



The Goodenia Family

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Introduction

The Goodenia family is a large and important component of the Australian flora. It occurs in all states of Australia, and a few species have found their way “overseas”. As is not unusual, it is well represented in Western Australia, with some genera occurring only there. It contains many well-known species, several of which have been adapted to gardens (and many more that could be).

The “type” genus (*Goodenia*) is large and diverse. It contains several species that are adapted to the arid and semi-arid zones. Best known among the other genera is Blue Leschenaultia, or “floor of the sky”. It is a prominent component of the landscape of the South West. It seems to be comfortable in heavier soils and is widely grown. The Wreath Leschenaultia has become one of the tourist “must sees” and therefore an important contributor to the economy of parts of the Western Australian wheat belt. Most Dampieras are blue(ish) and that means they are often compared with, and not infrequently confused with, Blue Leschenaultia. They deserve to be better appreciated for themselves. The genus that is best known outside Australia is *Scaevola* – a common sight in hanging baskets and on balconies in Europe. Again the species most widely grown has blue flowers and this reinforces the idea that *Goodeniaceae* equals blue. This is too simplistic: there are many species with flowers of other colours. This includes the many species of *Goodenia* that are yellow, white or mauve, the red flowered *Lechenaultia hirsuta* and *Anthotium rubriflorum*, and the pink annual *Velleia rosea*. Not to mention the bizarre *Diaspasis filifolia* with its swollen fleshy leaves. Read on!

Jim gives us an overall survey of the family, its genera and how they are distinguished. It is not always easy. Some plants don’t quite fit as neatly into boxes as we would like. The boxes we now recognise were made about 25 years ago. They could be changed!

The Goodenia family is Hazel’s favourite, as well it might be. Many species are already in cultivation, yet there are many more that could be. That is Hazel’s special interest. She has developed ways of propagating members of this family. Surprisingly perhaps, most species can be grown from detached leaves. The leaves produce roots from which new rosettes and suckers arise. Some species are not long-lived in cultivation, but Hazel points out that propagation is so easy that this is not a serious disadvantage.

The family members

Jim Barrow

Jim spent nearly 40 years working for CSIRO and “retired” as a Chief Research Scientist in 1992. Post retirement he has continued his scientific work but has also devoted time to his wildflower interests. He is a past president of the Wildflower Society of WA.

What characteristic defines the family? It is not the winged petals that are the most spectacular parts of the flowers of many species and which often attract our attention. It is the presence of a hollow pollen cup, called a pollen indusium, at the end of the style. This collects the pollen and presents it to the pollinator. Its function is therefore analogous to that of the pollen presenter in some species of the *Proteaceae*. The same effect is achieved by *Verticordias* by squeezing the pollen from the anthers, coating it with a sticky substance, and placing it on the style. In all of these cases, the pollinator picks up and deposits the pollen in pretty much the same spot.



Blue *Leschenaultia* with its spectacular petals with a central rib and colourful wings. The pollen indusium is marked with an arrow. It is sited just above the insect “guides” thus maximizing the chances of cross pollination.

The family is named for the type genus, *Goodenia*, and this, in turn, is named for the Reverend Samuel Goodenough, Bishop of Carlisle, from 1808 until his death in 1827. In addition to his ecclesiastic duties, he was an important botanist. When the Linnean Society was established in 1787 he was one of the framers of its constitution and treasurer during its first year. He contributed a classical memoir on the genus *Carex*. Unfortunately perhaps, he is better known for his opinions about the Linnaeus system of plant classification. He was profoundly appalled by Linnaeus’ decision to use the sex organs of flowers as a basic part of his classification system. “To tell you that nothing could equal the gross prurience of Linnaeus’ mind is perfectly needless. A literal trans-

lation of the first principles of Linnaean botany is enough to shock female modesty.” It seems that one thing that dismayed him was that ladies would no longer be able to dabble in botany as a genteel hobby. Strange that he could hold such a strong opinion yet play an important part in founding a society named after Linnaeus.

How many genera are there in the family? That depends. One of the allocations of botanical genera into families (Cronquist) puts *Brunonia* into a separate family all on its own. This was the scheme adopted when the *Flora of Australia* was planned. Modern opinion is that *Brunonia* belongs firmly in *Goodeniaceae* – so we have the odd situation that the authority (Volume 35 of *Flora of Australia*) has *Brunonia* in its own family while saying that it does not belong there! Putting it into *Goodeniaceae* means there are 12 genera in the family. There used to be more. As part of the review of the family prior to preparing the *Flora of Australia*, four small genera “disappeared”. For those looking at old books, *Calogyne*, *Symphyobasis* and *Neogoodenia* all went into *Goodenia*; and *Nigromnia* went into *Scaevola*.

There are more than 400 species, many of which are very pretty. Most of them are confined to Australia with a few species present in New Guinea, Indonesia and even southern China. One wide-spread species is *Scaevola* which extends into islands in the Pacific; another is *Selliera* which extends to New Zealand and Chile.

The family falls into two distinct groups. In the *Dampiera* group (*Lechenaultia*, *Dampiera*, *Brunonia*, *Anthotium*, and *Diaspasis*) the anthers adhere to each other.



Squashed Flower of *Dampiera lavandulacea* “photographed” using a scanner. The yellow arrow indicates the anthers adhering around the style and now empty of pollen. The red arrow indicates the “ear” (auricle) that encloses the indusium in bud and which is important in characterizing *Dampiera*.

The anthers not-free species

The four genera treated in *Flora of Australia* as in this group (the *Dampiera* group) are easily sorted.

First character - ovule/ seed number	Second character	Genus
>2	No basal leaves	<i>Lechenaultia</i>
	Basal leaves	<i>Anthotium</i>
1 - 2	No auricle	<i>Diaspasis</i>
	With auricle	<i>Dampiera</i>

Lechenaultia

Why is it *Lechenaultia* (no “s”) when it is a Latin name but Leschenaultia (with “s”) when it is a common name? And why “Lake Leschenaultia” and Leschenault Inlet? The name derives from Jean Baptiste Claude Théodore Leschenault de la Tour who was one of the “experts” on the expedition lead by Nicolas Baudin who was selected to complete the French cartographic survey of the coast of Australia and conduct other scientific investigations. He had two ships, Le Géographe and Le Naturaliste (Captain Hamelin).

