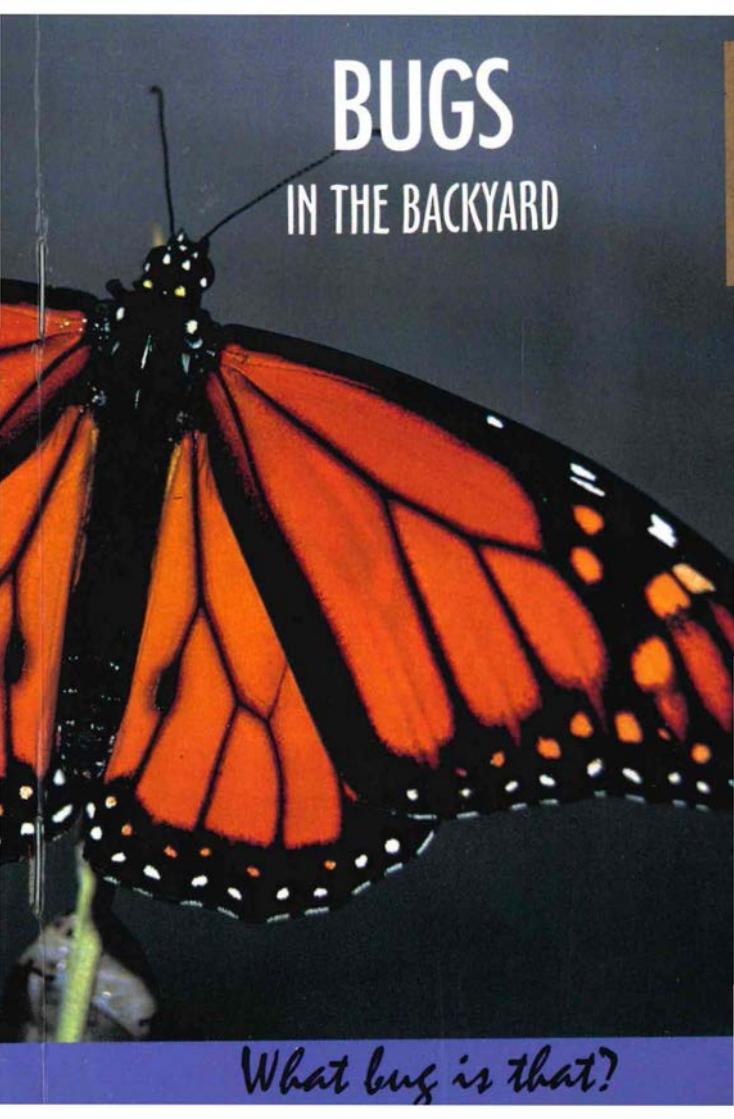
BUGS
IN THE BACKYARD
What bug is that?

Bush Books are a series of practical field guides to help you learn about and discover WA's unique plants, animals and special features, region by region.

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ABOUT THE AUTHORS

Barbara York Main is a world renowned expert on spiders. She has written several books on spiders and is particularly interested in Australian trapdoor spiders.

Matthew Williams is a Senior Research Scientist for CALM. Over the past seven years, he has been documenting the distributions, life histories and conservation status of WA's butterflies.

John Hunter is CALM's Public Affairs Officer. He has written numerous articles and books on Western Australia's parks and wildlife and is the author of the popular Urban Antics column in *LANDSCOPE* magazine.

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BUGS
IN THE BACKYARD

by Barbara York Main,
Matthew Williams and John Hunter

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

INTRODUCTION

Mention invertebrates and most people think of centipedes, slugs, maggots and large dark spiders – the classic "creepy-crawlies". But they are much, much more than this. Invertebrates, or animals without backbones, account for as much as 98 per cent of Earth's animal diversity, and are of fundamental importance in every ecosystem on Earth. In Australia, there are about 108 000 species of invertebrates (compared to about 2000 recognised vertebrate species), with many thousands still to be described.

Many invertebrates are very appealing, with an almost infinite variety of form, colour and behaviour. Invertebrates are consumers of plants and animals, and decomposers and scavengers in food webs throughout terrestrial, inland aquatic and marine ecosystems. They degrade and release organic matter from plants and animals, putting it back into circulation for biological use. Invertebrates are an important, often primary, food for many other animals, including fish, birds and mammals.

This book describes some of the invertebrates found in gardens, homes and other buildings. A few of the commonest and most easily recognised insects, such as ants, lawn beetles and flies, are not included.

Photo – Trevor Lundstrom

Monarch butterfly

REDBACK SPIDER

(Latrodectus hasselti)

The redback spider is firmly embedded in Australian bush lore and culture. Outside toilets are one of its favourite haunts. Around buildings, they shelter against fences, under furniture, in tins and boxes. Once greatly feared because of its venom, it is not now regarded as such a danger because of the availability of an antivenene.

DESCRIPTION: The body of an adult female is about the size and shape of a pea, shiny black with a red stripe on the back and a red hourglass pattern underneath. The legs are long, spindly and spineless. Young females and male spiders are cream, with darker streaks, and the red stripe and hourglass pattern is paler.

DISTRIBUTION, HABITAT AND WEB: Redback spiders are found throughout Australia, especially in drier regions. This species lives within a permanent, tangly, very tough cobweb, which has a few sticky threads, used to trap insects. The web always has contact with the ground. In the bush, webs may be in logs, under stones or at the butts of shrubs or under dry cliff faces and cave openings.

LIFE HISTORY: Spiders mature in the spring and early summer. The males cluster in female webs, and are eaten after mating. Females produce about four or more, marble-sized yellowish egg cocoons, which are deposited in a tubular retreat in the web. The tiny, black-spotted creamy spiderlings disperse aerially in the autumn, before settling and making individual webs.

SYMPTOMS AND TREATMENT: Care should be taken when moving about in likely haunts of the redback spider. While the bite may not be painful, the symptoms are. Abdominal and leg pains usually set in within a couple of hours and profuse sweating, which may cause dehydration, is a common symptom. Seek immediate medical attention.

Photo – Babs & Bert Wells/CALM

CHRISTMAS SPIDER

(Gasteracantha minax)

Male Christmas spiders have an important mating ritual. Because of their size they must communicate their intention, or be mistaken for prey and killed. Part of a male Christmas spider's courtship ritual is to pluck a successful message on the female's web with his front legs. This stimulates her interest and suppresses her predatory impulse.

DESCRIPTION: You can easily recognise this small, black spiny spider by its star-shaped abdomen, with bright yellow or white raised patches on a black background. Occasionally there are colour variations: all black, red and white body patches, orange and black legs, or greenish black legs. The six, tapering spines, which give the spider its star shape, are longer on the female than the male, and, like most spiders, the female (about 10 millimetres long) is larger than the male (about three millimetres long).

OTHER NAMES: Jewel spider.

DISTRIBUTION, HABITAT AND WEB: Christmas spiders live in home gardens and scrub all over southern Australia. They produce, beautiful large orb webs. At times and in places where there is an abundance of very small insects, hundreds of webs may enswathe surrounding bush.

