Issue 50 September 2026

Cactus & succulent REVIEW

The online magazine for cactus and succulent enthusiasts



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Darren Sleep
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Growing in the Sonoran Desert
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Editor's NOTES

Welcome to the September issue of the Cactus and Succulent Review



The amazing flower of *Moraea tulbaghensis* see Irids – South African bulbs from the Western Cape Page 13

This year to date (late August) the UK has experienced five heatwaves. A heatwave is defined as at least three consecutive days when the daily maximum temperature meets or exceeds a specific temperature threshold. The threshold depends on the region of the country concerned; in London it is 28°C.

It seems we have it comparatively easy, however. Go to page 31 to read 'Growing in the Sonoran Desert' to find out what real heat is like!

Also in this issue I am pleased to include 'Irids – South Aftican Bulbs from the Western Cape' an introduction to these attractive plants. The picture on the left, together with the front cover, shows just two of their amazing flowers. Go to page 13 to read the article.

Also in this issue is the first description of a new *Agave* cultivar, named after Derek Bowdery who many people in the UK will have known as an expert grower and nurseryman. See page 9.

Finally the dates for 'Cactus at the Castle' are almost upon us. Full details are on page 4 and details of our half price vouchers for CSR readers are on page 68. Please note that the cut off time for requesting voucers is midday on Friday 4th August.

Sheila Cude

Cactus & Succulent REVIEW

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The *Cactus and Succulent Review* is a free quarterly magazine published in pdf format in March, June, September and December.

Contact Sheila Cude

Back issues

All back issues are available to download from the website.

See page 68



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Cactus at the Castle 2026

UK's largest annual cactus event

Saturday 5 & Sunday 6 September
11.00am to 5.00pm

Cactus Mart — SAT & SUN
Featuring **three marquees**
plus outdoor sales space

Demonstrations — SAT & SUN
Graham Charles – cultivation hints

World Garden Tours — SAT & SUN
With **Tom Hart Dyke**

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Got a plant to sell?
Bring it along to our popular auction

A Tribute to Tony Mace — SAT ONLY
The late Dr. Tony Mace was a lifelong supporter and Trustee of the BCSS

In his honour we present a series of short talks on plants in which he had a particular interest including opuntiods and notocacti

Admission
Adults **£15.00*** Under 16s **FREE**
BCSS members **£12.00***
*One day entry – Saturday or Sunday

SPECIAL OFFER

Cactus&Succulent REVIEW

Half price entry for Cactus & Succulent Review readers

See page 68 for details of how to apply

Guest presentation — SUN ONLY
A special appearance by popular television horticulturalist Camilla Bassett-Smith



The Haworthia Growers UK Show — SUN ONLY
A display of the finest Haworthias and allied genera

A talk on haworthias — SUN ONLY
By **Adrian Weatherill**
Based on 40 years experience, Adrian will talk about how to grow haworthias

MEXICAN FOOD

T's Tacos
Mexican street food

The Blue Agave Bar
Serving a wide range of Mexican inspired cocktails and Harvey's fine Sussex ales

Lullingstone's
Mexican Funday Sunday

Family Fun

Mariachi Band
Mexican-themed games
Treasure hunt
Facepainting

Cactus at the Castle

Lullingstone Castle, Eynsford, Kent DA4 OJA

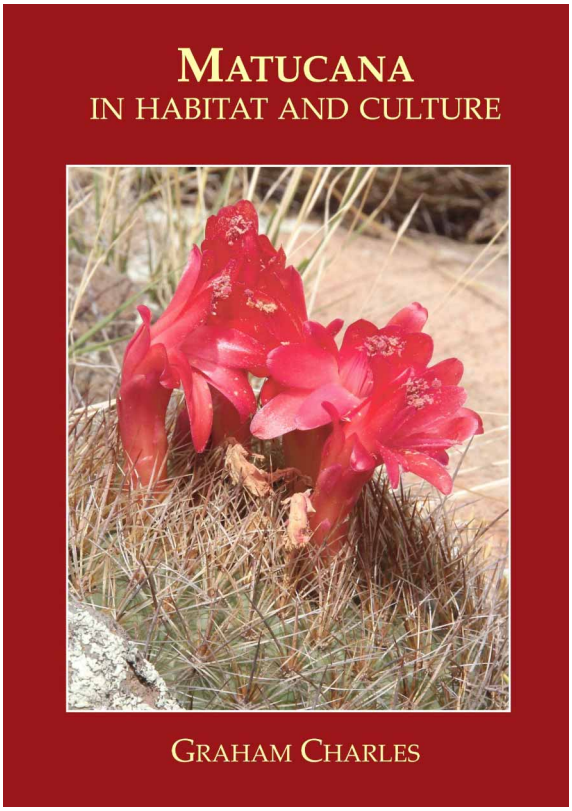
Cactus at the Castle

Matucana
in habitat and culture

by Graham Charles

Reviewed by Ian Woolnough

240 pages Hardback 11.25 x 8.5.
SBN 978-0-9562206-1-5 2026
RRP £48.00



Graham Charles is well known as an author, speaker and President of the British Cactus and Succulent Society. He has travelled extensively in Peru researching the plants that grow there.

Prior to the publication of this eagerly anticipated and long awaited book the only one on the genus in English was Rob Bregman's 1996 *The Genus Matucana*.

Graham Charles had however produced a book on *Matucana* and *Oroya*, in German, for the German Cactus Society, *Deutsche Kakteen-Gesellschaft,* in 2018 – *Matucana & Oroya Juwelen der Anden* to give it its full title. Given the new discoveries and popularity of the genus in cultivation such a publication in English is welcomed and sure to be popular.

In a similar format to the author's previous book *Gymnocalycium in habitat and culture* this is a lavishly illustrated tome.

It starts with the history of the genus *Matucana* then lists the 38 recognised species. It is worth noting that since his 2018 publication Graham has revised things a little in light of a recent molecular study and includes a newly described species. So, for example, what were previously species of *Oroya* are now *Matucana*. There are then sections on the characteristics and classification of the genus, cultivation, natural habitats and distribution together with some paintings by Christabel King.

The majority of the book is a full treatment of each species, in alphabetical order, with descriptions, synonyms, distribution (including habitat maps), conservation status, history, commentary and specific cultivation. Every page in this section has lavish colour photos which are often full or half-page, illustrating the general habitats and many with plants in flower. Although the vast majority of pictures are plants in habitat there are some shots of plants in cultivation and all of the photography is first class.

To finish off there are short sections on intergeneric hybrids, cristates, a glossary, further reading, references, appendices of field numbers and Ritter's types lodged at Utrecht and an index of names.

As to be expected from this author the book has been beautifully produced, thoroughly researched and methodically compiled. The price tag reflects the quality of the printing and production.

In summary *Matucana in habitat and culture* is a lavishly illustrated book that provides an essential resource for both the casual hobbyist and the dedicated grower. It doubles as a lovely coffee table book that can be dipped into at any time and also a detailed reference that can be pored through avidly as an up-to-date comprehensive treatment of the genus.

I would thoroughly recommend it to anyone who grows or wishes to know more about these Peruvian plants.

Matucana in habitat and culture is available from Keith's Plant Books Price £48 + p & p



The hybrid plant

An unusual hybrid

Seticereus icosagonus × Matucana weberbaueri var. flammea

by John Hughes

I have always kept a brief note of my new succulent acquisitions and I can see that on 28th July 2005 I visited Terry and Jennifer Smale at their home in Epsom Downs. Terry was always known for his extensive knowledge of the Mesembryanthemaceae and of South African bulbs, but he had one greenhouse filled with an impressive collection of cacti, many of which he had raised from seed.

One reason for his extensive seed raising was that he was for some time the Seed Co-ordinator for the then Cactus and Succulent Society of Great Britain. I remember being roped in by Terry to fill packets, generally containing ten seeds of various succulents, for later distribution. I know he used to do viability trials of many of the seeds before they were put on the members' list.

I do not know from where the present plant originated, but perhaps it was from this source. I came away with three cuttings that day, one of which was a three inch (7.5cm) long (tall) cutting of the above-named hybrid.

The parents

So what about the parents? I have had *Seticereu*s (or *Cleistocactus,* or *Borzicactus*) *icosagonus**, depending on which authority you follow, in my collection, for longer than I care to remember. It is said to be widespread in the Ecuadorian provinces of Azuay and Loja and in the Peruvian Piura region at altitudes of 1000 to 3000 meters.

* Currently listed as *Borzicactus icosagonus* by POWO

I suspect that the parent of my hybrid would be the orangey-red flowered form of the species, rather than the pink-flowered sub-species *roseiflorus*, described by Graham Charles, as I doubt that this would have been readily available at the time the hybrid was produced.

In habitat it is said to form a prostrate creeping shrub, with more upright ends to the stems. The light green shoots are said to reach a length of 20 to 60cm, with diameters of 3 to 5cm.

The stems are clothed with short, fine yellow spines, but areoles capable of flowering are covered with numerous, fine, long bristles. The yellow tone is particularly vibrant and makes the plant instantly recognisable.

My own plant flowers most years, with a beautiful display of orangey-red, slightly zygomorphic flowers. I have always loved this plant. When it was young I always admired the stem formation, the end of which was quite flattened rather than the pointed tip on other ceroid species, but as it has grown older it has been relegated to a far corner on account of its sprawling arms.



Seticereus (*Borzicactus) icosagonus*
(Photo: Michael Wolf) CC BY-SA 3.0)



The use of *Matucana weberbaueri* var. *flammea* as the other parent has produced a hybrid that is more easily housed in my main collection. This plant originates from Balsas on the Marañón river where it grows at some 800-2200 metres, and differs from the type in having orangey-red flowers.

The hybrid

The hybrid does seem to combine aspects of each of the reported parents. In my collection, over some 21 years, it has grown into an upright plant, the main stem approximately 35cm long. It leans slightly, but not enough to make the plant fall over, despite the relatively small pot in which it is housed.

Matucana weberbaueri var. *flammea*
(Photo: Valentino Vallicelli)
From LLifle CC BY-SA 3.0

It has fine yellow spination, but not as attractive as that on the *Seticereus* parent, but I prefer its habit and the flowers are stunning. Over the years I have removed offsets and now have two more plants. I remember passing on at least two further plants in the hope of keeping it in cultivation.

Although I do not know the origin of the cross, the large geographical separation of the parents would suggest it is of horticultural origin. In my early days of collecting, I was always taught that hybrids could only be formed between closely related species. What I am discovering, due to my own interest in cacti with pretty flowers (my highly sophisticated requirement for plants in my collection), is that there are more and more crosses being performed between South American cacti of different genera, particularly of *Cleistocactus* and various South American globular cacti; it will be interesting to see whether the DNA evidence on plant relationships agrees with the hybrids produced.

Photos: John Hughes or as credited



The fine yellow spination



The hybrid: *Seticereus icosagonus* × *Matucana weberbaueri* var. *flammea* showing the attractive flowers

Agave ‘Derek Bowdery’ a new cultivar

by Colin C. Walker

The background

In 2007 and 2008 I obtained plants labelled *Agave polianthiflora* (Fig. 1) from the late Derek Bowdery, an enthusiastic grower, propagator and past owner of the Eau Brink Nursery in Norfolk. A friend, Tina Wardhaugh, obtained a similar plant from the same source (Fig. 2).

It was very obvious to me that these plants were incorrectly labelled because the true *A. polianthiflora* is a rather different plant (Fig. 3). This species has stemless, usually unbranched, rosettes 20–30cm in diameter. Its leaves, though, are very different to the plants I obtained. They are up to 20cm long, 1–1.3cm across, linear-lanceolate, widest in the middle, prominently white bud-imprinted above and below and, most significantly, the margin is conspicuously white-filiferous and minutely toothed near the base bearing a terminal weak, greyish spine 7–10mm long (Gentry, 1982). Starr (2012) wrote that “with this leaf shape one could put feathers at the base and use it as a dart at the local pub”!

Agave polianthiflora

Compare Figs. 1 and 2 with the true *A. polianthiflora* (Fig. 3) (shown on the next page) and it is obvious that the bud-imprinting and white marginal fibres are absent from Derek’s plants.

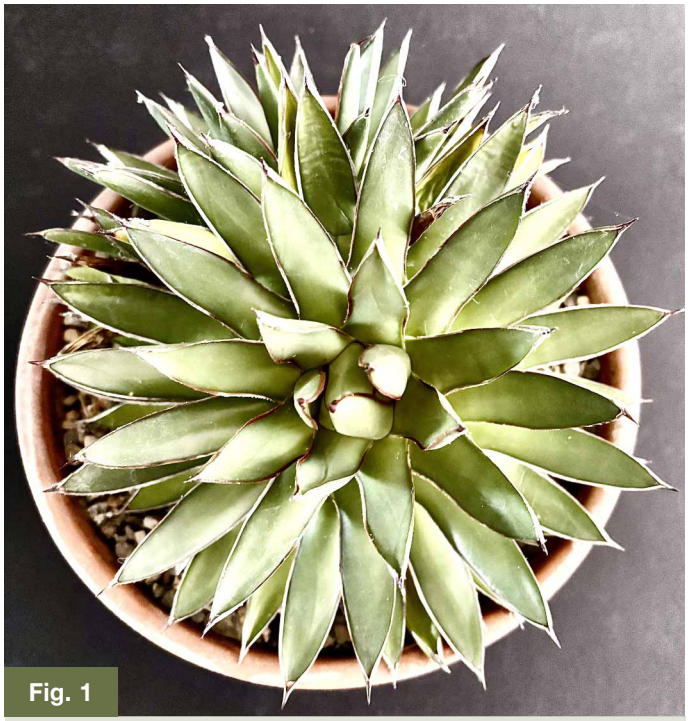


Fig. 1

Agave ? *polianthiflora*, a double-headed plant in an 18cm diameter pan (Photo: Colin C. Walker)

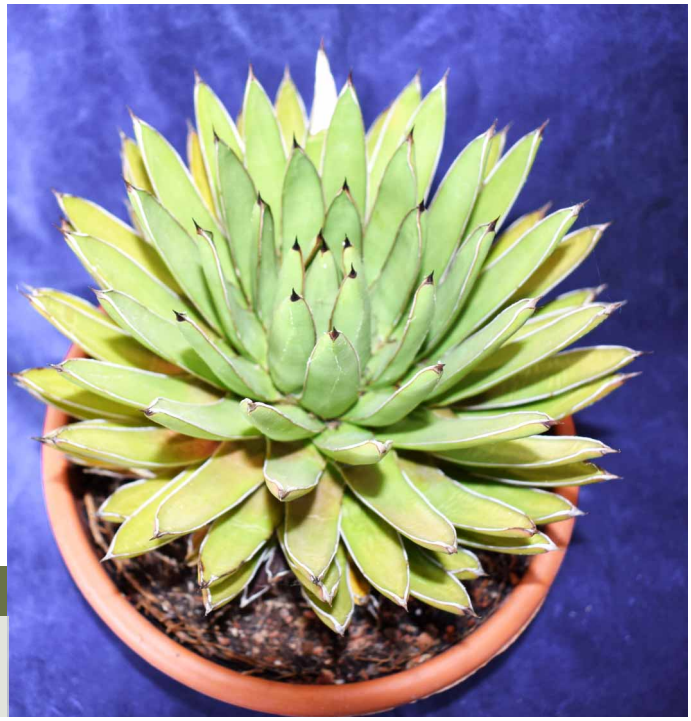


Fig. 2

Agave ? *polianthiflora*, in a 20cm diameter pot (Photo: Tina Wardhaugh)



Fig. 3

Agave polianthiflora in a 15cm diameter pan (Photo: Tina Wardhaugh)

Most importantly, *A. polianthiflora* has very distinctive flowers. Its flower spike is typical of *Agave* subgenus *Littaea* in being unbranched, spicate (spike-like) and up to 2m tall. Indeed, it differs from all other members of this subgenus by its 38mm long tubular flowers with very short lobes, similar to those of *Agave* section (formerly genus) *Polianthes*, hence its name.

A highly distinctive feature of the flowers is that these (i.e. the tepals) are a pruinose (powdery) pinkish-red to red, usually in pairs (Gentry, 1982; Spath & Moore, 2025). The plant and its flowers are well illustrated by Pilbeam (2013: Fig. 199), in which part of a flower spike is shown from a plant in cultivation in Derek’s collection. Starr (2012) records that these red flowers are highly attractive to hummingbirds. It should be emphasised that reddish, pink or white flowers are exceptionally rare amongst the ±250 species of *Agave*, the flowers of which are usually yellow or greenish to brownish.

The flowers, then, would confirm that Derek’s plants were incorrectly identified. My two plants have grown relatively slowly for agaves and I have had to wait 19 years for my first plant to flower (Figs. 4–6). The flowers confirm that these plants were indeed incorrectly identified since the flowers do not match those of *A. polianthiflora*.

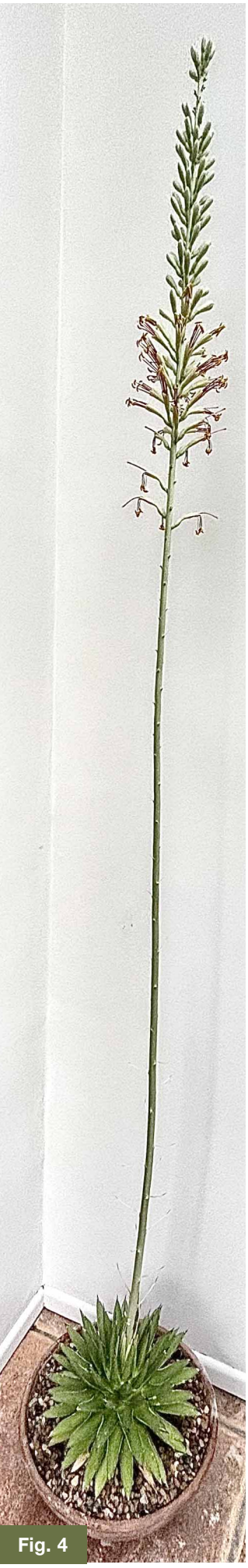


Fig. 4



Fig. 5

Agave ‘Derek Bowdery’

Sadly, Derek is no longer with us so I am unable to obtain further information on the plants he distributed as *A. polianthiflora*. I am assuming that seed was produced on one of his plants of this species and that he distributed the resultant seedlings under this name.

I have no information on the male parent. I am proposing that this was either *A. victoriae-reginae* or, less likely, its closest relative *A. nickelsiae* (see Walker, 2017).

The leaves of the hybrid are similar in shape but much smaller when compared to both these species, which are among the most architectural of all the agaves and hence are very popular in cultivation. They are very closely related being characterised by the toothless margins to their leaves which have a continuous white border and decorative white bud imprints together with short, but very sharp and hence potentially dangerous, terminal spines. A significant feature of these species is that they are especially slow-growing in cultivation compared to many other agaves.

My conclusion is that the plants shown in Figs. 1 and 2 are hybrids. They are slow-growing and flower at a small size relative to most agaves, so they deserve a name. I am delighted to honour Derek (shown in Walker, 2017: Fig. 15) by naming this hybrid *Agave* ‘Derek Bowdery’.

Agave ‘Derek Bowdery’

Parentage: *Agave polianthiflora* x *A*. ? *victoriae-reginae* or *nickelsiae*.

Plant acaulescent (stemless rosettes), solitary or occasionally branching up to 20cm in diameter. Leaves linear-lanceolate, convex on both surfaces, mid to dark green, up to 8cm long, 2.5cm wide at the base, prominent nearly black or whitish cartilaginous margins, tip very sharply pointed (mucronate), up to 5mm long, nearly black; (filiferous white fibrous margins, marginal teeth and bud-imprinting absent) (Figs. 1 & 2).

Inflorescence spicate, unbranched, up to ±1.5m tall, 1.6cm diameter at base; bracts up to 4cm long, thin and wiry; flowers laxly arranged in the upper third, 3.4–3.7cm long, usually in pairs, tubular, tepals pale green (not pruinose nor reddish), tube basally swollen, 6-lobed, lobes 5 mm long; stamens exserted (protruding beyond the tepals) 4m, style exserted 3cm beyond the tepals (Figs. 4–6).

Far left: Flower spike of *Agave* ‘Derek Bowdery’, 1.5m tall; plant in a 22cm diameter pan (Photo: Colin C. Walker)

Left: top of the flower spike of *Agave* ‘Derek Bowdery’ (Photo: Colin C. Walker)

A significant feature of this hybrid is that the anthers (male) develop before the styles (female). This is shown clearly in Fig. 6, where the youngest flowers at the top of the spike have the fertile (dehiscent) anthers exserted beyond the flower tube (tepals).

The older flowers in the lower part of the spike have dying anthers but the styles are visibly exserted beyond the flower tube. Most agave flowers behave like this, being first male with fertile anthers releasing pollen, before becoming functionally female when the anthers die and styles develop and become receptive to pollen; these are termed proterandrous. *Agave* ‘Derek Bowdery’ behaves in this typical manner. In contrast, *A. polianthiflora* is unique in its genus, being proterogynous with styles developing before the anthers (Pilbeam, 2013: Fig. 199).

