be found more on the ground or on surfaces.

### Identification

Beetles can be distinguished from other similar bugs by their hardened forewings called elytra that meet down the middle of their back which can look 'shell-like.' Look for a central 'seam' running down their back.

### Where to look

Beetles are another group which can be found in most places.

Most of the more colourful beetles can be found near flowers or on bushes and shrubs. The less colourful ones tend to be found under shelter such as bark, logs or in the water.

### Fun Facts

Beetles are the largest fauna group in the world with around 400,000 described species. It is estimated that there are more likely to be over one million total.

Australia has 500 species of native dung beetle alone - these beetles live on and eat dung.

Rove beetles (Staphylinidae) are a family of beetles which look somewhat like very large thrips due to their exceptionally short elytra and longer body shape.

Beetles are a common host of small mites.



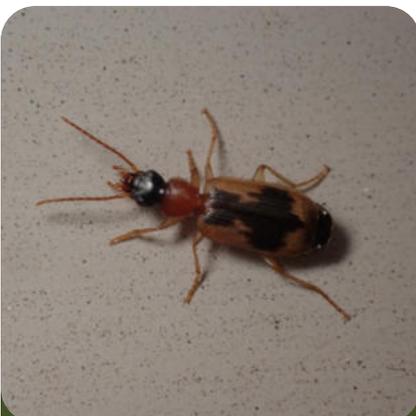
**Malachite Beetle**  
(*Carphurus cyaneipennis*)  
~1 cm long  
Found on leaf during day  
Native



**Weevil (Laemosaccini)**  
~3-4 mm long  
Found on leaf at night  
Native



**Blue Pie-dish Beetle**  
(*Pterohelaeus* sp.)  
~1-2 cm long  
Found on underside of log  
Native



**Ground Beetle**  
(*Anomotarus crudelis*)  
~8 mm long  
Found on wall at night near light  
Native



**Transverse Ladybird Beetle**  
(*Coccinella transversalis*)  
~5 mm long  
Found on a flower during day  
Native



**Hop-bush Leaf Beetle**  
(*Callidemum hypochalceum*)  
~1 cm long  
Found on a branch during the day  
Native



**Cribrate Weevil**  
(*Otiorhynchus cribricollis*)

~7 mm long  
Found under log in leaf litter  
Native



**Predaceous Diving Beetle**  
(*Dytiscidae*)

~1-2 cm long  
Found in pond  
Native



**Click Beetle**  
(cf. *Monocrepidius basalis*)

~1 cm long  
Found on tree trunk at night  
Native



**Garden Weevils**  
(*Phlyctinus callosus*)

~5 cm long individually  
Found on leaf at night  
Introduced



**Dusty Surface Beetles**  
(*Gonocephalum* sp.)

~1 cm long  
Found on underside of log  
Native



**Orange Sutured Diving Beetle**  
(*Allodessus bistrigatus*)

~3 mm long  
Found on the ground near light  
at night  
Native



**Middle-bar Acacia Leaf Beetle**  
(*Peltoschema suturale*)

~1 cm long  
Found on leaf during night  
Native



**Darkling Beetle**  
(*Chalcopteroides cupripennis*)

~2 cm long  
Found on the tree trunk during  
day  
Native



**Weevil (*Thechia* sp.)**

<5 mm long  
Found on a leaf  
Native

# Flies (Diptera)

## Overview

Flies often have quite a poor reputation due to their sometimes irritating nature but are actually exceptionally important. Not only are they a food source for other animals but pollinators too.

On top of this, flies are quite a varied group (which may be becoming a theme in this booklet) and encompass groups like blow flies, mosquitos, hover flies, crane flies and midges amongst others. There are even flightless flies!

## Identification

There are many flies which mimic other bugs such as the hover fly in the top left of the six species pictured below. The giveaway of flies is that they always have two wings.

## Where to look

Flies are often easy to find during the day, especially near water sources or flowers. They can also be found on leaves.

Another easy way to find flies is to search on barren twig ends and low dead shrubs at night. Keep an eye out for them near light on walls at night too.

## Fun Facts

Flies share a similar larval stage to beetles where the larva seems worm-like.

Flies tend to have extremely short lifespans with house flies having around 15-30 days.

Despite people believing flies are dirty animals, they are surprisingly clean. A well-known behaviour of theirs - rubbing their legs together - is actually a cleaning process.

Flies can have a reaction time of up to five times the average human's, which is why they are so often hard to keep away.



**Yellow-shouldered Stout Hover Fly (*Simosyrphus grandicornis*)**  
~1 cm long  
Found on end of twig at night  
Native



**Flesh / Satellite Fly (*Sarcophagidae*)**  
~1 cm long  
Found near garden during day  
Native



**Australian Fruit Fly (*Austrotephritis poenia*)**  
<1 cm long  
Found on leaves at night  
Native



**Bristle Fly (*Tachinidae*)**  
~1 cm long  
Found on tree trunk at night  
Native



**Typical Crane Fly (*Tipuloidea*)**  
3-4 cm long  
Found on a wall at night  
Native



**Bathroom Moth Fly (*Clogmia albipunctata*)**  
~7mm long  
Found on a wall at night  
Introduced

# Slaters / Pillbugs (Isopoda)

## Overview

Isopods go by a variety of names; slater, pillbug, roly-poly or woodlouse. All of these names refer to a land-living crustacean - meaning isopods are related more to crabs than to beetles and other bugs. Isopods are also found in the ocean however, where they can grow to large sizes.

