Fabulous Fanflowers

by Suzanne Curry

Springtime in the jarrah forests of south-western Western Australia is a visual delight. Wildflowers abound. Among them is the blue lechenaultia, one of the best known and most colourful plants in the State. But this striking plant is only one of several hundred species belonging to the fanflower family.

The family Goodeniaceae, which consists of 11 genera and about 400 species, is predominantly confined to the southern hemisphere. Indeed, nearly all the genera are confined to Australia and New Guinea, with Australia having about 370 species. Australian members occur in almost every habitat outside rainforest and mangrove forests, with Western Australia possessing the greatest proportion of species.

Members of the Goodeniaceae family are annual or perennial herbs, or low-growing shrubs that are easily distinguished by one unique and unusual floral character, known as the indusium.

THE INDUSIUM—A FAMILY FEATURE

Located at the top of the style, the indusium is a cup-shaped or two-lipped structure. Before the flower opens, pollen is shed into the indusium, which is later carried upwards by the lengthening style. When the flower opens, the pollen is retained and protected in the indusium until collected by a pollenator (commonly an insect), as it probes inside the flower for nectar. In addition, many species have a number of hairs or bristles along the lip of the indusium, and when these are disturbed the pollen is released. The stigma, which until this stage had been immature, then grows out to collect pollen transferred from other flowers.

The flowers also have other important diagnostic features. First, they are usually zygomorphic, which simply means that the flowers are divisible into symmetrical halves by one plane only, usually the vertical plane. Second, each flower has a corolla consisting of five petal-like lobes. These lobes are often fused in the lower part to form a tube. This tubular corolla is slit on one side to varying degrees. It is common for the slit to create a distinctive two-lipped flower with three 'upper' and two 'lower' lobes, as in many of the *Dampiera* species. In the genus *Scaevola* the petals spread out like a fan, and it is this attractive and familiar flower shape that has led to that genus being commonly known as the 'fanflowers'.

The petal-like lobes are often described as being winged. The central band along the midrib of the petal commonly differs in colour and texture from the thinner and more delicate wings.

Additionally, in many species of *Goodenia* and *Dampiera,* the basal portion of the 'lower' petal-like lobes has developed another smaller lobe (known as an auricle) which envelops the indusium at the bud stage. This is a useful addition, protecting the precious pollen in the indusium. The pollen may then be exposed as the flower matures and opens, or when an insect, for example, pushes the lobes apart as it seeks nectar from the base of the flower.

Unlike many Australian wildflowers, which are commonly scented, the flowers of Goodeniaceae usually lack a perfume.

THIS WAY, PLEASE

The flower also provides some wonderful guides that appear to orientate the pollinators towards their reward of nectar, and to pick up and deposit pollen. Visible guides are often coloured lines running downwards into the throat of the tubular corolla. Tactile guides are varied and numerous in this family. In the genus *Coopernookia* and in some *Goodenia* there are long flat hairs on the margins of the petal wings and running into the throat of the flower. Other genera, such as *Scaevola,* have unusual branching hairs leading into the throat of the corolla. In *Dampiera* there may be small ridges running downwards, often with small outgrowths. Others may have folds running down the inside of the flower. All of these, in some way, would appear to act like 'tracks' for insects to follow into the flower.

Another important characteristic of the family is the type of hairs that occur on the plants. There are two main types

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The spectacular wreath lechenaultia has large yellow flowers, which are often suffused with the deep pink or red on the wings.
Photo – Ann Storrie

Above: The stunning variations in the flowers of the blue lechenaultia make the plant one of WA's best known.
Photo – Wade Hughes/Lochman Transparencies

Left: Felted fanflower (*Scaevola tormentosa*). Both the common name and specific name refer to the hairs that cover much of this plant.
Photo – Marie Lochman

of hair—those with and those without glands. Most of the hairs with glands are secretory and may make some parts of the plants clammy or viscid. In numerous species of *Goodenia* and *Scaevola* this secretion develops into a varnish over the plant which may crack with age. As many plants within the family grow in arid conditions, it has been suggested that the varnish may assist in water conservation. It is known that some of these varnishes contain substances traditionally used as medicines by Aborigines.

