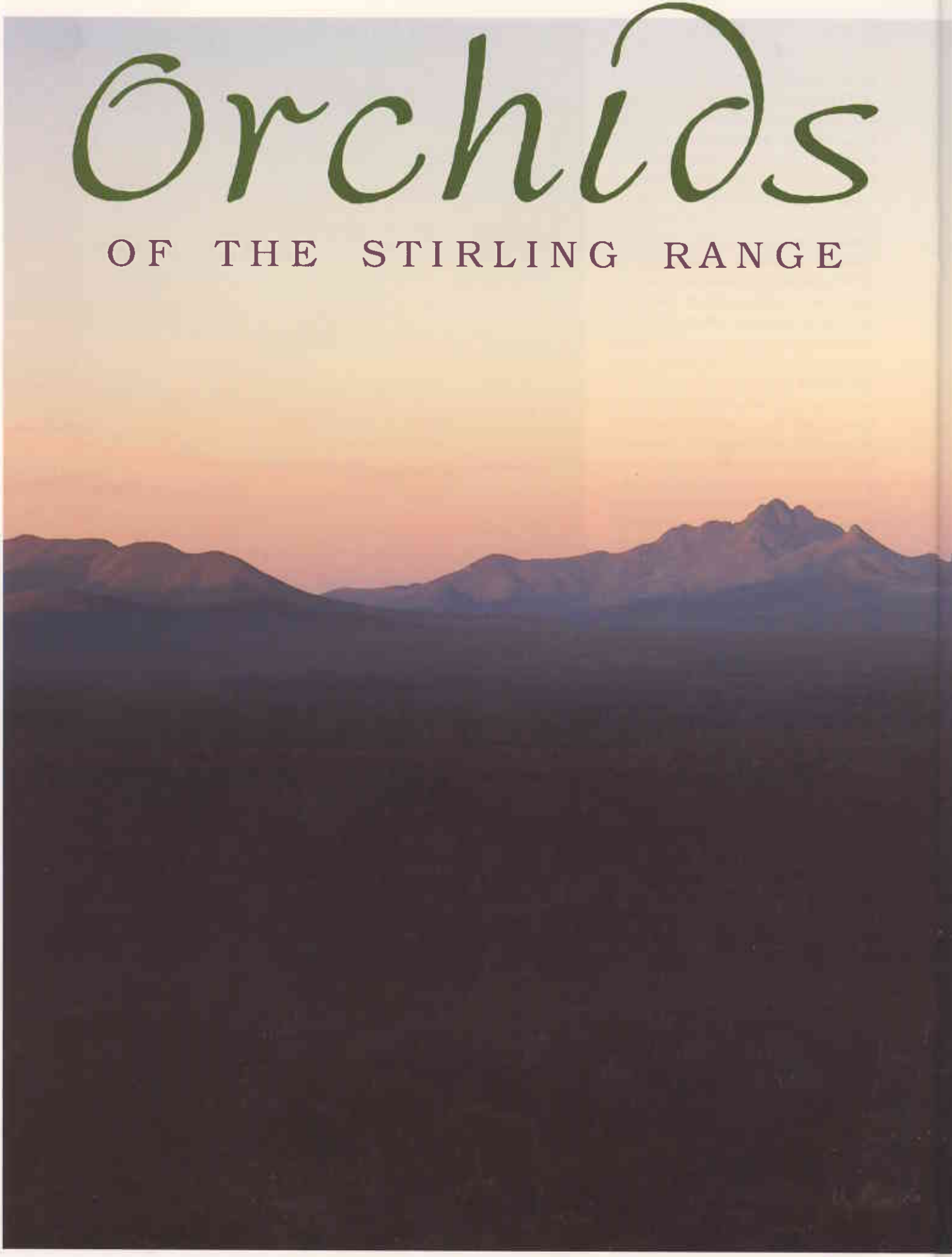