LIFE HISTORY: About early summer the spiders mature and are quite obvious on their webs. During summer, the mature spiders mate. By autumn, most of the spiders have laid their eggs in a long lens-shaped sac bound by strands of brown silk to a twig or reed. Shortly afterwards they die. The spiderlings hatch during winter, but it is not until mid-spring that the animals or their webs are large enough to attract attention once more.

Photo – Babs & Bert Wells/CALM

BLACK WISHBONE SPIDER

(Aname diversicolor)

Like some other trapdoor and funnelweb spiders, the black wishbone spider is often mistaken for the venomous funnelweb of eastern Australia. However, although it can give a painful bite and cause temporary illness, it is not known to be lethal.

DESCRIPTION: These large, shiny black spiders have a body length of about four centimetres and long legs. When annoyed or cornered, the spiders are aggressive, raise their front legs and open the long, parallel needle-like fangs ready to strike.

DISTRIBUTION AND HABITAT: Black wishbone spiders are widespread in inland and coastal southern Australia, from the Flinders Ranges and Eyre Peninsula in South Australia to the west coast of WA. They are common in bushy Perth suburbs and throughout the jarrah forest, particularly in sandy soils.

BURROW: In profile, the burrow is like a Y or wishbone, and is lined with white silk. One shaft opens like a broad funnel at the surface, amongst litter or in bare ground. The other shaft is loosely closed, like the top of an empty sock, and serves as an escape hatch if the spider is disturbed in the main burrow.

LIFE HISTORY: Like most trapdoor and funnelweb spiders, the black wishbone spider takes several years to mature, and females may live for many years, probably up to 15 or more. When males mature, in summer, they leave their burrows to find a female. This wandering of males occurs at night and usually in humid weather, such as just before a thunderstorm. After mating, the male either dies or may be killed by the female. The female lays the eggs in a silken cocoon in the burrow, and the young hatch and leave the mother's burrow several months later. They then dig a burrow of their own, enlarging it as they grow. Spiders feed on insects, which they catch at the burrow entrance, or will sometimes run out to chase prey, which they seize with their front legs and feelers and bite with their fangs.

Photo – Babs & Bert Wells/CALM

DOUBLE-DOORED TRAPDOOR SPIDER

(Missulena species*)*

Double-doored trapdoor spiders belong to a Gondwanan family, the Actinopodidae, which occurs only in South America and Australia, but *Missulena* is found only in Australia. Male spiders are often found in bush suburbs, and occasionally even in long settled areas, if there is some bush parkland nearby. When disturbed, spiders may be aggressive and, like all trapdoor spiders, raise the front legs and open the fangs. These spiders are venomous, but few people who have been bitten have developed symptoms. Nevertheless, they should not be handled, but pushed into a container such as a large glass jar with a screw top and then released into the bush or taken to the Museum.

DESCRIPTION: Double-doored trapdoor spiders are chunky looking, with a squarish body and short, stout legs (longer and thinner in males). The head is high and slopes vertically back to the thorax part. The eyes are small and spread across the front of the head, unlike most trapdoor spiders, which have the eyes in a cluster. The body of large females is about three centimetres long. These spiders are generally black, but many male spiders have bright red jaws, sometimes with a bright red head, and a bluish abdomen.

DISTRIBUTION AND HABITAT: These spiders occur all over Australia and on some offshore islands, such as Rottnest, but not Tasmania. Different species are characteristic of particular habitats, such as forest, woodland and swamps.

BURROW: The burrows are closed by two, hinged flat doors made of silk-bound soil or litter fragments. The doors open into a common silk-lined tube, up to 30 centimetres deep. Silk trip threads sometimes radiate from the lips of the burrows. About halfway down the burrow is a sideshaft with another door. This is a "safety" retreat for the spider and a brood chamber for the young spiderlings.

Photo – David Knowles/Lochman Transparencies

LIFE HISTORY: Spiders live for many years and stay in the same burrow, enlarging it as they grow. Sometimes the silk lining and doors are removed and a completely new lining and doors are constructed over time. Female spiders are sometimes disturbed at the surface when repairing or enlarging their nests or laying out "trip threads". However, it is the males which are most commonly encountered on the surface. Males mature in the winter and, unlike other trapdoor spiders they wander in search of female nests during daylight, often on warm, sunny mornings. Females lay the eggs in a silk cocoon and raise the young in the burrow until they are ready to leave the next autumn. Spiderlings disperse by floating on silk threads a short distance from the mother's burrow.

RIDGE-BACK TRAPDOOR SPIDER

(Idiosoma sigillatum)

The ridge-back trapdoor spider was one of the first spiders collected (from the Swan River in 1864) and named (in 1870) from southern Western Australia. It was not subsequently recorded in the literature until 1952, although six specimens from the Perth area were deposited in the Western Australian Museum in the 1920s and 1930s. Though it is now known from throughout the metropolitan area, it is becoming rare because of urbanisation and loss of bush habitat.

DESCRIPTION: Large female specimens are about two and a half to three centimetres long (including the jaws). They are stout-bodied, with relatively short legs and a distinctively corrugated abdomen. The ridges of the corrugations are dark, reddish-brown and bear tooth-like spines and long bristles, and the grooves are yellowish. The hind part of the abdomen has two pairs of large button-like bare patches or sigilla. The eight eyes, which are visible to the naked eye, are arranged in three rows with two very large ones on the front edge of the head. Male spiders are slightly smaller, but with longer, thinner legs.

DISTRIBUTION AND HABITAT: Although formerly distributed throughout the metropolitan area, the Swan Coastal Plain, Rottnest and Garden Islands, and the northern jarrah forest, this species is becoming rarer because of urban sprawl, industrial developments, horticulture and other human activities. Favoured habitats are in sandy and sandy-gravelly soil in sheoak, wattle and banksia patches. Occasional specimens are still found in older built-up suburbs where a few native trees have been left.

BURROW: Spiders dig a deep, straight burrow which has a vertical, cup-like entrance that has a half circle of radiating twigs and leaves attached to the rim. These are the "feeling lines" that pick up movements of insects which the spiders feed on. The door is wafer-like and made of silk-bound litter fragments.

Photo – Barbara York-Main

LIFE HISTORY: Adult males leave their burrows in the autumn and early winter in search of female nests. At this time, they may accidentally wander into gardens and occasionally enter buildings. Several months after mating, a female spider lays its eggs in a silk cocoon attached to the wall of the burrow. Spiderlings hatch in the early summer but stay in the mother's burrow until the following autumn, when they leave and dig individual burrows. Each spider spends its whole life in the same burrow. Females are sometimes disturbed from their burrows during excavations for water and gas pipes, road making and other activities including landscaping and gardening. Disturbed spiders may be very aggressive and can bite with their needle-like fangs, but are not known to be dangerously venomous.