WA'S OWN GENERA

Besides having the greatest number of species of Goodeniaceae in Australia, Western Australia is unique in having three genera, *Anthotium*, *Verreauxia* and *Diaspasis*, which are endemic (found nowhere else) to the State. The genus *Anthotium* consists of three species that are endemic to south-western WA. Red anthotium (*Anthotium rubriflorum*), as the species name suggests, is easily distinguished from its relatives by its vibrant scarlet flowers, seen in November and December. It forms attractive tufted herbs growing to 15 centimetres tall, and is confined to the inland areas between New Norcia and Ravensthorpe.

The genus *Verreauxia* also consists of three species endemic to south-western WA and is characterised particularly by its very hairy, nut-like fruit that does not open when ripe.

Diaspasis is represented by only one species. *Diaspasis filifolia* was first described in 1810 by the English botanist Robert Brown, from his own collection, made from King George Sound in 1801, during Matthew Flinders' voyage in the

Above right: **The dwarf anthotium (*Anthotium humile*) is a tiny herb that is widespread but inconspicuous in the kwongan of southern Western Australia.**
Photo – Alex George

Right: **The distinctively nerved or striated corolla lobes of the royal robe's flowers give the plant its species name of 'striata'.**
Photo – Jiri Lochman

Investigator. It grows as an erect, many-stemmed herb to about 30 centimetres tall and has narrow, linear leaves (hence the Latin specific name of *filifolia* and common name of thread-leaved diaspasis). It is distinguished by its white or vibrant lolly-pink flowers with petals 9–16 millimetres long, and can be found in bogs and seasonally wet areas in the extreme south-west.

Such bright and vibrant colours are a feature of the family. The native cornflower (*Brunonia australis*), as the common name would suggest, has pincushion-shaped clusters of brilliant cornflower-blue flowers. It forms an attractive herb to 35 centimetres tall, commonly covered with silvery or brown hairs and with the leaves in a basal cluster. It occurs widely in Australia south of the 17th parallel (roughly, south of Derby in WA). Although accepted as a genus within the family Goodeniaceae, *Brunonia* is sometimes regarded as belonging to its own family, Brunoniaceae.

A PALETTE OF COLOUR

Cornflower-blue is only one of a myriad of spectacular shades of blue for which the family is renowned. Species in the genus *Dampiera*, named in honour of William Dampier (1652–1715), the first Englishman to collect plants from our shores, have predominantly blue flowers. The prostrate, trailing perennial *Dampiera diversifolia* has clusters of small leaves and flowers ranging from deep blue to purple. Growing in the South West in sandy heath from near Cranbrook east to Ravensthorpe, it is the only species of *Dampiera* without hairs on the outer surface of the corolla.

Top left: Karri dampiera. This attractive south-west species grows in association with karri and karri wattle.
Photo – Marie Lochman

Above left: The pretty winged-stemmed dampiera (*D. alata*) forms a perennial herb growing up to 40 cm tall.
Photo – Jiri Lochman

Left: The genus *Goodenia* is almost entirely confined to Australia and offers many shades of yellow flowers.
Photo – Jiri Lochman

Left: Ngurubi or sticky goodenia (*G. scaevolina*) is confined to northern parts of WA in scrub communities on shallow sandy soil.
Photo – Marie Lochman

Below: The common name of red lechenaultia appropriately highlights the stunning red flowers of this species.
Photo – Babs & Bert Wells/CALM

Many Western Australian *Dampiera* species occur in the south-west of the State. Contrasting in habit and flower-colour to *D. diversifolia* is the beautiful woolly-headed dampiera (*D. eriocephala*). This plant is an erect herb growing to 40 centimetres tall, usually with masses of densely clustered pale lilac flowers on leafless stems. The distinctive leaves, clustered at the base of the stems, are almost entirely without hairs on their upper surface, but have dense silvery hairs underneath. A widespread species in the South West, it occurs in various habitats, often in burnt or disturbed sites.