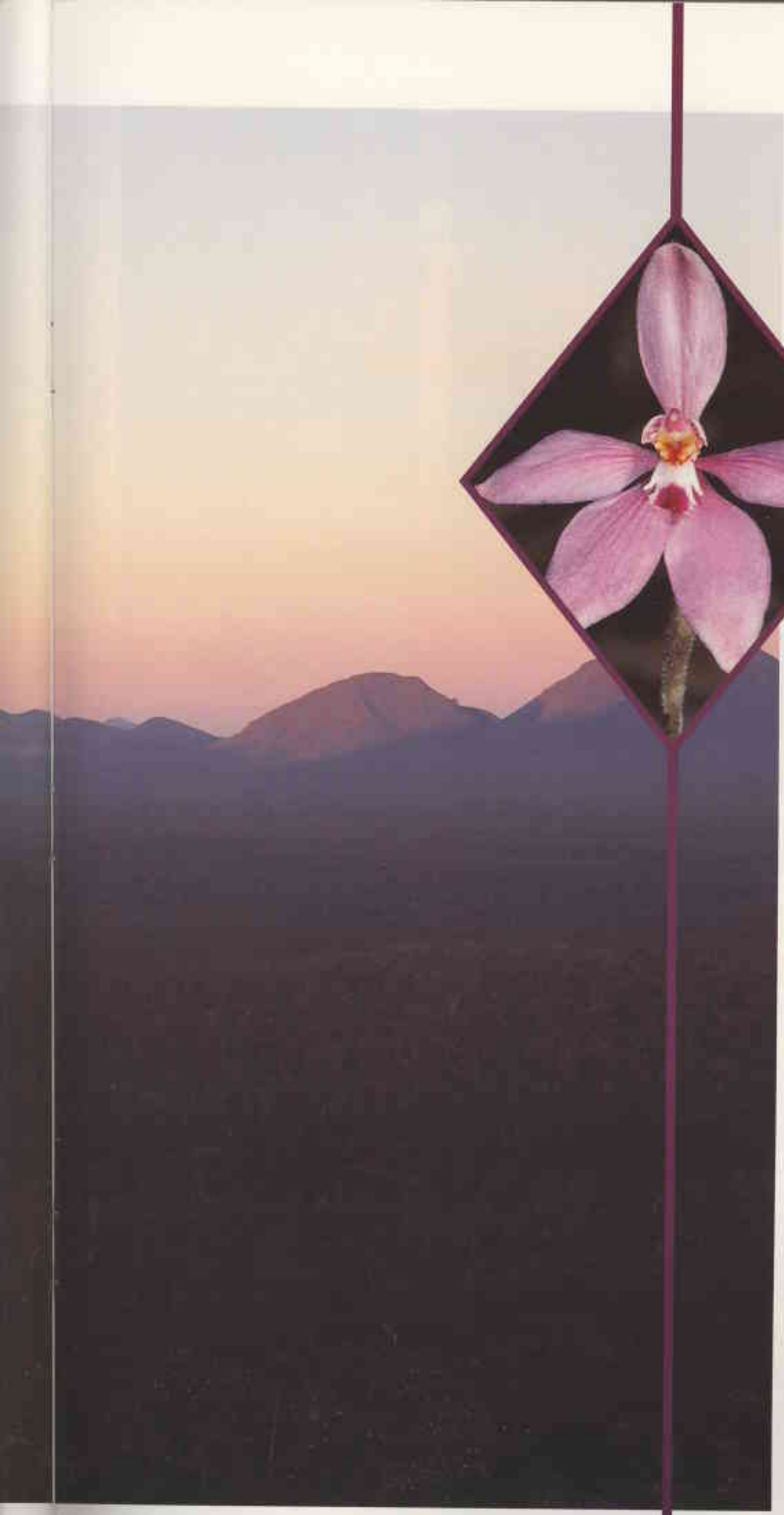
# Orchids