In summary, the flowers of *A*. ‘Derek Bowdery’ clearly show that these plants are hybrids, originally distributed incorrectly by Derek as *A. polianthiflora*.

Two interesting points remain. Will plants of *A*. ‘Derek Bowdery’ die after flowering or will they sucker? In my experience single rosettes of *A. victoriae-reginae* die post flowering. My plants of *A. nickelsiae* have yet to flower but I assume that single rosettes of this species and those of *A. polianthiflora* will behave similarly, although I have no experience in growing this latter species since my plants so identified have now turned out to be hybrids.

I have self-pollinated the flowers of the hybrid but no fruit developed so, as is typical of agaves, this hybrid is self sterile. However, it is worth noting that, as with the flowers, the fruits of *A. polianthiflora* are unique within its genus, being red, globose to ovoid, pruinose red, dehiscent capsules “that look like small cherries before they ripen” (Starr, 2012). ■

Photos: Colin C. Walker and Tina Wardhaugh as indicated



Fig. 6

Close up of part of the flower spike of *Agave* ‘Derek Bowdery’ (Photo: Colin C. Walker)

Acknowledgements

I thank the late Derek Bowdery for plant material of his hybrid. I am deeply indebted to Tina Wardhaugh for advice and use of her excellent photos.

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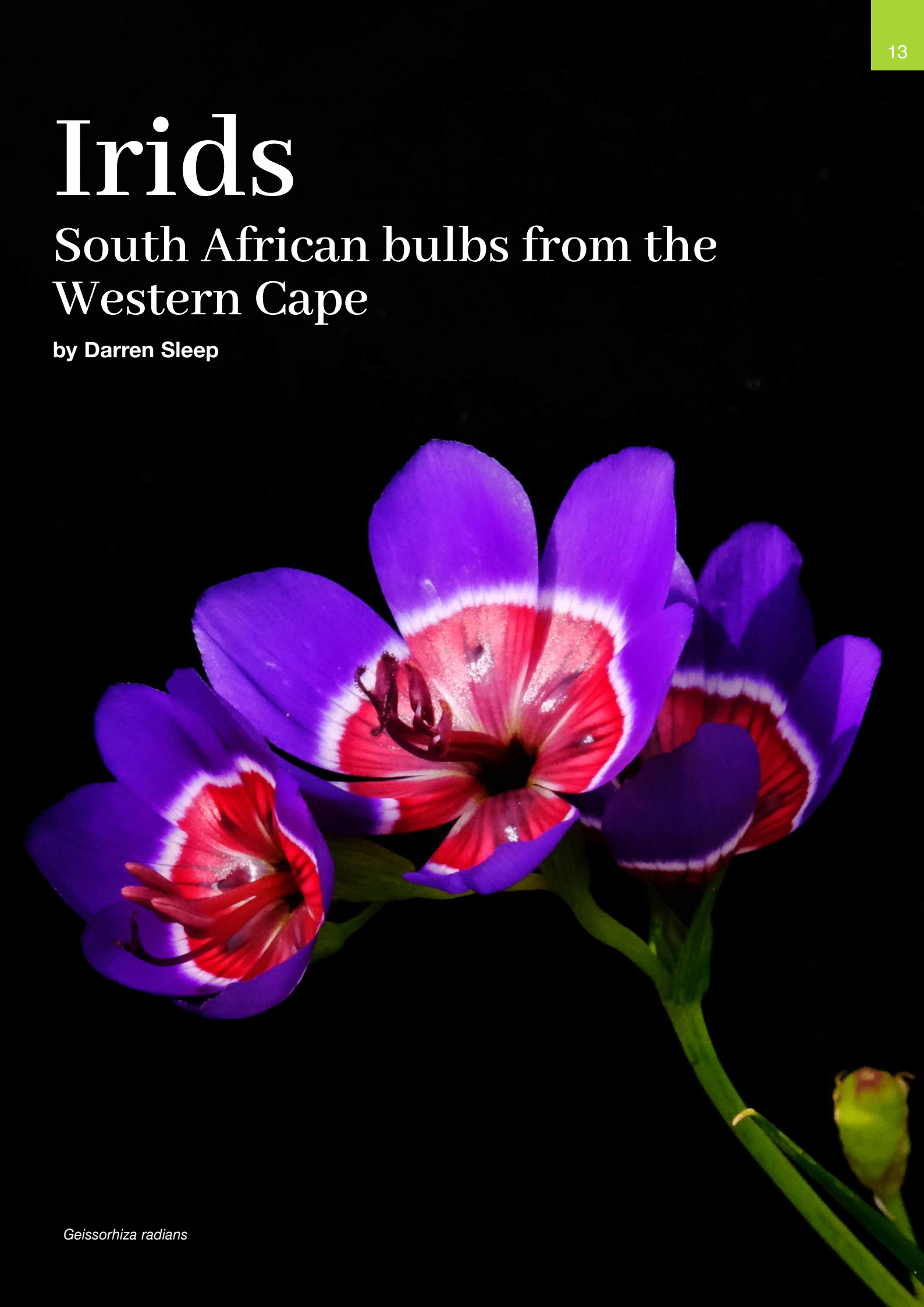
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Irids

South African bulbs from the Western Cape

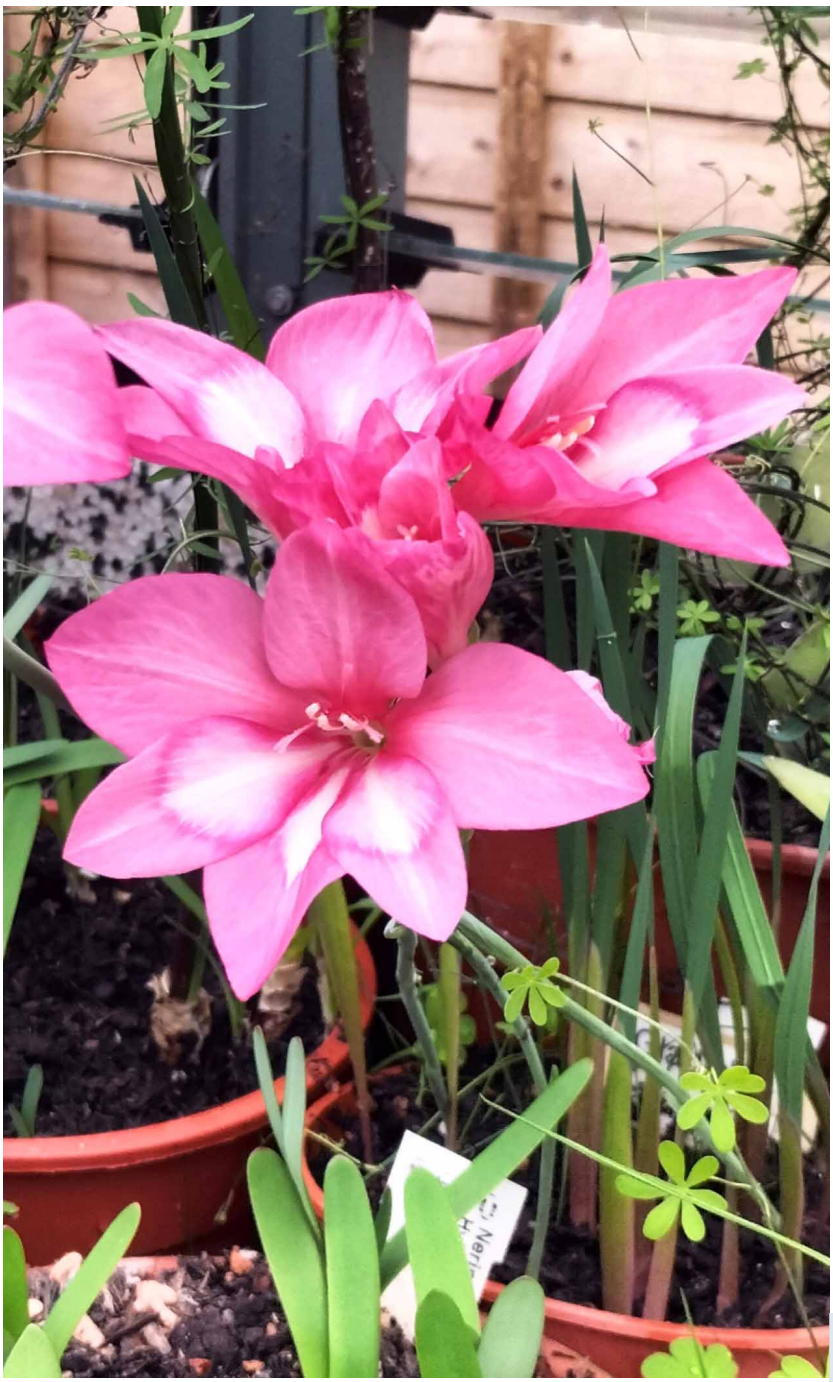
by Darren Sleep



Geissorhiza radians

My interest in Cape bulbs was ahead of my interest in cacti and succulents and stems from a trip to South Africa in their spring of 1999.

Succulent plant enthusiasts do accept a few of the monocots into their collections, for example *Bulbine*, *Massonia*, *Albuca* and *Haemanthus*. So when Sheila approached me about a Cape bulbs article I decided I would concentrate on the Iris family because they are rarely represented.



Gladiolus carmineus

There are a lot of Irids in South Africa, therefore some further whittling down was needed. I decided that I would concentrate on the winter growers from the western side of the country.

The summer growers from the east are well represented in our gardens by many *Gladiolus*, *Crocosmia* etc and don't need any special treatment in the UK.

I also decided to exclude the more familiar winter growers that are sold specially treated by garden centres to plant for summer here: *Freesia*, *Sparaxis* etc. Incidentally – these will revert to winter growing if planted too late in spring and hot weather keeps them dormant until autumn, whence they will try to grow; and get frosted.

What I will include are my favourites from several genera. All are small enough for pot culture.

Gladiolus

Gladiolus carmineus

G. carmineus is unusual in flowering in autumn, before any leaf development. Flowering corms usually do not produce leaves and flowering knocks them right back to non-flowering size offsets. Sometimes they don't survive at all and need replacing from seed, which is easily produced and germinated.



Gladiolus maculatus

Gladiolus maculatus

G. maculatus is my favourite Cape bulb of all. It has scented and variably marked flowers that are always open for Christmas day here. Seed set often happens but seeds are sometimes not viable. I guess because of the low temperatures here at flowering time.

Gladiolus orchidiflorus

Tall with spectacular green flowers, sometimes with a red tinge. Reddish forms tend to be a bit shorter if the height bothers you.

Gladiolus pritzelii

G. pritzelii has very scented yellow flowers in late winter.

Gladiolus alatus (not recommended)

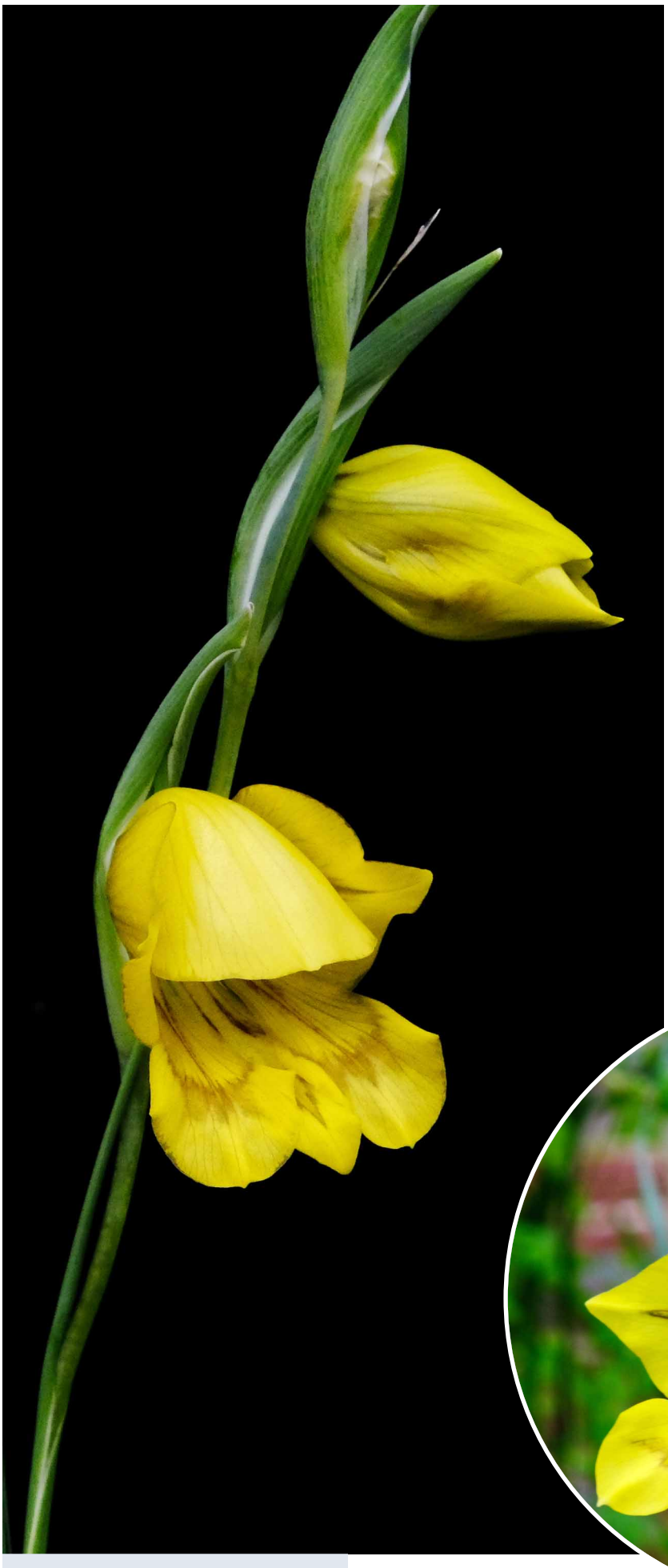
Common and spectacular in the Cape but I find it extremely hard to please in cultivation. The rest of its section are easier to grow, but not easy to flower. The exception being the lovely dwarf *G. uysiae*, which is amenable.



Gladiolus orchidiflorus – green form



Gladiolus orchidiflorus – reddish form

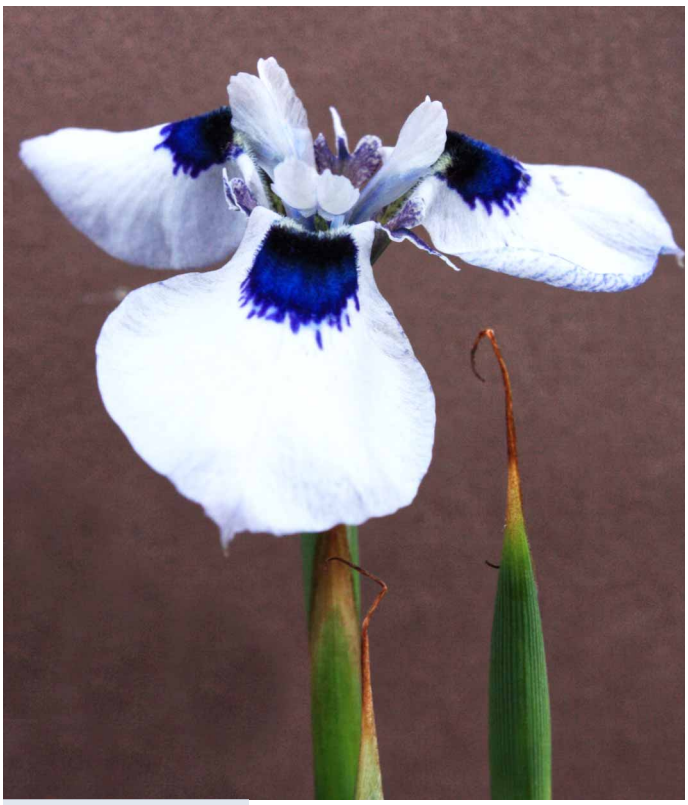




Gladiolus uysiae



Above and inset *Gladiolus pritzelii*



Moraea aristata



Moraea loubseri

Moraea

The other 'big' Cape Irid genus and the one most iris-like.

The 'Peacock Moraeas' usually have an iridescent blue or green patch on the falls. They are spectacular but sadly some are critically endangered (e.g. *M. aristata* and *M. loubseri*). Happily they are no real trouble to grow.

Moraea aristata

*M. aristat*a is white with a few blue markings and a blue iridescent patch. Hybridises very easily and the hybrids are often nice.

Morea tulbaghensis

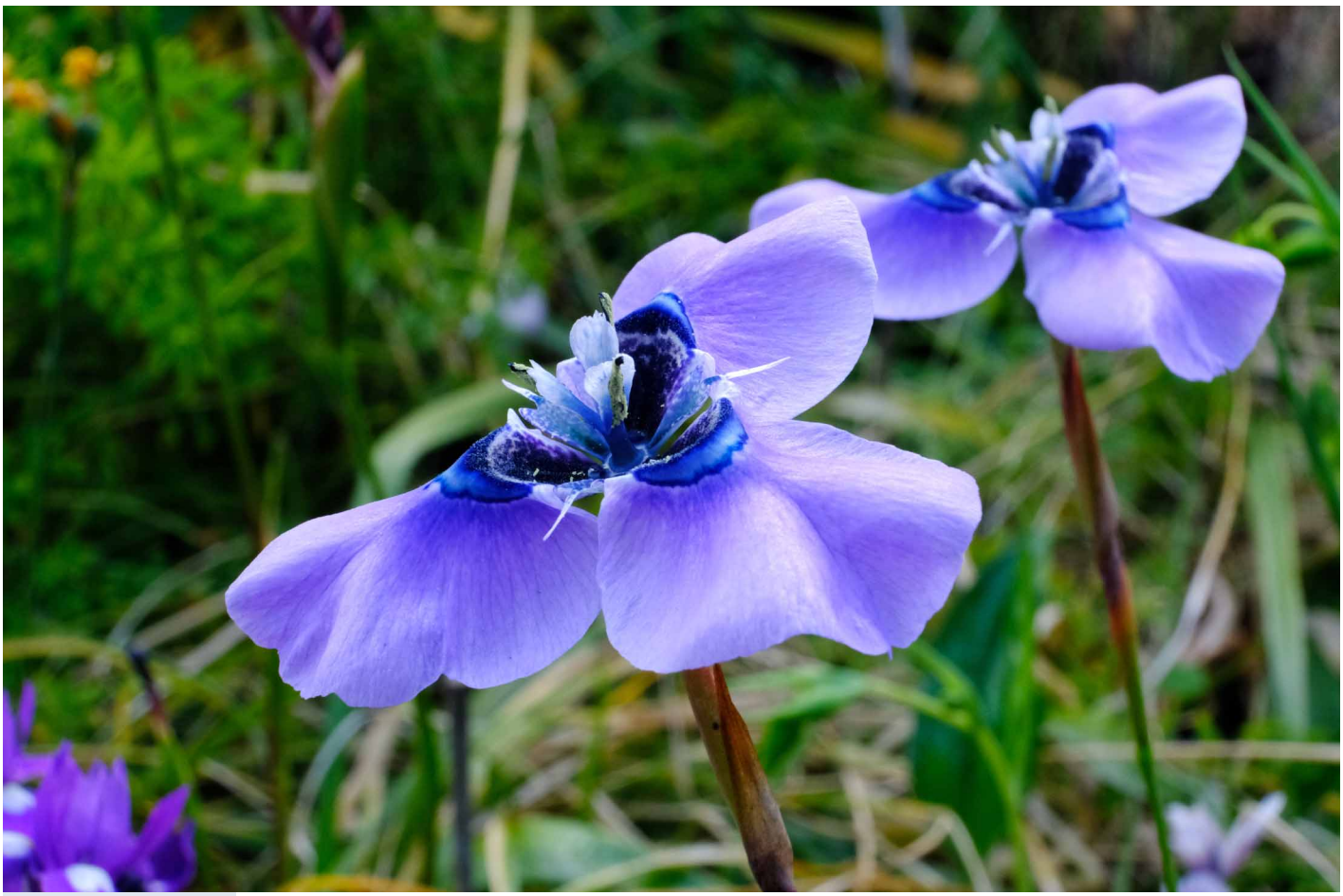
M. tulbaghensis is a beautiful orange, again usually with a blue patch but I have a form that used to be called *M. neopavonia* that lacks it.

Morea gigandra and *M. calcicola*

M. gigandra and *M. calcicola* are both blue but do differ in flower size as well as other characters once you get to know them. Slow to produce offsets, unlike those above.



Moraea tulbaghensis



Moraea gigandra

Moraea calcicola



The other *Moraea* have many species to recommend too.