BLACK HOUSE SPIDER

(Badumna insignis)

Several species of the genus *Badumna* are commonly called the black house spider, but in Western Australia the only species so-called is *B. insignis*. It is very common in yards and around houses and outbuildings. Also called the window spider, lace-web spider or funnelweb spider, it should not be confused with the venomous Sydney funnelweb, which is related to trapdoor spiders.

DESCRIPTION: These spiders are about 12 or 14 millimetres long, often jet black with a greyish or black abdomen (sometimes with a faint dorsal pattern). They have a shiny or velvety appearance and rather stout legs. Juvenile spiders may be greyish, and adult males have relatively longer legs.

DISTRIBUTION AND HABITAT: The species is widely distributed in southern Australia, especially in dry areas. It does not occur naturally in the extreme South-West forest region (including Albany). However, it is readily carried around in goods and trucks, machinery and cars. Webs are sometimes established in the hinges of car and truck doors. Thus, the spider has become established in many South-West towns around which only the local species *B. microps* occurs in the forest. In the bush, spiders occur naturally under and around bark on trees and in logs, mallee roots and loose rocks. In and around buildings, they build their webs in window frames, under garden furniture and amongst flower pots and junk.

WEB: The web is a lace-like sheet. It is sometimes funnel-shaped and always spreads out from a retreat tube, which often continues into a crevice such as the corner of a window frame. The "lace" is made up of parallel dry threads between which are ladder-like or herringbone, adhesive threads. Spiders sit in the entrance of the retreat "funnel" at night, and run out on the web to catch insects. On still evenings, you may see the spiders laying down new, "ladder" threads at the edge of the web.

Photo – Jiri Lochman

LIFE HISTORY: Details of the life history are not known, but black house spiders probably live for about two years. Males wander from their own webs to find females. Eggs are laid in fluffy cocoons in the female's retreat, and spiderlings disperse in the autumn.

BITE AND VENOM: Black house spiders rarely bite people because they tend to retract into their retreats when disturbed. However, they are mildly venomous, and bites can cause persistent, large and bruise-like weeping sores.

HUNTSMAN SPIDER

(Isopeda leishmanni)

There are many species of huntsman spider in southern Australia. All are liable to enter and establish a territory in houses. Most species are not dangerous, but there are cases of bites causing illness, particularly of *Olios* (or *Neosparassus*) and, in the north, *Heteropoda*.

DESCRIPTION: These large, flat, greyish spiders have crab-like bodies and legs. All the legs are spread out flat at the side and turn towards the front. Spiders can run sideways and backwards and run readily up walls and smooth surfaces.

DISTRIBUTION AND HABITAT: This species occurs from south-western Australia, across southern South Australia and into south-western Victoria. On the Nullarbor, it is replaced by a similar species, *Isopeda magna*, which ranges from Eyre Peninsula to the west coast. Huntsman spiders live under bark, amongst wood, in old tree stumps, on the outside walls of timber houses, and they occasionally enter houses and other buildings. Extreme summer heat may drive them indoors out of roof spaces.

LIFE HISTORY: Huntsman spiders may live for several years. Females lay their eggs in flat, round white cocoons. Most huntsman spiders guard the young for several weeks or more after they hatch, so you can sometimes find family groups. The spiders do not make a snare web but hunt their prey. However, tough silk threads often enclose a shelter or brood chamber under bark or between flat objects.

Photo – Jiri Lochman

WHITE TAIL SPIDER

(Lampona cylindrata)

The white tail spider has recently gained notoriety, sometimes misplaced, because of suspected bites causing serious skin and tissue damage, as well as illness. However, most recorded bites have caused little more than blistery scabs and itching. Some authorities claim that it is the introduction of bacteria with its bite, rather than the spider's venom, which has caused serious reactions in some victims. Nevertheless, white tail spiders should be treated with caution.

DESCRIPTION: Spiders are about 1.5 centimetres long, cigar-shaped, with a dull polished look. They are a dark reddish-brown, with a white spot at the tip of the abdomen, just above the spinnerets (silk tubes). Immature spiders have several pale bands on the back of the abdomen.

DISTRIBUTION, HABITAT AND NESTS: The white tail spider is common right across southern Australia, but may be confused with several other species, especially in rural areas. Spiders live naturally under bark, but are also found amongst wood and debris. Around buildings and in houses they live amongst boxes, garden furniture, in flower pots and behind cupboards, and may creep across walls, particularly during the summer. The cocoon-like silk retreat and moulting shelters are often made in the corners of rooms and along the angles between the ceiling and walls. White tail spiders do not build webs to catch their insect prey, but are wandering hunters.

LIFE HISTORY: White tail spiders probably live one or possibly two years. Juvenile spiders rarely attract attention. Spiders mature in the summer. Females lay the eggs in a cocoon in their silken retreats, and brood the eggs until they hatch and the spiderlings disperse. Adult spiders sometimes prey on other spiders, as well as insects. A common victim is the black house spider. The white tail spider will enter its web, where it kills and eats the host spider.

Photo – Jiri Lochman

DADDY LONG LEGS

(Pholcus phalangioides)

This is an introduced cosmopolitan species, and has probably come from Europe or Britain. It is one of the commonest "domestic" spiders in suburbia. In some country areas, particularly in the Goldfields and tropics, native daddy long legs fill the same household niche. Daddy long legs are not venomous and, apart from their messy webs, do not cause any inconvenience.

DESCRIPTION: Daddy long legs have a small body with a long, cylindrical abdomen and extraordinarily long, thin, thread-like legs. They are usually greyish-buff coloured, with slightly darker markings on the upper abdomen. Males and females are about the same size.

DISTRIBUTION AND HABITAT: The species is found throughout temperate Australia, but is always associated with houses, shops, offices and other buildings, particularly outbuildings. Daddy long legs like warm, dry places, but can be found on sheltered verandahs.

WEBS: The webs are flimsy sheets. Beneath them, the spiders hang upside down, with their leg tips clinging to the silk. Daddy long legs frequently move around in an ungainly fashion and make new sheets. Thus, in a short time they can festoon a shed or part of a room with their soft webs. Webs ensnare insects on which the spiders feed and are thus useful (and harmless) pest exterminators.

LIFE HISTORY: Daddy long legs mature in a year but may live longer. They can mature at any time of the year, hence large and small spiders are often present throughout the year. In places with cold winters (such as the South-West) spiders may congregate and hibernate in undisturbed warmer nooks and crannies, such as under stairs or in boxes in sheds. Females carry the eggs in a loose silken sac (like a string bag) in the jaws until they hatch. After

Photo – Dennis Sarson/Lochman Transparencies

hatching, the spiderlings scatter and make their own tiny sheet webs.

BANDED ORBWEAVER

(Argiope trifasciata)

This genus has many species, most of which are tropical, but the banded orbweaver is Australia's most widespread orbweaver. The related Saint Andrew's cross spider does not occur in the South-West.