These bugs are well known for being able to roll into a ball as a defence, but this is actually not something every isopod can do.

## Identification

Isopods have seven jointed limbs and seven segmented body parts called tergites.

## Where to look

Isopods can be found in a variety of places. They tend to enjoy environments where there is a fair bit of moisture, such as under logs, rocks or in leaf litter.

They can also be found in water where they oftentimes still hide under rocks or in the mud at the bottom of the water.

After rain, they can be found moving more actively on the ground or trees.

## Fun Facts

There are quite a few native species of isopod but these are often quite hard to find. Invasive isopods are found nearly everywhere. For example, all isopods recorded so far in the Bushgardens are of invasive species.

At times of rain in the arid zone and deserts, swarms of isopods can be found roaming the outback.

While most isopods are herbivorous, there is a species of marine isopod that eats fishes' tongues and then replace it as a parasite.



**Common Rough Woodlouse**  
(*Porcellio scaber*)  
~1 cm long  
Found on bark at night  
Introduced



**Powder Blue Isopod**  
(*Porcellionides pruinosus*)  
~1 cm long  
Found under log  
Introduced



**Common Pill Woodlouse**  
(*Armadillidium vulgare*)  
~1 cm long  
Found under rock  
Introduced



**Swift Woodlouse**  
(*Porcellio laevis*)  
~1 cm long  
Found under rock  
Introduced



**Pillbug**  
(*Armadillidium sp.*)  
~1 cm long  
Found on flower at night  
Introduced



**Porcellionid Woodlouse**  
(*Porcellio sp.*)  
~1 cm long  
Found on underside of a log  
Introduced

# True Bugs (Hemiptera)

## Overview

The hemipterans or true bugs are a weird group of some very varied groups. For example, cicadas, leafhoppers, stink and shield bugs, lerps and psyllids, assassin bugs, aphids and seed bugs are all true bugs.

Some of the hemipterans live most of their life attached to plants while some are free roaming herbivores and carnivores. Hemipterans also often engage in symbiotic relationships with other animals.

## Identification

Hemipterans can be confusing to identify but all of them have distinctive tube-like mouthparts.

## Where to look

Hemipterans can be found in many places, depending on species. On branches, leaves and flowers are brilliant places to look due to hemipterans' close connection to plants.

Plant-parasitic hemipterans (Sternorrhyncha) can be found with attached constructs on leaves and other plant parts.

## Fun Facts

Some hemipterans are parasitic. The most well-known example of this are bed bugs (*Cimex* sp.).

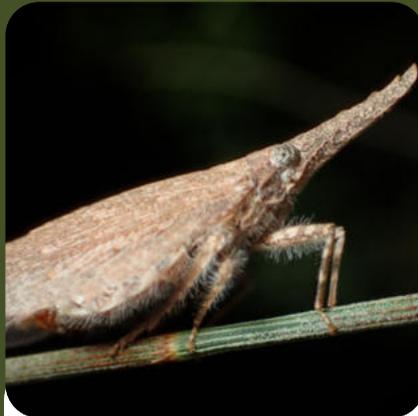
Assassin bugs (*Reduviidae*) have evolved modified sucking mouthparts which are used to pierce other bugs and consume them.

Some true bugs have also evolved to walk on water to the point where they can 'skate' faster than they can run on land.

There are many hemipterans which are regarded as agricultural pests like aphids and scale insects.



**Crusader Bug**  
(*Mictis profana*)  
~5 cm long  
Found on leaves during day  
Native



**Lantern Fly**  
(*Rentinus dilatatus*)  
~4 cm long  
Found on leaves during night  
Native



**Broad-headed Bug**  
(*Hemedius incarnatus*)  
~2 cm long  
Found on leaves at night  
Native



**Gum Clamshell Lerp**  
(*Spondylaspis plicatuloides*)  
<1 cm long individually  
Found attached to leaf  
Native



**Torpedo Bug**  
(*Complex Siphanta acuta*)  
~7 mm long  
Found on leaf at night  
Native



**Red and Black Seed Bug**  
(*Melanerythrus mactans*)  
~1 cm long  
Found on a flower  
Native



**Soft Scale (Coccidae)**

~2 mm long  
Found attached to leaf  
Native



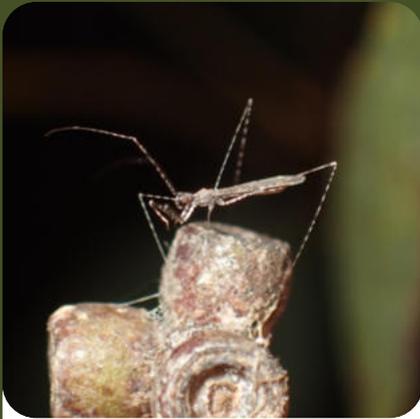
**Psyllid (Triozidae)**

~2 mm long  
Found on leaf at night  
Native



**Horned Treehopper  
(*Ceraon tasmaniae*)**

~1 cm long  
Found on branch at night  
Native



**Thread Bug  
(*Empicoris rubromaculatus*)**

~1.5 cm long individually  
Found on branch at night  
Native



**Red Jewel Bug  
(*Choerocoris paganus*)**

~1cm long  
Found in flower pods  
Native



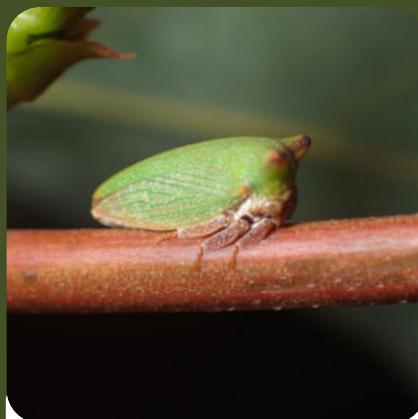
**Dirt-colored Seed Bug  
(*Arcleda fusca*)**