The ships took six months to reach Mauritius where, because of shipboard quarrels, illness and poor conditions, 46 sailors and 10 experts abandoned the party. The defectors included the first botanist so that the relatively inexperienced Leschenault (who was 28) was head botanist by default. Contrary to his instructions, Baudin in Le Géographe sailed north along the WA coast as far as Cape Levêque then to Timor hoping to refresh his crew (but in fact many contracted dysentery). Next month, Le Naturaliste joined him there after having explored the coast as far as Shark Bay much more thoroughly. In Timor, Baudin transferred Leschenault to Le Géographe. It is not clear why – perhaps it was his opinion that the gardener was “a better Botanist than the Gentleman at the head of this Department”.

Subsequently Baudin met Mathew Flinders in Encounter Bay. It is often said that it was here that Brown and Leschenault met each other but Leschenault was on the other ship and they did not meet until later when all three ships were in Port Jackson simultaneously. It was then that Brown spent some time in the field collecting with Leschenault. Brown remarked in a letter to Banks “The only botanist now remaining with the expedition is Mr Lechenault.... He is a young man, and, as far as I could judge from my very short acquaintance with him, an acute

observer.” (Notice the misspelling of the name.)

It was apparently as a result of this short acquaintance that Brown decided to name the genus *Lechenaultia*. Mind you, it was a close thing. He originally called it “*Cubospermum*” or “*Goodeniastrum*” in manuscript. I am rather glad he changed his mind. For a long time, his spelling error was corrected and the “s” was reinstated, but in botany “rules is rules”. The way it was first spelled is the way it must be spelled. Consequently, since about the 1950’s the genus has been spelled without the “s” – but it is of course pronounced as if it were there. To add to the quirkiness, the common name is Leschenaultia.

There are about 30 species in the genus, mostly in WA.

The genus is divided into three sections. One section now has nine species after the addition of three species in 2006. Its members have the corolla tube split open and the “top” petals both have lobes.



L. floribundum is a member of this group. The picture shows the open corolla tube. This is a fairly widespread but very variable species often mistaken for the better known *L. biloba*.

This group also contains *L. biloba*, Blue Leschenaultia, the logo of the Wildflower Society. It grows well in gravel soils. But it isn’t always blue. Like most blue-flowered plants, white forms occur.



Blue and white forms of *Lechenaultia biloba* growing together.

In contrast, *L. galactites* is normally white, but has blue forms. It was not named until 2006 and is fairly rare. It grows in the eastern wheat-belt under fairly tough conditions. It is closely related to *L. biloba* but is more erect and robust, and with bigger flowers. Its large flower and hardiness suggest it might be a good source of desirable genes in a breeding program.



Lechenaultia galactites.

The next section differs in that the “top” petals *usually* don’t have wings. Some of its members are found in semi-arid or tropical regions.



a & b. *L. subcymosa* grows on North West Cape and on the Shark Bay islands but flowers only sporadically. As picture b shows, the requirement that the top petals do not have wings is not always fulfilled.

c. *L. heteromera* grows in deep white sand along the coast near West Mount Barren, WA. The top petals have bent over and are covering the indusium. It does not seem to be closely related to other members of this section.

All three photos Eddy Wajon.

In the third section, the corolla tube is not split. It contains several attractive species well suited to horticulture.



L. laricina (Scarlet Leschenaultia) an erect, much-branched, suckering shrub was once common near Meckering WA but now restricted to a few populations.

L. hirsuta (Hairy Leschenaultia) is a straggling sparsely-branched shrub from the sand plains between Kalbarri and Badgingarra WA. Photo: Eddy Wajon.



L. tubiflora was named by Robert Brown and even though the name was well established it was the subject of a famous mistake when it was "rediscovered" by Charles Gardner in 1923 and named *Ericopsis formosus*. It was considered especially remarkable as the only member of the Erica family in WA. Ironically its common name is Heath Leschenaultia. It is fairly common on sandy soils and may be red (as here), cream, or cream with a red tip.



L. macrantha, beloved by tour operators, is often found on roadsides. It retreats below ground in summer to emerge again when it rains, flowering at the edges of the expanding branches, thus giving rise to its common name – Wreath Leschenaultia.



L. linarioides is a very widespread plant, ranging from Shark Bay to Perth. It is a tangled shrub, never as spectacular as some of the other species but with a long flowering period. It takes well to cultivation in Perth. Its common name is the rather unimaginative: Yellow Leschenaultia.

Anthotium

(The anthers adhere; the indusium is not two-lipped; there are some basal leaves; and "ears" enclose the indusium in bud.)

The name was bestowed by Robert Brown (again!) from *anthos* (flower) and *otos* (ear). There are only four named species plus two with manuscript names, all occurring only in WA. They are very attractive and should be better known.



Anthotium rubriflorum grows mainly in the Avon Wheatbelt and Esperance Plains. For obvious reasons, its common name is "Red Anthotium". Photo: Sally Page.



Anthotium sp. Darling Range is one of the, as yet, un-named species. It is a "Priority 1" plant found, as the name indicates, in the Darling Range. It grows in drainage lines of swamps and flats, but here is in cultivation. Photo: Hazel Dempster.

Dampiera

(The anthers adhere; ovules one or two; and “ears” enclose the indusium in bud.)

Yet another name bestowed by Robert Brown, and, obviously, honouring William Dampier. Often dismissed as a pirate, Dampier was a man of

Groups in Dampiera

Group	Criterion 1	Criterion 2	Criterion 3	No in group#	Number in SW of WA	Illustrated in article
1	Leaves mostly basal			5	5	<i>D. wellsiana</i> <i>D. eriocephala</i>
2	Not	Ovary gibbous*		8	8	<i>D. alata</i>
3		Not	Stems triangular, compressed or flattened	15	11	<i>D. trigona</i>
4			Flower head with reduced leaves	9	4	<i>D. teres</i>
5			Margins of leaves tightly rolled down	11	4	<i>D. lavandulacea</i>
6			Leaves flat or concave, not hairy	9	8	<i>D. juncea</i> <i>D. linearis</i>
7			Leaves flat or concave, hairy below	14	9	<i>D. altissima</i> <i>D. salaha</i>
8			Leaves flat or concave, hairy on both sides	6	5	<i>D. luteiflora</i> <i>D. incana</i>

*Gibbous means bulging on one side, like the moon before or after full moon.