DESCRIPTION: Banded orbweavers have a white, shiny or silvery body, with yellow and brown bands on the upper side of the abdomen, and dark brown bands or rings on their leg joints. They are about 1.5 centimetres long and flattish. When in the web, they hang head down, with the legs outstretched in pairs on either side (with two front legs and two back legs together on either side) in the form of a cross. Male spiders are much smaller.

DISTRIBUTION AND HABITAT: The species is circumtropical, but in Australia it also occurs in temperate areas right to the South Coast. It is common in coastal areas of Western Australia, and occurs in suburban gardens, parks and wetlands. Webs are usually made close to the ground and often placed in reeds around swamps.

WEBS: The webs are permanent. That is, they are not made fresh every day but are repaired and enlarged frequently. The vertical orb web is supported by a labyrinth or tangle of threads on both sides. Banded orbweavers often make a cross of silvery silk ribbons on the webs. Spiders remain in the web during the day and night, often catching day-flying insects.

LIFE HISTORY: Banded orbweavers live for about a year, and mature in the spring and summer. Males search out females in their webs. After mating, the females lay the eggs in cup-shaped cocoons of very tough silk, which are sometimes greenish-coloured. These are suspended in vegetation near the web. The spiderlings disperse in the autumn.

Photo – Babs & Bert Wells/CALM

GARDEN ORBWEAVER

(Eriophora biapicata)

The garden orbweaver is one of the many species of *Eriophora* and *Araneus*, and is one of the two which are widespread in the South-West that are common in gardens.

DESCRIPTION: This large, bristly orbweaver is about 1.5 millimetres long. It is light to dark brown, usually with a leaf-shaped darker outline on the upper abdomen (occasionally this leaf or arrowhead shape is white) and long, spiny legs. Males and females are about the same size and look very similar, apart from the bulbous palps (the second pair of appendages on either side of the mouth) of the males.

DISTRIBUTION AND HABITAT: The species occurs south of the tropics, from the western part of the Great Dividing Range in eastern Australia to the west coast of WA. Coastal eastern Australia has a similar species (*E. transmarinus*). Garden orbweavers are found in open bush and forest areas and are very common in parks and gardens.

WEB: The web is a simple orb (or wheel shape), with a sticky spiral thread spun across the dry radii or "spokes". The orb is supported by frame threads spun between vegetation or parts of buildings, such as verandah posts, with one or more lower threads of the frame usually fixed to the ground. The supporting frame may span several metres and the orb may be up to three quarters of a metre in diameter. A new orb is spun each evening and taken down (and rolled up and eaten) before morning. Very young and older spiders often leave the web up in the daytime and stay in it. This means they are likely to be eaten by birds. Spiders hang head down at the hub of the orb and move out along the radii to catch insects when they tangle in the web.

LIFE HISTORY: Spiders mature in early to mid-summer. Males search out a female's web and tweak the outer threads before advancing for the mating ritual. Females lay their eggs in a fluffy

Photo – Barbara York-Main

cocoon affixed to leaves or against a building, but do not care for them further. Young spiderlings hatch in the autumn and, on damp mornings, one can often see the tiny orbs with drops of moisture sticking to the spirals.

MONARCH BUTTERFLY

(Danaus plexippus)

The monarch butterfly was introduced to Australia around 1870 and was first recorded in WA, near Perth, in the 1890s. The butterflies became more common as milkweed, their main food plant, became more widespread and abundant. The monarch is famed for its ability to fly long distances: every year monarchs migrate from Canada and the USA to Mexico and southern California, flying south in autumn and returning north in spring. During winter, they hibernate in vast congregations. In Australia such long-distance migrations do not occur, but winter congregations of butterflies have been seen in the eastern states and South Australia.

DESCRIPTION: The upper surface of the wings is tawny orange, with black margins and veins. The under surface is similarly marked but much paler. Males have a "sex mark" - a black spot near the middle of the hind wing. Their black markings are also less prominent. The monarch is one of the largest butterflies in WA, with a wing span of around 10 centimetres. The caterpillars are boldly striped in black, white and yellow, and have a pair of black filaments at each end.

OTHER NAMES: Wanderer, black-veined brown.

DISTRIBUTION: The species is found throughout Australia, excluding arid and semi-arid areas. In WA, it occurs in the South-West, at least as far north as Geraldton, and in the wetter areas of the north-west and Kimberley. The butterflies are most common near swamps and other winter-wet areas, where milkweed grows.

LIFE HISTORY: Butterflies may be seen in any month, but are most common in spring and early summer. Breeding occurs year-round and the early stages (eggs, caterpillars or pupae) can usually be found wherever a stand of food plants occur.

FOOD: Introduced milkweed species such as swan plant (*Gomphocarpus fruiticosa*) and red cotton bush (*G. curassavica*).

Photo – Marvis Norgard

Above: *Adult butterfly*
Right: *The caterpillar*

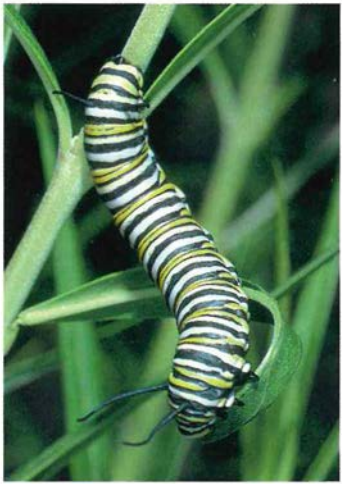

Photo – Trevor Lundstrom

CABBAGE WHITE BUTTERFLY

(Pieris rapae)

Although sometimes called the "cabbage moth", the cabbage white butterfly is definitely a butterfly - it flies during the day, has clubbed antennae and holds its wings erect when at rest. The cabbage white is a common pest of vegetable gardens and was introduced to Australia in the late 1930s, reaching Western Australia by 1942.

DESCRIPTION: The wings are white, both above and below, with a yellow suffusion on the underside of the hind wings. The fore wings have black tips, with one or two black spots near the middle: males have one spot, whereas females have two. Both sexes have a single black spot on each hind wing. The cabbage white is the only mostly-white butterfly in the southern half of Western Australia. The wing span is around 50 millimetres.

DISTRIBUTION: Cabbage white butterflies are found throughout southern Australia, excluding arid and semi-arid areas. They are most common in urban and agricultural areas, where their cultivated and weedy food plants grow.

LIFE HISTORY: Butterflies may be seen in any month, but are very common in spring and summer. Breeding probably occurs year round. Caterpillars grow to about 15 millimetres long. The caterpillars usually crawl away from the food plant to pupate. The papery skinned pupae adhere to the undersides of leaves and plant stems. The colour of the pupa often resembles the colouration of whatever it is attached to. The caterpillars often fall victim to paper wasps (see page 36-37).

FOOD PLANTS: The green caterpillars are pests of various species of cultivated crops, especially cabbages, cauliflowers, broccoli and others. Nasturtiums are also commonly eaten, as well as some weeds such as peppercress.

Photo – Matthew Williams

AUSTRALIAN PAINTED LADY

(Vanessa kershawi)

During spring and summer, Australian painted ladies are commonly seen flying in gardens and feeding at flowers. At other times of the year they still occur but are very uncommon. They are one of few native butterflies that have adapted well to urban and agricultural areas.