~7 mm long  
Found on the underside of a log  
Native



**Stink Bug (*Poecilometis* sp.)**

~2 cm long  
Found in leaves during night  
Native



**Green Treehopper  
(*Sextius virescens*)**

~8 mm long  
Found on branch at night  
Native



**Bronze Bug  
(*Thaumastocoris peregrinus*)**

<3 mm long  
Found on a leaf  
Native

# Ants, Wasps, Bees and Sawflies (Hymenoptera)

## Overview

Hymenopterans are a group of flying insects. A large number of these species form nests or hives and are social creatures but there are also many examples of solitary hymenopterans such as wasps.

Hymenopterans tend to have close associations to other groups either in a symbiotic (ants - hemipterans) or predatory relationships (spider wasps).

## Identification

Hymenopterans can be distinguished from other groups by having a combination of six legs, biting mouthparts and two pairs of thin wings.

## Where to look

Ants can be found under rocks and logs and on tree trunks along with moving along the ground.

Bees, wasps and sawflies are usually easiest to find by watching for movement near flowers and plants. Another spot to watch for is on the end of twigs at night.

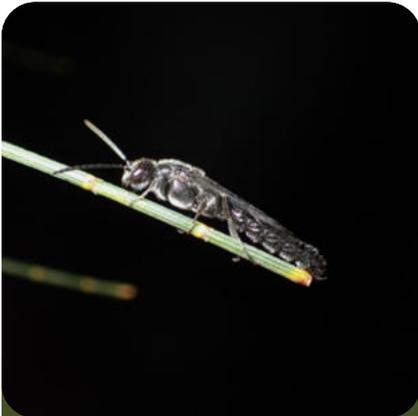
## Fun Facts

Ants can carry objects up to 10-50 times their weight, which allows them to bring food back to their colonies.

Some wasps are obligate parasitoids which means that they lay eggs in or on their host and the larvae eat the host when they hatch.

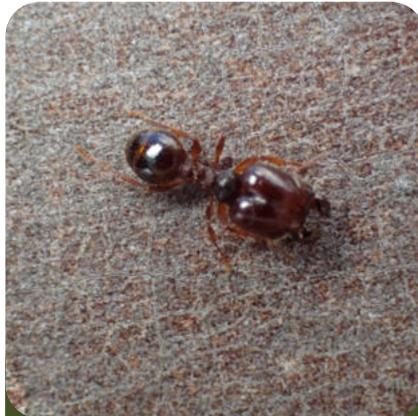
Some bees, especially natives, live in nests in the ground.

Many hymenopterans have evolved their ovipositor (egg-laying tube) to become a defensive weapon, a sting.



**Thynnid Flower Wasp (Thynninae)**

~2 cm long  
Found on leaf at night  
Native



**Big-headed Ant (*Pheidole* sp.)**

<1 cm long  
Found on tree trunk  
Native



**Acrobat / Cocktail Ant (*Crematogaster* sp.)**

~5 mm long  
Found on tree trunk  
Native



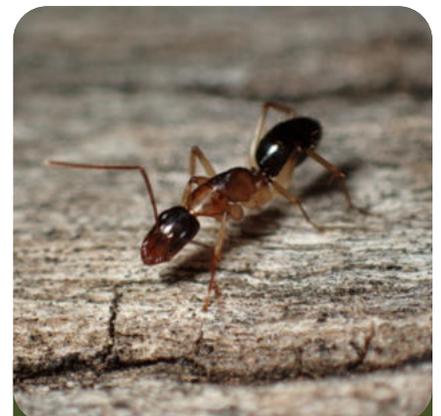
**Green-head Ants (*Rhytidoponera metallica*)**

~5 mm long  
Found under rock  
Native



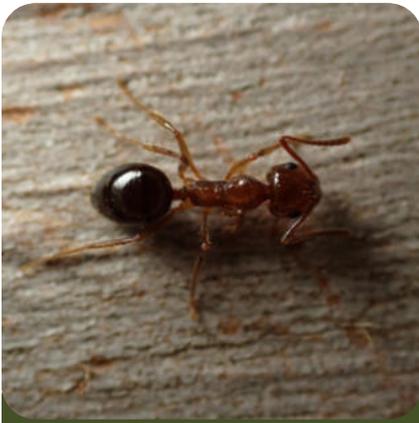
**European Honey Bee (*Apis mellifera*)**

~1.5 cm long  
Found on ground  
Introduced



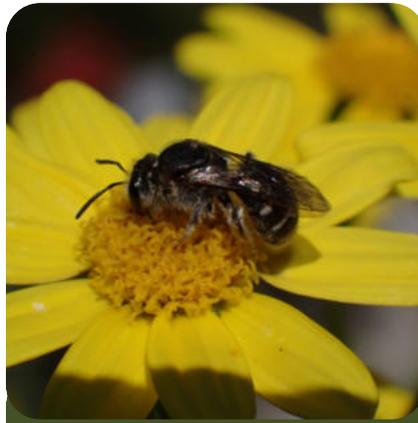
**Carpenter / Sugar Ant (*Camponotus* sp.)**