This is a key not a classification so a species can occur in more than one cell. Hence the numbers in this column sum to more than the total numbers.

many talents: the first Englishman to explore parts of Australia; the first person to circumnavigate the world three times; Australia’s first natural historian; a successful author; and one of the most important British explorers of the period. Indeed, if he had been given a better ship, he would have mapped the east coast of Australia 71 years before Cook. He was the first to collect and record samples of Australian plants, one of which was subsequently named *Dampiera incana* by Brown in honour of “the very famous captain and traveller ... an assiduous observer of nature”.

Dampiera is divided into sections and subsections based mainly on characters of the flowers. For ease of identification, it is also divided into “Groups” based mainly, but not entirely, on characters of the leaves and stems. For example, Group 1 has basal leaves. Opposite is a tabulation of those groups.

When the “Goodeniaceae” volume of *Flora of Australia* was published in 1992, there were 66 species of *Dampiera* of which 38 were restricted to the south west of WA. Since then, a few further species have been described and Florabase also lists a few manuscript names. With few exceptions, *Dampiera* flowers are blue(ish); one exception is appropriately named *D. luteiflora* (“yellow flower”). There are also two red-flowering species in the north of WA. The blue flowers are often very striking, but the very blueness means that, more than occasionally, *Dampiera* is mistaken for blue Leschenaultia.



D. wellsiana (left) and *D. eriocephala* (right) belong to Group 1. They seem to be closely related and have a similar distribution in the south west of WA. The main difference is that *D. eriocephala* leaves are woolly underneath.



Left: *D. alata* (Winged-stem Dampiera) is from Group 2 for which the ovary is somewhat swollen on one side. It is common in the south west of WA in the fairly high rainfall areas mostly south of Perth.



D. trigona is from Group 3. It has triangular stems. It occurs in near-coastal areas of WA from near Moore River to Albany, and is often seen in cultivation.



D. teres (Terete-leaved Dampiera) is from Group 4 for which the flowers are aggregated as shown. It is an erect shrub from the near-coastal areas north of Perth and is sometimes seen in cultivation.



Dampiera lavandulacea at Scott Road near Merredin WA. It is in Group 5 which has the leaf margins in-rolled, but is so splendid that you can't see the leaves! The front and back of a leaf "photographed" on a scanner are shown as an insert. About 1 cm long.



Two Dampieras from Group 6 for which the leaves are flat or concave and hairless.

Left: *D. juncea* (Rush-like Dampiera) occurs somewhat inland in the south west of WA from north of Perth to the south coast.

Right: *D. linearis* (Common Dampiera) is, as the name suggests, widespread in the south west of WA from near Geraldton to the south coast.



Three *Dampiera*s from Group 7 for which the leaves are flat or concave and hairy below.

Top left: *D. salaha* occurs in a fairly small area inland from Geraldton in WA.

Top right: *D. altissima* (Tall *Dampiera*) is closely related to *D. salaha* and occurs somewhat closer to Geraldton. Its name is a bit misleading as it is not especially tall.

Bottom left: *D. purpurea* is fairly widespread from south Queensland to Victoria.



Left, *D. luteiflora* (Yellow *Dampiera*) may sometimes key out in Group 7, when the leaves are only hairy below, or in Group 8 when the leaves are hairy on both surfaces. It occurs in the drier edge of the WA wheat belt extending as far inland as Wiluna and Kalgoorlie. Photo B. Kieghery.

Right, *D. incana* keys as Group 8 because of its dense hairs. It grows from Geraldton to the Pilbara but here photographed in Kings Park garden in December.

Diaspasis

Diaspasis filifolia is the only member of this genus. It is a many-stemmed perennial found in swampy ground near the south coast of WA.

As pointed out on page 143, forms in the eastern end of its distribution have smaller white flowers whereas those close to the west include colour forms with larger flowers.



Diaspasis filifolia
Photos: Bronwen Kieghery



Brunonia

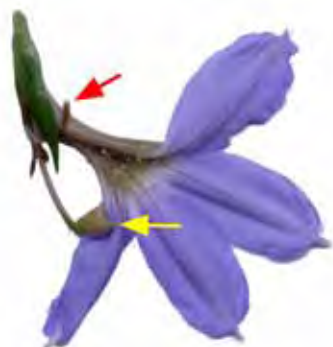
(The anthers adhere; indusium hollow.)

This time the genus is named *after* Brown rather than *by* him; *Brunonia* is the Latinized form of Brown. There is only one officially recognized species in the genus: *B. australis*. It is the most widespread species in Goodeniaceae and is present in all states but not north of the 17th parallel. (Florabase lists three other species, but as manuscript names: they haven't been officially published). With its upright stems bearing heads of blue(ish) flowers, it is commonly called "Native Cornflower" – which is a pity. It doesn't grow in corn crops; it is not some second-rate (native) version of the "true" corn-flower; it has a perfectly good name of its own and one that reflects the importance of Robert Brown.



The anthers-free species

In this group the anthers do not form a bundle around the style. It contains the following genera: *Goodenia*, *Scaevola*, *Velleia*, *Cooper-nookia*, *Pentaptilon*, *Selliera* and *Verreauxia*.



Flower of *Scaevola nitida*, a spreading shrub from coastal communities from near Albany to north of Perth. The anthers, now empty of pollen, are marked with a red arrow; the pollen indusium is marked with a yellow arrow..

Distinguishing the genera within this group isn't easy. Important characters include the shape of the seed, the number of ovules and whether the fruit splits; these may be difficult to see when you have a flower in your hand in the field. Nor are the divisions between the genera always clear cut. *Goodenia* flowers usually have two petals pointing upwards plus three pointing sideways or down; *Scaevola* flowers are usually white or blue and have the petals open like a hand (see later).



Goodenia varia a yellow-flowered *Goodenia* from the coastal limestone and cliffs of the Australian Bight.