DESCRIPTION: The upper surface of the wings bears a complex pattern of orange, black and white markings. Each hind wing has a row of four "eye" spots, three of which have blue centres. The under surface of the fore wings is similar to the upper surface, but the under surface of the hind wings has a camouflage pattern. Males and females are almost identical. The wing span is around 50 millimetres. This butterfly could easily be confused with the European painted lady, which as four all-black eye spots. However, the European painted lady is extremely rare in Australia, and is presently known only from the suburbs of Bunbury.

OTHER NAMES: Blue-spotted painted lady.

DISTRIBUTION: They are found throughout Australia.

LIFE HISTORY: Butterflies may be seen in any month, but are most common in spring and early summer. Breeding occurs predominantly during the spring growing period of the food plants, which are annuals.

FOOD PLANTS: The caterpillars feed on numerous species of daisies, both native and introduced. In Western Australia, these include everlasting daisies and the very widespread cape weed (*Arctotheca calendula*).

Photo – Matthew Williams

COMMON GRASS-BLUE BUTTERFLY

(Zizina labrudus)

Grass-blue butterflies are the most common and ubiquitous of our native butterflies. They have adapted well to urban and agricultural areas because the caterpillars can feed on clovers.

DESCRIPTION: The upper surface of the wings are blue or bluish-purple, with grey margins. The under surface of the wings is pale grey to brownish-grey, with a mottled camouflage pattern. Males and females are almost identical, but females have less extensive blue markings.

OTHER NAMES: Common blue, clover blue butterfly.

DISTRIBUTION: Throughout Australia.

LIFE HISTORY: Common grass-blue butterflies may be seen in any month, but are most common in spring and summer. Breeding occurs predominantly during the spring and summer growing period of the food plants. The caterpillars may be attended by one or more ants, which obtain a sweet honeydew substance from a gland on the caterpillar's back. In return, the ants protect the caterpillar from attack by predators.

FOOD PLANTS: The food plants include numerous species of pea plants, both native and introduced. In Western Australia, these include cultivated peas, beans and lucerne, as well as clover.

Photo – Trevor Lundstrom

HONEY BEE

(Apis mellifera)

Bees are among the most useful of all insects, producing honey and beeswax, which is used in candles, lipsticks, polishes and other products. Unfortunately, they have turned feral in many areas, and probably compete with native bees for food. Honey bees live in large social colonies of up to 80 000 members.

DESCRIPTION: Like all insects, a honey bee has a head, thorax (chest) and abdomen. Its body is thickly covered with fine hairs and the general colour is a light brown, with black bands on the abdomen. Two pairs of wings on the thorax, locked together by fine hooks when in flight, enable bees to fly forward, backward, sideways or hover. A tubular tongue siphons nectar into a special "honey stomach", or reverses the action to feed other bees. To defend their hives or themselves, worker honey bees have a barbed stinger in their tails used to inject poison. Bee stings can be serious if you are allergic to them.

LIFE HISTORY: Bees drink nectar from flowers and collect tiny grains of pollen on long, curved hairs on their back legs. The nectar is taken back to the hive to produce honey for food. In their meandering, bees pollinate and fertilise many plants, including important agricultural crops. Life for a honey bee starts off as an egg laid by a "queen bee" in a wax cell in a brood chamber honeycomb. The egg hatches into a small white grub, which is fed by worker bees. If fed a special "royal jelly" the larva will pupate into a young queen, but if fed a simple beebread of honey and pollen the young will develop into workers or drones. A few larvae are selected as queen bees, the majority as infertile female workers and the rest as male drones for mating with young queens. Workers keep the whole hive running, supplying food, caring for young and maintaining and defending the hive. In the busy summer months, a worker bee may only live for about six weeks. In winter, it may live for several months.

Photo – Babs & Bert Wells/CALM

Above: *A honey bee*

HOVERFLIES: These medium-sized flies, larger than houseflies but smaller and more slender than blowflies, are sometimes confused with bees, as their abdomen has yellow bands on the upper side (see photo on page 62). Hoverflies tend to "swarm" in flowering trees and vegetation on still warm days and make a distinct humming, or low buzzing sound, which is often confused with that of bees. The flies appear to hang motionless in the air, while "buzzing". However, this hovering is due to the rapid movement of their wings. The larvae (maggot stage) live in rotting vegetation and fruit and "muck" as in drains.

COMMON PAPER WASP

(Polystes humilis)

Two species of paper wasp inhabit our gardens, both alien creatures which were accidentally introduced to the State. They have a highly developed social organisation and will not hesitate to pursue anyone who bumps into their nest. The common paper wasp, a native of the eastern states, was first discovered in Perth in 1949. It probably arrived on a ship.

DESCRIPTION: Common paper wasps have brown, black and yellow bands. Their waist is narrow, and they are more slender and slightly longer than a bee. They also have orange-brown antennae. They are about 15 millimetres long. The yellow paper wasp is yellow and black, with no brown bands.

HABITAT AND NEST: The nest resembles an upturned toadstool of hexagonal cells, suspended by a short stalk from a tree, bush or building. Some nests may reach 15 centimetres across and house several hundred wasps. The yellow paper wasp prefers hidden sites such as fence capping, downpipes or under tiles.

LIFE HISTORY: After hibernating over winter, a fertile queen scrapes wood fibres from weathered power poles or fences with her powerful mandibles (jaws), and constructs the stalk and the first few cells of her greyish-brown, papery nest with a mixture of saliva and chewed wood. An egg is laid in each cell and the young larva, which hatches a few days later, is fed on masticated nectar and caterpillar. The stout white legless larvae mature and spin silken cocoons within their cells. After pupation, mature adults emerge. The first progeny are all infertile female workers which take over nest construction, food gathering and feeding the developing brood, while the queen continues egg laying. Later in the season, males, recognised by their yellower faces, are produced and mate with those females destined to be future queens. Late in autumn, the new queens fly off to hibernate and the workers and males die off around their declining colony. Nests may be reactivated the next year.

Photos – Babs & Bert Wells/CALM

ANT-LION

Order Neuraptera

Have you ever noticed tiny, cone-shaped excavations in loose sand in sheltered places around your house? Under each one lies an insect larva that is more monstrous as a hunter than many of our planet's larger beasts of prey. Hence the name ant-lion. The ant-lion is the larva of a lacewing, a graceful insect with gauzy wings and a slender abdomen that resembles a dainty damselfly.

DESCRIPTION: An ant-lion is a small, squat creature with a fat, bristly body and narrow head. Each wields a pair of large, sword-like jaws used to attack and devour ants and other insects that stumble into its pit-trap. Three pairs of legs are attached to the body, close behind the head. This enables the beast to move more easily, because it only walks backwards, using its body like an inverted shovel as it manoeuvres through loose dry soil.

