FALSE FLOWERS

The plants of south-western Australia are renowned for their bizarre flower shapes and strong colours. But many of them are not flowers in the true sense. They are clusters of flowers so tightly grouped as to appear like an individual flower. They are WA's false flowers.

BY NEVILLE MARCHANT

Identification of native plants is often difficult because of their complex flower structures and frequently small flower size. In many cases it is not easy to recognise what is or is not a flower. South-western Australia has approximately 9 000 plant species in more than 150 families. Within these, the flower form varies greatly.

Familiar flowers like those of the common Mangles' kangaroo paw (*Anigozanthos manglesii*) have brightly coloured parts and individual paw-like flowers at the end of a strong stem. The individual flowers of this species and its relatives are quite large, unlike most of our wildflowers. Native hibiscus (*Alyogyne hakeifolia*), the widespread *Hibbertia* species and many of the pea-flowered plants, for example, also have large individual flowers where the calyx, petals and other flower parts are easily distinguishable.

The term 'flower' is often used very loosely to describe a composite structure made up of many individual flower units. A number of very familiar flowers, such as those of the wattles, bottlebrushes and banksias, are not composed of individual flowers, but are aggregations of small flowers grouped into a dense inflorescence (cluster of flowers). In the wattles, for example, each yellow or cream head is made up of a few to many individual flowers closely packed onto a stalk apex. Each individual flower can be recognised easily at the bud stage where, depending on the species, the outer calyx and the inner petals can be seen. At maturity, however, each wattle flower bursts open and the numerous pollen-bearing stamens splay out, making the individual flowers of the head indistinguishable so that the head really appears to be a single unit.

Bottlebrush 'flowers' in the genus *Callistemon* and some species of *Melaleuca*, *Beaufortia* and *Kunzea* are also composed of numerous small flowers borne on one part of the stem. Each may have a calyx and petals and numerous stamens that are often bright red or orange, giving the false flower its colour.

The individual flowers of the banksia family are simple structures that superficially resemble those of the kangaroo paw in their form. Each banksia family flower, such as those of grevillea, consists of an outer floral envelope, the four-lobed calyx that remain joined at their tip until the flower is quite mature. The petals are undeveloped or they are modified to nectar-bearing organs at the base of the ovary. The stamens are borne in a shallow depression on each calyx segment tip and the ovary is capped by a long style that bends sideways through a split in the calyx. The tip is tightly enclosed in the joined ends of the calyx, giving each flower a jug-like appearance. Some species of grevillea, like the Darling Scarp grevillea (*Grevillea bipinnatifida*), have widely spaced flowers forming an open inflorescence. Banksia flowers, like those of the related *Dryandra* genus, are very similar to those of grevillea in their structure.

With banksias, however, hundreds or, in some cases, a thousand or more grevillea-like flowers are borne on a woody spike clothed in dense packing tissues. The whole spike forms what is commonly called a 'banksia cone'. In Menzies' banksia (*Banksia menziesii*) the individual flowers making up the cone may exhibit different stages of maturity on the one cone. The flowers in a wide band in the lower part of the cone mature first, each individual flower opening so that the four calyx parts are spread widely. This gives the lower part of the flower a lighter and more tangled appearance. The upper flowers of the cone may remain closed for some time so that the whole cone has an acorn-like appearance.

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Left: The Mangles' kangaroo paw has individual flowers that mature at different stages. Here, two flowers have opened to show the pale green inner tissues, the stamens and hooked style.
Photo - Babs and Bert Wells

Right: Mulla mullas of *Ptilotus* spp. have bottlebrush-like false flowers. The individual flowers are closely packed on a long axis and clothed in long hairs.
Photo - Chris Garnett

Above left: Hibiscus spp. have the largest flowers of any WA plant. Inside the five large whorled petals are the sexual organs, the yellow stamens and ovary capped with a five-lobed style.
Photo - Jiri Lochman

Above right: In *Hibiscus huegelii* the stalks of the stamens are united into a tube which surrounds the style with its five enlarged lobes.
Photo - Jiri Lochman

FALSE FLOWERS

In the dryandras, close relatives of the banksias, the individual flowers arise from the centre part of a flat disc-like structure, surrounded by large bracts (modified leaves) which are stiff and usually coloured brown. Rows of closely packed bracts surrounding the inflorescence protect the developing flowers. Even when the flowers mature and open, the surrounding bracts are often prominent, so that each inflorescence resembles a large cup-shaped, single false flower.