Moraea atropunctata

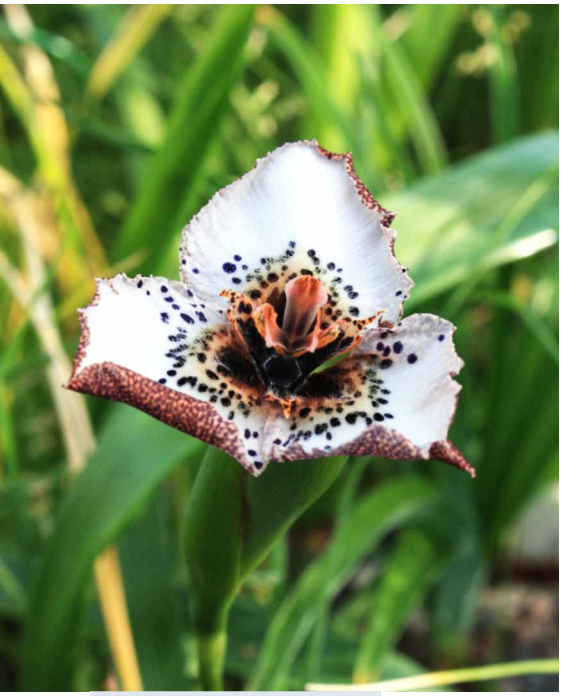
A very curiously marked white flower with reddish-brown reverse. I think it is very attractive.

Moraea ciliata

M. ciliata is lovely. It is dwarf and flowers in late winter with a scent of old-fashioned sweet shops or cardamon. Produces stem bulbils too, so easy to propagate. Quite variable but on a blue/purple theme.

Moraea elegans

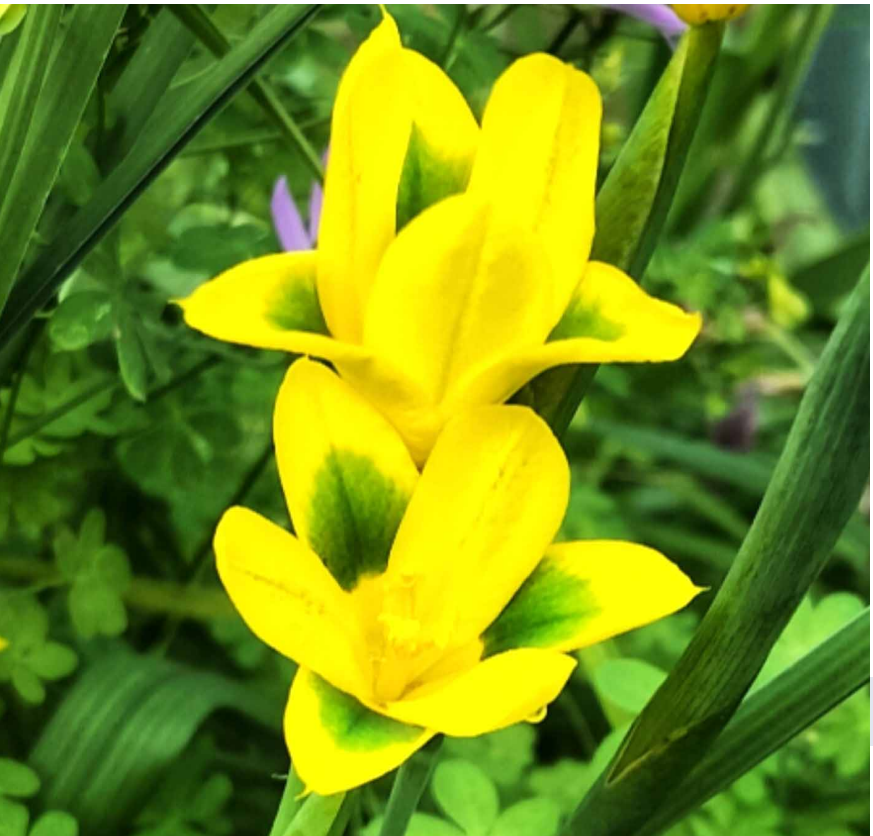
Easy, and the only member of the former genus *Homeria* that I would recommend for pots, though some of the others are hardy outdoors in my garden. I have two forms, one is yellow and green whereas the other also has orange patches on the falls. It also has beautiful shiny corms with a reticulated pattern.



Moraea atropunctata



Moraea ciliata



Moraea elegans



Moraea serpentina

Not recommended

Tempting though they are, the small desert species such as *Moraea falcifolia* are not easy to germinate or grow for long in my experience. I've had some success with *M. serpentina* but don't expect the curly leaves in our sunless climate!



Moraea ciliata

Babiana

Sometimes hybrids are seen in UK garden centres for summer growing.

Babiana pygmaea

Huge pale yellow flowers with a dark centre, on short stems

Babiana rubrocyanea

One of the many Cape bulbs with ‘wine cup’ coloration – a red centre and blue outer. Easy but can be virus-prone so grow it and keep it going from seed. Commercial corms are almost always hybrids and infected with viruses in my experience, with deformed flowers.

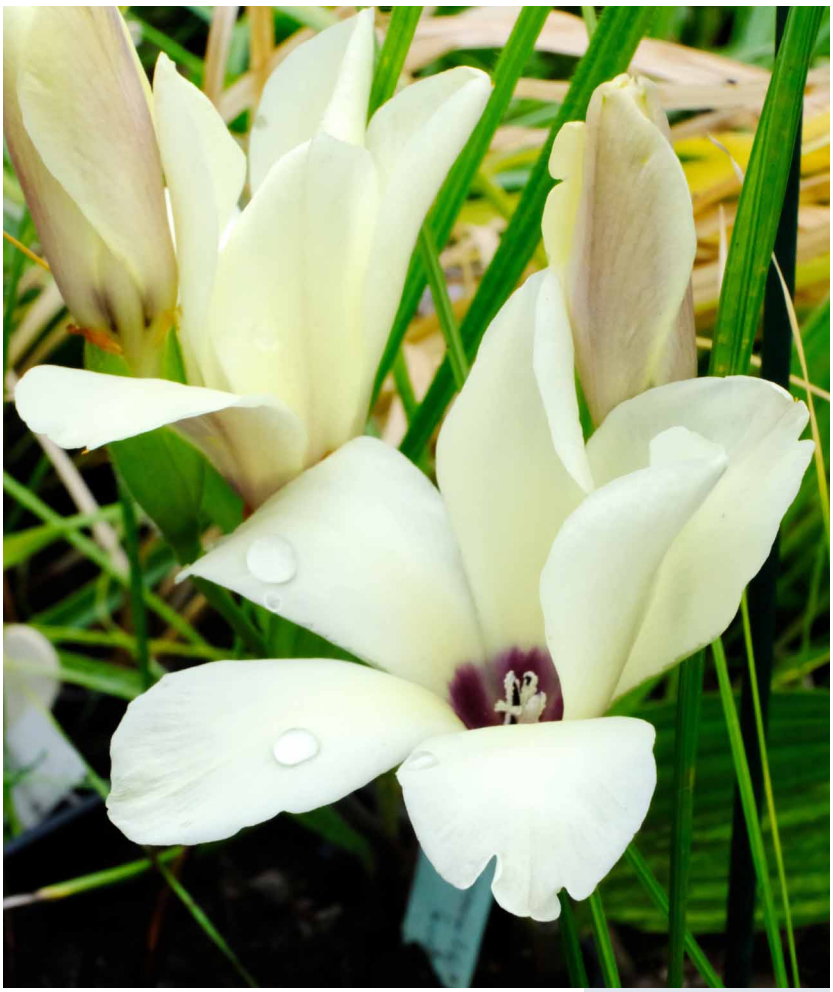
Babiana villosa

Can be a lovely true red but varies. Also virus-prone.

There are also a lot of quite similar (to each other) blue/purple-ish flowered species which are all worth growing.

Babiana ringens (not recommended)

This is a spectacular bird-pollinated species that seems to be extremely slow growing and hard to flower.



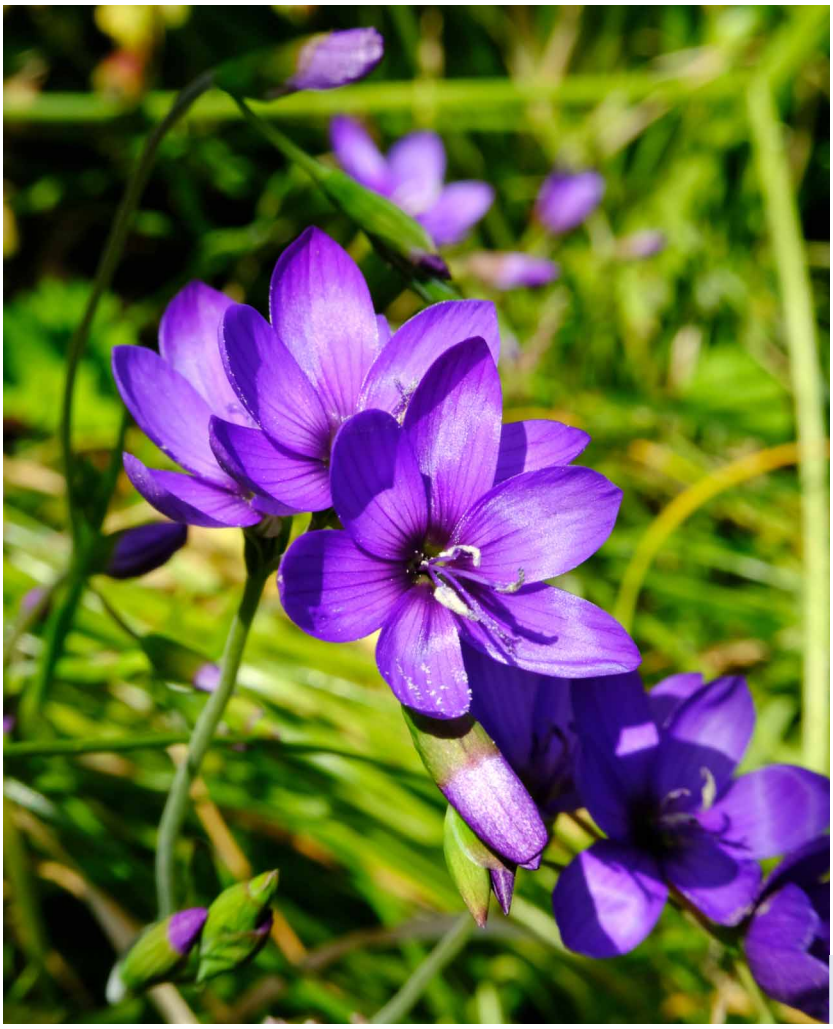
Babiana pygmaea



Babiana villosa



Babiana rubrocyanea



Geissorhiza aspera

Geissorhiza

Geissorhiza aspera

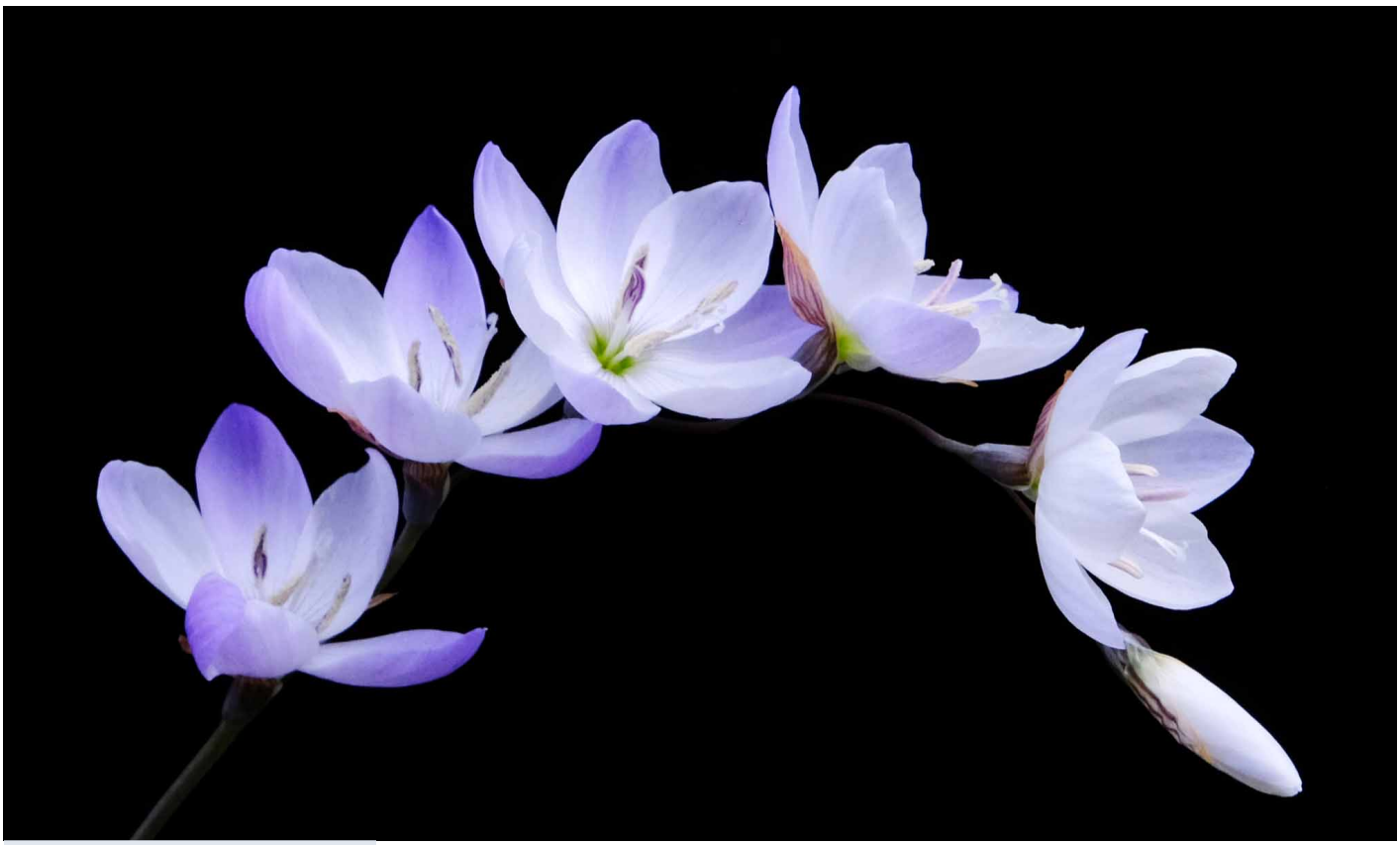
Easy going. Sprays of blue flowers of assorted shades. Produces a lot of tiny cormlets.

Geissorhiza radians

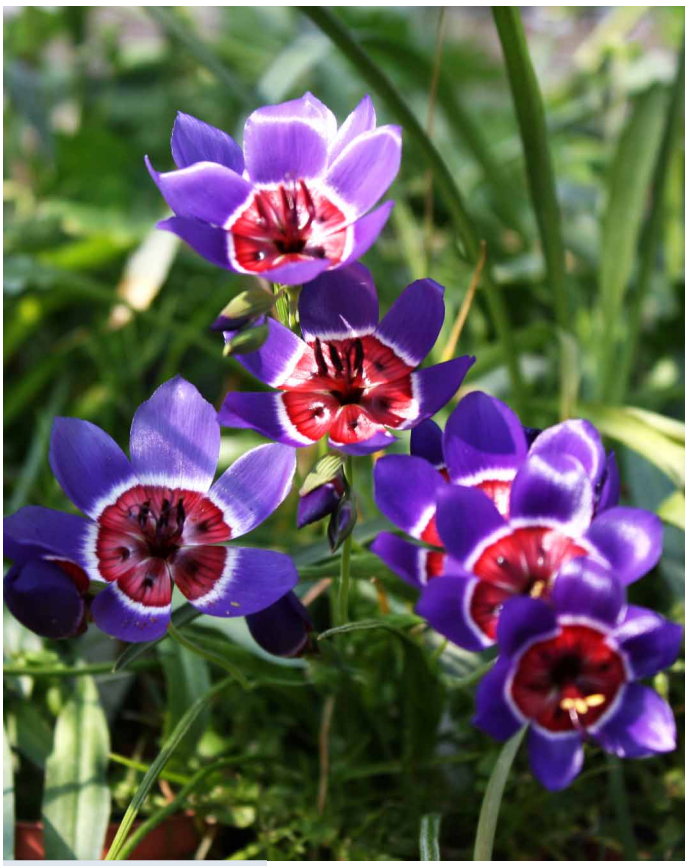
Another stunning flower with ‘wine-cup’ coloration (see *Babiana rubrocyanea* above and also page 13). Likes acid soil and extra water. Not long-lived so keep propagating from seeds.

Geissorhiza splendidissima

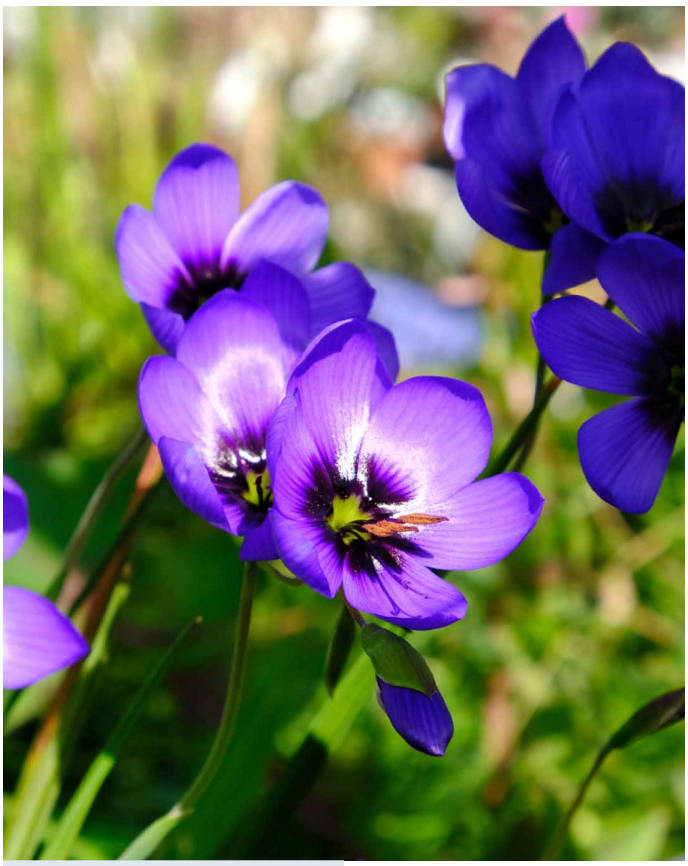
Big shiny blue flowers with a dark centre.



Geissorhiza aspera pale form



Geissorhiza radians



Geissorhiza splendidissima

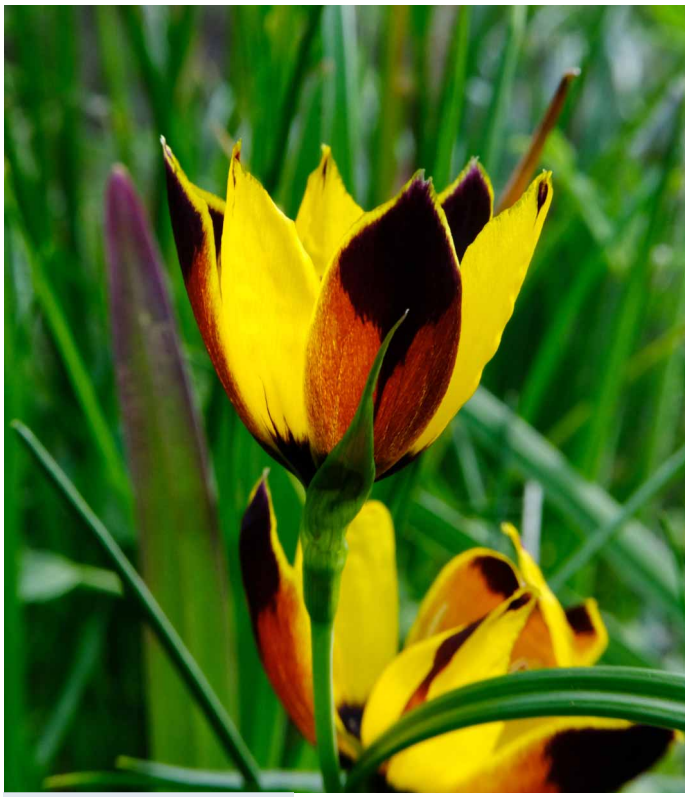
Hesperantha

Hesperantha vaginata

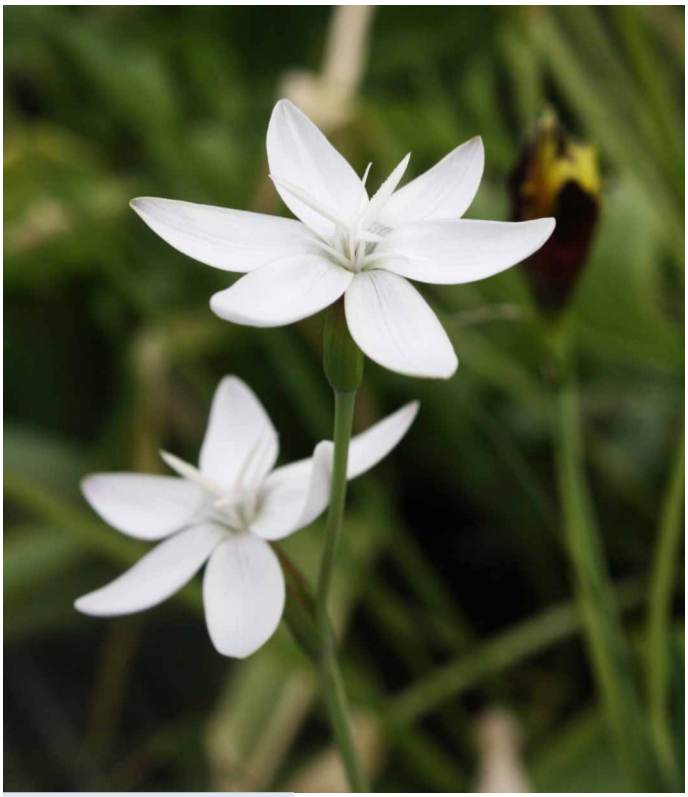
Unique tulip-like flowers of yellow and black.