## OF THE STIRLING RANGE





Nestled between the wetter south-west and the drier inland regions, and rising some 1 000 metres above sea level, the Stirling Range National Park provides refuge for an astonishing 123 orchid species. This article is based on a chapter from a new book, Mountains of Mystery: A Natural History of the Stirling Range National Park, to be published by CALM next year.

BY ANDREW BROWN

The Stirling Range National Park contains about 38 per cent of all known Western Australian orchids and includes 23 of the 27 genera that grow in the south-west of the State. To find such a large number of orchids in such a relatively small area is remarkable by any standards, but is not surprising when you consider the diverse topography of the region. This varies from salt lake margins and deep, moist valley floors to rocky mountain tops. The wide range of habitats scattered throughout these areas include low-lying swamps, seasonal creeks, forests, woodlands, and the dense low shrublands that clothe much of the landscape. These vastly different areas display a magnificent array of orchid species, many of which are now rare elsewhere. Many species reach the limits of their distribution in the park and several species contain forms that are found nowhere else.

At least five Western Australian orchids have been named from collections made in or near the Stirling Range National Park. The narrow greenhood (*Pterostylis angusta*) and the tall snail orchid (*P. dilatata*) were both described from plants collected by botanist Alex George west of Mount Trio and below Bluff Knoll in July, 1969.

The first species named from the park was found in 1869, when Baron Ferdinand von Mueller collected the zebra orchid (*Caladenia cairnsiana*) north of the Stirling Range. The pink beak orchid (*Burnettia forrestii*) was discovered just a few years later by John Forrest, after whom it was named, and in 1903 the rare sandplain sun orchid (*Thelymitra psammophila*) was also found near the Stirling Range. Ironically, the last two are far more common elsewhere and probably were never very abundant in the Range.

More recently, a number of other new orchid species have been found in the park, several of which may be described from collections made there. They are: the big clubbed spider (*C. arrecta*), the Jerramungup spider (*C. flaccida* ssp. *pulchra*), Heberle's spider (*C. heberleana*), the painted spider (*C. polychroma*), the Christmas spider (*C. serotina*), the late spider (*C. ultima*), the common spider (*C. varians* ssp. *varians*), the late hammer (*Drakaea confluens*), the slender hammer (*D. gracilis*), the dwarf hammer (*D. micrantha*), the crinkle-leaved bunny (*Eriochilus dilatatus* ssp. *undulatus*) and the swamp bunny (*E. helonomos*).

*Previous page:*
Rising some 1 000 metres above sea level, the Stirling Range provides refuge for an astonishing 123 orchid species.
Photo - Jiri Lochman
*Inset:*
Dwarf pink fairy (*Caladenia reptans* subsp. *reptans*). A winter flowering species, the dwarf pink fairy forms attractive clumps in rocky areas of the park.
Photo - Gerhard Saueracker

*Above left:*
King spider orchid (*Caladenia pectinata*). An inhabitant of jarrah-marri woodlands the stately king spider is often found standing well above surrounding vegetation.
Photo - Andrew Brown

*Above:*
Blue china orchid (*Cyanicula gemmata*). Rarely flowering unless the bush has been burnt, the blue china orchid is common in mallee heathland areas of the park.
Photo - Andrew Brown


## WHAT IS AN ORCHID?

Orchids have several unique features that distinguish them from other plants. For example, orchids have combined their pollen-bearing parts (anthers) with their pollen-receiving parts (stigma), to form a single structure known as a column.

Orchids also amass all their pollen into one or two large bundles, which become attached to the body of a visiting insect. When these bundles are successfully transferred to the receptive stigma of another flower an exceptionally large number of ovules are fertilised at the same time, producing literally thousands of tiny seeds that are dispersed widely by the wind. The advantage of this strategy is obvious, when it is considered that most other plants require multiple pollination events to achieve a similar amount of fertilisation.

All orchids rely on soil fungi to infect the germinating seed and provide a food source on which the young plant can grow. This association continues throughout the plant's life and without it orchids would be unable to survive.