Scaevola canescens is found near the west coast mostly north of Perth

So which genus does the next plant belong to? If you thought *Scaevola*, you would have been right before 1990, but it was then changed to *Goodenia*. This shows the difficulties involved in allocating plants to genera within this group

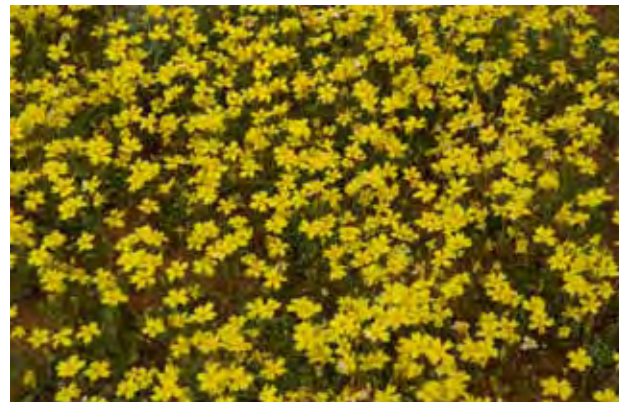


Goodenia fasciculata occurs in the Darling Range (WA) and adjacent areas. The problem is that it (and two related species) have some characters appropriate to *Goodenia* and some appropriate to *Scaevola*. In 1990 it was decided that the *Goodenia* characters were more significant.

Not to be confused with *G. fascicularis*, which is a yellow-flowered plant widespread in inland areas of the eastern two-thirds of the continent.

Goodenia

Named, as indicated earlier, for Reverend Samuel Goodenough, Bishop of Carlisle. Easily the biggest genus in the family, with about 179 species. The genus is divided into two sub-genera and the larger sub-genus is divided into four sections as indicated on the next page. These components correlate fairly well with flower colour and with location. Yellow flowers are by far the most common and are spread across the continent; other colours tend to be in particular regions.



In the semi-arid zone, annual *Goodenias* can form carpets of colour in good years. Here about 120 km east of Geraldton WA.

Groups within *Goodenia*

Sub-genus	Section	No of species	Flower colour	Where found	Species illustrated
1		10	White, usually purple spots at base of petal	SW of WA	<i>G. fasciculata</i> , <i>G. pinifolia</i> , <i>G. scapigera</i>
2	1	15	Mostly either yellow or purple	Mostly eastern and northern Australia	<i>G. humilis</i> , <i>G. paniculata</i>
2	2	17	Blue	Mostly western half	<i>G. caerulea</i> , <i>G. incana</i>
2	3	135	Usually yellow	Widespread	<i>G. lanata</i> , <i>G. macmillanii</i> , <i>G. laevis</i> , <i>G. concinna</i> , <i>G. heterophylla</i>
2	4	2	Brown/red	Northern Australia	

Subgenus 1 = *Monochila*; Subgenus 2 = *Goodenia*.

Within Subgenus *Goodenia*, Section 1 = *Porphyranthus*; Section 2 = *Caeruleae*; Section 3 = *Goodenia*; Section 4 = *Amphichila*.



G. scapigera with its white flowers plus purple throat spots is typical of Section 1. You can see why *Goodenia fasciculata* was transferred to this section.



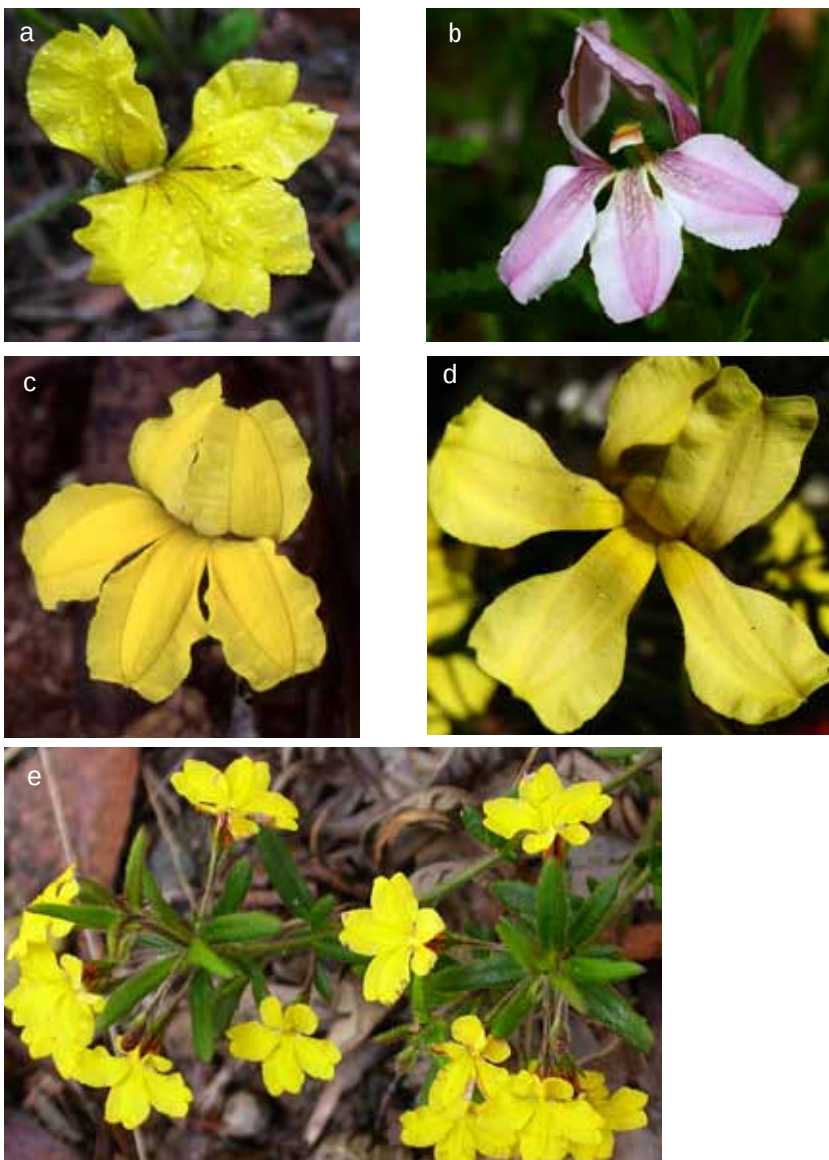
G. pinifolia, with its white flowers also belongs to sub-genus 1. It occurs in the south-west of WA. Note that this species has the two-up, three-down petal arrangement that is common in the genus and that the throat spots are brown.