~1 cm long  
Found on tree trunk  
Native



**Melophorin Ant**  
(*Notoncus hickmani*)

~3 mm long  
Found on tree trunk at night  
Native



**Sweat Bee**  
(*Lasioglossum (Chilalictus) sp.*)

~3 mm long  
Found on flower during day  
Native



**Spotted Muscman Tree Ant**  
(*Podomyrma adelaidae*)

~7 mm long  
Found on tree trunk  
Native



**Southern Michelin Ant**  
(*Amblyopone australis*)

~1 cm long individually  
Found under rock  
Native



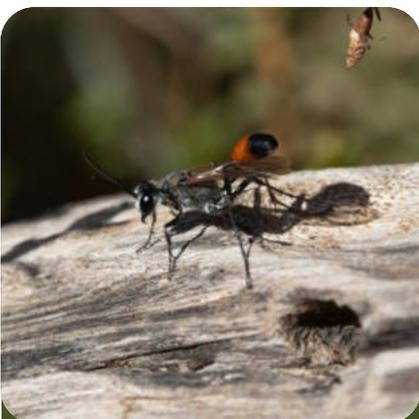
**Gulosa-group Bull Ants**  
(Complex *Myrmecia gulosa*)

~3-4 cm long  
Found on tree trunk  
Native



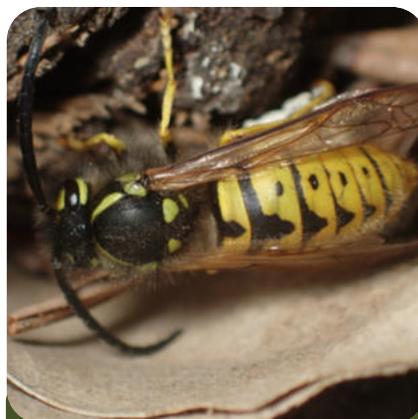
**Chalcidoid Wasps**  
(Chalcidoidea)

~2 mm long  
Found on tree trunk  
Native



**Tyde's Sand Wasp**  
(*Podalonia tydei*)

~2-3 cm long  
Moving on sand and logs during day  
Native



**European Wasp**  
(*Vespula germanica*)

~3 cm long  
Found on leaf at night  
Introduced



**Cuckoo Wasp (Chrysididae)**

<3 mm long  
Found on tree trunk  
Native

# Butterflies and Moths (Lepidoptera)

## Overview

Lepidopterans are a group that is hard to miss - from colourful butterflies to large moths - there is a great variety of species within the group. However, not all lepidopterans are colourful or large. There are many small inconspicuous species, especially the moths.

Butterflies and moths are also sometimes found in their younger form, caterpillars.

## Identification

Lepidopterans can be distinguished from other groups by having four scaled, often 'fluffy-looking' wings, six legs and mouthparts which resemble a coiled hose reel. Butterflies tend to sit with their wings upright while moths sit with their wings against their body.

## Where to look

Look for moths on tree trunks and posts during the day and for butterflies flying near flowering plants and grassy areas. A good way to find moths is to set up a mothing light at night to attract them to a wall or sheet.

## Fun Facts

Some moths have a flightless female, such as the Lucerne Looper (*Zermizinga sinuata*), which can be found in the Barossa!

While most butterflies sit with their wings all upright, skippers are a butterfly group that sit with a pair upright and a pair flat.

The female Hercules moth can have a wingspan nearly reaching the full length of a ruler.



**Vine Hawkmoth**  
(*Hippotion celerio*)

~6-8 cm wingspan  
Found on branch at night  
Native



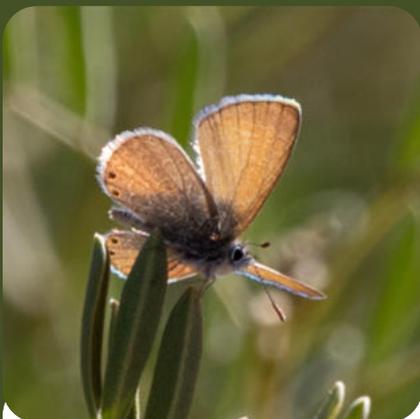
**Monarch**  
(*Danaus plexippus*)

<9 cm wingspan  
Found on leaves during the day  
Introduced



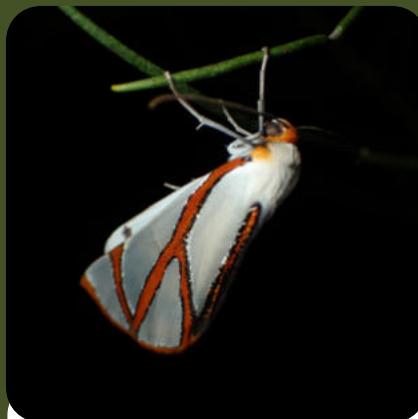
**Diamondback Moth**  
(*Plutella xylostella*)

~5-6 mm long  
Found on flowers at night  
Introduced



**Two-spotted Line-Blue**  
(*Nacaduba biocellata*)

~1.5-2 cm wingspan  
Found under rock  
Native



**Angled Satin Moth**  
(*Thalaina angulosa*)

~1-2 cm long  
Found on leaves at night  
Native



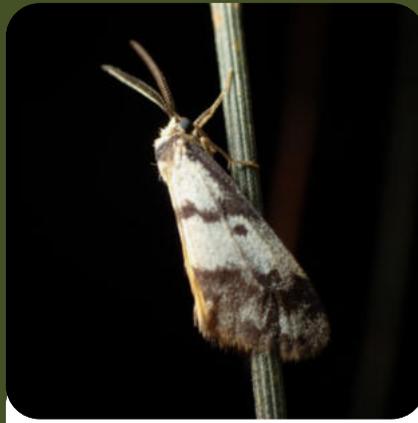
**White-banded Grass-Dart**  
(*Taractrocera papyria*)

