



delightful daisies

*Beneath the mulga of
the hotter inland
areas of Western
Australia there can
be seen one of the
State's most
spectacular sights. A
carpet of everlastings
- yellow, pink and
white - sparkles in the
sun for as far as the
eye can see.*



by Suzanne Curry



Daisies belong to the family Asteraceae, also known as Compositae. They have an almost worldwide distribution; the Antarctic mainland is the only place that they do not grow.

The Asteraceae is one of the largest families of flowering plants in the world, and is represented by more than 1 100 genera and as many as 25 000 species. In Australia, as in other parts of the world, many species occur in arid and semi-arid areas. In a single region, one or a few species often dominate and cover vast areas. The success of the family stems mainly from the adaptability of the species and their high reproductive rate, accounting for both its cosmopolitan nature and the fact that its species frequently become widely distributed weeds. In Western Australia there are about 500 species and 140 genera of Asteraceae.

Daisies cover such a wide area and occur in so many habitats that it is not surprising to find numerous growth forms. The biggest daisy in the world is a tree! Native to the Galapagos Islands about 2 000 kilometres west of South America in the Pacific Ocean, *Scalesia pedunculata* can grow to more than 20 metres high and forms the mountain cloud forests of the islands. With few competitive tree-species on these oceanic islands, *Scalesia* may have evolved to fill a vacant niche.

In stark contrast, Australia's daisies are commonly annual or perennial herbs, *Pogonolepis stricta* is one such example. This small annual herb is commonly up

to 20 centimetres in height, with tiny yellow compound flower-heads that are less than four millimetres in diameter. It is widespread throughout the southern parts of Western Australia, where it commonly occurs on the edge of saline depressions with saltbush, though it may also occur in open shrubland.

A particularly interesting characteristic of *Pogonolepis* and some other closely related genera is the 'slime' cells of the fruit, which create a sticky mucus when wet. The function of these cells is debatable - it has been suggested that the sticky nature is important in fastening the fruit (achene) to the soil particles during germination. Another possibility is that the cells and their degree of water uptake and/or period of hydration are associated with some

mechanism for breaking dormancy. That is, the seeds will probably only germinate when sufficient external moisture is available for continuing growth.

Another genus containing 'slime' cells on the fruit is *Blennospora*, an Australian genus of two species, including *B. drummondii*. This species is an annual herb up to 10 centimetres high. The leaves are often more or less succulent, are held erect, and the uppermost leaves usually grow above the flowers. The flowering part of the plant comprises about 10 to 25 composite flower-heads, known as capitula. Each capitulum is a cluster of small individual flowers or florets. *Blennospora drummondii* grows in an array of habitats in the south-west of Western Australia, the southern part of South Australia,



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Main: The white flower spider is perfectly camouflaged on the white everlasting *Waitzia sauveolens*.

Photo - Jiri Lochman

Inset: A carpet of everlastings.

Photo - Ray Cranfield

Above right: *Blennospora drummondii* is a species that contains 'slime' cells on the fruit.

Photo - B. A. Fuhrer

Right: The climbing daisy (*Brachyscome latisquamea*) is the largest of the genus.

Photo - Jiri Lochman

and in parts of western Victoria.

Not all our daisies are small herbs. For example, the climbing daisy (*Brachyscome latisquamea*) can be found on the sand of the north-west coast. This is the largest species of the genus, and scrambles over other shrubs to a height of two metres. The flower heads, which are three to four centimetres across, are usually pink. The *Brachyscome* (formerly *Brachycome*) genus provides many beautiful examples of daisies. Of about 90 species, 18 occur in Western Australia. The pretty Swan River daisy (*Brachyscome iberidifolia*) is an erect, branching annual that can grow to 45 centimetres tall, but is often shorter. The white or violet outer, petal-like ray florets are up to one-and-a-half centimetres long.

The jarrah forest provides many lovely examples of daisies, including the familiar native gerbera (*Trichocline spathulata*), a member of a genus mostly native to South America. It is a common forest dweller, from Gingin to Augusta, with single flower heads of creamy ray

florets that are up to three centimetres long.

The northern areas of the State are not without their fair share of Asteraceae, though the grasslands hide many of the smaller annuals. *Olearia arguta* is an attractive shrub that grows in a variety of soils throughout the Kimberley. The large leaves are often covered with dense white hairs, giving them a soft, grey-green appearance. The solitary heads extend on long stalks above the leaves and have white, blue or purple ray florets to about one-and-a-half centimetres long.

The ephemeral (short-lived) everlastings of the mulga and spinifex scrub provide some of the most spectacular displays created by the daisies. In these dry areas rain falls irregularly throughout the year, and after heavy winter rains the red soil is carpeted with these ephemerals. The splendid everlasting (*Rhodanthe chlorocephala* subsp. *splendida*, previously known as *Helipterum splendidum*) has solitary cream or white flower-heads up to six centimetres across and is the largest of the ephemeral everlastings. Growing among these can be found the yellow pom-pom everlastings of *Cephalipterum*

drummondii and also pink everlastings (*Schoenia cassiniana*).