Two *Goodenias* from row 2 of the table; left, *G. humilis*; right *G. paniculata*. Both grow in damp soils in eastern Australia with *G. humilis* having a more northerly distribution. Photos: Jill Dark.



Two *Goodenias* from row 3 of the table. Left: *G. caerulea*, first collected by Robert Brown near the present Albany, it is widespread in the SW. Right: *G. incana* again first collected by Robert Brown, is also widespread in the SW. Photos: Hazel Dempster.



Five Goodenias from the fourth row of the table from five different environments.
a. *G. lanata* occurs in southern Victoria and in Tasmania. Photo: Brian Walters.
b. *G. macmillanii* from the forests of East Gippsland. Photo: Brian Walters.
c. *G. laevis* restricted to southern inland WA. Photo: Eddy Wajon.
d. *G. concinna* from the the south coast WA. Photo: Hazel Dempster.
e. *G. heterophylla* subspecies *heterophylla* from the coastal and tableland regions of central NSW. Photo: Jill Dark.

Scaevola

The name is derived from a Roman surname, originally C. Mucius Scaevola (577) who attempted an assassination and on being apprehended burnt off his right hand. Nice. The name refers to the hand-like shape of many species. The genus contains about 96 species of which 71 occur in Australia and the remainder in the Indo-Pacific region.

The genus is divided into three sections. In the first two sections, the fruits are fleshy and growth continues through the inflorescence after flowering. In section 1, the leaves are alternate. They are mostly shrubs or small trees; most occur outside Australia. The Australian ones prefer tropical or arid conditions. In section 2, the leaves are opposite. Only one species occurs in Australia: on forest margins in NE Queensland. Section 3 has dry fruit, and growth of a shoot stops with flowering. Most of the species are in this section, and there are further subdivisions based on details of the flower. Here is a summary.

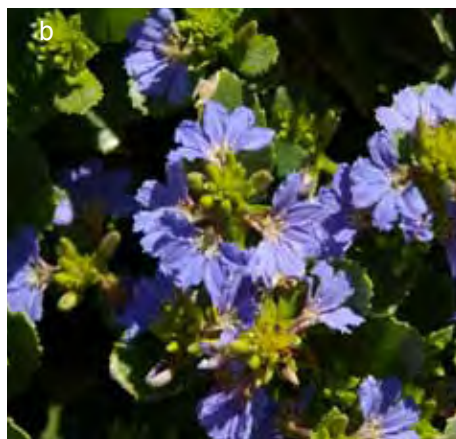
Section	Sub-section	Series	Total number	Number in Australia	Flower colour	Where found in Australia	Examples here
1			24	6	White to pale lilac.	Mostly arid to semi-arid.	<i>S. spinescens</i>
2			10	1	Yellow	NE Q'land coast	
3	1	1	31	29	Mostly white or shades of blue. One species yellow.	Widespread in northern and southern Australia. Many occur in WA.	<i>S. nitens</i> <i>S. crassifolia</i> <i>S. globosa</i>
3	1	2	19	19	Mostly shades of blue to white.	Widespread.	<i>S. striata</i> <i>S. cristata</i> <i>S. glandulifera</i> <i>S. aemula</i>
3	2		7	7	Blue to purple.	2 in E Australia, 5 in the south west.	
3	3		9	9	1 yellowish brown, rest blue to white.	Widespread.	



S. spinescens. Arguably the most-widespread member of the genus occurs across the arid zone. Its white flowers are followed by conspicuous fruit and hence the common name: Currant Bush. Photos: Phil Stanley.



S. globosa. A very distinctive species known only from three locations in the WA wheat-belt. Its minute flowers are buried in a mass of soft hairs. Some idea of the scale can be obtained from the size of the sand grains.



Three similar species, all erect plants with attractive blue flowers and all of which grow close to the coast in the south west. They differ in the characteristics of the fruit and in whether the leaves have petioles

a: *S. nitida* has smooth fruit and leaves without petioles.

b: *S. crassifolia* has wrinkly fruit and leaves with petioles.

c: *S. thesioides* has ribbed fruit and leaves without petioles. Photo: Eddy Wajon.



S. glandulifera. An erect shrub, widespread in the south west.



Two closely related and very attractive species. Left *S. striata* (Royal Robe) from the Darling Range east of Perth. Right *S. calliptera* grows from near Perth to further south.

There has been a second “escape” of *Scaevola* from Australia, this time as cultivars mostly from *S. aemula*. These are popular in Europe.



A form of *S. aemula* for sale in a German nursery. The sign reads “Schöne große Ampeln nur 8.” That had me confused because I had only heard the word “Ampeln” to mean “traffic lights”. What did traffic lights have to do with it? Then, with the help of Google, I found it had an older meaning to refer to something suspended and thus to hanging baskets. So the sign means “Beautiful large hanging baskets - only €8”.



The original *S. aemula* photographed on Kangaroo Island. It makes an excellent nurseryman’s plant: easy to propagate, attractive, and best of all, doesn’t live long so must be regularly replaced.

Velleia

This genus is close to *Goodenia* and is differentiated from it in the way the flowers are arranged in the inflorescence. It is named for Thomas Vellej, a friend of J. Smith, first President of the Linnean Society.

There are 21 species, all occurring in Australia, with one also present in New Guinea. Some species have five sepals and these all occur in WA with a couple also extending further eastward, seven species have but three sepals and these occur in eastern Australia with one species extending into New Guinea. Flower colours are yellow, orange, pink, mauve and (rarely) white.



Velleia rosea is an annual, common in the arid and semi-arid zones of WA. In good years, it covers large areas. The flowers fade to the palest pink so it looks like snow on the ground.



Velleia trinervis is an attractive herb, fairly wide-spread in WA, often in damp places



Velleia montana occurs in the eastern highlands of NSW and Victoria and in Tasmania. Photo: Dick Burns.

Verreauxia and Pentaptilon

Verreauxia is named for Jules Verreaux, who collected plants in Australia in the late 1840s. It is a genus of only three species all with yellow flowers and all restricted to the south west of WA. It is close to Pentaptilon (five wings) for which the ovary and fruit are winged and which has only basal leaves.