Most orchids also have a modified third petal, known as the labellum or lip, that looks quite unlike the other two. The labellum of most species provides a landing platform for visiting insects, and in some cases actually resembles a female insect.

While some species found in the park, such as the common snail orchid (*Pterostylis nana*), multiply freely by producing two or more new tubers each year, most are like the white spider orchid (*Caladenia longicauda* subsp. *eminens*), which rarely replaces its old tuber more than once and must therefore rely on seed dispersal to multiply.

This has led orchids to rely heavily

Cowslip orchid (*Caladenia flava* subsp. *flava*). The bright yellow flowers of the cowslip orchid are a common sight during the spring months.
Photo - Andrew Brown

on successful cross-pollination by insects (though in rare cases they self-pollinate). The resulting relationship between insects and plants makes for a fascinating study.

The lengths to which orchids go to attract pollinators are as varied as the species themselves. Some have flowers that resemble fungi, some smell like rotten meat, others have structures like the pollen-laden anthers of lilies and some simply mimic other flowers. The masters of deception are, however, those orchids that fool male wasps or flying ants by imitating the females of the species. A number of the park's orchids have these attributes. (See also 'Wicked Deceptions', *LANDSCOPE* Winter 1991 issue.)

## ORCHIDS IN THE PARK

Due to the Mediterranean climate of cool, wet winters and hot, dry summers, the park's orchids largely grow and flower during autumn, winter and spring. While a few species continue into summer, most die back to dormant tubers, resprouting again when autumn rains moisten the soil. The best time to look for orchids is from August to October, when up to 90 species can be found in flower. In good seasons you will be rewarded with massed displays.

The orchids of the Stirling Range are remarkably diverse. They range from the dainty dwarf spider (*Caladenia bryceana*), which grows only six centimetres high and produces flowers just two centimetres across, to the tallest of all Western Australian orchids. The king leek orchid (*Prasophyllum regium*) grows to well over two metres and has up to 100 or more flowers. Floral shape varies enormously and some species, such as the greenhoods (*Pterostylis* spp.) and hammer orchids (*Drakaea* spp.), have bizarre flowers that hardly resemble flowers at all.

Some species are quite common, such as the yellow-flowered cowslip orchid (*Caladenia flava*), which grows in most of the park's habitats and often blooms in large numbers. Other species are much rarer or are restricted to specific habitats. The rare dwarf spider, for example, is known from only one small area at the northern end of the park.

Other species appear only after hot summer fires have blackened the landscape. It is believed that ethylene gas produced by the fire promotes flowering. For instance, red beak orchids (*Burnettia nigricans*) appear only as leaves in unburnt bushland, but flower *en masse* after fire. The rabbit orchid (*Leptoceras menziesii*) produces dense mats of leaves in moist areas along creeklines and swamps. These come up year after year without ever producing more than one or two flowers. However, if the area is burnt, almost every plant bursts into bloom. Most leek orchids (*Prasophyllum* spp.), bunny orchids (*Eriochilus* spp.) and beak orchids (*Burnettia* spp.) are stimulated by fire.

Two named hybrids grow in the park. The prisoner orchid (*Caladenia* x *ericksoniae*) is a cross between the zebra orchid and the painted spider orchid, and the shy spider orchid (*C.* x *triangularis*) is a cross between the cowslip orchid and the white spider orchid. A careful observer may find them growing amongst their more common parents.

## WANDOO WOODLANDS

One of the best places to look for orchids is in the wandoo woodlands at the northern end of the park, just south of the Bluff Knoll turnoff. Over 50 species can be found in this habitat and, as it is fairly open, the majority are reasonably accessible and easy to spot. The best time to search is from August to early October when most are in full bloom.

The zebra orchid is instantly recognised by its upswept red-striped lip and distinctive stem-clasping petals and sepals. Clumps of the colourful painted spider orchid, with its red, white and yellow flowers and wispy spider-like petals and sepals, may be found scattered in open situations. In good seasons, thousands of white spiders flower in favoured areas. The unusual and attractive dark red flowers of the blood spider orchid (*C. filifera*) are far less common and often require a careful search before they are found. A patient observer may also discover the rare dwarf spider orchid growing in small colonies under low shrubs.