FEEDING: After selecting a flat area, the ant-lion moves in ever decreasing circles underground, scooping sand over its body. From time to time, it flicks the soil to one side with a snapping jerk of its head, until it has reached a centre point. By then, it is at the bottom of a funnel-shaped hole where it waits patiently with its head and mouth parts protruding. To ensure that prey falls from the rim of the pit into its outstretched mouth, the ant lion fires a powerful salvo of sand granules the moment the pit is disturbed. It rarely succeeds in clasping its victim firmly on the first try, and often must repeatedly toss its quarry against the walls of the pit. When the jaws are in position, the ant lion will drag the body underground and suck it dry, later to unceremoniously flick the drained carcass out of the trap. The jaws of an ant-lion are piercing, sucking tubes. When the tips are in position, a glandular secretion passes through that paralyses and liquefies body tissues.

LIFE HISTORY: Ant-lion lacewings scatter their eggs on sand. After three to five moults, ant-lion larvae spin silken cocoons, pupate and emerge as adults.

Above: *An antlion*

Below: *The adult lacewing*

Photos – Jiri Lochman

PRAYING MANTIDS

Order Mantodea

Praying mantids are a group of predatory insects, found throughout the tropics and sunny temperate zones of the world. They are usually green or brown, and adorned with outgrowths that result in them looking like grass, leaves, flowers or pieces of stick or twig. This helps them hide from their enemies, and disguises them from potential prey. They are of the Order Mantodea, a word derived from Greek. It means "like a prophet", and describes their habit of remaining still with their fore legs in a praying position. There are some 2000 named species of mantids in the world.

DESCRIPTION: Mantids are generally long, slender, stilt-legged insects that use their heavily-spiked fore legs to seize prey. While some species are wingless, most have tough narrow fore wings and large, gauzy, fan-like hind wings. The triangular head, with two large compound eyes, moves freely on a long, narrow, neck-like prothorax. It allows them to follow a moving insect, while the rest of the body stays rigid. Two very fine antennae adorn the head, and they have very powerful jaws which are capable of devouring other mantids, leaving only the wings.

LIFE HISTORY: Female mantids have a tendency to eat the male during copulation. While it is thought that a female attacks her partner through lack of recognition, it could be a way of ensuring nourishment for development of the first egg batch. When the young nymphs hatch, they disperse quickly. Like their relatives the cockroaches, mantids undergo an incomplete metamorphosis. They do not have a caterpillar, but go through several stages, all of which look like miniature wingless adults.

Photo – Babs & Bert Wells/CALM

WOOD TERMITES

Termites, although commonly called white ants, are not ants and belong to a different order of insects, the Isoptera.

DESCRIPTION: Termites are small, soft-bodied insects with darker, bulbous heads and jaws. They are social insects, in that they live in colonies with different "castes" which perform distinctive duties in the colony. The workers are smaller than the soldiers (guards) and much smaller than the queen, which is larger, grub-like and lays eggs continuously.

NATURAL HISTORY: The common native termite species in the metropolitan area (*Coptotermes frenchi*) lives underground, often associated with buried stumps or rotten tree roots. In damp weather, particularly after rain during summer and autumn, the termites move to the surface. Under the cover of soil-coated galleries, which they construct as they move about, they feed on tree butts, loose timber lying on the ground or wooden constructions such as fences, sheds and timber houses. They will also construct galleries on limestone foundations and thus enter houses, where they attack floorings, furniture and paper products such as cardboard boxes and books. Termites can be very destructive in a short time. However, they are sensitive to disturbance and retreat rapidly underground, so are hard to control without chemical treatment.

During late spring and summer on warm, still and humid days, the alates (winged forms) emigrate from nests and fly about before settling and forming new colonies. As they shed their wings and fall to the ground, birds and cats may be seen feeding on them. The common species found in suburban yards (and houses) does not build mounds like many other species, so they are difficult to detect until after damage to property has occurred.

INTRODUCED SPECIES: The dry wood termite (*Cryptotermes brevis*), which is now well established in parts of eastern Australia,

Photo – Jiri Lochman

has recently been found in Perth. These termites are not associated with the soil during their life cycle, but live entirely within standing wood, including furniture. They are usually not observed until the structure crumbles or heaps of pellets, the size of sand grains, are noticed at the base of structures. Any suspicion of the presence of these termites should be reported to Agriculture Western Australia, as they can spread rapidly.

SPITFIRES

Family Pergidae

Spitfires or sawflies are the larvae of a group of wasps, and belong to the Order Hymenoptera. Thus, they are related to bees and ants, and are not flies in spite of the common name "saw flies". Most species are native and many are associated with eucalypts and eat gum leaves. They are unlike the slug-like larvae of the pear and cherry slug (*Caliroa cerasi*) in the Family Tenthreninidae, which are leaf miners and tunnel within leaves, including those of fruit trees.

DESCRIPTION: The grub-like larvae have a waxy, bristly appearance and are superficially like a caterpillar. The brownish coloured adults are rather flat, thick set and have a broad connection between their thorax and abdomen, unlike other wasps, which have a thin waist. The wings are stiff and membraneous.

BEHAVIOUR AND LIFE HISTORY: When aroused, the grubs raise the head and exude oil (derived from gum leaves) which is stored in the foregut, hence the name "spitfires". Although perhaps unpleasant, the "spit" is not toxic. The larvae live in groups, feeding on eucalypt leaves during the night and resting in bunches on stems or foliage in the day time. The larvae move down into the ground to pupate, where they form clumps of attached pupal cells from which the adults emerge. Eggs are inserted in gum leaves.

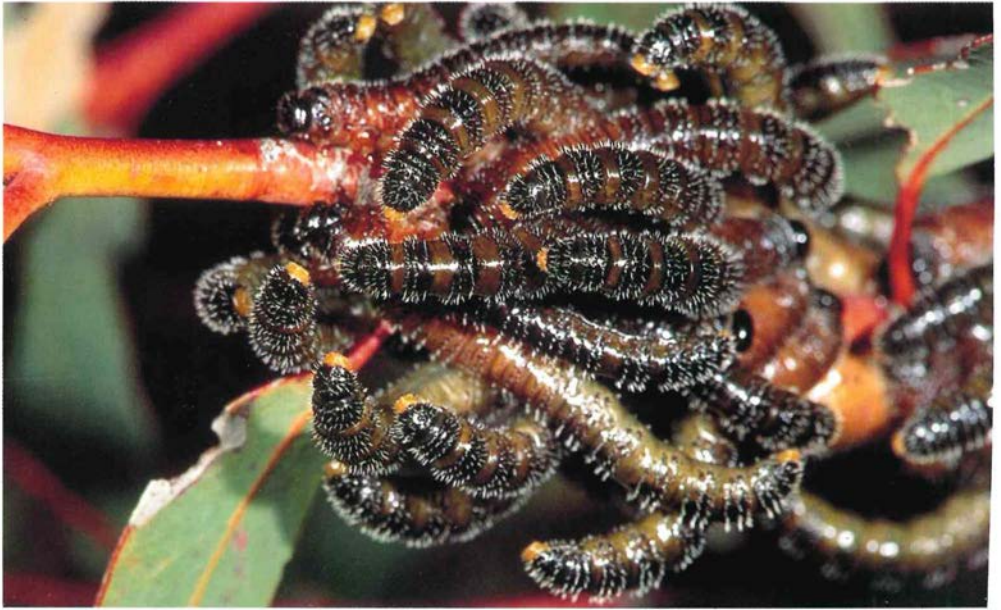

Photo – Jiri Lochman

CICADAS

Family Cicadidae

There are many species of cicada, with some inland and northern species being very large. The common metropolitan species, however, are small to moderate in size (up to two centimetres long). Cicadas are renowned for their shrill choruses, especially in spring and summer, although south-western species are not as deafening as some eastern Australian species, and do not occur in such large numbers.