Hesperantha cucullata

White flowers that open and produce scent at dusk – they look almost luminous in the twilight. Very enthusiastic self-seeder.



Hesperantha vaginata



Hesperantha cucullata

Romulea

Rather crocus-like but with flower stems, so they need good light to stay compact.

Romulea sabulosa

The spectacular red flowered ones often seen in habitat photos are happily not hard to grow. *R. sabulosa* is the easiest for me.

Romulea saldanhensis

R. saldanhensis has yellow flowers and is usefully late-flowered, often into May

Romulea komsbergensis

This is one of several similar magenta, yellow-centred species. Very easy. Can be early and prone to getting leggy and flopping in dull winters, but worth it. (See front cover.)

Romulea sabulosa



I won't try these again…

Lapeirousia

Utterly beautiful dwarf plants. Anyone hunting mesembs has probably seen *L. silenoides*.

I find that they are all very prone to extended dormancy. Perfectly sound corms stay dormant for years. I have a theory that our summers are simply not warm enough to ready the corms for growth in the autumn. Certainly this is likely in my case (effectively an alpine house in Lancashire).

I've had a little success by putting the pots of dormant corms in a propagator at 25°C for July and August, then soaking them. It can be done – lovely pots of *L. oreogena* appear on show benches in the UK, presumably from further south than I am!

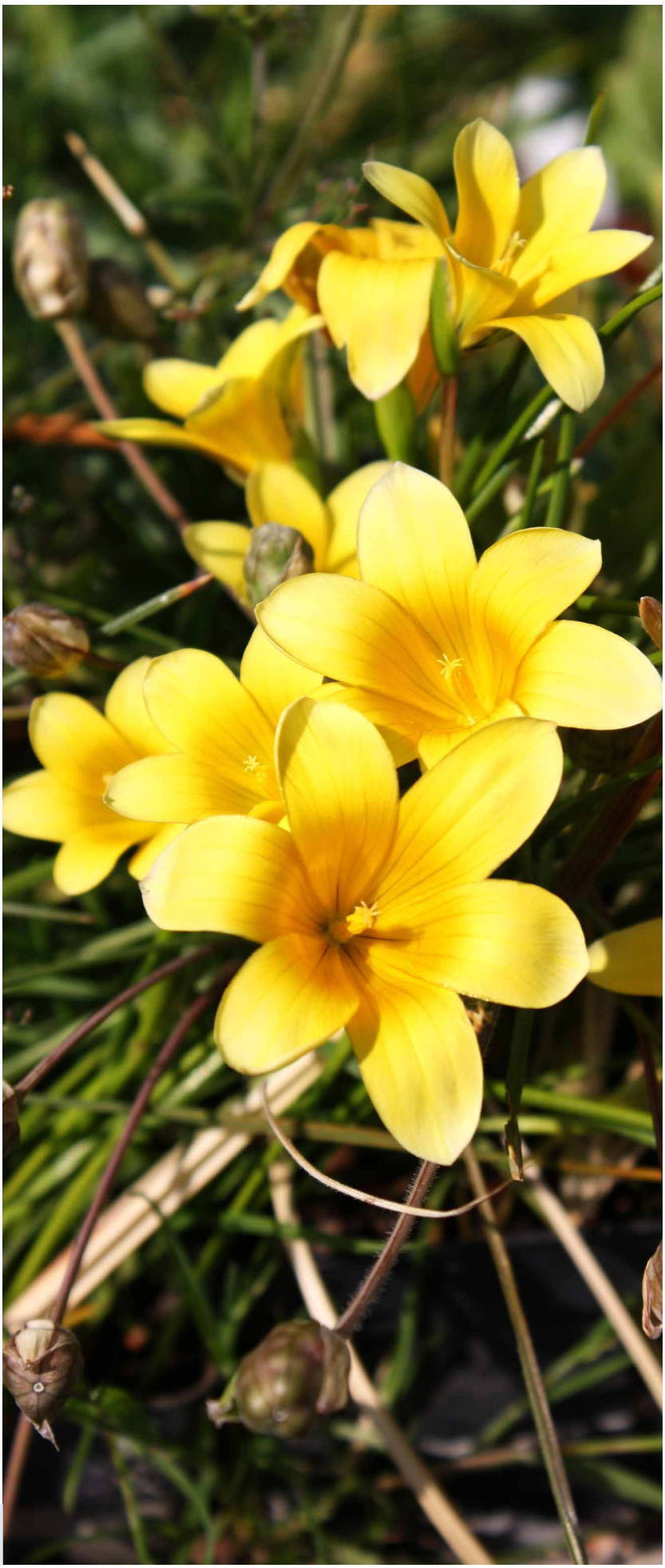
Cultivation

South African books on growing Cape bulbs will usually state that they want 'very sandy, acidic soil'. Which is all very well if you can grow them outdoors in big containers like they do. It doesn't work so well in small pots!

The good news is that a standard bulb/alpine 50:50 mix of John Innes 2 or 3 and grit works perfectly well for the majority. Exceptions being *Geissorhiza radians* which likes a more acidic and moisture-retentive mix. Just add 30% by volume of ericaceous compost to the usual mix.

Watering starts on 1 September. First shoots (of the above listed) are usually *Gladiolus maculatus* which appear by late September, along with flowers of *G. carmineus*. The pots get another flood at this time and are then never allowed to dry out until they have flowered.

This can be tricky to manage especially if you close your greenhouse totally in winter as the shoot bases can get fungal problems if things are too humid. Dryish down to 2cm depth in mid-winter is the kind of balance I aim for.



Romulea saldanhensis

Irids produce flower buds during the current growing season (unlike Amaryllids) and will abort if they get too dry. After flowering the foliage will start to go yellow in late April or May and the pots are then allowed to dry out fully. Dead foliage can usually just be pulled away – but *Babiana* are determined to hang on to dead top growth and will need scissors and a careful inspection for well-hidden stem bulbils.

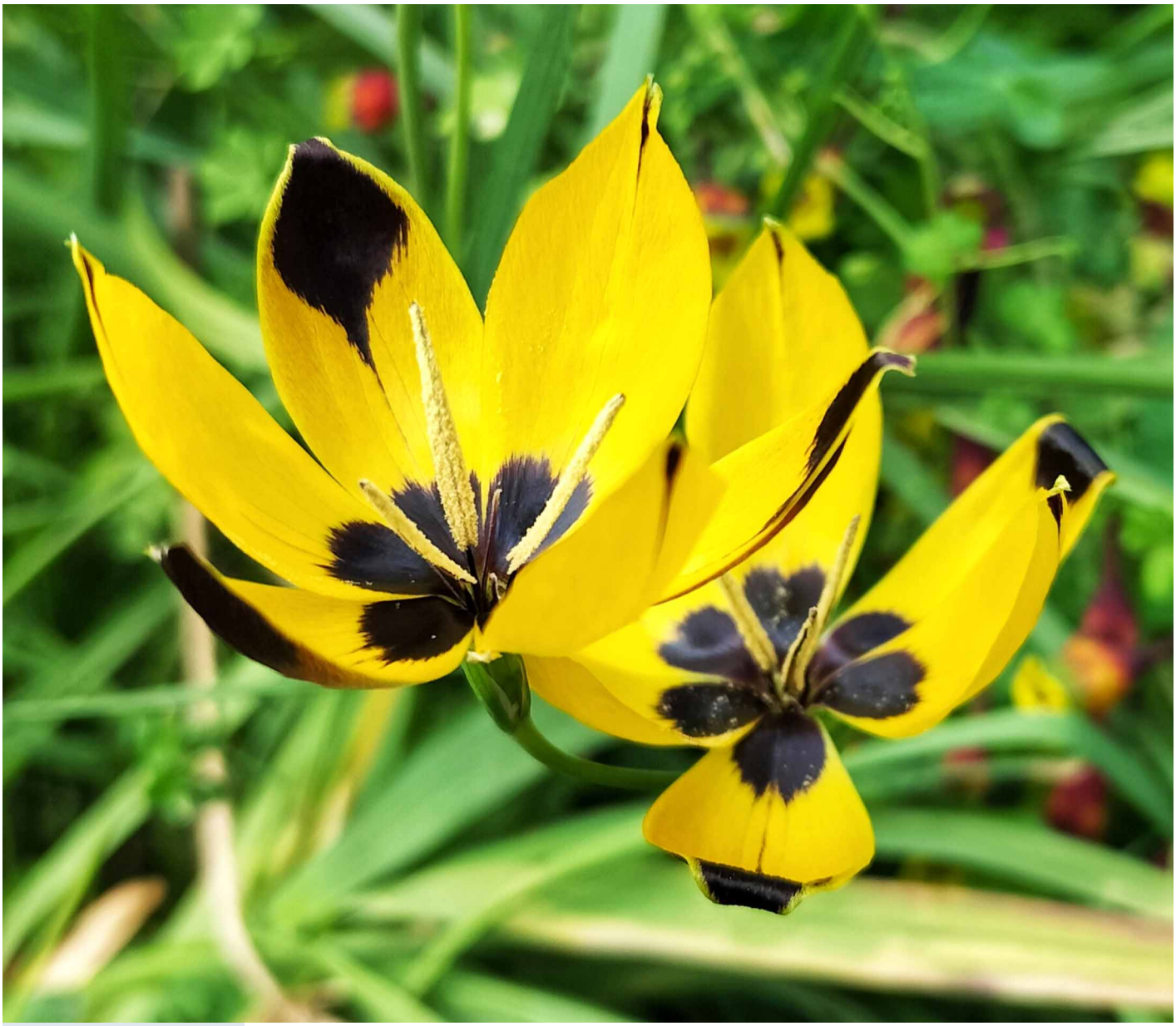
My (deep square) pots are grown pushed together or plunged in sand to create even temperatures at the roots. Ventilation of the greenhouse is year-round. Extra louvre vents are installed at bench level and even the doors are left wide open unless gales or more than two degrees of frost are forecast. Last winter, 25/26, I closed the doors and vents on only 12 nights and switched on the fan heater (set at 2°C) on only half of those. Living on the west coast of England helps a lot! My cacti and mesembs of many genera have never objected to this treatment either.

Photos: Darren Sleep

Sources

Silverhill Seeds are probably the best South African supplier and have a mechanism in place to send seeds to the UK.

Within the UK, the South African Bulb Group has an excellent plant and seed exchange each summer.



Hesperantha vaginata

A passive succulent greenhouse

by Ed Seeley

A new concept in greenhouse growing and some greenhouse tips

Like many of us in the hobby, I have reached the point where my current growing spaces are full! Well, when I say full, what I really mean of course is overloaded to the point of bursting, with extra trays cluttering any open spaces! I particularly enjoy growing new hybrid *Echinopsis* from seed so, unless I radically change my plans dialling back how many plants I grow is not an option. This means the only way forward is to expand my growing spaces!

I am also very conscious of the environmental impact of our hobby, especially with the use of electricity for heating through the colder winter months (not to mention always being keen to reduce the costs!). While I have experimented with keeping *Echinopsis* and other cacti in unheated, traditional glass houses, I found that some of the hybrids suffered in the cold. I feel that a cold winter will see too many of them either die or be so badly damaged that they can't flower in the subsequent summer.

I have also looked at the places in the world where many of the cacti we grow live outside or in unheated conditions and, while they may get the odd night below freezing, (sometimes well below), they don't usually sit there for days at sub-zero temperatures while it pours with rain, as can be the case in the UK.

As I started to do some research for my new greenhouse, I began by looking at what dimensions I wanted. Knowing no greenhouse will ever really be big enough, I was determined to go as large as possible! I soon realised that a wider, squarer greenhouse would allow a number of benefits. One of these would be in the layout; in a 16ft (4.8m) wide greenhouse, say, I could have two, 2ft (0.6m) wide aisles with 3ft (0.9m) wide benches (6ft (1.8m) in the middle) which would seem to be the most effective use of space (without rolling benches or anything that fancy!)

But looking at the lack of available wide traditional greenhouses and the price of a custom order, I quickly realised I was going to have to build this myself. As soon as I started looking at DIY greenhouses it opened my eyes to looking at doing something a little bit different and I was drawn to the potential of a passive solar greenhouse.

What is a passive solar greenhouse?

Passive solar greenhouses have been largely designed as structures that can grow food for much more of the year, rather than just late spring to early autumn, using the sun almost exclusively to heat them. They do this by balancing solar gain while radically increasing the insulation of the structure so that they use little or no supplementary heating. They can keep food growing for three or sometimes four seasons with minimal heating even as far north as Canada.



A passive solar greenhouse

Image downloaded from the website of Partners Gardens, located in the Monadnock region of New Hamshire, USA.

See Blog – Passive Solar Greenhouse

Partners Gardens Home

While doing more research, I found an excellent book called, *The Year-Round Solar Greenhouse* by Lindsay Schiller with Marc Plinke which contains a wealth of details about all the different aspects of creating a greenhouse suited to your needs. I would heartily recommend this to anyone.

This book and my subsequent research made it clear that the centres of development of these sorts of structure have continental climates with cold but bright winters, but I could find very little information about them in the UK. Any mentions I did find spoke of the failure of the design and how it needed additional heating. Upon further research it appears that these structures are not maximised for dreary but fairly warm climates (yes, our winters are considered fairly warm compared to everywhere else at this latitude).

These 'failures' were from people trying to grow food crops through the winter including items such as tomatoes and bananas that need to stay at pretty warm temperatures and in bright light to grow and crop.

This is where having a passive solar **succulent** greenhouse could have an advantage and be a much more efficient way of growing our plants. I am not looking to keep my plants growing all year, I just want a structure to keep my plants frost-free over winter so they have a dormant period which is crucial for flowering the following year. I am also hoping to extend the growing season earlier into spring and later into autumn – months where there is usually adequate light but heat can be lacking. In this context I think a modified passive solar greenhouse may well be a really effective structure to consider.

If frost-free growing isn't attainable without additional heating, this type of greenhouse might still work well as, even if it did briefly fall below freezing overnight, it should rapidly warm up during the day. An efficient design in a sunny spot should do this easily in all but the worst temperatures.

The second thing that led me to look at this type of greenhouse was how poorly insulated conventional greenhouses are. I realised this after trying to better prepare my current greenhouse for the winter and finding it leaked like a sieve! So I wanted to start by looking at how the principles of a passive solar greenhouse could be applied to a more traditional greenhouse structure to improve its performance.

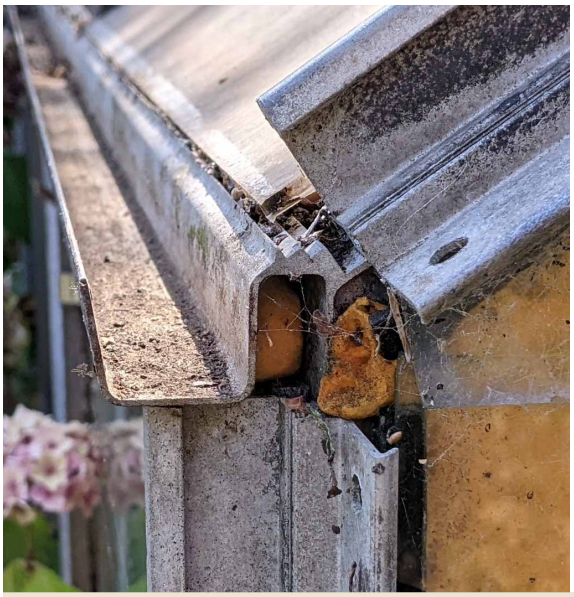
Adapting a classical greenhouse

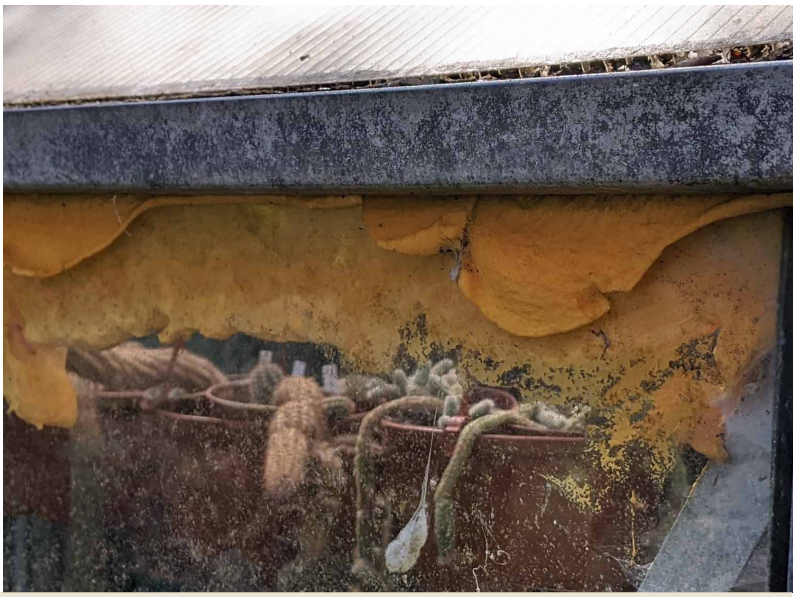
Draught-proofing

In my opinion, the very first thing on which to spend money, time and effort is making your structure more airtight. It shocked me how ridiculously porous my greenhouse was when I first started to look at insulating it. All the areas where glazing meets the top of the frame or roof have massive gaps where air can flow in and out. Looking at other new greenhouses, this seems a common issue to many designs.

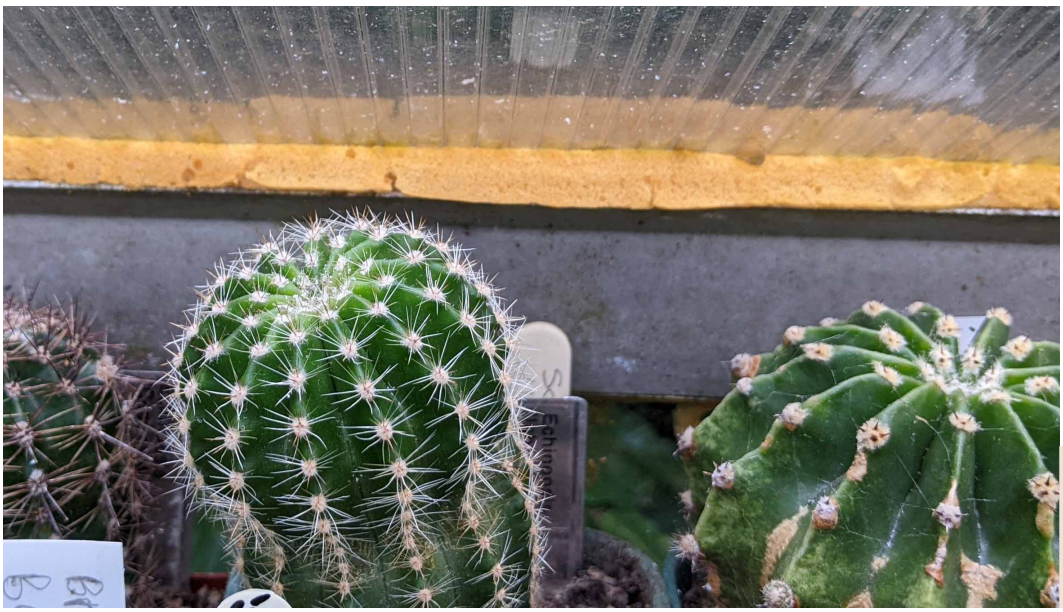
I used expanding foam on the top and bottom of each run of panes and replaced the rubber beading the glazing sits on with foam that supports and seals better between the panes of glass. I tested this afterwards with a garlic smoke bomb and it was much better but air still escaped around the door and where the panes of glass overlap. My roof, which is 4mm polycarbonate, is much better sealed than the sides and ends, except for the joints around the vents.

The second step of making the structure air tight was to add a second skin. Last year I bought polytunnel sheeting to create a fully airtight skin inside the greenhouse frame. The gap between the glazing and the plastic would also have given me an air bubble. I chose this over bubble wrap as it should last much longer, should allow greater light through and, crucially, I could use one sheet for both the sides and the roof





The gaps at the top of the vertical panels or glass where they meet the aluminium frame, now filled with foam



After being trimmed the foam neatly fills the gaps at the bottom of the roof panels.

and just have edges in the corners to join this to the ends, which could be sealed with repair tape.