Other species of the wandoo woodlands include the bee orchid (*Diuris laxiflora*), which is often seen growing in small clumps in damp sites; the hairy greenhood (*Pterostylis ciliata*), an unusual species with four or five nodding flowers and a flat rosette of leaves; and the tiny, but common, laughing leek orchid (*Prasophyllum ringens*), which is often overlooked due to its diminutive flowers and rather drab colours.

## SHEOAK THICKETS

The sheoak thickets found along seasonal creeklines also have their own array of orchids. The dragon orchid (*Drakonorchis barbarossa*) often forms large colonies in these areas and is particularly abundant along Papacolla Creek. Its flowers, which appear from late September to October, have an unusual lip that resembles the size, shape and texture of a flightless female wasp. As with the hammer orchids, male wasps are initially attracted to the plant by an irresistible chemical lure that mimics a sexual attractant given off by the female wasp. When they clasp the lip and attempt to fly off with it, the flower's hinged stem throws them against the column. Pollen is thus removed or deposited during their frustrated lift-off.

The lazy spider orchid (*Caladenia multiclavia*) also inhabits these thickets. It is quite rare in the park and is only found along a few rocky creeklines near the north-eastern end. However, its unusual red and yellow striped flowers, with their humbug-like lip, are well worth looking for. Other orchids of the sheoak thickets include the fragile pale pink sugar candy orchid (*Caladenia hirta*), the clown orchid (*C. roei*) and the white bunny orchid (*Eriochilus dilatatus*), which is one of the first orchids to flower in the park.

## MALLEE HEATHLANDS

There are many orchids to be discovered in the mallee heathlands which dominate much of the Stirling Range National Park. These areas are rich in common species such as the red beak orchid, which appears year after year as large oval-shaped leaves, often called elephants' ears. Should its habitat be burnt, it will produce up to eight red and white striped flowers on each plant. A species which does not require fire is the magnificent Queen of Sheba (*Thelymitra variegata*). It is rarer than many other heathland orchids and appears to be confined to moist pockets in sandy or rocky soils. Like other sun orchids it remains closed on cool, cloudy days, but if the weather is right, its beautiful golden-yellow, red and purple flowers display their full glory. Sun orchids differ from all other Australian orchids in lacking a lip or labellum. Like many other flowering plants, their third petal is the same as the other two.

One of the first orchids to appear is the leafless orchid (*Praecoxanthos aphyllus*), which flowers in late March and April. As its name suggests, it has no leaves, just a flowering stem growing straight out of the soil. Each plant has one creamy-yellow flower which emits a

*Below left:*
Dancing orchid (*Caladenia discoidea*). The common name of this species is derived from its delicately balanced lip which vibrates in the slightest breeze.
Photo - Jiri Lochman

Blue sun orchid (*Thelymitra canaliculata*). A rarely seen species, the blue sun orchid can be found during late August and early September in swampy areas of the park.
Photo - Andrew Brown

delightful perfume. Other species of the mallee heathlands include the purple enamel orchid (*Elythranthera brunonis*), the blue china orchid (*Cyanicula gemmata*), the common donkey orchid (*Diuris corymbosa*) and the dark banded greenhood (*Pterostylis sanguinea*).