DESCRIPTION: Adults are brownish, with hooded wings which are stiff, heavily veined and transparent. The whole body is dry and papery to touch and the claws also have a prickly feel if the insect is enclosed in the hand. Holding a cicada or putting it in a container (such as a jar or matchbox) will usually provoke a thin wheezy sound. The sound-producing organs, usually present only in males, consist of a drum and one or paired resonant air sacs on the underside of the abdomen. These give the appearance of the insect being "hollow".

OTHER NAMES: Tick-tock, tick-t-tick.

LIFE HISTORY: The larvae live in the soil, where they feed on plant roots. The pupae crawl to the surface and attach themselves to plants. The pupal skin splits along the back of the thorax and the adult winged insect emerges, leaving behind the "shell", which becomes rigid when it dries and may remain intact for months. Cicadas sometimes become entrapped in large orb webs and spiders wrap and eat them.

Photo – Peter Marsack/Lochman Transparencies

SLATERS

(Porcellio scaber)

Slaters are common and prolific members of our urban environment. They are seen regularly in gardens, backyard sheds or dark, moist areas. It is not unusual to have them come from behind a skirting board and scamper across the lounge room carpet. Slaters are terrestrial crustaceans, direct relatives of crabs, prawns and lobsters. Several species of slater are found in Western Australia, but the one most likely to be seen (*Porcellio scaber*) is an exotic species probably transported here in a packing case many years ago.

DESCRIPTION: This species has seven pairs of pointed legs and two sets of antennae. The animals are a dull pinkish-grey and are covered with a segmented armour-like cuticle, which resembles the tailpiece of a rock lobster. Like an armadillo, they can roll up into a ball which protects them from predators and the loss of body moisture.

OTHER NAMES: Woodlice.

LIFE HISTORY: Slaters are hatched as miniature adults, with some species carrying their young on their antennae. The thin shell or exoskeleton of slaters does not have the waxy component of terrestrial insects and spiders, hence their nocturnal habits and their preference for nooks and crannies where the atmosphere is humid. They feed on any moist decomposing organic matter, mostly decaying vegetation, and are therefore an important link between plants and larger animals in the food chain.

Photo – Peter Marsack/Lochman Transparencies

COCKROACHES

Order Blattodea

Cockroaches roamed ancient fern forests 250 million years ago, 150 million years before the dinosaurs and some 240 million years before humans. They have survived plagues, radiation and modern insecticides. Australia has about 450 species of cockroach, which live in the bush. They eat vegetation and, as scavengers and recyclers, are vital to a balanced environment. The two species most common in our homes – and loathed by most people – are the introduced German and American cockroaches.

DESCRIPTION: While native cockroaches are all shapes and sizes, the pest species are generally flat and thickset. Mature insects have thick, leathery wings which lie flat on the abdomen. The small German cockroach is between 10 and 15 millimetres long, while the big, dark brown American cockroach ranges from 28 to 44 millimetres.

HABITAT: The small German speedster is the most widespread species, preferring moist, warm places indoors. The American cockroach is equally at home indoors or outdoors, needing only shelter, warmth, moist surroundings and a ready source of food. The warm Western Australian climate has been readily adopted by the American cockroach and, over the past 10 to 20 years, they have become prolific in woodpiles, laneways, gardens, sewers, drains and any room in the house.

LIFE HISTORY: The females of most cockroach species lay eggs in a progressively grown, horny purse-like case formed by special glands. In a few weeks the nymphs break out and begin to forage. Cockroaches are omnivorous and can live on human hair, bird droppings, or the smear of oil on a cleaned kitchen bench.

Above: *American cockroach*

Below: *German cockroach*

Photos – Jiri Lochman

CRUSADER BUG

(Mictis profana)

The crusader bug is a very common and distinctive inhabitant of our gardens. When disturbed, it is capable of shooting out a stinking fluid. It is a garden pest, but not usually a major one, that attacks the new growth of citrus trees and other plants.

DESCRIPTION: The crusader bug is about two or three centimetres long. It is easily recognised by the yellow cross on its broad back when the wings are folded. The prothorax tapers sharply to the head. The head is small, with long antennae, which have four segments, and a short, sharp beak. Males can be distinguished from females by the longer hind femora and spines on the hind leg.

DISTRIBUTION: These insects are found throughout the Australian mainland, but are absent from Tasmania. They are also found in Indonesia, Fiji and Papua New Guinea.

HABITAT: Crusader bugs feed on a range of native and introduced plants. In the garden they are often seen on citrus plants, but are also particularly common on a variety of native wattles and eucalypts. They have been recorded on camphor laurels, grapes, pawpaws, plumbago and roses.

LIFE HISTORY: Adults live for about three and a half months, mating regularly throughout their life span. Several eggs are laid every five to six days, with only about a third surviving the various larval stages to reach adulthood.

Photo – Jiri Lochman

EARWIGS

Order Dermaptera

The common earwigs found in metropolitan and many rural gardens are native species, including *Gonolabis michaelseni*. However, the European earwig (*Forficula auricularia*) has been introduced to the South-West. The species can become a pest when in large numbers, because it will eat garden and horticultural plants and crops. In hills' suburbs and rural areas, native earwigs which normally live in forest and woodland litter may also encroach on gardens, but do not become a nuisance amongst garden plants. The common name is probably a corruption of "ear wing", referring to the shape of the hind wing.

DESCRIPTION: Earwigs are small and usually shiny brown, though some species are duller, greyish-brown and rather beetle-like, with the fore wings forming small, flattish covers, under which the large hind wings are folded like fans. Immature stages are wingless, but do not pass through a resting pupal stage. Some are wingless. Adults are about 15 to 17 millimetres long, with a narrow, flat body terminating in a pair of "prongs" or tweezers. Although the tweezers (or pincers) may pinch, they do not contain venom, and the insects are harmless. Females are a little larger than males.

NATURAL HISTORY AND LIFE CYCLE: Earwigs eat decaying vegetable matter, including garden mulch and sometimes flower buds. Earwigs are nocturnal and live in "nests" or scoops in the ground under stones, bits of wood and flower pots in damp places. Pairs may be found sometimes. Eggs are laid in the "nests", and the female guards them, sometimes curling the body around a clutch.