~1-2 cm wingspan  
Found on grass during the day  
Native



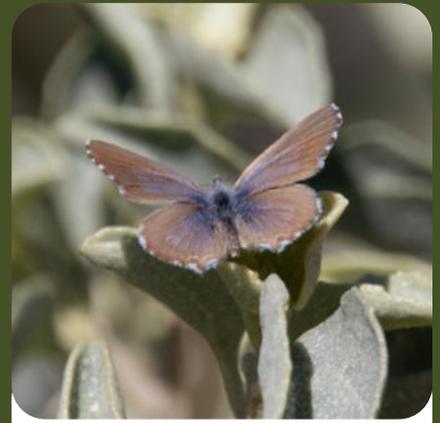
**Australian Painted Lady**  
**(*Vanessa kershawi*)**

~4-5 cm wingspan  
Found flying during the day  
Native



**Clouded Footman**  
**(*Anestia ombrophanes*)**

~1 cm long  
Found on leaves at night  
Native



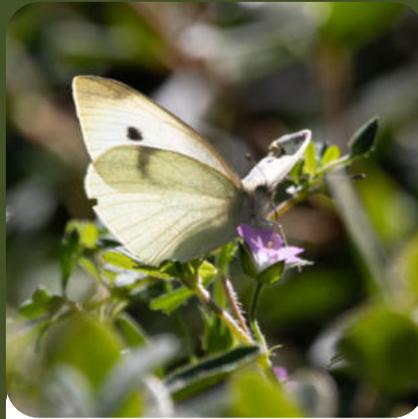
**Saltbush Blue**  
**(*Theclinessthes serpentata*)**

~2 cm wingspan  
Found flying near plants during the day  
Native



**Brown Pasture Looper**  
**(*Ciampa arietaria*)**

~2-4 cm long  
Found on tree trunk at night  
Native



**Cabbage White**  
**(*Pieris rapae*)**

~3-5 cm wingspan  
Found flying near flowers during the day  
Introduced



**Heliotrope Moth**  
**(*Utetheisa pulchelloides*)**

~2-3 cm long  
Found on branch at night  
Native



**Red-lined Looper**  
**(*Crypsiphona ocultaria*)**

~4-5 cm wingspan  
Found on wooden post at night  
Native



**Concealer Moth**  
**(*Hoplostega ochroma*)**

~1 cm long  
Found on wall near light at night  
Native



**Cotton Tipworm Moth**  
**(*Crociosema plebejana*)**

<1 cm long  
Found on wall near light at night  
Introduced

# Mantises

## (Mantodea)

### Overview

Mantises are an incredibly iconic group of insects due to their often larger size compared to other bugs and their odd look and behaviour.

They are often slow and rely mostly on camouflage to capture their prey - other bugs. This camouflage, their spiny arms to hold prey and 3D vision make mantises effective hunters. For this reason, they are a farmer's friend, often contributing to getting rid of pests similar to ladybugs.

### Identification

Mantises often look somewhat stick or leaf-like and closely mimic their surroundings.

A dead giveaway for this group is their folded forearms which they often hold in front of them.

### Where to look

Most mantises are found on bushes or trees. However, there are also some mantises which thrive more on the ground, such as the southern boxer bark mantis in the top right of the images below.

### Fun Facts

Mantises have often been recorded eating other mantises.

Mantises are able to swivel their heads around 180 degrees, giving them brilliant effective field of view. This and their 3D vision lets them hunt prey easier.

Mantises have been known to occasionally eat non-bug animals such as reptiles, birds and even mice. If they can catch it, they can probably eat it!

Before developing wings, young mantises are known to be pretty good jumpers!



**Australian Garden Mantis**  
(*Orthodera ministralis*)  
3-4 cm long  
Found on bush at night  
Native



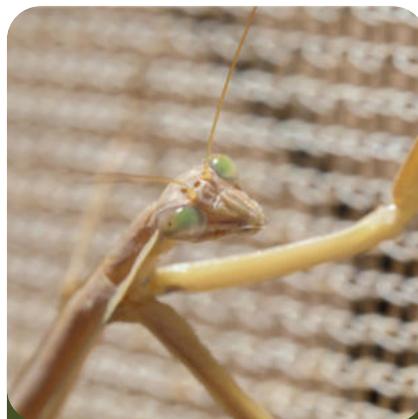
**Mallee Grass Mantis**  
(*Archimantis sobrina*)  
8-10 cm long  
Found on bush during day  
Native



**Southern Boxer Bark Mantis**  
(*Paraoxyphilus tasmaniensis*)  
2-3 cm long  
Found under log  
Native



**Stick Mantis**  
(*Archimantis latistyla*)  
8-10 cm long  
Found on bush during day  
Native



**Purple-winged Mantis**  
(*Tenodera australasiae*)  
8-10 cm long  
Found on a fence  
Native



**Mallee Grass Mantis**  
(*Archimantis sobrina*)  
8-10 cm long  
Found on bush at night  
Native

# Snails and Slugs (Mollusca)

## Overview

Snails and slugs aren't like a lot of other groups in this book - they aren't insects, but molluscs. They don't have legs but one muscular 'foot'.