Such spectacular sights point to the importance of the Asteraceae. Names such as aster, calendula, zinnia, chrysanthemum and gerbera are only a few that are familiar to both the home gardener and the commercial horticulturalist. The wildflower tourism industry markets many tours based on the displays of the everlastings. Daisies are also an important component of the dried-flower export industry.

POLLINATION ADAPTATIONS

In the daisies, nectar is secreted at the base of the narrow petal-tube. As it accumulates it rises to the wider part of the tube, where it is protected from the rain by the anthers. The nectar is easily accessible to all insects, and not only the short-tongued insects. Among the many insect pollinators are moths, butterflies, true flies and ants, but the main pollinators seem to be the bees. Some bees are known to sleep in the daisy flower. This is the case with the male solitary burrowing bee, which can often be found in everlasting flowers. Unlike insects, which collect nectar or pollen, the white flower spider uses the daisy in a different way. This spider is common, although difficult to detect, on the white everlastings; its perfect camouflage allows it to wait in prey for unsuspecting insects to visit the flower head.



Above right: The native gerbera (*Trichocline spathulata*) growing in John Forrest National Park, near Perth. Photo - P. Armstrong

Below: A solitary burrowing bee on variable groundsel (*Senecio lautus*). Photo - Jiri Lochman



ECONOMIC USES

Indirectly, the family Asteraceae plays an important economic role in many parts of the world. It supplies food plants, sources of raw material, medicinal and drug plants, and plants for the cut-flower and tourism trades. For example, the

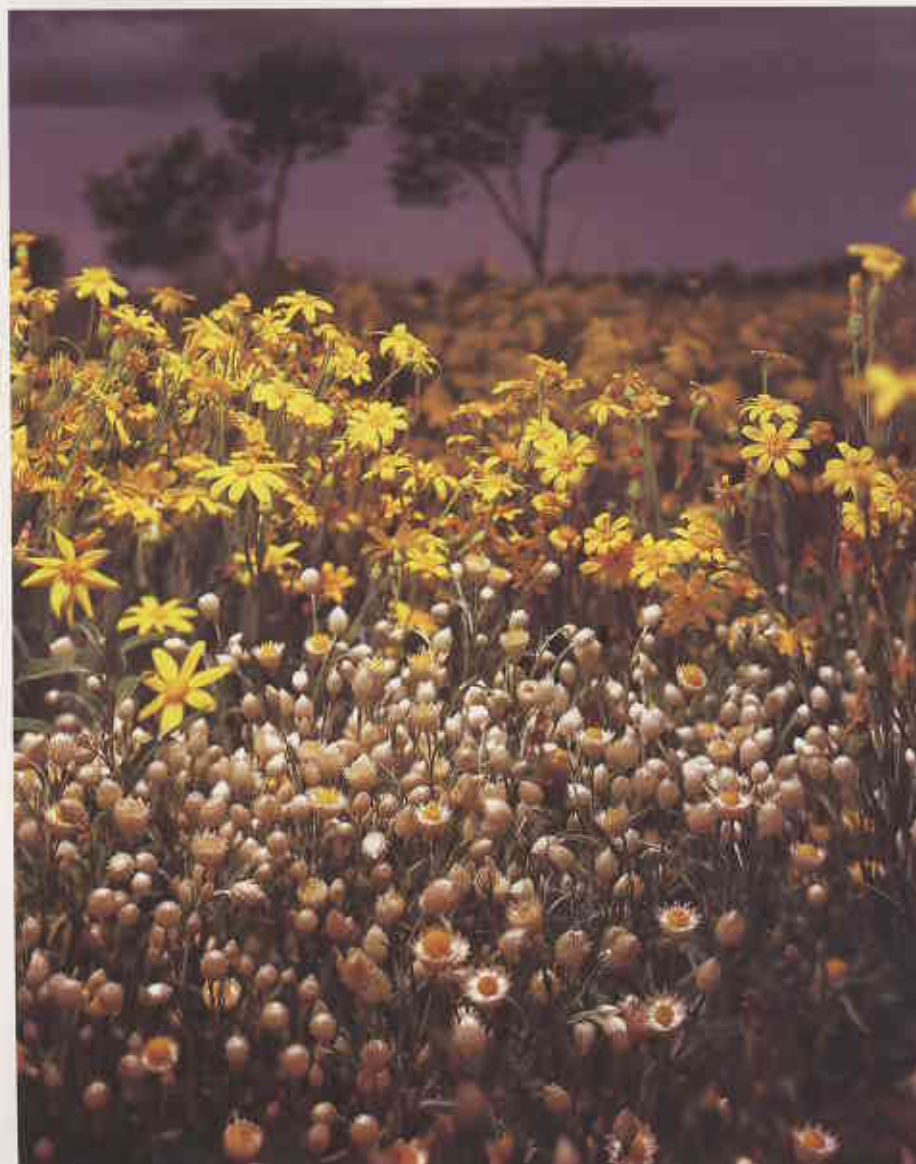
sunflower (*Helianthus* sp.) and the safflower (*Carthamus* sp.) are two species introduced to Western Australia and cultivated for their seed oil.