Karri dampiera (*D. hederacea*) is another attractive south-western species that grows in association with karri (*Eucalyptus diversicolor*) and the karri wattle (*Acacia pentadenia*). This slender perennial herb has trailing stems, which scramble over the ground and undergrowth in sheltered areas and along streams in the forest. The leaves often have prominent basal lobes, and the clusters of blue or (rarely) white flowers extend out on delicate branches well past the leaves.

With more than twice as many of species as *Dampiera*, the genus *Goodenia* offers many shades of yellow flowers. The genus honours Samuel Goodenough (1743–1827), Archbishop of Carlisle and member of the Linnean Society. It is almost totally confined to Australia with most species occurring in Western Australia. One of the largest flowered is *Goodenia grandiflora*, appropriately named as its petals grow up to 2.5 centimetres long and vary in colour—yellow, white or purplish. Growing as an erect sub-shrub to 1.5 metres tall, it is viscid and covered with a dense layer of hairs. The attractive leaves are triangular to heart-shaped with toothed margins. A widespread species, it is mainly confined to mountainous areas of central Australia.

Another attractive and widespread species is cut-leaf goodenia (*G. pinnatifida*). This ephemeral herb has a characteristic basal rosette of pinnatifid or dissected leaves. The yellow flowers are displayed on long flowering stalks that extend well past the leaves. A variable species, it occurs in a variety of habitats in all States of Australia except Queensland.

SPECTACULAR LECHENAULTIA

Dampiera and *Goodenia* may offer us glorious shades of blue and yellow, but no genus within the family can match the spectacular colours of *Lechenaultia*, with its stunning shades of red, blue, mauve, white or yellow. The attractive generic name honours Jean-Baptiste Louis-Claude-Théodore Leschenault de la Tour, botanist with Nicholas Baudin's expedition to Australia from 1800–1804.

This relatively small genus consists of fewer than 30 species, most of which are confined to the south-west of Western Australia. They are commonly glabrous herbs or small shrubs, often with suckering stems. Their usually linear leaves grow along the length of the stem, and the fruits are capsule-like and elongated. They have become the most widely cultivated member of the family.

Left: These wreath lechenaultias are reminiscent of floating floral tributes in a marine commemoration.

Below left: The solitary terminal flowers of the heath lechenaultia are a characteristic of the species.
Photos – Babs & Bert Wells/CALM

Lechenaultia formosa must represent one of the most stunning red-flowering species, hence its common name of red lechenaultia. It is widespread in inland south-western and southern coastal areas of the State. The plants may be prostrate or erect with many branching stems. The solitary flowers vary from scarlet through orange-red to pale orange or may often be yellow.

Unique among the *Lechenaultia* is the unusual and spectacular wreath lechenaultia (*L. macrantha*). The species is so named because of its unique wreath-like flowering habit, which grows annually from a persistent root stock up to diameters of 50 centimetres. When seen in open flat areas of inland southern Western Australia, the wreath lechenaultia paints a picture akin to the spectacle of floating wreaths at a marine commemoration.

THE FABULOUS FANFLOWERS

Perhaps the most widely known plants in the family Goodeniaceae would be the fanflowers of the genus *Scaevola*. According to F.A. Sharr, in his book *WA Plant Names and their Origins*, the generic name *Scaevola* is from the Roman surname Scaevola (itself derived from *scaevus*, meaning 'left-handed') and originating from C. Mucius Scaevola (507 BC). In botany, the name refers to the hand or fan-like shape of the flowers in many species. The flowers, which may be solitary or in leafy spikes, range in colour from blue and purplish to pinkish or white. They are sometimes streaked, but rarely yellow. There are almost 100 species in Australia, with more than half of them occurring in Western Australia. The beautiful royal robe (*Scaevola striata*) is common in the jarrah forest from New Norcia, north of Perth, to the south coast of Western Australia. It has large blue to purplish flowers with a yellow throat and a bearded yellow indusium. The distinctively nerved or striate corolla lobes of the flower give the plant its scientific name.

Australia's most widespread *Scaevola* has proved to be an invaluable resource for traditional Aboriginal medicine. The currant bush (*S. spinescens*) is a rigid shrub to two metres in height and has characteristic dwarf, often spinescent branchlets. Found throughout the drier part of all mainland States, the currant bush grows on hillsides and on stony or loamy plains. Some recorded medicinal usages include stem-wood infusions for cancer of the tongue, inhalations for colds, root infusions for alimentary tract infection, and treatments for boils, rashes and itches.