A number of plant families develop false flowers. These include members of the Asteraceae family, the Apiaceae family, the Myrtaceae family, the Rutaceae family and the Thymelaeaceae family.

Above: The buds of the *Acacia extensa* show that each flower head is made up of tiny flowers.
Photo - Marie Lochman

Centre: Malaleuca fulgens. The lowermost, unopened flowers show the white-margined calyx and petals. The stalks of the stamens are joined into a claw.
Photo - Marie Lochman

Above right: Grevillea bipinnatifida has loosely packed flowers that have a long, looped style which bursts from the bud.
Photo - Jiri Lochman

Right: This daisy, *Waitzia acuminata*, has a compact head surrounded by chaffy bracts. The florets are grouped in the centre and can be recognised as true flowers by their five petals.
Photo - Marie Lochman

THE ASTERACEAE FAMILY

The daisy 'flower' is a highly developed unit. The individual flowers are so modified and specialised that there are special botanical terms to describe the parts. Each, sometimes minute, flower is called a floret. The florets are usually densely packed on a disc-like receptacle and the whole head of florets is surrounded by a definite layer of chaffy, often brown bracts. As well as protecting the flower head when young, the bracts may also protect the developing seeds after the florets have withered.

THE APIACEAE FAMILY

The 'flower' of the southern cross (*Xanthosia rotundifolia*), a striking-looking flower seen by visitors to the jarrah forest and Albany district, at first appears complex. On close examination, however, five groups of tiny flowers can be seen. One group is at the centre of the whole structure and there is one on the end of each of the four arms of the cross. Each group of individual flowers is a false flower, being surrounded by modified petal-like leaves that are creamy white. The whole inflorescence is composed of five false flowers.

THE MYRTACEAE FAMILY

False flowers are well developed in the mountain bells (*Darwinia* spp.) and the Albany daisies (*Actinodium* spp.)

Some darwinias, such as pom-pom darwinia (*Darwinia vestita*), have leaves surrounding each small bottle-brush type inflorescence that hardly differ from ordinary stem leaves. Other species, like Oldfield's darwinia (*Darwinia oldfieldii*), have short and obviously modified leaves surrounding flowers that are grouped onto a flat receptacle.

The most spectacular false flowers are found in the Stirling Range mountain bells and their relatives such as the Narrogin bell (*Darwinia carnea*), the Mogumber bell (also *Darwinia carnea*), and the common lemon-scented myrtle

(*Darwinia citriodora*). In these often tulip-like false flowers, the bracts surrounding the true flowers are large and brightly coloured red or yellow, depending on the species. The individual flowers, protected by the bracts, vary in number according to species. In the lemon-scented myrtle, for example, there are usually four individual flowers.

The Albany daisies (*Actinodium* spp.) have bizarre false flowers that, as the common name suggests, so resemble a daisy that even experienced botanists find it hard to believe they are members of the myrtle family. Even within the family, the two known WA endemic species have no close relatives. They occur in the south of WA from Busselton to east of Fitzgerald River. Each flower head has a cone-shaped receptacle upon which many individual flowers are borne. Each flower has small, petal-like bracts at the base. The outer part of the flower head has rows of outwardly pointing modified branches that have enlarged petal-like bracts on elongated stalks. This gives the whole flower head the appearance of a daisy.

THE RUTACEAE FAMILY

A few members of the boronia family also develop false flowers. The WA endemic genera *Diplolaena* and *Chorilaena* have pendulous flower heads composed of a number of individual flowers surrounded by a cup-shaped layer of densely packed bracts. Species of *Diplolaena* are found throughout WA forests and the Wheatbelt. One species, commonly called the native rose (*Diplolaena dampieri*), grows near the west coast on sand dunes.

The karri hazel (*Chorilaena quercifolia*) is widespread through the southern forests and along the south coast. Its flower heads are less compact than those of *Diplolaena*, but they are also surrounded by a definite envelope of modified leaves.