Snails and slugs both are covered in a gel-like mucus which reduces damage and friction during movement and allows them to maintain moisture. However, they still tend to be found in moister areas.

## Identification

Snails and slugs can both be identified by their lack of legs and gel-like covering (which often makes them look 'goeey').

The main difference between snails and slugs is that slugs don't have a well-developed outside shell whereas snails do.

## Where to look

The easiest place to find both species is in moist areas such as near ponds or water sources or under logs and other shelter.

Another easy way to find snails and slugs is to walk around after rain.

## Fun Facts

Snails and slugs both have a radula, a flexible mouthpart covered in thousands of teeth that they use to grind up whatever they eat - usually plant matter.

Both can also move their eyes on eye stalks which allow them to hide their sensitive eyes from danger.

Some snails are poisonous to eat but some, such as the cone snail, are venomous - they can inject poison without a predator ingesting them.



**Small Pointed Snail**  
(*Cochlicella barbara*)

~5-10 mm long  
Found on plant at night  
**Introduced**



**Threeband Slugs**  
(*Ambigolimax* sp.)

~2-3 cm long  
Found under log  
**Native**



**Vineyard Snail**  
(*Cernuella virgata*)

~1 cm long  
Found on side of tree at night  
**Introduced**



**Smooth Land Slug**  
(*Deroceras* sp.)

~2-3 cm long  
Found under log  
**Introduced**



**Acute Bladder Snail**  
(*Physella acuta*)

~5-10 mm long  
Underwater near edge of pond  
**Introduced**



**Threeband Slug**  
(*Ambigolimax* sp.)

~2-3 cm long  
Found under log  
**Native**

# Grasshoppers, Crickets and Katydids (Orthoptera)

## Overview

Grasshoppers, crickets and katydids share some similar characteristics such as the ability to leap significant distances due to their large bent legs which sit to the side of their body.

While they often do fly, and are quite powerful flyers at that, they do tend to use their legs to move around the ground or trees by jumping.

## Identification

Orthopterans are usually identifiable due to their large legs which sit on the side of their body and have quite a large first segment attached to the body.

## Where to look

Orthopterans can be found in most places on land. Bushes and trees can have some of them such as katydids and some grasshoppers. Crickets can be found under logs, rocks and leaf litter.

An easy way to find smaller ground orthopterans is by moving forward while watching the ground.

## Fun Facts

Grasshoppers tend to have their ears on their belly while crickets and katydids tend to have this in a much weirder place - their legs.

Most orthopterans can perform a sound-making process called stridulation which aids in finding a mate.

Grasshoppers and crickets are (mostly) herbivores, eating plant matter. Katydids are usually too, but there are some which specialise in predated on other bugs.



**Wingless Grasshopper**  
(*Phaulacridium vittatum*)  
~1-2 cm long  
Found on log during day  
Native



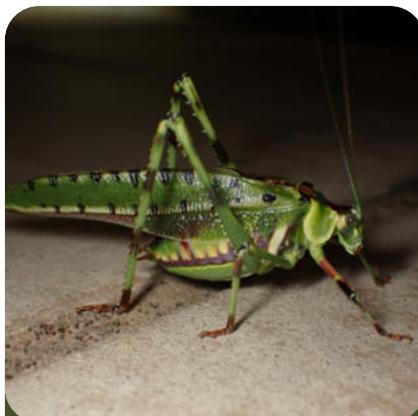
**Bark-mimicking Grasshopper**  
(*Coryphistes ruricola*)  
~2-3 cm long  
Found under log  
Native



**Field Cricket (Gryllinae)**  
~1 cm long  
Found on ground at night  
Native



**Greenish Meadow Katydid**  
(*Conocephalus upoluensis*)  
~4-5 cm long  
Found on branch at night  
Native



**Spotted Katydid**  
(*Ephippitytha maculata*)  
~10 cm long  
Near light at night  
Native



**Scaly Cricket (Mogoplistinae)**  
~2-3 cm long  
Found on log at night  
Native

## Antlions, Lacewings and Allies (Neuroptera)

### Overview

Neuropterans are an odd - and very variable - group. Some look something like dragonflies while others may look closer to moths. Most have a younger phase that looks like a caterpillar with large pincers.

### Identification

Neuropterans can be hard to ID, especially to genus or species. The most distinctive shared trait is their web-like pattern of veins in their wings. They also tend to hold their wings in a tent-like shape over their body at rest.

### Where to look

Neuroptera are found in most habitats but mainly at night.



**Green Lacewing**  
(*Plesiochrysa ramburi*)

~3 cm long  
Found under light at night  
Native



**Australian Variable Lacewing**  
(*Drepanacra binocula*)

1 cm long  
Found on plant at night  
Native

### Fun Facts

Some neuropteran larvae actually camouflage themselves by creating a 'shell' of their dead prey to their back.

Antlion larvae construct a pitfall trap in sandy soils to trap prey. This is often what you see when you see small circular funnel-shaped holes in sandy areas.

## Dragonflies and Damselflies (Odonata)

### Overview

Dragonflies and damselflies are some of the more well-known insects due to their often beautiful colouration and larger size. They also tend to be more active during the day and can often be found near areas with water.

### Identification

Dragonflies and damselflies can be identified by their large eyes covering most of their head and their elongate body that goes past their four wings.

### Where to look

They can be found near water during the day, can often be seen flying and usually end up perching.