Last year, however, I got caught out by an early colder spell so didn't have time to put this up inside so, instead, I put it on the outside of the greenhouse, like a gift-wrapped greenhouse! (It would have looked a lot better with a bow!)

Despite the way it looked and the slightly Heath Robinson nature of it, the effect of this was very noticeable. I have a temperature sensor that tracks the temperature over time and plots it on a graph and three meters that measure temperature and humidity all of which showed that the extra wrap really slowed the cooling and also retained more heat during the day. Overnight in the cool autumnal nights it was staying 2°C warmer than ambient without heating and taking much longer to cool down. In the winter the effect was more marginal, due to lower light levels, but I am sure it reduced the amount of time the heater was on. (It's hard to be sure without having a second unwrapped structure with which to compare it.)

I covered over all the vents with a layer of bubble wrap before putting the polytunnel material on, which covered them again without any joints. This just left the door which I obviously needed for access. I haven't yet found an amazing solution to draught-proofing the sliding door of my greenhouse so last year I just wrapped and unwrapped the end when I needed to get in. This year I am planning to leave longer overlaps of the plastic to act as draught excluders but if anyone has any better ideas let me know!

Orientation

Now obviously if you have an existing structure you may not want to lift your greenhouse up and turn it around but, in case you have the option, it would be worth making sure your greenhouse is aligned with the longest side facing south. Also check that the light won't be blocked in the low winter sun. For me, this means my new greenhouse will be right at the bottom of my garden as that is the only spot that gets the winter sun on the shortest days.

This will allow maximum light to enter the greenhouse at the coldest times of the year when you really need it. Having a side facing south also means you have a side facing north and this will be vital to the next step.



A gift wrapped greenhouse

Insulation

There are three parts to insulation.

Insulating the glazing – either with bubble wrap and/or polytunnel plastic as mentioned above or switching glass for polycarbonate (alongside draught-proofing).

Insulating the base. This might not be something you want to consider in an established greenhouse but, if you are able, you could add insulation underneath any base slabs or paving.

Insulate the north side (and roof). Assuming your greenhouse is orientated with the longer sides facing south and north this is an absolute must. The entire north vertical face needs to be completely insulated, covering the glass. There will be no massive amount of light coming in from this direction and covering it with opaque insulation (such as polyurethane foam sheets) and then painting them white or leaving the foil lining will reflect light from the south aspect back on to your plants, stopping it leaving through the north side glazing. You would need to look at your budget and level of heating required but I would suggest 25mm sheets on to the glazing and then covering them with the plastic used to seal the structure would be a good starting point. You could use polystyrene sheets and the white colour will give a more diffuse reflected light and be much cheaper but for less insulation value. There are also silver bubble-wrap type materials that boast much higher U-values that might be worth considering and would require less work to fit them.

Heat sinks

The final major trick with a passive greenhouse is storing the heat from the day to heat the space at night. To try this for an existing greenhouse the first step is to use any brick, block, concrete or slab structures already there. All of these will heat up during the day while the sun is shining on them and then radiate the heat back out into the air at night. One thing to consider might be to paint these surfaces black to increase their heat absorption during the winter days – but this would need experimentation to make sure they didn't get too hot during the summer.

The next step to increase thermal mass is a nice low-tech (but still very effective) method of using water. Lots of contained water can store a lot of heat during the day. Many passive solar greenhouses have solar walls on the north face that are rows and rows of black metal barrels full of water. These will be hit by the sun during the day and warmed up and radiate the heat back out again at night. Metal barrels are recommended due to their conductivity and would usually be sealed to prevent evaporation.

A full wall of metal containers, however, would take up way too much space in a typical UK greenhouse so a little lateral thinking is needed. Instead, these can be placed all the way under the benching on the north side.

The other critical element of heat sinks is to make sure that this thermal mass gets hit by the sun as much as possible. This is especially important in the winter when it will be most critical in terms of heat storage and also when there will be the least amount of sun. This would mean looking at the organisation of the greenhouse to allow light to hit any concrete or water barrels as much as possible. This might mean reducing shelving and benching on the south side of the greenhouse and making sure any storage is either on the north side of the greenhouse (between/behind water containers) or stored somewhere else.

I have had a great flowering this year after removing the shelves over winter in my greenhouse. While I can't prove this, I feel the increased light hitting the cacti during the winter has definitely had a positive effect on some hybrids that hadn't flowered before despite being mature enough.

In a future article, I will introduce the design for my 'idealised' passive solar succulent greenhouse and show the first steps of building the insulated base and walls and hopefully further progress and some initial findings. I will also hopefully share a few experiments I am planning down the line to help maximise the benefits that I hope will boost performance. ■

Photos: Ed Seeley unless indicated otherwise



Site of my proposed new greenhouse. It needs a bit of work!

Growing in the Sonoran Desert

by Sue Hakala

I've lived in the Phoenix, Arizona, USA metropolitan area for nearly 50 years. This is the Sonoran Desert.

The Sonoran Desert is different from most deserts in the world in that it has two rainy seasons: one in the winter, and one in the summer. This makes for a lush desert landscape with trees, bushes and cacti of all sizes.

With global climate change, however, the rain has been less each year, and plants are suffering in the desert and in home landscapes.

The last good rain I had was in October 2025 when I had three inches (7.6cm) of rain in my yard in one day. This last winter, I had what I call teardrops in my rain gauge, with the weather man reporting 0.01inch (0.025cm) of rain!

I've seen temperatures as high as 122°F (50°C) and as low as 16°F (–8°C) in my yard. Keeping plants, not just alive but thriving, has been a learning process for sure!



The Sonoran Desert in spring bloom after a good year of winter rain

I've learned a lot through the years on my own, and from other more experienced growers in the local Central Arizona Cactus and Succulent Society to which I belong.

First, I don't buy plants that grow naturally in coastal areas, or over 3,000 feet in elevation, as they just won't make it here. It is also best to buy plants from nurseries in Arizona or to trade with friends who have been growing the plant here successfully. Buying plants from other sources means they haven't yet experienced our weather extremes and have a very difficult time adapting. They can sometimes, but not often.

I keep a list of plants I've researched and that I'm looking for when I go to a nursery so I don't impulse buy. If I purchase a plant, I bring it home and isolate it from my collection for about a week, while watching for damaging insects. Been there, had that, when I introduced mealy bugs to my whole collection.



Cochemiea boolii



Mammillaria magnifica living up to its name

I water the new plant with a systemic insecticide to kill anything I can't see. Then, after it has dried a bit, I repot it into my cactus mix. I use 50% cactus and succulent mix and 50% pumice. My club buys pumice in bulk and has permission from a local nursery to store the pile on its property. The pile is only open to paid members a few times a year. When it's open, I bring my husband, a shovel and five gallon buckets to take home what I'll need in the next months. When mixing the soil with the pumice, my husband always wears a tight fitting N95 mask, or a respirator, so he won't breathe in the bad stuff.

I've tried many mixes through the years, but find that all my plants like this the best. When potting in a large pot, I throw in an extra handful of pumice and 1/4" gravel, which helps to open up the mix so that it dries out quickly cutting down on rotting.



Tephrocactus (*Puna*) *bonnieae*



Cleistocactus colademononis gets shade from a tree after 1.00pm



Portulacaria afra

I was taught early on to know where a plant comes from, when it gets rain in its natural environment, its temperature tolerances, and anything else that will help raise it successfully. I keep written records of this and of when I repot, when the plant starts to grow, when it blooms, when it goes dormant, and anything else that will lead to successful horticulture. I update my records annually and have a picture of the plant on the sheet with its name. I don't like the cluttered look of plant tags, so this solves that problem.

I'm lucky to have two shade houses in my yard. One has 30% shade cloth on the top, south and west side. The other has 50% shade cloth on the east, west and south side, and a solid fibreglass roof. The second house is for those plants that don't like rain at the wrong time, and want more shade. Altogether, I grow about 120 plants in pots (the majority being mammillarias) and about 90 in the ground. Most plants are grown in clay pots, with sansevierias and aloes needing glazed or plastic pots that will dry out more slowly in this environment.



Pachypodium brevicaule graft. The secret to keeping this alive is to water twice a week with acidified water in the warm months

Gardeners need to take care of themselves during the summer too. I only water in the early morning and wear a neck fan. You can find them on the internet. The one pictured has three speeds and really makes a difference on a hot morning.

The plants I grow all get watered once a week. I water once, let the water drain, then water again. With a few exceptions, plants are not watered at all from early November to February, when our nights will be the coldest at 40° to 30°F (4°C to –1°C).

In the growing season, along with regular watering, I water once every three weeks with fertiliser at one-half strength, and acidified water (1 tablespoon white vinegar to 5 gallons of water in a bucket). Acidified water mimics rain water which the plants love. I could do it more, but I like to grow my plants hard so that they look like they might in nature. During the summer monsoon season when the humidity (50%+) goes up, the plants go dormant and I don't water at all as they will rot. We also can get some unbelievable dust storms/haboobs at this time. So it's important to be sure pots are secured.



Neck fan



A huge monsoon summer dust storm moving into Phoenix 2025

Plants in the ground are watered monthly with an oozer hose during the warm months. This is a black hose made from recycled tires that oozes the water out of its sides. In my hard desert ground, I let the hose go for 1–1.5 hours. I check with a metal soil probe to make sure that the water has gone down three feet. No roots grow in the top three inches of soil as it's just too hot. It's important to get the water down to where the roots are, or why bother watering. I also put shade cloth on in-ground plants for their first summer to help them acclimatise, and only plant in late October so they have a chance to establish before summer. Remember, putting the right plant in the right place makes everyone happy.

So how hot does it get? With our changing climate, summer temperatures can be pretty extreme.



Echinocereus engelmannii an Arizona native



Ferocactus acanthodes

During the summer of 2025, we had weeks of daytime temperatures of 110°F+, (43°C) with the hottest that summer of 119°F (48°C). I put shade cloth, 30% or 50%, on landscape plants depending on the plant and its exposure. When it gets over 110°F, I add a second layer to some plants so they don't sunburn. I've learned through the years to put a label on the shade cloth when I take it off the plant and put it in my storage containers. Then, next time, I know just which plant gets what piece. Really reduces the stress. Don't worry about me when I'm not working with my plants as everything here is air-conditioned (refrigerated).

The biggest problems are the night temperatures. In 2025, we had several weeks when the temperature didn't get below 95°F (35°C) at night! The big problem with this is that succulent/cactus plants open their stomata (pores) at night to exchange gases and breathe. They won't open their pores when it's over 89°F (31°C). So it's like you holding your breath for all that time. You'd die, and so do they, usually turning to mush.





Lophocereus schottii var. monstrosus. Look closely at the left arm. As the plant got bigger, it stopped getting the funky growth, smoothed out and had flowers. It's against a six foot (1.8m) fence.

Inset above: Close up of the flowers

The way I help the plants in these extreme times is to bring about 85 plants in the house for a short time. I don't water, I just let them be. I don't want them to break dormancy, because if they start growing and then go back outside, they could rot or die.

Another thing that really helps is to wait until about one-half hour after sunset. Then I go outside and put the spray nozzle on my hose. I go around my yard spraying my concrete block walls and all the hardscaping in the yard and just quickly spray over the plants. This helps to add some humidity to the very dry air and brings down the temperature a bit. I swear some nights I can feel the plants exhaling. I haven't lost any landscape plants during the worst of the summer season since doing this the last several years. Other local growers say the same thing.

When the nights get in the low 30°sF (approx 1°C) I bring in the most sensitive plants. Sensitive landscape plants I cover with frost cloth. I label these for storage too. We wrap the shade houses in a heavy weight plastic for the winter and put in a heater on a thermostat to turn on if it drops below 50°F (10°C). I keep a small fan on 24/7 to circulate the air, which helps keep them healthy, and I open the door during the day.

At home I can somewhat control what happens, but in the desert…well, it's pretty sad. Giant saguaros are toppling over, trees and bushes are dying, it's hard to find any small cacti as they need their 'nurse plants' to provide shade for them when they are small. Researchers here say that between 2050-2070 60% of all cactus and succulents will be gone due to climate change. Enjoy them while we can!

Photos: Sue Hakala

Sue Hakala is Editor of *Central Spine*, the newsletter of the Central Arizona Cactus and Succulent Society.

Sue has indexed *Central Spine* articles from 1975 onwards, which include many items on plant care which will be of interest to anyone growing cacti and succulents in similar conditions to those of Arizona.

The articles are available on the CACSS website for anyone to read.

Go to CACSS Newsletter Plant Care Index for a full list of these articles.



Carnegia gigantea (saguaro) dead and down in the desert

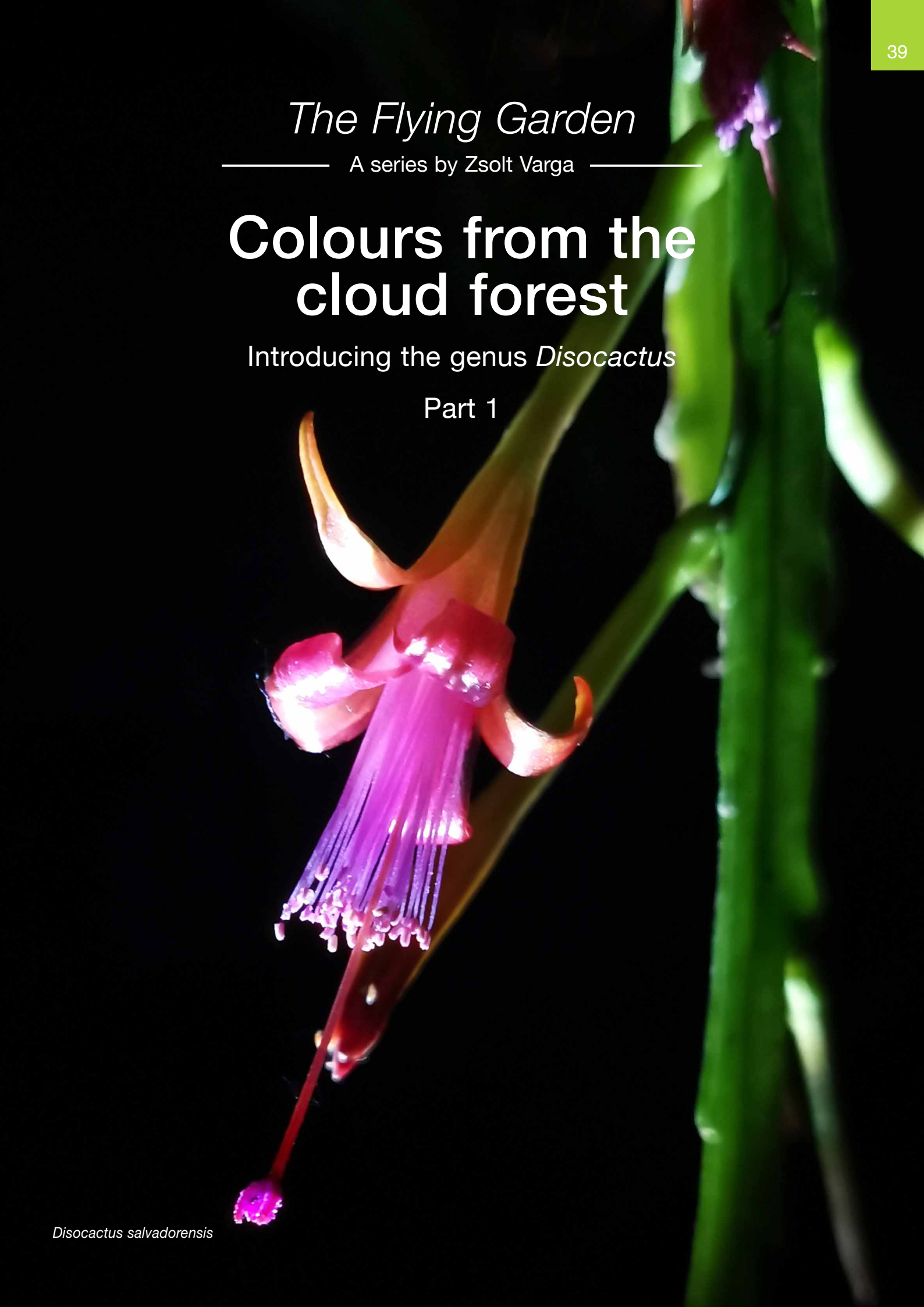
The Flying Garden

A series by Zsolt Varga

Colours from the cloud forest

Introducing the genus *Disocactus*

Part 1



Disocactus salvadorensis

What is a cloud forest?

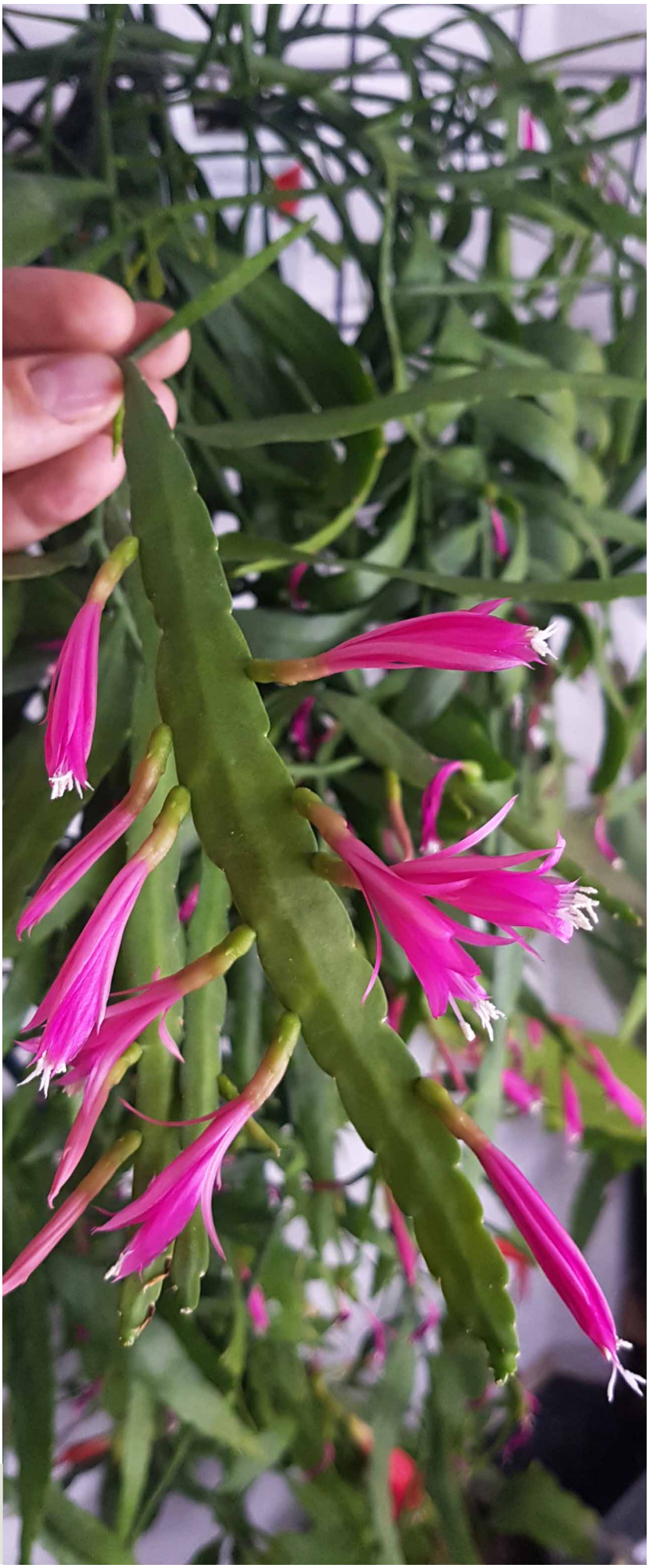
For Central and South America the term ‘tropical montane cloud forest’ is the most widely accepted scientific name for mountain forests that experience frequent or persistent immersion in clouds and mist at the canopy level. These ecosystems typically occur between approximately 800 and 3,500 metres above sea level.

Cloud forests are distinguished from lowland tropical rainforests by their cooler temperatures, high atmospheric humidity, frequent fog interception and the additional water input derived from cloud condensation on vegetation, resulting in different dry-wet seasons from their lowland counterparts.

This unique hydroclimatic environment strongly influences forest structure, nutrient cycling, and species composition. The dense canopies and abundant moss cover favour an exceptionally high biomass of epiphytic communities, including orchids, bromeliads, ferns, mosses, liverworts, and numerous specialised vascular plants.

Epiphyte abundance generally increases with elevation and cloud persistence, making cloud forests among the most epiphyte-rich terrestrial ecosystems worldwide. In the Neotropics, particularly from southern Mexico through Central America and along the Andean chain, cloud forests represent biodiversity hotspots with high levels of endemism. The complex vertical structure of these forests provides a wide range of ecological niches. As a result cloud forests serve as major centres of diversification for epiphytic lineages, including several groups of cacti that have evolved specialised adaptations for canopy life.