THE THYMELAEACEAE FAMILY

Banjines (*Pimelea* spp.), belonging to the family Thymelaeaceae, are very common in the south-west. Like darwinias, most species of banjine have their true flowers aggregated into heads that are surrounded by large, usually yellow, modified leaves. Most banjine false flowers have a number of true flowers inside, each of which is easily seen with their long, often hairy, tube-like form and only two protruding stamens.

TRUE OR FALSE?

The most spectacular banjine is the Qualup bell (*Pimelea physodes*), which occurs in the Fitzgerald River National Park. It has very large inflorescences with reddish yellow modified leaves. This species so closely resembles some species of *Darwinia* that it is often necessary to closely examine the individual flowers to identify the family

Left: The true flowers of *Dryandra* spp. are seen standing upright. Some have matured and split into four lobes with pollen being released from the stamens.
Photo - M and I Morcombe

Below: The outer bracts of *Dryandra ferruginea* are stiff and leathery and they protect the buds. At maturity they protect the developing seeds.
Photo - Jiri Lochman

correctly. The close resemblance of the Qualup bell to the Mondurup bell (*Darwinia macrostegia*) is an excellent example of the need to examine flowers more closely before attempting to identify the species.

The minute differences in flower forms indicate just how difficult it can be for both professional and amateur botanists to correctly classify individual species and sub-species. Complex flower structures offer a continuing challenge for botanists at the Department of Conservation and Land Management's (CALM) WA Herbarium who wish to make it easier for amateur wildflower enthusiasts to know more about WA's unique flora.

So next time you go for a walk through the bush, take a closer look at the flowers around you. There may be more to them than first meets the eye.

Above: *Diplolaena* spp. have false flowers that are easily mistaken for single flowers. The true flowers are closely packed so that their stamens are almost intertwined at maturity. Close inspection will show a number of styles, each of which indicates an individual flower.
Photo - Jiri Lochman

Left: Many *Darwinia* spp. have true flowers that are surrounded by coloured bracts. Each true flower has a long, curved style.
Photo - Jiri Lochman

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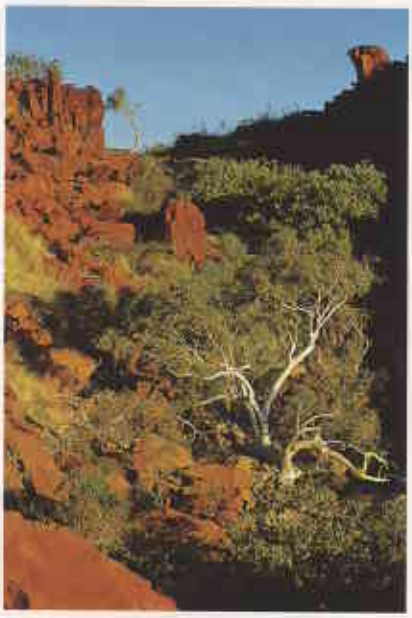

LANDSCOPE

VOLUME EIGHT NO. 4 WINTER ISSUE 1993

Nature-based tourism is a rapidly-growing industry and WA is poised to take a slice of that growth. See 'Our Natural Advantage' on page 10.

'Seagrass, Surf and Sea Lions' (page 21) are just some of the features of a string of islands that dot the WA coastline north of Lancelin.

Forrestdale Lake is an 'Outer City Sanctuary' for thousands of visiting and resident waterbirds. See page 35.

Frogs can be an interesting addition to any suburban native garden. Grant Wardell-Johnson describes how to attract them to your garden on page 16.

When is a flower not a flower? Neville Marchant, from CALM's WA Herbarium unravels the intricacies of the State's many 'False Flowers' on page 39.

F E A T U R E S

R E G U L A R S

C O V E R

*The bull frog (*Litoria moorei*) is very large and has a voracious appetite. It is a frequent visitor to gardens and may be found particularly in greenhouses, ferneries and wet areas such as streams and ponds.*

The illustration is by Philippa Nikulinsky, inspired by a Peter Marsack photograph, courtesy of Lochman Transparencies.

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