**Tau Emerald**  
(*Hemicordulia tau*)

~5 cm long  
Found on leaves during the day  
Native



**Wandering Percher**  
(*Diplacodes bipunctata*)

~3 cm long  
Found perched on branch at night  
Native

### Fun Facts

Dragonflies can be distinguished from damselflies by the way in which they sit their wings. Dragonflies sit with their wings out, almost like a plane, whereas damselflies sit with their wings against their body. Dragonflies are some of the only insects that can fly backwards and are quite capable while doing so. They can also fly upside-down.

# Springtails, Bristletails and Coneheads (Entognatha)

## Overview

Entognathans are a group of incredibly small animals. The two groups you can find in the gardens are springtails and bristletails. Coneheads have only been rarely recorded in Australia so far.

Springtails in particular pop up quite a bit in the Barossa, especially after rain. Despite this, their very small size makes them easy to miss.

## Identification

Entognathans are small, usually under 1 or 2mm but sometimes a bit larger. They don't have wings and if you have them under a microscope, they won't have external mouthparts (which is where the word entognathan comes from - 'inside jaw' in Greek).

## Where to look

You will want to look in places with moisture. However, you'll need to keep a close eye, or bring a microscope, to see them due to their size. You can also find them nearly anywhere after rain.

## Fun Facts

Springtails often have a specialised appendage at the end of their body called the 'furcula' which acts as spring. They use it to launch themselves many times their body length to escape predators.

Despite being incredibly small, many are actually very well-coloured or patterned - especially some of the globular springtails.

They are likely one of the most abundant groups of animals on the planet, only behind mites.



**Two-pronged Bristletail  
(Diplura)**

~5 mm long  
Found under log  
Native (likely)



**Globular Springtail  
(Symphyleona)**

~1 mm long  
Found under log  
Native (likely)



**Slender Springtail  
(Entomobryidae)**

~1 mm long  
Found under rock  
Native (likely)



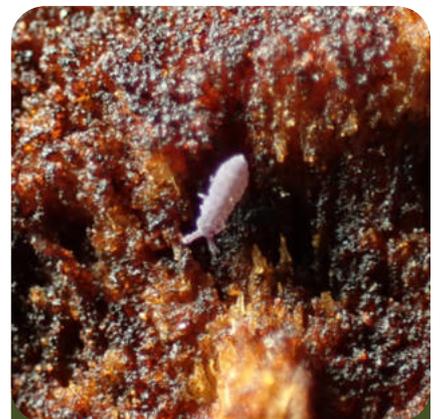
**Plump Springtail (Poduromorpha)**

~1 mm long  
Found under log  
Native (likely)



**Slender Springtail  
(Entomobryidae)**

~1 mm long  
Found under log  
Native (likely)



**Plump Springtail (Poduromorpha)**

~1 mm long  
Found under log  
Native (likely)

# Scorpions and Pseudoscorpions (Scorpiones and Pseudoscorpiones)

## Overview

Despite their similar names, scorpions and pseudoscorpions aren't from the same taxonomic order. However, both are arachnids similar to spiders, ticks and mites.

They do share many similarities though, they both use specialised claws to capture prey, they both tend to hunt other arthropods and both tend to live on the ground or in trees.

## Identification

Pseudoscorpions and scorpions are easy-to-pick due to their claws. To tell them apart, pseudoscorpions tend to be incredibly small (< 1cm) and lack a tail with a sting, whereas scorpions are larger and have a tail with a sting at the end.

## Where to look

Both can be found on the trunk of trees at night or under rocks, logs and other debris on the ground. Pseudoscorpions are usually found on the underside of the debris, not on the ground. Scorpions can also be found roaming on warmer nights.

## Fun Facts

The venom gland that a scorpion has in its tail is found instead in the claws of pseudoscorpions.

Pseudoscorpions are well-known for hitchhiking on other animals to move around. This technique is known as 'phoresy'.

Scorpions often have an elaborate dance which they use to choose their partner. They often lock claws in a sort of 'tango'.

Scorpions glow under UV light which can be used to find them with ease at night.



**Little Marbled Scorpion**  
(*Lychas marmoreus*)

2-3 cm long  
Found under log  
Native



**Pseudoscorpion**  
(*Nesidiochernes* sp.)

<0.5 cm long  
Found under rock  
Native



**Pseudoscorpion**  
(*Austinochernes* sp.)

<0.5 cm long  
Found under log  
Native

# The importance of insects in ecosystems

Insects play a vital role in keeping our ecosystems healthy. Without insects there will be no pollination, seed dispersal, decomposition, nutrient recycling or pest control. Insects are essential for both plant and animal life and contribute to healthy soils, water quality and are part of the big food web.

Everyone knows about the pollination 'services' insects, especially bees, provide and there are many other critters like flies that are just as important in this role.

Seed dispersal is another big contributor to ensure natural regeneration in the landscape and ants are known for their work ethic when it comes to seed dispersal, but also decomposition of organic matter.

Some insects break down debris in wetlands, ponds, creeks and rivers, contributing to cleaner water; and most insects are a food source for other animals. Even mosquitoes play an important role and we are not talking about the nasty bites.

Thousands of mozzies are eaten by a single bat every night and each dragonfly eats hundreds of them during the day.

Looking at the economic value that insects bring to the agriculture sector, it is worth noting that only around 0.5% of known species can damage crops and many more that will actually help with pest control, weed control, soil aeration and the breaking down of animal waste. Just look at the dung beetles that can reduce overall methane emissions on dairy and beef farms.