Photo – Jiri Lochman

Above: *European earwig*

HOUSE CRICKET

(*Raquena* species)

Several species of cricket occur in and around houses and in gardens. In suburban areas the native species (*Raquena*) is the commonest. The introduced and almost cosmopolitan Indian cricket (*Gryllodes sigillatus*) is also widespread in houses and public buildings and, although flightless, it appears at night around street lights and shop windows. In streets and around parks it retreats to covered drains, rubble and sheltered areas during the day. Its high-pitched singing, produced by males scraping the edges of the reduced fore wings together, can be irritating.

DESCRIPTION: The house cricket is small, only about 15 millimetres long. It is pale (almost translucent), with long antennae (feelers). It has large mandibles and will bite if picked up and held roughly, but is not dangerous and has no venom. Females have a long egg-depositing organ (ovipositor), which projects from the end of the abdomen. Both the native and introduced species have sensory processes on the end of the abdomen – these are not stings and are harmless. The Indian cricket is a darker colour and has a spotty or freckled pattern.

HABITAT AND BEHAVIOUR: The native crickets live in vegetation close to houses, especially amongst pot plants and hanging baskets. They also live indoors and commonly invade kitchens, where they may be seen resting high up on walls in the angles of ceilings or might be disturbed from behind cupboards or inside cupboards, vegetables and fruit. They are nocturnal and after dark come out on sinks and benches, where they scavenge like cockroaches. In fact, behaviourally, in domestic areas they are like elegant cockroaches, feeding on food scraps and unwashed dishes. However, they are not known to carry diseases and can be regarded as miniature pets. Like all arthropods, they shed their skin as they grow. Occasionally they can be seen, very pale after moulting, eating the shed skin – nothing wasted!

Photo – Jiri Lochman

Above: Raquena verticalis

Below: *Indian house cricket*

Photo – Babs & Bert Wells/CALM

MOLE CRICKETS AND SANDGROPERS

The commonest genus of the mole cricket (*Gryllotalpa*) has several species. These crickets have a superficial resemblance to the sandgroper (*Cylindracheta* species), but the adults are winged.

DESCRIPTION: Mole crickets are large stout crickets with heavy fore legs that are used for digging. Sandgropers resemble large, cylindrical wingless crickets. They have a smooth, shiny skin, with the head and front part of the thorax hard and tan brown to orange. The abdomen is paler and soft. The hind legs are short and stumpy, not "kneed" as in most crickets. The fore legs are stout, sideways flattened, almost blade-like and used like shovels for burrowing.

MOLE CRICKETS: The insects spend most of their lives underground, and are rarely seen on the surface, except at night, when they may come to lights. They are occasionally found in gardens, especially if they are not heavily cultivated or over fertilised. Most feed on plants and roots, but they are not generally found in sufficient numbers to be a pest. Some eat other insects in the soil. They dig permanent burrows and males call from the entrance. Tube-like foraging galleries are made just under the soil surface during or after rain (or heavy sprinkling) and may run for more than a metre, giving the appearance of a piece of buried hose or rope.

SANDGROPERS: Sandgropers live permanently in the soil, where they feed at the base of plants, including garden and crop annuals. They may be disturbed and turned over on the surface during gardening and excavation activities. They are commoner in sandy, coastal suburbs than in heavier soils.

Photo – Jiri Lochman

Above: *Mole cricket*

BROWN SNAIL

(Helix aspersa)

There are several introduced snails in Western Australia, two of which occur throughout the metropolitan area: the brown snail and the Mediterranean snail (*Theba pisana*). The Mediterranean snail (also called the sand dune or white Italian snail) is not only a garden pest but also causes crop damage in some coastal areas.

DESCRIPTION: When fully grown, the brown snail is large, slightly smaller than a walnut. Its shell is dark brown with lighter markings, roughly spherical, and sometimes glossy. When it moves about, the soft, slimy, slug-like body protrudes from the shell and the antennae (or horns) are extended.

OTHER NAMES: Common garden snail.

HABITAT AND BEHAVIOUR: Snails live among low vegetation and on the ground, but climb small shrubs and low perennials and annual plants and feed on the leaves. Small tender plants may be eaten entirely.

LIFE HISTORY: The snails leave a silvery trail of slime behind them as they creep about. They mate on the ground and deposit clumps of gelatinous eggs in small depressions in the ground. Snails do not moult, but as they grow they enlarge the shell around the opening. In dry weather, the snails shelter in nooks and crannies in the garden, such as under stones in rockeries, in old flower pots or they climb up trees and shrubs and fasten themselves onto trunks and stems with a mucus-like substance which hardens and dries, sealing off the moist body within. In this way, they can survive for many months, but a heavy shower of rain or generous watering causes softening of the seal, and they will promptly move about again to feed.

Photo – Jiri Lochman

SIGHTING RECORD

SPECIES	REMARKS
monarch butterfly	
cabbage white butterfly	
Australian painted lady	
common grass-blue butterfly	
redback spider	
Christmas spider	
black wishbone spider	
double-doored trapdoor spider	
ridge-back trapdoor spider	
black house spider	
huntsman spider	
white tail spider	
daddy long legs	
banded orbweaver	
garden orbweaver	

Photo – Jiri Lochman

Above: *Hoverfly*

SIGHTING RECORD

SPECIES	REMARKS
honey bee	
paper wasp	
ant lion	
praying mantids	
wood termites	
spitfire	
cicada	
slaters	
cockroaches	
crusader bug	
earwig	
crickets	
mole crickets	
sandgropers	
brown snail	

Photo – Matthew Williams

Above: *Australian painted lady*

INDEX

4352-0598-7500

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Wildflowers of the South Coast
Common Wildflowers of the Mid-West
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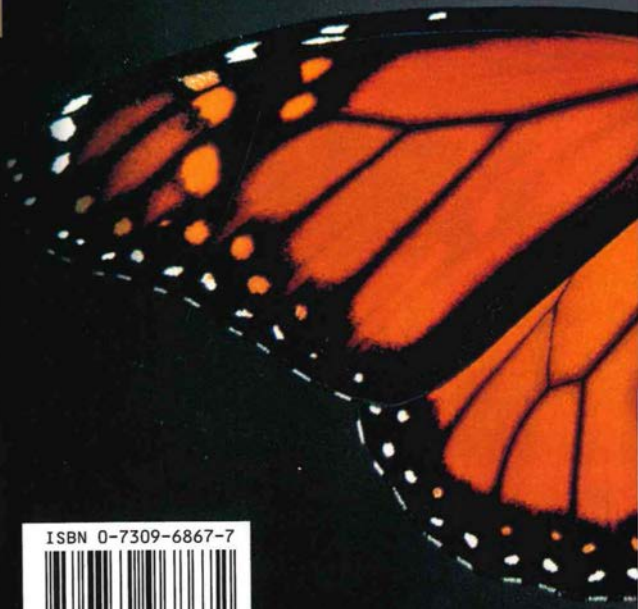

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