Verreauxia reinwardtii is an erect shrub covered in fine grey hairs. It occurs from Geraldton to Perth and inland, on sandy soil.



Pentaptilon careyi showing the flower stem arising from the basal stock. It grows on sandy soil mainly near Geraldton WA. Photos: Eddy Wajon

Coopernookia

A genus with six species, three of which occur in WA. The curious name comes from the Coopernook State Forest in NSW, where one of the species is common. The seeds have a warty appendage which is rich in lipids. These aid seed dispersal by ants.



Left: *C. strophiolata* a viscid (sticky) shrub occurring in inland areas of south west WA and extending into SA.

Below: *C. polygalacea*, an attractive undershrub, occurring in heathland on near-coastal areas from the Stirling Range to Esperance, WA.

Photos: Hazel Dempster.



Selliera

Named for Natale Sellier an illustrator, this is a genus with only one species: *S. radicans*. In the *Flora of Australia*, it is recorded as occurring in Chile, New Zealand, and Eastern Australia, but was subsequently also found growing near Albany in WA.



Selliera radicans has thick fleshy leaves typical of a salt marsh plant. It is found in coastal salt marshes and also in some periodically flooded inland areas. Its seeds have very sticky wings, well adapted to dispersal by sea birds. Hence its wide distribution. Photo: Dick Burns.

Postscript

The preceding text is based on *Flora of Australia* Vol. 35, which was published in 1992. Prior to this publication, a great deal of “tidying-up” work was done on the family: several genera disappeared, being swallowed by *Goodenia* or *Scaevola* and some species were transferred to different genera. But now, almost a quarter of a century later, botanists are becoming restless. The “boundary” between *Goodenia* and *Scaevola* seems rather ill-defined. Perhaps *Goodenia* contains too much diversity and should be broken into say three more-natural genera. Perhaps *Verreauxia* and *Pentaptilon* should be moved to one of the new *Goodenia* genera and *Selliera* into another. Perhaps *Diaspasis* really belongs in *Scaevola*.

Or perhaps the concept of a genus is merely a human one and Nature doesn't quite design things that way? In any case we may not yet be at the end of the road and the remainder may be bumpy.

Acknowledgement

The author thanks the several people who willingly gave permission to use their photos.

Propagating

Hazel E Dempster

Hazel's life-long interest in wildflowers, including 20 years in the nursery industry, has given her an encyclopaedic knowledge of our plants, their cultivation and especially their propagation. She is a Life Member of the Wildflower Society of WA and recipient of the Australian Plants Award in 2013.

Introduction

For many years I have been interested in growing these colourful and beautiful members of the Goodeniaceae family. I have been especially interested in the *Dampiera* genus. There are many suitable species for most areas of the garden, no matter how large or small, including garden pots and containers. Many of the smaller colourful species may not be very long lived in cultivation so the fact that they propagate readily from vegetation propagation is of great advantage for ongoing replacements. The more robust species also propagate readily. This ease of propagation enables the home gardener and enthusiast grower as they become more familiar with them, the opportunity to reproduce and replace plants as needed, while providing a pleasant and creative experience.



Four species of Goodeniaceae growing in a raised tank garden. White is *Goodenia thesioides*, blue is *Dampiera linearis*, gold is *Velleia trinervis*, and mauve is *Scaevola argentea*.

This plant family provides great splashes of colour amongst all the other beautiful and colourful flowering shrubs which are the delight of WA's unique and famous flora. Many species are also highly perfumed.



Dampiera spicigera (Left) and *Lechenaultia hirsuta* (Right) growing in bushland provide splashes of colour.

More generally known as the Leschenaultia family because Blue Leschenaultia has always taken the breath away from the time of our early settlers who were faced with the mass display of electric blues always seen throughout the Jarrah forest and Wheatbelt.

My propagating in WA is carried out at the volunteer-run nursery of the Wildflower Society of WA, Northern Suburbs branch at the Landsdale Farm School in the suburb of Darch in Perth WA. Our methods are quite basic and can be repeated in most home gardens.



Two litre plastic bottles, with the bottoms removed are placed over pots and act as mini-greenhouses

Overview

There are many plant forms and growth patterns within the family. Leaf texture ranges from glabrous through to resinous and includes leathery, and fleshy, with many species covered in white wool. Growth patterns include annuals, rosettes, tufted, mounding, ground covers, and small and large shrubs. These growth patterns are important in deciding how the plants can be successfully propagated.

Most of the perennial herbs and shrubs have a strong central spreading taproot system. It is from this that new growth arises. This includes new and sometimes ascending shoots or spreading subsurface roots which produce suckers for cuttings or rosettes for division. The new growth begins after the summer dry and the first rains, and continues into the growing season. In the hot dry summers many plants go into summer dormancy surviving on the storage within the fleshy taproots, to later reappear with lower temperatures and autumn rains.

To establish initial plants for propagation, material is collected from the wild under licence in WA from the Department of Parks and Wildlife Licensing department.

Leaf cuttings As with the Stylidiaceae family (Dempster *et al.* 2013), most species can be grown from leaf cuttings (Dempster 1980) especially those growing from rosettes and larger leaf species. The individual leaves of workable size can be carefully pulled away from contact point and used as normal cuttings.



Goodenia affinis being propagated by leaf cuttings. Left: rooted leaf cuttings. Right: rooted leaf cutting showing new shoot (arrowed).

Suckers These sprout from the taproots. They should be taken when they are 5-20 cm long, that is, before they get too long. It is important to leave the base of the suckers intact for their treatment as cuttings.



New suckers arising from central roots.



Dampiera coronata suckers.

Division Clumps of plants can often be divided up from the central root system using cutting treatment.

Tip cuttings These are taken from the species of shrubbier forms.

Layering Some genera, especially groundcovers, have species that layer as they spread along the ground.

Initial collections of new shoots and sucker growth from the wild, strike with the base of the suckers and stems intact.



Dampiera suckers producing roots



Once stock plants are established, cuttings can be used from most parts of the plant. Woolly foliage species succeed as well as glabrous species. For some species it is difficult to build up numbers because of scarcity of propagation material. The use of stem segments with leafy shoots from the nodes is very successful for overcoming this.



Stem cuttings producing roots.