## SWAMPLANDS

The winter-wet swamplands are also very rich in orchids. Some 48 species are known from these areas. Many fire-stimulated species, such as the pale-yellow flowered nanny goat orchid (*D. laevis*) and the purple and white swamp sun orchid (*Thelymitra cucullata*), appear in burnt swamps during late spring, while earlier in the year, usually around September, bee orchids are often quite abundant. Some of the best places to see swamp-loving orchids in the Range are in the Moingup Springs area, along Stirling Range Drive and in creeklines along Salt River Road. The most common group found in and around winter-wet swamps are the leek orchids (*Prasophyllum* spp.). Following summer fires, as many as nine species can be seen scattered amongst the regenerating vegetation. The numerous tiny flowers found on leek orchids are the reverse of most other orchids - their lip or labellum is the uppermost rather than the lowermost segment. Growing to two metres high, the king leek orchid is easily the tallest orchid found in the park. Other species, however, are much shorter; the dainty red and white flowered swamp leek orchid is smaller but more than makes up for its size in colour and sheer numbers. Often thousands of plants can be found in areas of suitable habitat. Some other common inhabitants of swampy areas are the cinnamon sun orchid (*Thelymitra benthamiana*), the blue sun orchid (*T. canaliculata*) and the pink bunny orchid (*Eriochilus scaber*).

*Below right:*
Purple pansy orchid (*Diuris longifolia*). Found predominantly in jarrah-marri woodlands it is one of Western Australia's donkey orchids.
Photo - Andrew Brown

Lazy spider orchid (*Caladenia multiclavia*). The bizarre flowers of the lazy spider orchid are designed to attract male wasps which attempt to mate with the humbug-like lip.
Photo - Andrew Brown

Helmet orchid (*Corybas recurvus*). Found in cool, damp places the tiny helmet orchid undergoes an amazing transformation once fertilised, pushing its flowers skyward for up to 30 centimetres on an elongating stem.
Photo: Andrew Brown

## ROCKY AREAS

The rocky mountain tops and slopes have their own suite of orchids. During December and January, the unusual flowers of the slipper orchid (*Cryptostylis ovata*) can be seen scattered along the paths to the tops of Bluff Knoll and Mount Toolbrunup. It is the only orchid species of south-western Australia that has leaves all year round, as all others die back to dormant tubers during the summer

months. In January the drab flowers of the potato orchid (*Gastrodia lacista*) may also be found in a few rocky crevices. It has no need for either green colouration or true leaves, as it is able to survive on nutrients it receives from its association with soil fungi.

Much earlier in the year the tiny helmet orchid (*Corybas recurvus*) is seen in cool, damp areas along seasonal creeklines. Once fertilised, this species undergoes an amazing transformation. The tiny, ground-hugging flowers are pushed skywards for up to 30 or more centimetres by their elongating stem, resulting in the seed being dispersed more effectively by the wind. Then, a few months later, the minute flowers of the dwarf greenhood (*Pterostylis platypus*) appear among boulders and low shrubs in rocky slopes adjacent to Talyuberup picnic site. In October and November the butterfly orchid (*Caladenia lobata*) can be found in the low, dense jarrah-marri woodlands associated with the lower and more sheltered slopes.

## WOODLANDS

One of Western Australia's most bizarre orchids can be located in sandy areas in banksia and jarrah-marri woodlands at the Gold-holes on Chester Pass Road and in similarly sandy areas on the Stirling Range Scenic Drive. The hammer orchids have flowers so modified that it is hard to imagine that that is what they really are. The lip of these flowers resembles a flightless female flower wasp and is produced on the end of a hinged stem which allows it to move freely up or down. Thus they use a similar strategy to the dragon orchid to attract pollinators. Flowering from September to early November, they are generally found scattered in small groups. These can be seen in clearings between low shrubs, but they are never overly common.

Sometimes growing with the hammer orchid is the appropriately named flying duck orchid (*Paracaleana nigrita*). The lip of this species is irritable and springs over when touched so as to momentarily trap any pollinating insect. Also found in these areas is the bird orchid (*Pterostylis barbata*). Resembling a green beaked bird with its wings in a folded position, this orchid occurs in well-shaded dampish sites, along with several other greenhood species. Other orchids of the banksia and jarrah-marri woodlands include the shirt orchid (*Thelymitra campanulata*), the king spider orchid (*Caladenia pectinata*), the unusual ant-pollinated hare orchid (*Leporella fimbriata*) and the purple donkey orchid (*Diuris longifolia*).