# What can I do to create and support a healthy ecosystem?



Avoid pesticides and herbicides. There is no pesticide (insect killer) that will only kill bad bugs. Remember, only a very small percentage of insects will damage your crop whereas far more of them will feast on your pests. Given time and following some of the other tips below, pest and beneficial insects will find their own balance.

Planting native plants is fantastic but adding some non-natives will help to just fill seasonal gaps and add some extra 'flavour' to your garden. Aim for a selection of plants that will flower across the year and most importantly, cover the different layers like groundcovers, grasses, small shrubs, medium shrubs, large shrubs, small trees and large trees (if you have the space). Each layer is home to different animals.



Attract beneficial bugs by planting flowers with your veggies, as well as companion plants like herbs.

Compost your green waste. It is super easy, good for the environment and saves emissions and money.

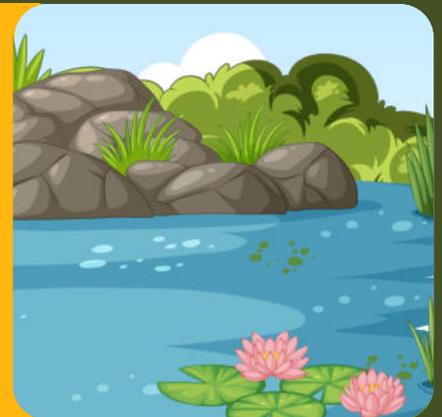


# What can I do to create and support a healthy ecosystem?



Creating insect homes is super easy. You can, but you don't have to build anything. Just leave some areas in your garden covered with leaf litter, or leaf life as we like to call it, and have a small log pile, including some bark, that provides hiding and breeding spaces.

Add a water feature. Having a bird bath with a little stick or a few rocks in it for insects to land on will help. If you have the space and water, you can think about adding a small frog pond.



Grasses are very underrated for use in gardens. Creating a meadow is a great way to provide habitat and food for insects but also your seed-eating birds like finches. Many butterflies use grasses to lay their eggs on and some native bees lay their eggs into the hollow stems.

Keep your cats inside. What do cats have to do with insects? They are predators, preying on key species like lizards and insect eating birds that help keep your critters in balance.



# Resources



## iNaturalist

iNaturalist is a website that allows you to upload observations of life in the form of photos. People can then help you learn about what you've photographed. If you're under 18, get your parent to help out.

## Ellura Sanctuary

Ellura Sanctuary is a website run by Brett and Marie Smith, two of SA's prominent naturalists. Many species on the website are found in the Bushgardens and valuable information is provided.



## Wild South Australia

Wild South Australia is run by Mark Newton, another of one of SA's notable naturalists and has a tonne of very high-quality photos of various bugs and links to associated resources.

## CSIRO

The CSIRO website has a variety of resources for different groups such as moths, and jumping spiders which help to identify and learn about the species you may find in the Bushgardens.



# Resources

CSIRO, 2025 - Insects

<https://www.csiro.au/en/research/animals/insects>

Good Living, 2024 - Your guide to encouraging local fauna to visit your backyard

<https://www.environment.sa.gov.au/goodliving/posts/2020/04/attracting-animals-and-bugs>

Grund, Roger, 1998, Butterfly Conservation SA Incorporated - South Australian Moths

[https://sabutterflies.org.au/moths/sa\\_moths.html](https://sabutterflies.org.au/moths/sa_moths.html)

Herbison-Evans D. and Crossley S., 2004, Coffs Harbour Butterfly House - What is the biggest Australian butterfly/moth/caterpillar?

<https://lepidoptera.butterflyhouse.com.au/faqs/big.html>

Lang, J. Peter, n.d., Buprestidae of South Australia (Jewel beetles)

<https://syzygium.xyz/buprestidae/introduction.php>

Marek P. E. and others, 2021, Scientific Reports - The first true millipede - 1306 legs long

<https://www.nature.com/articles/s41598-021-02447-0>

Western Australian Museum, 2025 - Entomology (Insect) Collection

<https://museum.wa.gov.au/research/collections/ant/entomology-insect-collection>

Whyte, Robert, 2025 - Spiders of Australia

<https://www.arachne.org.au/default.asp>

---

## Glossary

Appendages	In spiders they function primarily as sensory organs for touching and tasting. In other animals they are external body parts or structures (e.g. legs).	Crustacean	Large group of Arthropods which include the crabs, lobsters, crayfish, shrimp, krill, barnacles, brine shrimp, copepods, ostracods and mantis shrimp.
Arthropodes	An arthropod is an invertebrate animal having an exoskeleton (external skeleton), a segmented body, and paired jointed appendages.	Herbivorous	An animal feeding on plants.
Camouflage	A natural defense mechanism used to disguise appearance, allowing organisms (animals) to blend into their surroundings to avoid detection.	Inconspicuous	Not clearly visible or attracting attention.
Carnivorous	An animal or plant feeding on other animals.	Mimic	Closely imitating, copying or resembling another animal, often for deception or adaptation.
Colonies	Colony insects are social insects like ants, bees, wasps, and termites that live in organised groups with specialized roles for reproduction, defense, and foraging.	Parasite	A parasite is an organism that lives in or on another organism and takes its nourishment from that other organism, or "host."
		Predatory	An animal preying on other animals.
		Symbiotic	Interaction between two different organisms that is mutually beneficial.

Barossa Bushgardens  
653 Research Road  
Nuriootpa, SA 5355

08 8563 8330

[bushgardens@barossa.sa.gov.au](mailto:bushgardens@barossa.sa.gov.au)  
[www.barossabushgardens.com.au](http://www.barossabushgardens.com.au)