On the debit side, the Asteraceae family includes weeds and poisonous plants. Unfortunately, Western Australia

has many accidentally introduced daisies that have become unwanted crop weeds, such as the slender thistles (*Carduus* sp.), skeleton weed (*Chondrilla juncea*), boneseed (*Chrysanthemoides monilifera*) and Noogoora burr (*Xanthium occidentale*). But not all crop weeds have been accidentally introduced. Capeweed, one of the State's most widespread and commonly known daisy weeds, was originally introduced from South Africa as a pasture plant.

Herbs (or plants useful to humans) have always been popular, and the daisy family provides many examples. Most of our wild herbs have been introduced from overseas and have become weeds. Yarrow (*Achillea millefolium*) is a well-known, introduced plant, its fame as a wound-healing herb attracting much scientific study. Many herb species contain essential oils or, like tarragon (*Artemisia dracunculus*), are used for culinary purposes. Others, such as absinthe (*Artemisia absinthium*), are used in medicine.

Yet another introduced plant of the daisy family is the dandelion (*Taraxacum officinale*). Dandelion has an amazing range of uses - as salad plant, vegetable, coffee substitute, wine and beer ingredient, and medicine. The leaves are still widely used in Europe as a salad herb and vegetable. The dandelion's scientific name indicates its medicinal properties - *Taraxacum* meaning 'remedy for disorders' and *officinale* implying medical use. Dandelion is still used in many herbal tonics. Western Australia has its own equivalent, a plant commonly known as native dandelion or



Above left: The compound flower heads of *Actinobole oldfieldiana* are only about a centimetre in diameter.
Photo - Ray Cranfield

Left: The yellow-flowered *Othonna gregorii* and white everlasting (*Rhodanthe floribunda*) grow together in the Goldfields of WA.
Photo - M. & I. Morcombe

native yam (*Microseris scapigera*). Superficially resembling the introduced dandelion, it was used as a food source by the Aborigines, who roasted the fleshy roots.

THE WORK OF THE HERBARIUM

The Western Australian Herbarium, which is part of the Department of Conservation and Land Management (CALM), classifies and catalogues the State's native and introduced plants. The Asteraceae collection has more than 16 000 specimens. This collection of carefully dried, mounted, labelled and catalogued specimens provide the foundation for research into this diverse family. Paul Wilson and Nicholas Lander are two of CALM's research scientists who work on this collection, looking critically at the taxonomy (the science that deals with classification or naming). The Herbarium also maintains a Community Reference Herbarium. This rapidly-growing reference herbarium is open to the public and every effort is made to represent every species of plant in the State, including the family Asteraceae.

Western Australia is fortunate in having many members of the Asteraceae family that are uniquely Australian. Our daisies were well known to collectors and nursery proprietors in Europe for many decades before appearing in Australian gardening catalogues. Now they are doing so increasingly, and it is encouraging to see that popular appreciation of our native flora is rapidly growing.

Top right: The stunning, exotic gazania, from South Africa, is one of many cultivated daisies known to Australian gardeners.

Photo - Wade Hughes/Lochman
Transparencies

Above right: A gorgeous example from the *Brachyscome oncocarpa* complex.

Photo - P. S. Short

Right: The fruiting head of variable groundsel (*Senecia lautus*) showing the numerous white pappus, which are attachments to the one-seeded fruit.

Photo - Jiri Lochman



Suzanne Curry is a technical officer at CALM's Western Australian Herbarium responsible for research curation, including the family Asteraceae. She gratefully acknowledges the assistance of CALM research scientists Nicholas Lander and Paul Wilson (now retired), and National Herbarium of Victoria botanist Philip Short. An excellent reference is *Australian Daisies for Gardens and Floral Art* by Maureen Schaumann, Judy Barker and Joy Greig of the Australian Daisy Study Group 1987.

LANDSCOPE

VOLUME NINE NO. 1 SPRING ISSUE 1993



Wildfires are synonymous with Western Australian summers, but what can be done to lessen the threat to life and property? Lachlan McCaw discusses the problem on page 49.



Daisies belong to the Asteraceae family, one of the world's largest families of flowering plants. Suzanne Curry presents some of them in 'Delightful Daisies' on page 41.



Aborigines have eked out a living in the harsh Western Desert region for thousands of years. Their intimate knowledge of the desert is helping scientists learn more about its plants and animals. See 'Digging Sticks and Desert Dwellers' on page 10.



'Rainforests and Bats', on page 34, tells the story of the recent LANDSCOPE Expedition to the Mitchell Plateau.



Can images from space help locate desert mammals? See 'From Buckshot to Breakaways' on page 23.

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COVER

Cape Barren geese live on the islands and rocks of the Archipelago of Recherche. A few years ago their numbers appeared very low and their survival was in doubt. However, a recent survey of the islands has brought good news with a marked increase in the bird's population.

The illustration is by Philippa Nikulinsky.



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Marketing: Estelle de San Miguel ☎ (09) 389 8644 Fax: 389 8296
Colour Separation by Prepress Services
Printed in Western Australia by Lamb Print

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