## CONCLUSION

This brief insight into the orchids of the Stirling Range covers a fraction of what the park really holds. Just six habitats have been examined and, as many others contain their own suites of orchids, future biologists, park managers and visitors will undoubtedly discover many orchids not listed here. ⊡

*Below Left:*
White spider orchid (*Caladenia longicauda*). During the spring months literally thousands of white spider orchids can be seen in the wandoo woodland areas of the park.
Photo - Andrew Brown

*Below centre:*
Queen of Sheba orchid (*Thelymitra variegata*). In cool, cloudy weather the flowers of the Queen of Sheba remain closed, but on bright, sunny days they open to display their full glory of golden-yellow, red and purple.
Photo - Andrew Brown

*Below right:*
Ruddyhood (*Pterostylis platypus*). Found only on a few rocky slopes of the Range, it requires a keen eye to spot the tiny flowers of the ruddyhood.
Photo - Andrew Brown

Andrew Brown, a botanist with the Department of Conservation and Land Management, is just one of many authors who have contributed to *Mountains of Mystery: A Natural History of the Stirling Range National Park*, which will be published by CALM next year. Andrew can be contacted at CALM's Wildlife Research Centre, Woodvale, telephone (09) 405 5100.

# LANDSCOPE

VOLUME EIGHT NO. 1 SPRING ISSUE 1992

*Small and shy and quite unlike their exotic, urban cousins, high climbing rodents live throughout the Kimberley.* *See page 10.*

*Once it was a traditional battleground for Aboriginal people. Today the competition is between sailboarders while families of picnickers look on.* *See page 23.*

*The various groups of Aboriginal people around the Swan River lived in harmony with the seasons.* *See page 28.*

*His name is connected with plants and places around Australia. He was interested in everything from Aboriginal customs to the size of trees. Read about* A Man of Science *on page 16.*

*Learn about the incredible variety of orchids in the Stirling Range.* *See page 36.*

F E A T U R E S



R E G U L A R S

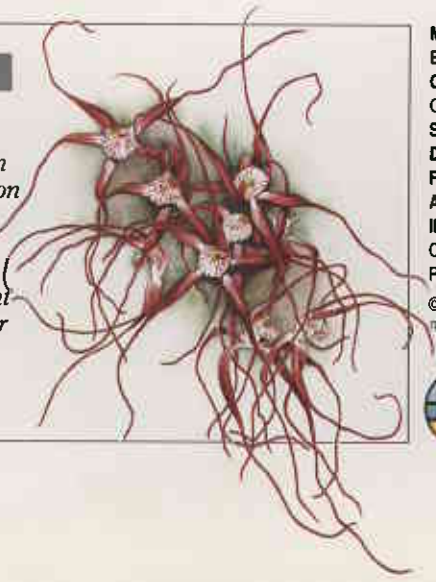


S P E C I A L S



C O V E R

*The many coloured orchid (*Caledonia polychroma *) is well named. Aside from the rich pinks there are clumps of lemon yellow and pure white. The orchid is found in the low areas of the Stirling Range, preferring wandoo and sheoak woodlands. While most years its vibrant flowers can be seen, it flowers best after fire. The illustration is by Phillipa Nikulinsky.*



**Managing Editor:** Ron Kawalilak
**Editor:** David Gough
**Contributing Editors:** Verna Costello, Helenka Johnson, Tanyia Maxted, Carolyn Thomson
**Scientific and technical advice:** Andrew Burbidge, Roger Underwood
**Design and production:** Sue Marais
**Finished art:** Gooitzen van der Meer
**Advertising:** Estelle de San Miguel ☎ (09) 389 8644 Fax: 389 8296
**Illustration:** Sandra Mitchell
Colour Separation by Prepress Services
Printed in Western Australia by Lamb Print



Published by Dr S Shea, Executive Director
Department of Conservation and Land Management,
50 Hayman Road, Como, Western Australia 6152.