Methods used At our nursery, all cutting material is prepared then dipped in Clonex Hormone Gel and placed in a cutting mix of 50/50 Perlite/seedling mix in 150 mm pots with about 20 cuttings per pot depending on cutting size. They are then watered gently, sprayed with Previcur fungicide, and covered with clear 2 L cool-drink bottles from which the lower few cms have been removed to give an open end. Soil is kept moist by watering outside the bottle. This keeps moist air within the bottle to keep foliage healthy. Striking rate varies, averaging four weeks. When struck, cuttings are potted into tubes to harden off.



Part of the propagation nursery showing, in the background, cuttings in their mini-glasshouses, and in the foreground struck cuttings.

Methods for the individual genera

Dampiera

When driving through the countryside, I am always amazed at the intensity of the blue colour of the mounds of *Dampiera* amongst all the other beauties. I consider myself lucky to be able to experience such a sight.

The love of these small plants, and sparked by my previous interest in alpine plants, with their size, colours and unique shapes, led to me choose the *Goodeniaceae* family featuring the beautiful blues and bright colours of *Dampiera* and many others, as great horticultural subjects.

Perennial plants and herbs in the genus can be found in the forms of rosettes, mounds, suckering plants, small shrubs, and groundcovers. Colours range from distinctive blue to mauve shades with occasional purple pink and white variations also one yellow flowered species (see page 112). More species are coming to light in the north of WA including red flowered species. Many species initially have very woolly new growth which becomes glabrous as it ages.



Woolly new growth of suckers of *D. altissima*. See also pictures page 112.

The initial cutting collections from the wild for propagation purposes are only allowed with a collecting licence, unless from private property where permission of owner is required.

New shoots and suckers The seasonally-appearing central shoots sprout from the base of the plants each year to provide a further layer



of cascading flowers. These new shoots are ideal for cuttings by gently removing from this central base. New suckers appear from the subsurface roots which radiate out from the central root system. These will eventually form new clumps which allow the spread of the plant and increase the size of mounds and therefore the colourful displays. These new suckers are gently removed to use as cuttings.

Left. New sucker arising from the central root of *D. linearis*.

Division Smaller clumps and species can be divided into segments from around the surface of the central tap root.

Leaf cuttings Individual leaves when removed gently from the stems or rosettes and treated as cuttings will produce roots within 3 to 4 weeks. The new shoots for the new plant appear from those new roots a couple of weeks later.



Rooted leaves of *D. sp.*

Tip Cuttings New growth is pruned from shrub species for cuttings for example from *Dampiera spicigera* and *D. teres*.

Rosetted species Species with basal leaves forming a rosette, such as *D. wellsiana* and *D. eriocephala* (Page 109), belong to one of the most spectacular and unusual groups. They have a large strong central taproot with separate rosettes forming around its edge as the plant ages. Small suckers also appear from the fleshy roots just below the surface around the central root.

These species become nearly dormant and lose all their leaves during the long hot dry summers. However with the first rains in autumn the rosettes reappear and suckers are formed to produce a lush green base with massed stems of spectacular blue heads of flowers from early spring.



Dampiera wellsiana thriving in gravel.

Propagation is best carried during the growing phase. Rosettes can be divided off and any suckers separated into individual plants. Excess larger leaves are treated as cuttings.

All material is dipped in Clonex Purple or Green hormone gel before setting. In the wild, the plants deteriorate after flowering has finished and go into summer dormancy but, in cultivation, some foliage is often retained and flowering prolonged.

Mounding and spreading forms Again, after the first rains, new shoots are soon produced from the central taproot. They form long

ascending and arching stems from the centre, some more than 80 cm long. Flowers are produced in sequence along these stems from mid-winter through to the end of spring. They are usually grouped at the leaf junctions. This is the best propagating material.

These mounding plants also produce suckers from around the central stem forming new plants. These make a new layer of stem adding to the flowering profusion each year. These suckers can be removed and used as cuttings. Leaf cuttings are also a viable choice. A large amount of cutting material can be obtained as the long arching stems can be cut up for numerous plants. Cut below each node at each leaf cluster leaving stem to support, then treat as individual cuttings with Clonex as mentioned previously.



D. lavandulaceae showing suckering.



D. lavandulaceae growing in a garden and showing the arching stems.

Suckering species Some species, for example *D. linearis*, spread by suckering away from the central mounds to form new separate mounds. Suckers are best pulled gently away from the under-surface fleshy roots and used as cuttings leaving the base tissue on the cuttings.



D. linearis

Shrubby species. *D. teres*, *D. spicigera* have many spectacular blue flower spikes over a long period. These small shrubby species have quite soft woolly foliage and are best grown from newly produced stem shorts about 12- 15 cm long. They strike readily at the end of the warmer months.



D. spicigera

Ground covers *D. diversifolia* is one of the few flat Dampiera ground cover species. It grows readily from most material on the plant. New growth tips and leaf tufts along the spreading stems which occasionally layer, are used for propagation material.

Goodenia

This genus is divided by colour into the blue group and the yellow shades group.

Blue-flowering species are perennials which flower in late spring, early summer. The southern species grow predominately in tufted clumps with some suckering adjacent to the main clump. These tufted clumps, including the retained flower stems e.g. *Goodenia coerulea*, can be divided up and the sections treated as cuttings. These tufted clumps often appear along roadsides where the subsurface roots producing suckers spread away from the original plants to form a raft of colour.

Small compact groundcovers such as *G. leptoclada* have a central root system. New seasons cuttings and suckers from this have a mass flowering over all the plant. White flowering forms are also seen.



G. leptoclada

Some northern blue species are shrubbier to 40 cm. For these, tip and stem cuttings are used. Suckers can develop from the fleshy roots which spread below the surface away from the central tuft and set as cuttings. Leaf cuttings are also an alternative.

Yellow flowering species include annuals which are widespread through the country. In dryer areas a wide selection of annuals thrive after rains, usually amongst brilliant displays of everlasting daisies, as well as massed displays in varying shades of yellow and golds. Annuals are grown from seed when available. Many flat seeds are produced with a hyaline edge which, when moistened, forms a jelly-like substance to stick them to the ground before germination.

Perennial species form clumps or cover the ground by underground roots producing suckers, eg *G. pulchella*. Many of these species also have a large strong central taproot with separate rosettes forming around the edge as the plant ages, eg *G. affinis*, *G. dyeri*. Small suckers also appear from the fleshy roots just below the surface around the central root. Leaf cuttings are successful with these species.