Among the neotropical cloud-forest epiphyte flora lives the genus *Disocactus*, a group of predominantly epiphytic or lithophytic cacti distributed from central and southern Mexico through Guatemala, Honduras, Nicaragua, Costa Rica, and Panama, with some species extending into northern South America.



Disocactus biformis, the type species for the genus

Unlike the predominantly terrestrial cacti of arid environments, *Disocactus* species have succesfully colonised the humid canopy habitats of neotropical cloud forests while retaining characteristic succulent adaptations for water storage and intermittent drought tolerance. Their often large, brightly coloured flowers are primarily pollinated by hummingbirds or nocturnal pollinators, contributing to their ecological specialisation within montane forest ecosystems.

The genus *Disocactus*

In this article, which is based on the works of Korotkova and Cruz et al. published in recent years, I will introduce *Disocactus*, the genus that is probably the dearest to me. The current genus *Disocactus* is not monophyletic, i.e. not derived from a common evolutionary ancestor. This is consistent with the results published by Hunt et al. in 2006.

The genus containing the type species *D. biformis* (Lindley) can be well-defined based on genetic analysis. This is confirmed by the results of Cruz et al. (2016). The genus *Disocactus* was originally described by Lindley (1845), specifically for *D. biformis*, and was characterised by the dimorphic stems (i.e. the main stems are cylindrical and erect like a spear, from which the secondary stems arise, which are narrow and flattened) and, secondly, by the small flowers.

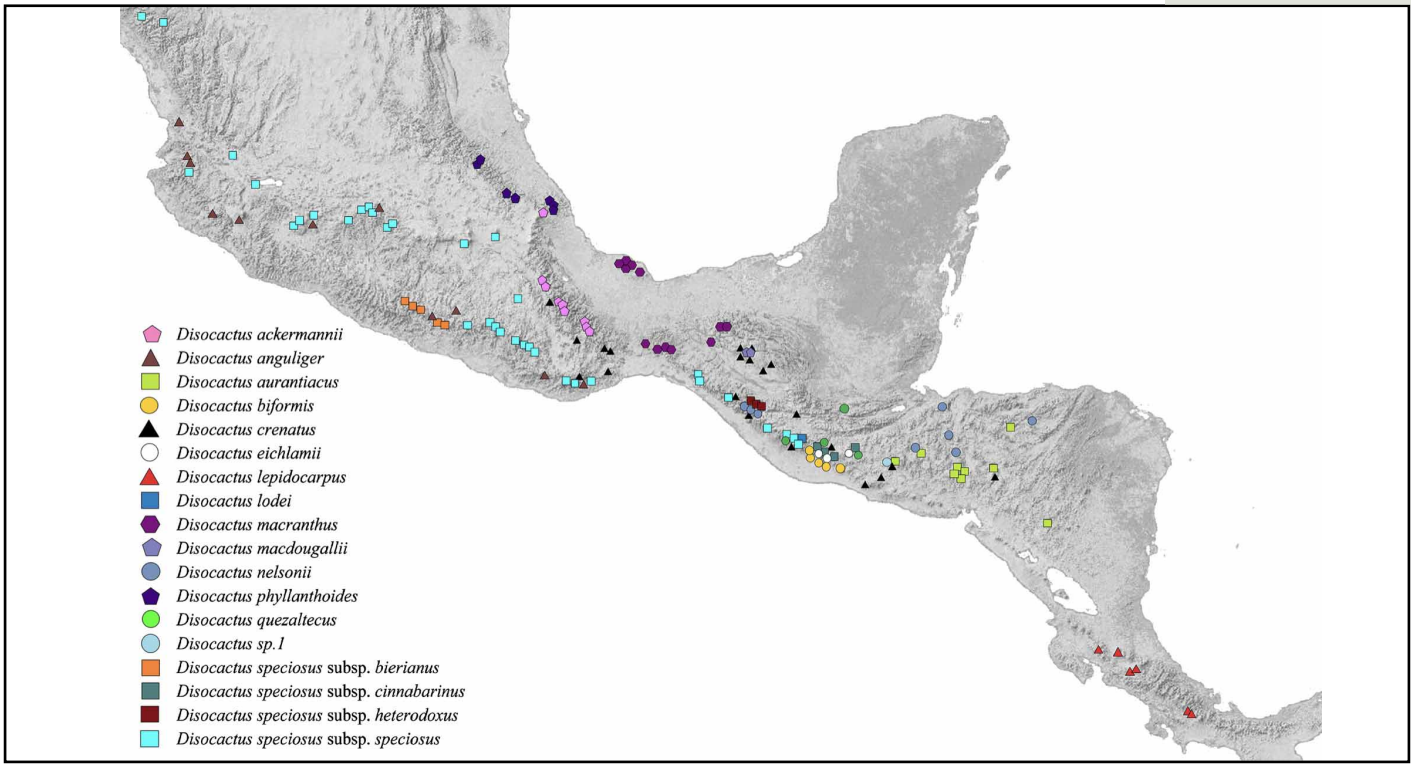
The widespread concept of the genus *Disocactus* was developed by Barthlott (1991), who combined the genera *Aporocactus* and *Nopalxochia* and *Heliocereus* in the genus, all of which are diurnal and have large, bright red or pink flowers.

Genetic studies, however, have shown that *Aporocactus* is not a member of the genus *Disocactus*, so the genus *Aporocactus* should be reinstated. This Mexican cactus family, consisting of only two species, can be hybridised very easily and many people specifically collect *Aporophyllum* hybrids. These are not true *Epiphyllum* hybrids but rather come from diverse *Disocactus* parents.

Disocactus is thus a well-defined group that includes *D. biformis* (type species) and is more closely related to the genera *Epiphyllum* and *Pseudorhipsalis* than to any other genus in the Hylocereeae.

Its most special feature, however, is its ability to easily hybridise with other species from within the genus group and sometimes from outside, which has given rise to the thousands of '*Epiphyllum*' hybrids that have enthralled collectors for generations. In this article I am describing the botanical species that can be found among the ancestors of many multihybrids.

Distribution of *Disocactus* species (from Cruz et.al.)



Within the genus *Disocactus*, Cruz et al. separated three subclades based on relationships between the species.

The first subclade

This contains the species *D. eichlamii* and *D. quezaltecus* and confirms Kimnach's earlier hypothesis (1959, 1993) about the close relationship of these two species, which he established based on the straight bracts and emerging stamens and pistil. (Kimnach 1993).



Above and right: *Disocactus eichlamii* Lautn99/4b

Disocactus eichlamii

Based on my experience, both species are delicate and somewhat difficult to grow. *D. eichlamii* is considered a real curiosity among epiphytic cactus collectors.

This species, described in 1911, lives in the high-altitude cloud forests of Santa Rosa Department, Guatemala, at an altitude of 1,900–2,800 meters, making it the highest altitude epiphytic cactus species described from Central America, along with *Disocactus speciosus* subsp. *cinnabarinus*.

After years of searching, I managed to acquire a cutting for my collection of *D. eichlamii* Lautn99/4b which grows in the foothills north-west of the Pacaya volcano, in the Department of Escuintla, Guatemala. This started to grow well for me but during the hot summer of 2022, it was irretrievably destroyed in a single week.

Fortunately, I was able to get a replacement and flowers first appeared on this plant in the summer of 2024.



I received another clone of *D. eichlamii* from an American collector taken from a seed-grown plant from an accession near San Pedro Yepocapa in the Department of Chimaltenango, Guatemala.

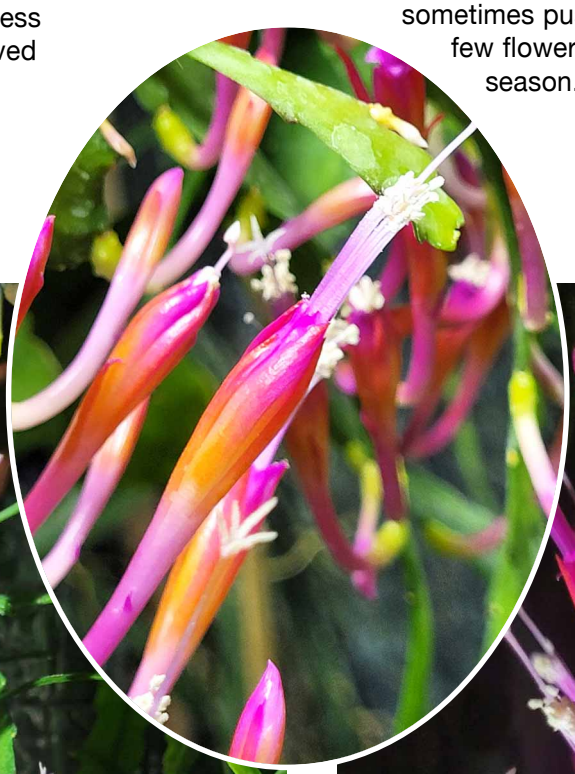
This clone ,which flowered for me in the winter of 2024, had stronger growth and a slightly different coloured flower, .

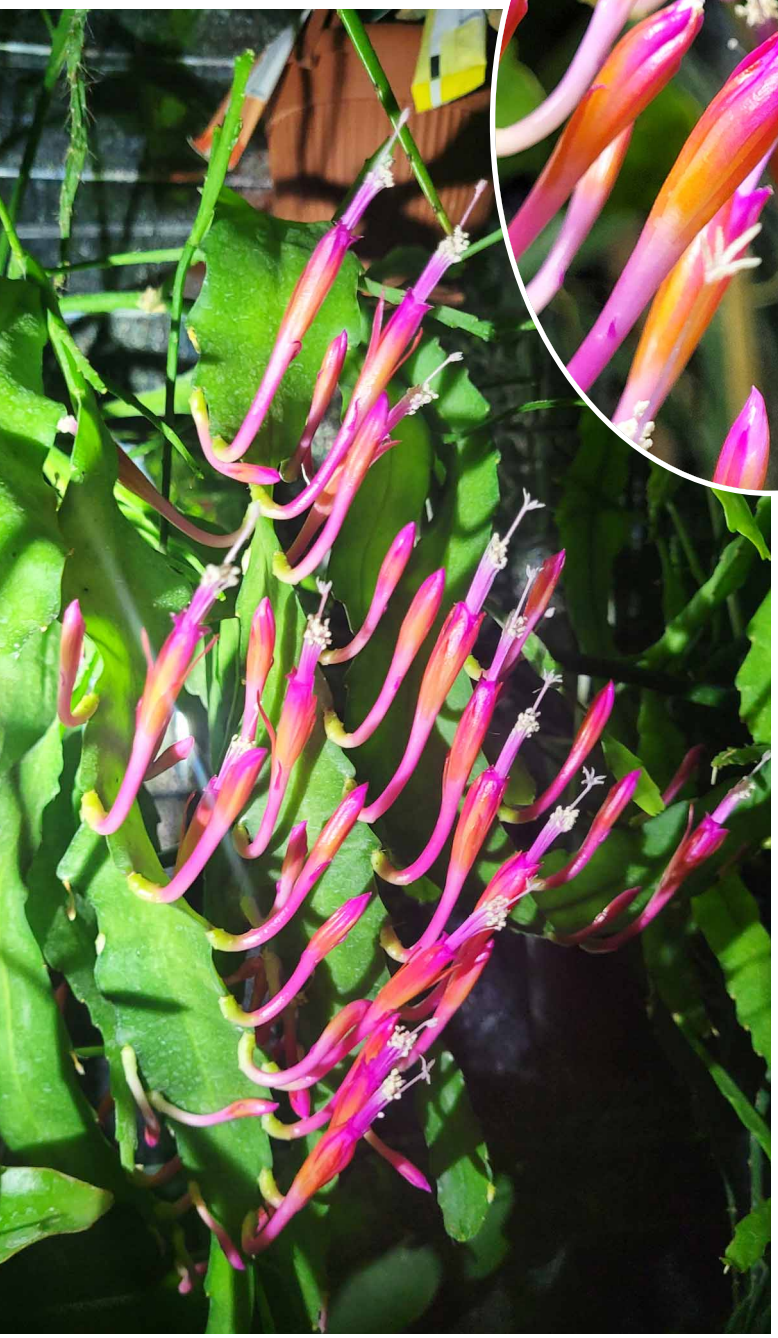
Both clones now show strong growth and behave as any other *Disocactus*. In my experience it seems that most disocacti must reach a certain size to be less problematic but once it is achieved they are quite hardy and flower abundantly.

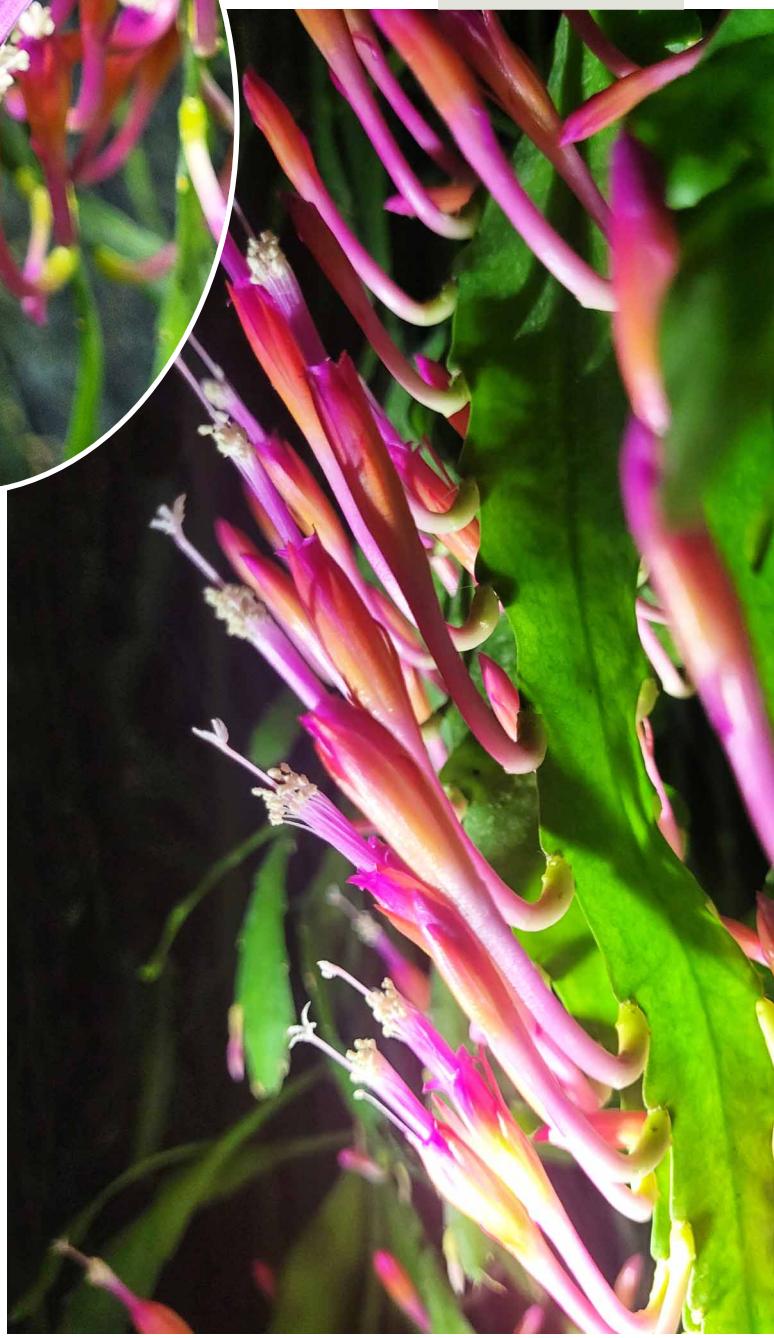
Disocactus quezaltecus

I have two different clones of *D. quezaltecus* in my collection. One, which has collection data, is small and, like *D. eichlamii* was struggling with the high temperatures outside.

Another clone, however, grew to flowering size in two years and showed its flowers for the first time in the spring of 2023, still in the winter compartment, under 10 hours of growlight. Since then it flowers regularly sometimes pushing out a few flowers out of season.





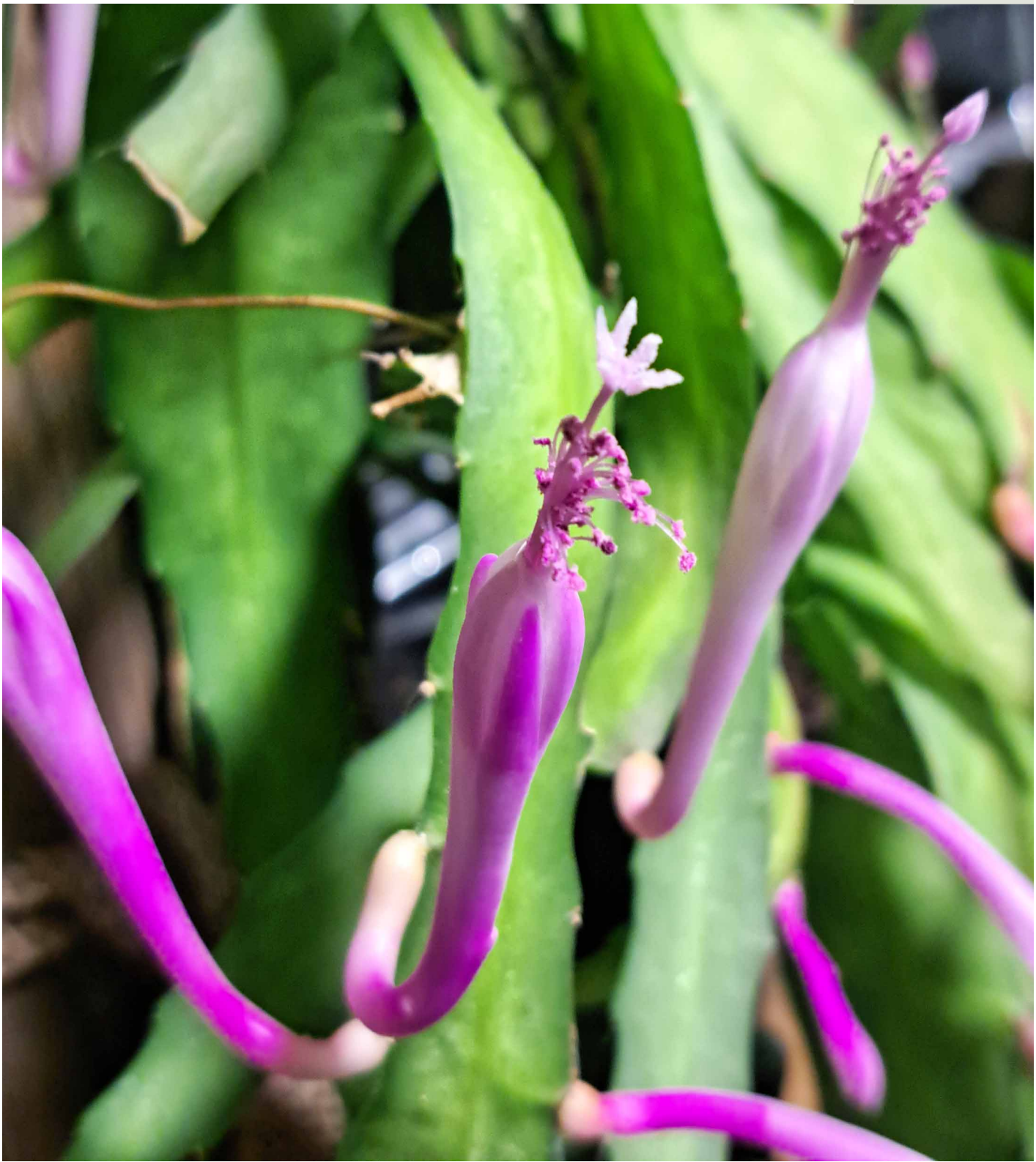


Below left and right and inset: *Disocactus eichlamii* from Chimaltenango

This species was described from the dense, cool high mountain cloud forests of south-west Guatemala, between Quetzaltenango, Nueva Mujuliá, San Martin Sacatepequez (also known as San Martin Chile Verde) and Colomba and also, based on Kimnach's monograph, from the white sandy hillsides of dense, cold and wet mixed forests at 1700-2000 metres above sea level.

It grows in the tops of the tallest trees where it forms dense colonies on the trunks and canopies. This is the coldest and wettest region of the area, where foggy conditions exist throughout the year except for the dry season, but fog is typical only in the afternoon (Kimnach 1993). *D. biformis* can also be found everywhere in its distribution area, but they are separated by a difference of 500 metres in altitude. *D. quezaltecus* is especially common in dense, cool cloud forests, while *D. biformis* is common in warmer, more sun-exposed tropical oak forests. *D. quezaltecus* is generally more prone to drying out but will recover from basal stems later. For wintering it needs good air circulation.

Disocactus quezaltecus



Disocactus speciosus

The first subclade also includes one of the most widespread and diverse species of the genus, *D. speciosus* which, however, could not be confirmed as monophyletic by the new genetic studies.