GOODENIACEAE IN CULTIVATION

This large family represents so many attractive species that it is not surprising to see more being propagated by keen gardeners and horticulturists. The genus *Goodenia* has much potential for cultivation, as it offers a great range of growth habits, bright flowers, attractive foliage and long flowering periods. *Lechenaultias* are already commonly cultivated, as are many species of *Dampiera* and some *Scaevolas*.

It is difficult to do justice here to such a large plant group. But we should be proud that the fanflower family is almost solely Australian and an important part of Australian botanical heritage.

Suzanne Curry is a technical officer with CALM's Science and Information Division. Much of her spare time is spent researching Western Australian natural history. She can be contacted at CALM's WA Herbarium on (09) 334 0492.

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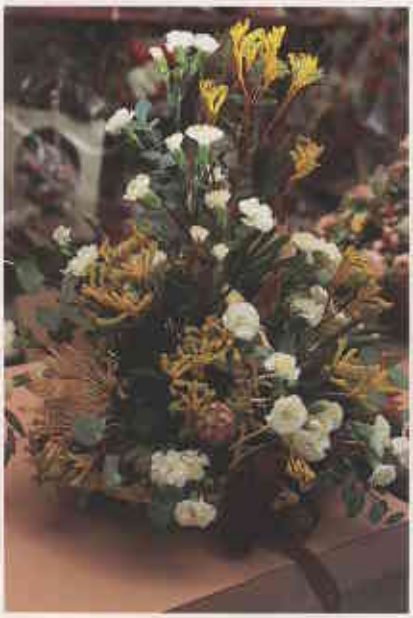

LANDSCOPE

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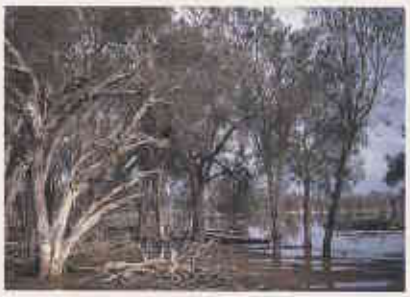
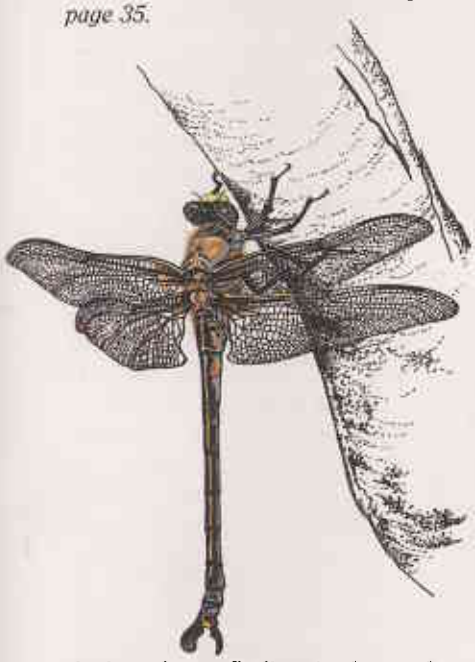
Flower arrangements featuring eucalyptus foliage are becoming popular with florists. Find out why on page 35.

Unseen for more than 100 years and believed to have been extinct, Gilbert's potoroo turned up quite unexpectedly. See page 28.



Salinity is a problem in the State's south-west, but farmers, communities and government agencies are working to find solutions. See page 39.



A giant dragonfly lives in the south-west of Western Australia. You can find out more about this ancient relict of the jarrah forest in 'Western Petalura' on page 52.

The thick-billed grasswren is one of several animals that may be reintroduced to Shark Bay as part of an ambitious project. See 'Return to Eden' on page 22.

FEATURES

REGULARS

COVER

The stunning royal robe (Scaevola striata) *is one of a host of fabulous fanflowers found in Western Australia. Suzanne Curry discusses this and other species in the family Goodeniaceae on page 10.*

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