G. dyeri propagated by leaf cuttings in cultivation growing with a *Dampiera*.

Some of these species become nearly dormant with the loss of all the leaves during the long hot dry summers but with the first rains in autumn the rosettes reappear and suckers are formed to produce a lush green base with massed stems of flowering sprays from early spring. Others from cooler areas flower all through the summer and are ideal plantings

around moist areas and in pots and containers for summer flowering. These species are easily propagated from suckering shoots and division of leafy tufts.



Goodenia affinis propagated from leaf cuttings.

White flowering species These are leafy perennial-like shrubs such as *Goodenia scapigera*



Goodenia scapigera

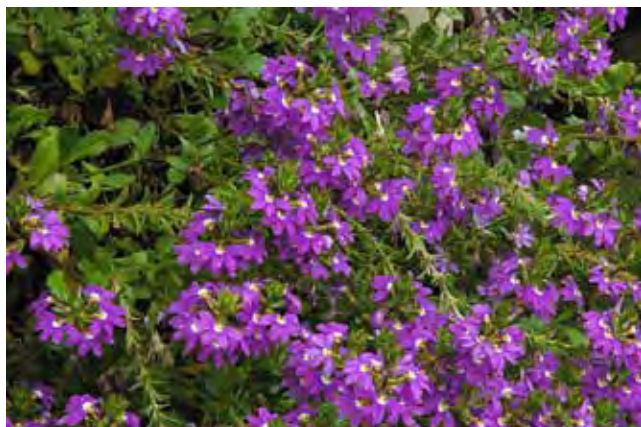
Ground covers The leafy prostrate *G. varia* propagates easily from new season growth, leaf and leaf with stem segments and leaf cuttings.

Pink flowering species The beautiful *Goodenia sericostachya* appears after fire and has pink to burgundy flowers on silky white flower spikes above felt-like foliage. It can be propagated from leaf cuttings and new season stem cuttings. (See front cover.)

Scaevola

This is the best-known genus in horticulture. They are found in many different areas and there are many different forms.

Perennials These small tufted clumps can be divided up and the sections treated as cuttings.



S. aemula, arguably the most widely grown member of the family thrives in hanging baskets. Photo: Jim Barrow.

Leafy perennial shrubs Upright leafy shrubs with colourful spikes for flowers which usually come in a selection of blues (*S. porocarya*) mauves and white (*S. oldfieldii*). They are propagated mainly from new season's growth, leafy stem segments and individual leaves.



The sweet-smelling *S. porocarya*.

Small woody small shrubs The coastal *Scaevola* species include the very variable and selected forms of *S. crassifolia* and *S. nitida* and are hardy and woody sub-shrubs adapted to withstand strong coastal weather conditions. *Scaevola tomentosa* is an orange-apricot flowering species with felt like soft green foliage from the north west. Tip cuttings of new season's growth are selected as cuttings.

Ground covers mainly prostrate perennials provide some spectacular colour displays *S. phlebopetala*.

Lechenaultia

The famous blue *Lechenaultia biloba* is a small, shrubby, suckering perennial, widespread throughout south west WA, especially in lateritic areas. Some forms spread by suckering from subsurface roots; others are of shrubbier form. Cuttings from new season's growth and from sucker's shoots strike readily. Most other species also strike easily including the famous wreath lechenaultia *L. macrantha* which has a strong central rootstock from which cuttings strike so quickly that the roots will rot off if not potted on quickly. Some species provide mass colour like the brilliant red *L. formosa* along with its many colour forms but may be short lived. Striking cuttings that are taken seasonally will renew these colourful displays.

Lechenaultia has already shown its ability to produce a myriad of rainbow colours with hybridising trials for new selections.



Different forms of *L. formosa* and *L. biloba* used for hybridizing trials..

Anthotium

This is a delightful, ornamental, dwarf, fleshy-leaf genus from the southern wheatbelt featuring rosettes increasing to form clumps. Round heads of colourful flowers in blue to mauve as with *A. humile*, the red flowered *A. rubriflorum* and the white flowered *A. odontophyllum* on short stems from 10cm are displayed in spring. They are ideal for pot plants and raised beds.

Tufted rosettes grow from the central root system with suckering shoots appearing from the spreading subsurface roots. Rosettes can be easily divided to form new plants. Suckers make ideal cuttings and leaf cuttings soon produce new plants.



A. rubriflorum propagated from a leaf cutting.

Coopernookia

Small shrubs from the southern wheatbelt. The few species differ in character from the rosemary-like shrub of *Coopernookia polygalacea* with its heads of mauve flowers. *C. strophiolata* is a leafy suckering shrub with white flowers and *C. georgei* is an upright green leafy shrub with large mauve flowers. Tip cuttings from new season growth strike well as do suckers which appear from around the base of the shrubs especially if there has been a disturbance around established plants. Leaf cuttings are an alternative method. Picture: see page 125.

Velleia

The annual *Velleia rosea* provides masses of marshmallow pink flowers growing over large areas throughout the everlasting daisy areas in the northern wheatbelt during the spring. It is usually grown from the masses of seed produced. Picture: see page 123.

The colourful yellow and gold flowered perennials have tufted rosettes grown from the central root systems in the very variable *V. trinervis*. Rosettes can be easily divided to form new plants and suckers taken from the spreading subsurface roots. Leaf cuttings soon produce new plants.



V. trinervis leaf cutting (left) and flower (above).

Diaspasis

The only species, *D. filifolia*, is a soft fleshy plant. It occurs near the southern coast of WA. It is usually found amongst sedge areas which support the stems with their starry white, pink and occasional mauve flowers. Forms in the eastern end of its distribution have smaller white flowers whereas those close to the west include the colour forms with larger flowers. The species strikes readily from all the available plant material. Picture: see page 125.

References

Dempster HE 1980 *Goodeniaceae from leaf cuttings*. Wildflower Society of WA Newsletter **18**: 11-12.

Dempster HE 2012 *Growing Natives in Tanks* Wildflower Society of WA Newsletter **48**: page numbers?

Dempster *et al.* 2013 *Triggerplants* Australian Plants **27** No 215