Of the five previously described subspecies Bauer proposed that only three of these actually belong there (Bauer 2003). These are three closely-related subspecies,

D. speciosus subsp. *bierianus*,
D. speciosus subsp. *cinnabarinus*
D. speciosus subsp. *speciosus*.

Due to the varied morphology throughout the species, however, their independent status can only be partially verified.

The variability of stems, spikes and flowers in these three subspecies is extremely high and only subtle differences distinguish them from each other (Bauer, 2007). Their common morphological characteristics include stems with stiff spines, large red or orange flowers (12–17cm), and a fruit with stiff spines. They are widely distributed in western Mexico (from Durango to Oaxaca) and central Guatemala (Sierra de los Cuchumatanes), in pine forests and tropical montane cloud forests.

Hunt et al. (2006) previously classified the very similar *D. speciosus* and *D. ackermannii* in the subfamily *Ackermannia*, because both have large red or orange flowers but based on the results of Korotkova et al., their close relationship can be ruled out.

Disocactus heterodoxus

This species lives in the region bordered by the Tacaná volcano between Mexico (Chiapas) and Guatemala (San Marcos Department). It was considered to be *D. speciosus* subsp. *cinnabarinus* due to the common floral morphology (Bravo-Hollis 1978). Bauer also described it, indicating that the observed differences were only due to the distance between the populations (Bauer 2007).

Consistent morphological differences of the stem members, however, had already been observed by Standley and Steyermark (1944) who described it as *Heliocereus heterodoxus.* Until recently it was considered to be *D. speciosus* subsp. *heterodoxus* (Standl. & Steyerm.) M. Á. Cruz & S. Arias.

Finally in 2022 it was confirmed to be a separate species due to its unique



Disocactus speciosus subsp. *cinnabarinus* Patzún (Photo: Shacarah Gagnon-Kvale)



Disocactus speciosus subsp. *cinnabarinus* WK399 (Photo: Shacarah Gagnon-Kvale)

combination of morphological characters (flat or 2-3-ribbed stems with few or no spines, and narrowly opening tubular flowers that range from white to pink or even red. (Gómez-Hinostrosa, C., Hernández 2022).

These are less common species in collections, due to their picky nature. I cannot report on their flowering, their growth is similar to other *Disocactus*, the *D. heterodoxus* and *D. speciosus* subsp. *cinnabarinus* clones show stronger growth, but are extremely susceptible to rot in the winter rest, they need to be kept cold and dry, which is a serious problem for my collection currently.

Disocactus aurantiacus

This species is characterised by flexible, narrow, extremely long and drooping stems, and longer hairs instead of spikes on both stems and flowers.

It can be found in the tropical montane cloud forests of El Salvador, Honduras and Nicaragua and was classified by Bauer (2003) as *D. speciosus* because some of its clones have ribbed stems and large flowers (12.5-15.5cm).

Although Korotkova et al. do not fully clarify the relationships of this taxon, the molecular results revealed in their study and the listed morphological characteristics indicate that it should be considered as a separate species, as was originally proposed (Kimnach 1974; Barthlott 1991).

Like *D. eichlami*, it was a problematic species in my collection when small. It is a high-mountain cloud forest species that cannot withstand the summer heat, so it can only be kept in deep shade, or over a pool of water for best results. Bigger plants tolerate conditions much better. I have also exchanged information with several foreign collectors about their cultivation; for example in German collections, where the summers are cooler, it grows well and in Ireland they spend the winter outdoors in a sheltered place.

In my experience the *D. speciosus* types require totally different winter conditions (cool and dry) compared to *D. aurantiacus*. This needs to be watered occasionally during the winter as it is prone to wither quickly when kept in dry conditions from which it cannot recover.



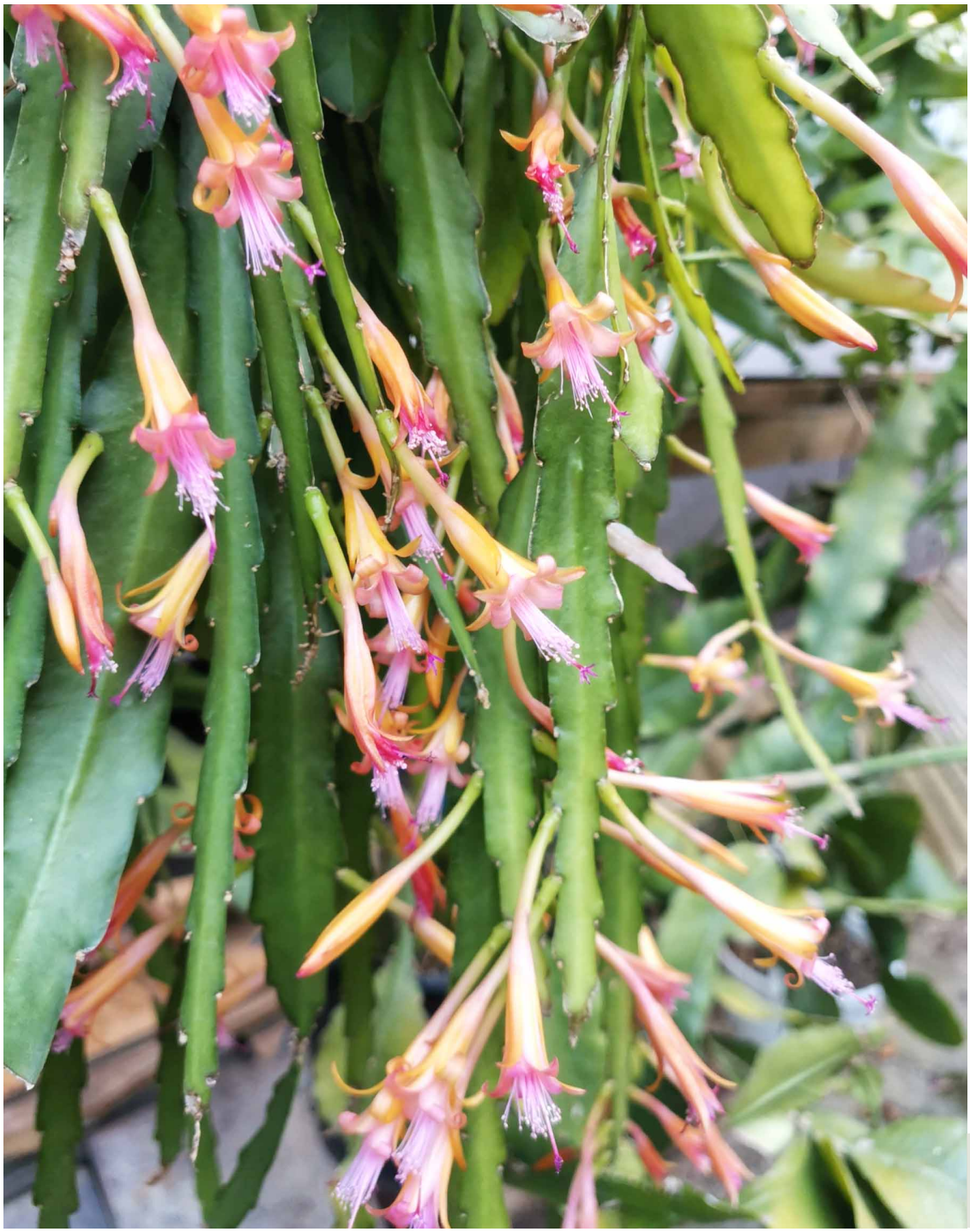
Disocactus speciosus subsp. *cinnabarinus* (Photo: Shacarah Gagnon-Kvale)

Disocactus salvadorensis

The authors (Cerén et al) classified *Disocactus salvadorensis*, described in 2017, in the *D. eichlami* clade on genetic grounds and reported it as growing in the Montecristo National Park, Santa Ana Province in the north-eastern region of El Salvador,

The habitat of *Disocactus salvadorensis* is found in the transition zone of tropical cloud forests and high mountain pine-oak forests. Precipitation is concentrated in the summer-autumn period, reaching 400mm per month. The lowest temperature rarely falls below 5–10°C, and the highest is around 25–30°C. It grows in a balanced climate all year round, with a dry rest period from autumn to spring.

It is a rare plant in collections although, as I learned in my research, it has a much longer history in European collections than expected. This began in 1982, when Manfred Köenen, the curator of the Bonn Botanical Garden, travelled to the Montecristo Mountains in the northernmost part of El Salvador. This mountain range is located on the border of El Salvador, Honduras and Guatemala, and its highest peak is Cerro Montecristo at 2350 metres.



Disocactus salvadorensis

It has an unusual climate with cloud forests even at an altitude of 1,800 metres above sea level, thanks to the generally long rainy seasons caused by tropical zenithal precipitation, which averages up to 3,000mm per year. The Montecristo Mountains are now a highly protected biosphere reserve.

On the eastern side of the massif, Köenen found an epiphytic cactus with small red fruits at an altitude of 1,850 meters. He took seeds to Bonn, where some of the seedlings survived but never flowered. When Köenen moved to Spain in the 1990s he took part of his collection, including this mysterious plant, with him. Spain's hot and dry climate was completely unsuitable for this plant, but it survived nonetheless.

In 2012 Martin Bischof, a friend of Manfred Köenen, visited El Salvador where he found the original site of the collection and recorded the climatic conditions necessary for its successful cultivation. Based on this information the plant was finally persuaded to flower and botanist and hybridiser Eckhard Meier concluded that it was a new species of *Disocactus*.

The description began in 2016, when Mr. Köenen's daughter Almut Redling, a biologist at the Institute of Botany at the University of Bonn, worked with Professor Barthlott to publish this plant as *Disocactus koeneni*.

Shortly before finalising the manuscript, however, they learned that a Salvadoran-Mexican team of authors had just preceeded them and named the plant *D. salvadorensis* (Meier 2018). ■

To be continued in the December issue of the *Cactus and Succulent Review*

Photos: Zsolt Varga, from his own collection, unless stated otherwise



Disocactus salvadorensis

This article has been translated, reworked and updated by the author of the original article:

Zsolt Varga. Betekintés az epifiton kaktuszok rendszerezésébe – Epifita Kaktuszok 4.rész. Cactus World XLVIII/1 ISSN 0209-9152 2024

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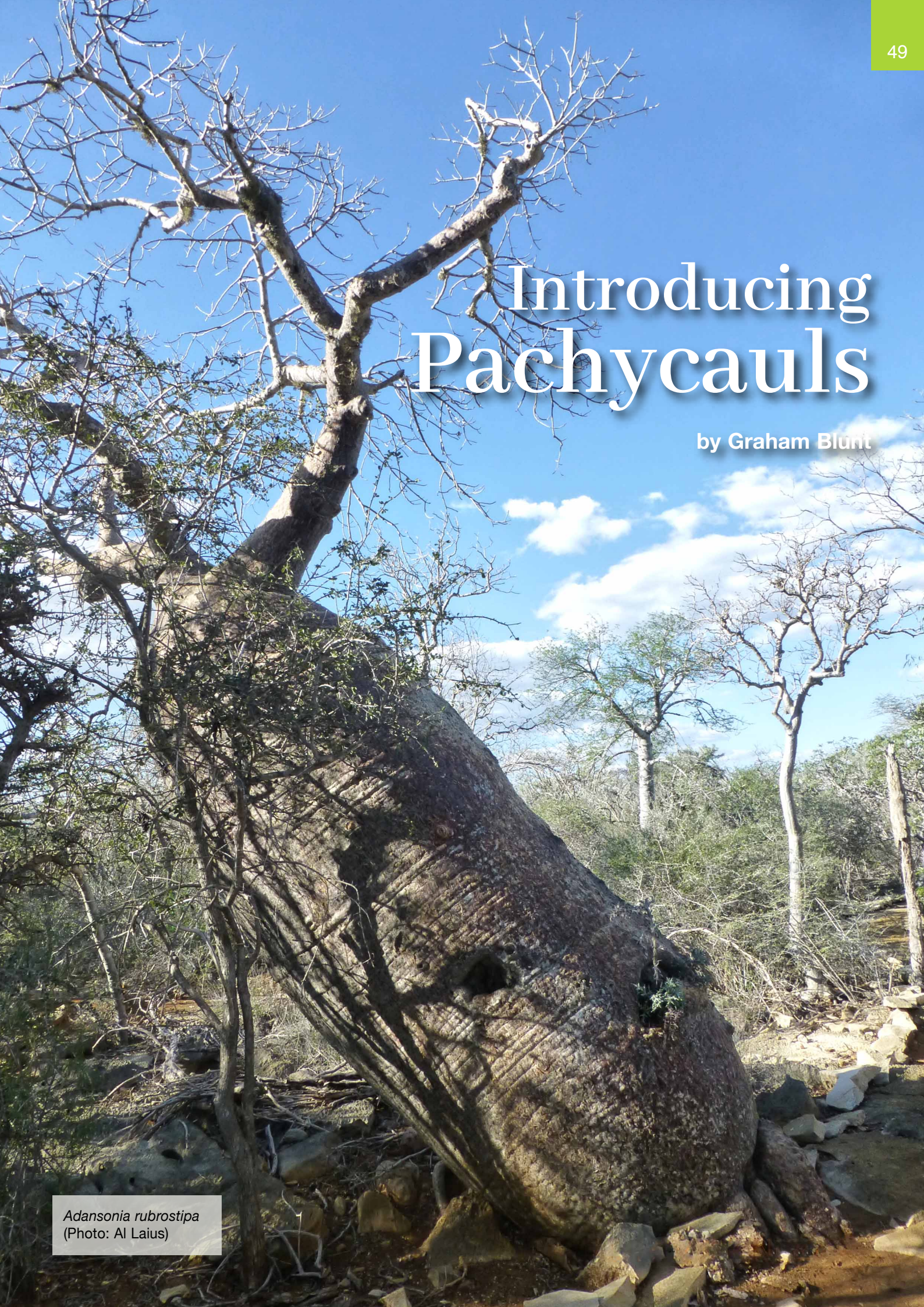
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Introducing Pachycauls

by Graham Blunt



Adansonia rubrostipa
(Photo: Al Laius)

This is an introduction to the world of pachycauls: how to grow them and most importantly, how to overwinter them, hopefully successfully.

First, the caveats: this is not a technical article as I am self-taught and, in the world of horticulture, educationally challenged. Second, I tend to generalise, so this article aims to give you a feel for these plants, for you to make up your own minds.

Now on to the fun part.

Adansonia rubrostipa
(Photo: Al Laius)



What are pachycauls? For the purposes of this article they are defined as woody plants with swollen stems for water storage, by and large trees, the most famous being the iconic baobabs.

Growing techniques

To begin with, a general overview of the growing techniques I recommend. Few of these plants can tolerate any frost, exceptions being some of the erythrinas, fouquierias and *Ceiba* (formerly *Chorisia*) *speciosa* but, never fear, there is an easyish way to overwinter them.

Their adaptation for survival through periods of drought or dry seasons can also be used to survive our winters, without needing a glasshouse borrowed from Kew and your own personal oil tanker from the Strait of Hormuz to heat it.

The other good thing for any potential bonsai nerds is that, by and large, they will happily form bonsai subjects and indeed some of the *Delonix* species are spectacular grown this way. Having said that, however, for the purposes of this article I will not be discussing how to produce bonsai plants and indeed I will now completely ignore this worthy topic.

Here are some general rules for all the following plants. I won't be discussing seed germination as my cunning plan is that you will be eager to buy ready-made plants. (See the link at the end of this article.)

In the summer and autumn, in other words their growing season, water well, particularly for plants in their first year. They will want to grow rapidly and should put on about a metre's worth of growth. This is necessary for them to create water storage tissue in their stems in order to survive their first winter. Luckily, this summer they have easily tolerated the ridiculously high temperatures we have been experiencing.



Adansonia za, the most massive of the Malagasy baobabs (Photo: Al Laius)

As soon as winter approaches cease watering entirely. At this point you have two options: either store the plants in the pots or depot and store them as you would do bulbs. Either way, bring the plants indoors and keep in a heated spare room out of sight, unless of course you have a fully heated conservatory. That's how they will overwinter; that is the easy bit.

The hard bit is bringing them out of dormancy in the spring. This is all about timing since they need warm days and nighttime temperatures, as well as good daylight, so a nice sunny warm windowsill would work.

You initiate watering at this point, either when some growth is spotted or, like me,



Adansonia za in fruit (Photo: Al Laius)

when you think the time is right (although more often than not I'm way too early and frequently rot them as an unforeseen bout of cold weather stops the process). Once growth has started – success – pat yourself on the back. Now repeat yearly.

I will now consider the plants that we grow at our nursery, how to look after them and any peculiarities they may have.

Adansonia

Let's start with *Adansonia*, the baobabs, the most massive and hence iconic of the pachycauls. There are eight recognised species:

A. digitata in Africa,
A. gregorii in Australia,
A. grandidieri,
A. madagascariensis,
A. perrieri,
A. rubrostipa,
A. suarezensis and
A. za in Madagascar.



Adansonia suarezensis in fruit (Photo: Al Laius)





These are very easy to grow in the summer through to the autumn and easy to overwinter, but among the trickiest to initiate into growth in the spring.

We grow five of these species. Even within their first year the trunks will show signs of swelling. When young they are pretty well impossible to tell apart, so don't muddle them up in the winter.

Young plants in the author's nursery.

Left: *Adansonia madagascariensis* and *Adansonia za*

Right: *Delonix floribunda*

(Photos: Graham Blunt)



Adansonia rubrostipa in fruit (Photo: Al Laius)

Delonix

Next, and my particular favourite, the genus *Delonix*, of which *D. regia*, the flame tree, is the most impressive, although as it isn't actually a pachycaul tree, I shall ignore it completely.

The two I currently have, *D. decaryi* and *D. floribunda,* are easy to grow in the summer and easy to return to life in the spring. These guys make excellent bonsai candidates, looking like miniature trees even when young.

Delonix decaryi
(Photo: Al Laius)





Delonix decaryi (Photo: Al Laius)

Both species are very fast growing from seed, reaching up to at least 60cm tall and multi-branching from birth in their first season. But of course, being from Madagascar, they are not remotely hardy.

As an aside, however, note that *Gunnera perpensa*, also from Madagascar, is the hardiest *Gunnera* going and *Buddleja madagascariensis* has survived down to –10°C even though the roots were frozen solid for nine days. So, what does that tell us about provenance and hardiness? Probably not a lot. Finally, again don't muddle them up when dormant because you'll never tell them apart.



Delonix decaryi in flower
(Photo: Al Laius)



The beautiful flowers of *Delonix decaryi* (a member of the legume family) (Photo: Al Laius)

Colvillea racemosa

Now to *Colvillea racemosa* (Colville's glory tree) also from Madagascar, not strictly a pachycaul but as I really like it and it behaves like a pachycaul, I'm including it here. This is a gorgeous looking thing and a good candidate for bonsai treatment. It is easy all year and not too difficult in the spring.

Colvillea racemosa
Plate number 3325
from Curtis's
Botanical
Magazine, 1834
Public domain



Ceiba speciosa

Ceiba (formerly *Chorisia*) *speciosa* is the silk floss tree from Brazil, Argentina, Paraguay, Bolivia and Peru. This is easy all year round including the spring and is reasonably hardy, tolerating temperatures below freezing, although I have never tested it to its limit. It is far too precious for that as I rarely get more than a couple of seeds to germinate each year.

This is a very quick growing plant, which should start to grow its characteristic trunk prickles in its second year from seed or, if you're very lucky, in its first.



Close up of the bark of *Ceiba speciosa* at Cairns Botanic Gardens
(Photo: Steve Fitzgerald) CC BY-SA 4.0

Ceiba speciosa in flower in Ceret Park, São Paulo (Photo: Mauro Halpern) CC BY 2.0



Operculicarya decaryi

Operculicarya decaryi is also from Madagascar. This is a small, weird-looking shrub, very hard to create babies from but I am currently trying cuttings to produce new stock (unsuccessfully so far, I should also add). Luckily, it is easy enough to grow, overwinter and, to date, the mother plant has reactivated easily enough each spring. This plant thrives on being well watered.



Operculicarya decaryi in a 12cm diameter pot
(Photo: Colin C. Walker)

Operculicarya decaryi, showing that it is a true pachycaul. (Photo: Al Laius)





The red-orange flowers of *Fouquieria splendens* photographed in Anza-Borrego, California (Photo: Ian Woolnough)

Fouquieria

I grow three species of *Fouquieria* of which *F. splendens* has the common name of 'ocotillo'. It comes from south-west USA and is reliably hardy in mild places in the UK. It is easy to grow and overwinter. I let it go dry but leave it in an unheated tunnel. This year it was frozen for nine consecutive days.

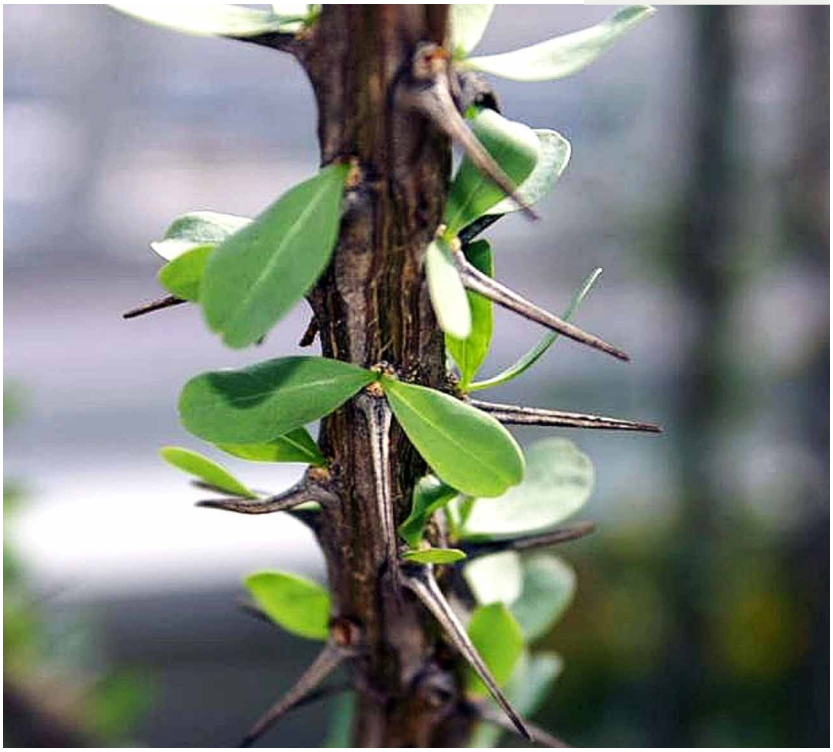
It is reasonably easy to reactivate although a couple have succumbed. This was probably due to the two months of rain and darkness after the freeze, followed by no discernible spring and a May that for us had more ground frosts than the whole winter combined. All this followed by record-breaking temperatures. No wonder the plants were freaked out.

Fouquieria macdougalii is not hardy and the one plant I have, bearing in mind it is now mid-July, is still suspiciously leafless, but I refuse to accept that it has shuffled off its mortal coil.

Fouquieria (formerly *Idria*) *columnaris* is not hardy but it is a big chap and quite spectacular. It is easy enough to grow, provided (a) I have stock, (b) I can get hold of seed if I haven't and (c) and if I do, I can get the little beggars to germinate.

All these chaps have spines (I do like my spines).

If memory serves, there was a gorgeous *F. splendens* at the entrance to the Princess of Wales Conservatory at Kew Gardens many years ago.



Fouquiera splendens section of stem, New York Botanical Garden (Photo: David J. Stang)
CC BY-SA 4.0

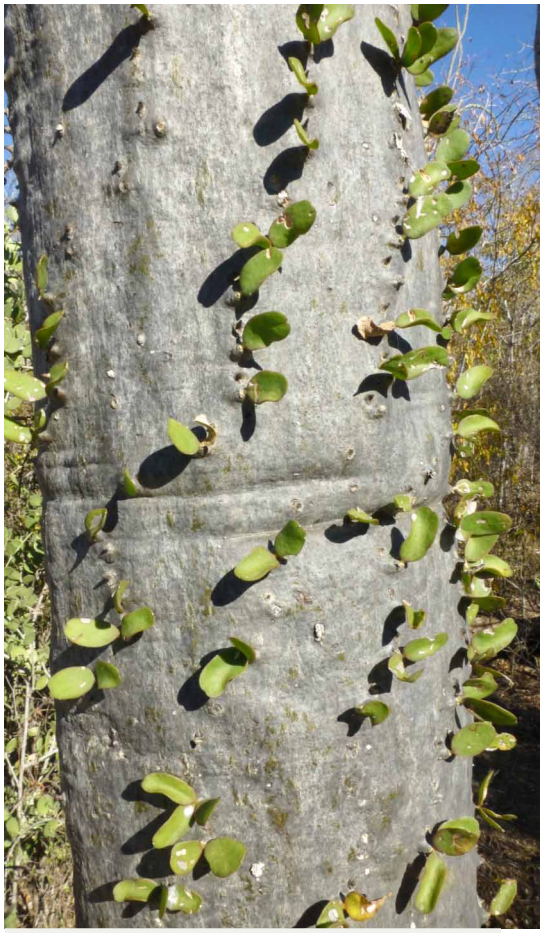


Alluaudia procera (Photo: Al Laius)

Alluaudia procera

Alluaudia procera is from the spiny forests of southern Madagascar – a large multi-branched shrub that is one of my favourites.

There are other genera in the Didiereaceae including *Alluaudiopsis*, *Decaryia* and *Didierea*. Sadly, and not for the want of trying, (since I can rarely get the seed and even when I do, I get a remarkable lack of germination), *Alluaudia procera* is the only one I grow. Happily, this one is easy to grow and easy to resuscitate in the spring. It is reasonably fast-growing as well and pretty easy from cuttings.



Alluaudia procera, a section of the stem (Photo: Al Laius)

Erythrina

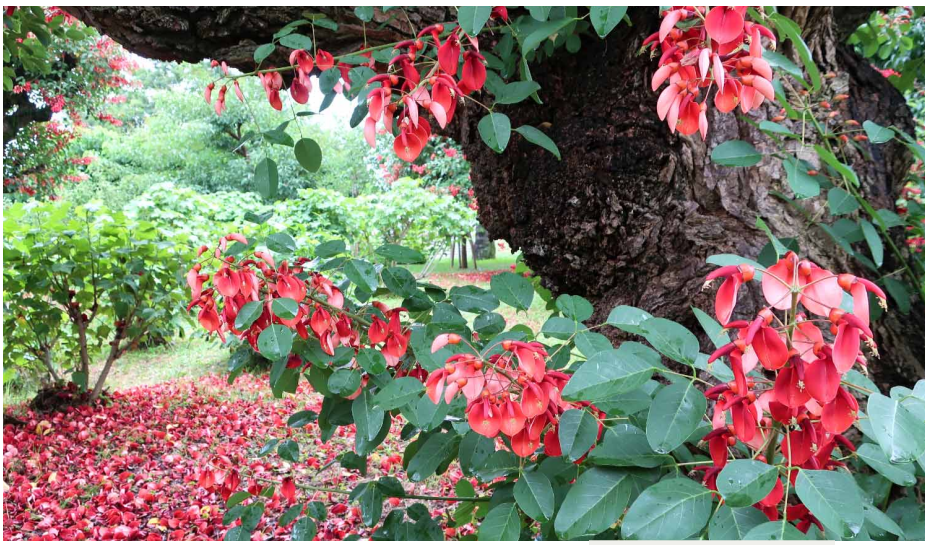
Many people may be familiar with the reasonably hardy *E. crista-galli* and its spectacular flowers but this is a big genus with a number of woody shrubs or pachycaul-like trees, all with pretty funky flowers.

E. lysistemon is tree-like from South Africa with stem prickles and is easy to grow, overwinter and resuscitate. *E. abyssinica* and *E. latissima* are very similar in size and from Africa, again very easy to grow, overwinter and resuscitate, and these guys have prickles and very, very large leaves to their credit.

E. humeana is another reasonably hardy species from South Africa but is a small shrub and hence so much easier to handle. It is also another easy one to grow with lovely prickles and flowers.

E. vesperitilio is from Australia, called bats wing coral bush because the leaves resemble bats wings: the Ozzies are nothing if not original in their descriptions. This is easy to grow but hard to bring back to life in the spring, with nice leaves, prickles and flowers.

Other species worth trying are *E. herbacea* from Mexico, the hardiest of all erythrinas and *E. speciosa* from the Amazon; it has very pretty leaves but is tricky to grow.



Erythrina crista-galli in Nagai Botanical Garden, Osaka, Japan

(Photo: Oilstreet) CC BY-SA 3.0

Finally and not least, *E. flabelliformis* from the Sonoran desert in the USA and Mexico, is a gem of a plant that grows quite happily with cacti and succulents and is easy to grow and keep.

In conclusion, this is a varied and fun group of plants to try, admittedly not for the novice but can be very rewarding and of course due to their rareness in cultivation, quite a talking point. ■

Photos as credited

Graham Blunt runs the Plant*base* nursery in Kent. See Plantbase for full details of the plants available, including many rarities.





*Erythrina lysist*emon at Kirstenbosch Botanical Garden, Cape Town (Photo: Derek Keats) CC BY 2.0

Erythrina humeana cultivated in Heidelberg, South Africa (Photo: Fritz Georg) CC BY-SA 4.0

It's nearly time for Cactus at the Castle

5–6 September 2026

by Vicky Davies

It's very nearly time for this year's Cactus at the Castle, which will one again form a major part of the Mexican Celebration Weekend at Lullingstone Castle in Kent on 5th and 6th of September.

All the plans for the weekend have come together nicely and we look forward to welcoming you to the event once again. Don't forget to apply for your better-than-half-price entry voucher as a reader/subscriber of the Cactus and Succulent Review! See page 68.

The weekend features all the festival favourites including, of course, the extensive mart that will offer a wide range of plants from top professional nurseries and growers as well as interesting propagations from keen and capable hobbyists.

The Bring and Buy Auction will once again be a highlight on Saturday afternoon and this year we are delighted to help a family local to Lullingstone Castle to find homes for their late father's collection. Eric Swinyard of Orpington had been collecting cacti since his teens and it was only ill-health at the age of 95 that kept him from his greenhouse. His family is keen for his plants to move on to people who will enjoy them as much as he did and all monies raised will be donated to charities that were close to his heart. Notable plants include a mature *Ariocarpus retusus* and a large offsetting *Strombocactus disciformis*.

The auction will also include a number of lots that will be sold in aid of the new Gordon Rowley Library, which houses a vast litany of literary knowledge relating to cacti and succulents. We are awaiting precise details of the plants but anything from Graham Charles will certainly be of interest.



Tom Hart Dyke giving speaking in the World Garden (Photo: Alan Graham)

There will be numerous talks and demonstrations throughout the weekend. A series of short talks relating to plant groups held dear by the late Dr. Tony Mace will take place in Saturday's Tribute to Tony.

On Sunday Dr. Adrian Weatherill will be sharing his years of knowledge of *Haworthia*, *Haworthiopsis* and *Tulista*. Practical demonstrations from top growers such as Graham Charles will take place across both days.

Sunday is also Show Day with the very first Haworthia Growers UK Show, incorporating the Lullingstone Open Show. Come and see some of the best grown haworthias in the country and then vote for your own favourite plant.

If that's not enough, there is also the World Garden to visit with guided tours given by owner and creator Tom Hart Dyke as well as Mexican food from T's Tacos and the return of the popular Blue Agave Bar offering cocktails, gins and Harvey's ales. Sunday will also see some fun family activities including a prize treasure hunt, face painting and music from the mariachi band. ■

Photos as credited

On Sunday there will be a special celebrity guest presentation by popular television horticulturalist Camilla Bassett-Smith. Let's hope she won't need her trademark bobble hat!



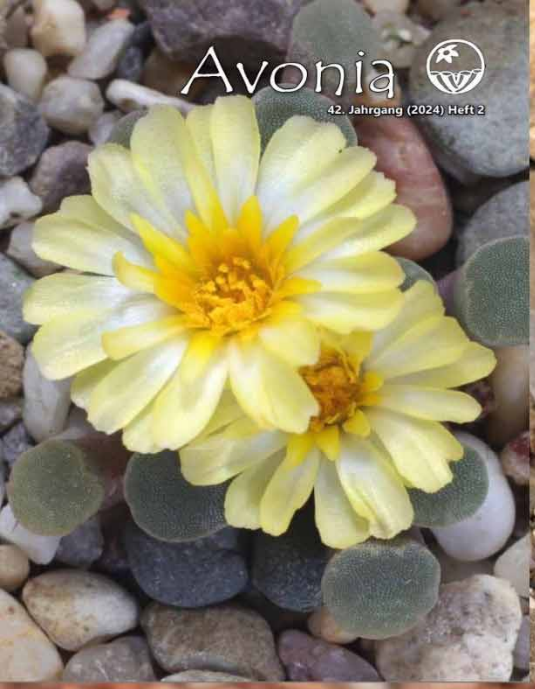
Camilla Bassett-Smith

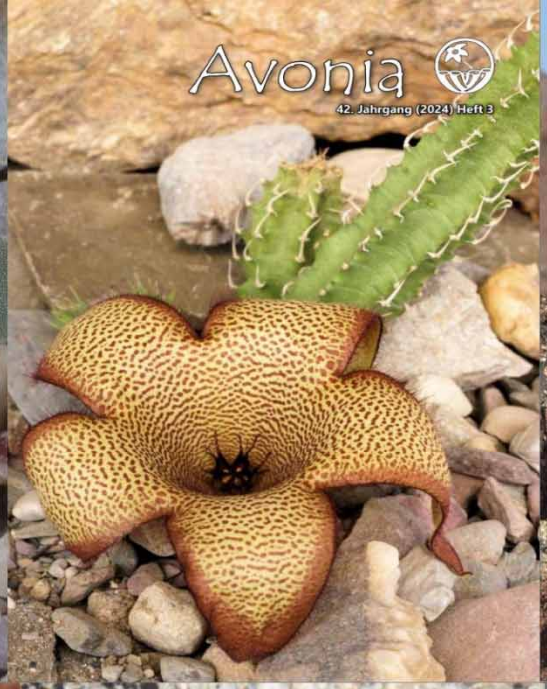


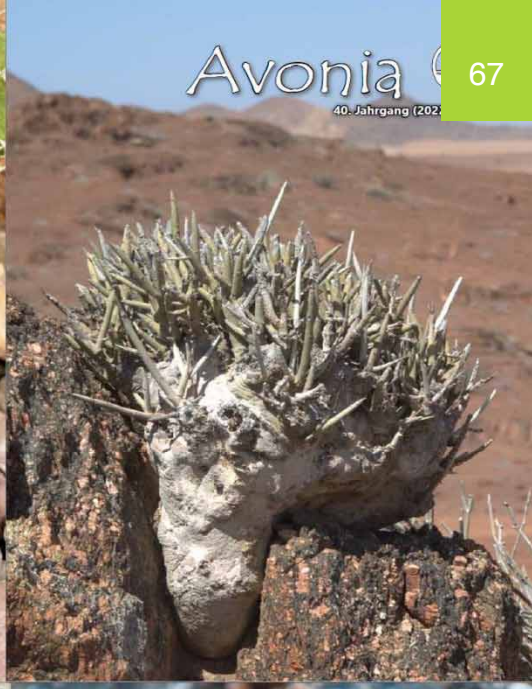
A superb display of prize-winning haworthias (Photo: Vicky Davies)

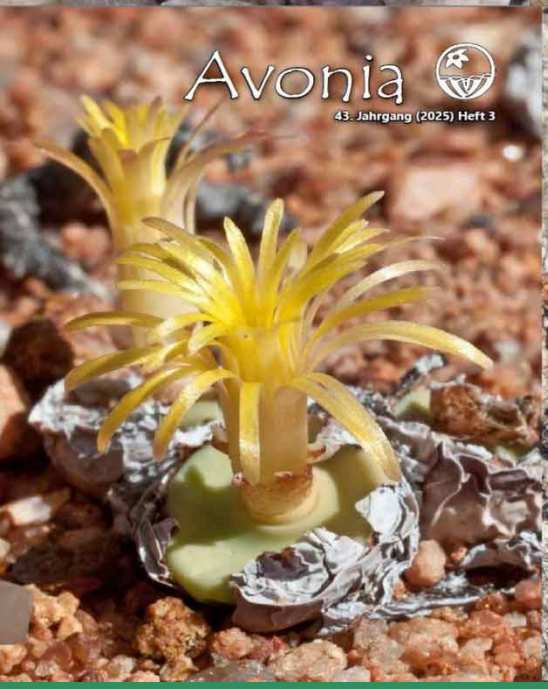


The Mariachi Band framed by Lullingstone's historic gatehouse (Photo: Vicky Davies)

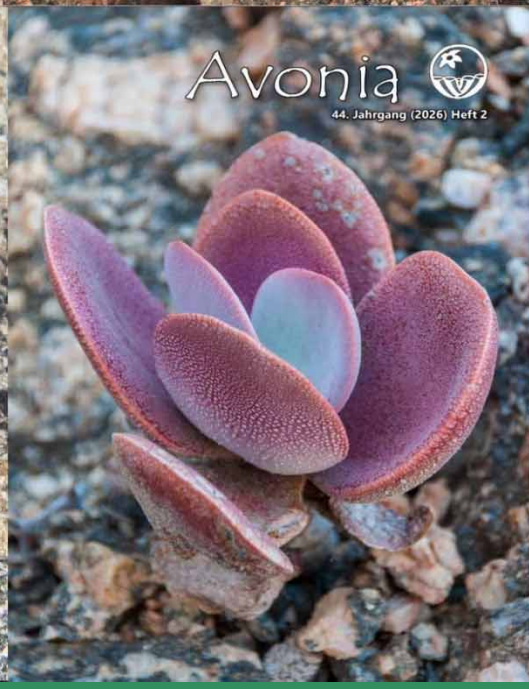












Invitation

Annual Meeting of the Fachgesellschaft andere Sukkulenten

Place: Ibis Styles Hotel Leipzig, Haynaer Weg 15,
D-04435 Radefeld/Schkeuditz

Date: Friday, October,09th 2026 from 07 p.m. until
Sunday, October, 11th 2026 till 11 a.m.

Program: Annual meeting including the election of the board, lectures:

- Marco Cristini (I): *Aeonium* & Sukkulenten on El Hiero
- Jörg Ettelt (D): Madagascar – tour of the south
- Ulrich Katz (D): Tasmanian and Singapore & Yemen and Socotra
- Elmar Mai (D): Namaqualand in bloom

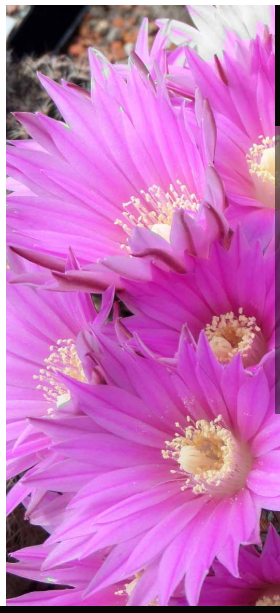
Large succulent exchange!

(Note: no cacti!)

Free admission! Guests are very welcome!
Further Information: www.fgas-sukkulenten.de.

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Cactus & Succulent REVIEW

BACK ISSUES

Back issues from June 2014 to March 2025 are available to download from the website.

Cactus and Succulent Review



Cactus at the Castle

5-6 September 2026

Reduced price entry for readers of the Cactus and Succulent Review

To claim this please email to request a voucher to be displayed at the gate on arrival.

One day voucher Admits two adults £7.00 per person

One day only – Saturday or Sunday

Two day voucher Visit on Saturday and get entry on Sunday for only £3.50 per person.

To claim your voucher please email contact@cactusandsucculentreview.org.uk

Please indicate if you require a voucher for one or two days

Please note the cut-off time for requesting vouchers is midday on Friday 4 September.

The World Garden 2005-2025 Lullingstone Castle

The World Garden

Lullingstone Castle Eynsford Kent, DA4 0JA

Founded in 2005, Tom Hart Dyke's World Garden pays homage to the amazing achievements of Victorian and Edwardian plant hunters who brought back the plants and flowers we now cherish and grow in our gardens in the UK.

'Absolutely beautiful, will certainly be returning and sharing with friends to come and visit'

Admission

Open April to October
Thursday to Sunday 11am to 5pm

www.lullingstonecastle.co.uk

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Eastoft Echeveria

Quality UK grown plants

All our plants are grown in our nursery from seed, offsets or cuttings.

Holder of the National Collection of Echeveria, Graptopetalum & Pachyphytum species, cultivars & hybrids (incl. intergeneric hybrids).

The National Collection is open to the public on selected dates or by appointment.

See details on our website.

Eastoft Echeveria

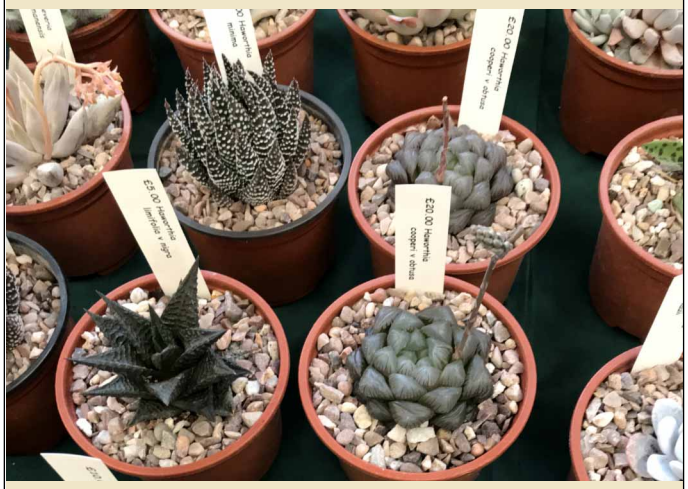
Online shop is now open with over 300 varieties of Echeveria, Graptopetalum and Pachyphytum for sale.

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Ian & Sarda Woolnough

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Formerly Eau Brink Cacti, visitors are welcome to view the collection and sales plants by appointment.

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Contact us for further details.

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