Issue 45 June 2025

Cactus & succulent REVIEW

The online magazine for cactus and succulent enthusiasts



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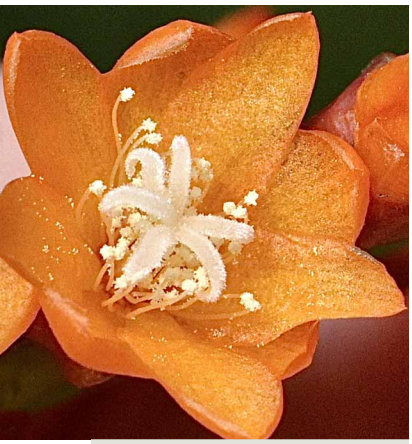
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Editor's NOTES

Welcome to the June issue of the Cactus and Succulent Review



Pfeiffera monacantha (Photo: Shacarah Gagnon-Kvale)

The first thing you will notice about this issue is that is looks slightly different and I hope that you will like the new look.

Are you reading the *Cactus and Succulent Review* for the first time? If so please consider subscribing to our free mailing list. You can unsubscribe at any time.

The CSR comes out at the beginning of March, June, September and December and you will receive an email notification with a link to each new issue. Just scan the QR code below and you will be taken to the subscribe page on our website.

We have plenty of interest in this issue. I am delighted to feature another article in Zsolt Varga's series on epiphytic cacti, this time on '*Pfeiffera*' which is truly a unique genus. We also have the second part of Colin C. Walker's article on 'The marginate agaves of section Heteracanthae' and even two items for opuntia lovers.

Finally plans for Cactus at the Castle are well under way and this year we are holding an extra event to celebrate the 20th anniversary of the founding of the World Garden. See pages 4 and 5 and also the article on page 64 for details.

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.

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Cactus at the Castle 2025

UK's largest annual cactus event

Saturday 6 & Sunday 7 September
11.00am to 5.00pm

Saturday

Bring and Sell Auction
Start 2.00pm

Saturday & Sunday

Cactus Mart with 40 sellers

Talks and demonstrations
Including Graham Charles and Mellie Lewis

Tours of the World Garden
With Tom Hart Dyke

Sunday

Lullingstone Open Show
Open from 11.00am
Download the show schedule from the website

Meet the Alpacas & Rheas

Mariachi Band

MEXICAN FOOD

T's Tacos
Mexican street food.

The Blue Agave Bar
Open all weekend, The Blue Agave Bar will be serving a range of Mexican beers and Tequila cocktails. The bar will also have Harvey's beers, G&Ts and wine available.

Admission

Adults **£14.00*** Under 16s **FREE**

BCSS members **£12.00***

*One day entry – Saturday or Sunday

*Visit on Saturday and get **half price** entry on Sunday*

NB Admission does **not** include entry to the Convention. *See next page for details*.

SPECIAL OFFER

For Cactus & Succulent Review readers

Cactus&Succulent REVIEW

1 DAY voucher 2 adults **£7** per person *(One day only – Saturday or Sunday)*

2 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 indicating if you would like a 1 day or 2 day voucher. *Last date for requesting vouchers midday Friday 5 September.*

Cactus IN THE Chapel

ONE DAY CONVENTION

Sunday 7 September
1.00pm to 5.30pm

See the following page for further details

Cactus at the Castle

Lullingstone Castle, Eynsford, Kent DA4 OJA

https://www.cactusatthecastle.co.uk

To mark the 20th anniversary of the founding
of the World Garden at Lullingstone Castle

Cactus IN THE Chapel

ONE DAY CONVENTION

Sunday 7 September
1.00pm to 5.30pm

TALKS

Graham Charles
Matucana in habitat and culture

Roger Ferryman
Chile and Argentina over 20 years of travel

Ian Woolnough
Some Mexican highlights



TICKETS

AVAILABLE FROM Sunday 8 June

Tickets £16 per person
(includes booking fee)

Places limited to 60 people

Tickets in advance only
via the Cactus at the Castle website

Entry includes

Early access to Cactus at the Castle from 10.30am

Coffee and cakes

https://www.cactusatthecastle.co.uk

Cactus at the Castle

Lullingstone Castle, Eynsford, Kent DA4 OJA

Errata and an Effervescence of Echinocereus



This picture appeared in Roger Ferryman's article, 'Spring has Sprung' in the March 2025 issue of the *Cactus and Succulent Review*. It was captioned *Echinocereus viridiflorus*. It might be considered to be *E. viridiflorus* subsp. *chloranthus* although Roger felt that there are many plants in habitat that do not really fit the definition of any subspecies.

Studies carried out by the recently disbanded Echinocereus Study Group, *Der Echinocereenfreund,* suggest that *Echinocereus chloranthus* (treated in *The New Cactus Lexicon* as *E. viridiflorus* subsp. *chloranthus)* is a distinct species, so this plant could be *Echinocereus chloranthus* subsp. *chloranthus*. At present these findings are not universally accepted so perhaps the name of this plant is a matter of opinion.

I plan to include more information on this group of plants in a later issue of the *Cactus and Succulent Review.*

Echinocereus dasyacanthus

I have been told by Peter Berresford, a knowledgeable specialist on the genus *Echinocereus*, that the plant pictured at the start of Roger Ferryman's article is actually a form of *E. dasyacanthus* (not *E. reichenbachii* as captioned).

This is based on the spination which is extremely dense and so is far more characteristic of *E. dasyacanthus* where the individual spine clusters are difficult to see and have a seemingly random distribution pattern. Spine clusters on plants in the *E. reichenbachii* complex are arranged in definable columns.

E. dasyacanthus is an extremely variable species found in many locations in the southern US and Mexico. Flower colours range from shades of yellow, orange and red to pink and magenta.











Some of the many flower colours of *Echinocereus dasyacanthus* (Photos: Peter Berresford)

Two internet resources

The Cactus and Succulent Plant Mall

https://cactus-mall.org.uk

An update on this valuable compendium of internet resources by its creator, Tony Mace

The Cactus-Mall has had to move hosts again. This is the fifth or sixth time in its 30-year history we have had to move and it is, as ever, a very work-intensive process as it currently involves over 60 websites.

I have taken the chance to revamp the Mall as it had become full of broken links. I have also completely deleted some areas which are no longer used very much if at all.

New sections for Facebook pages, Pinterest boards, and YouTube channels have been added and I have expanded links to other plants such as cycads, palms, bromeliads and carnivorous plants.

I still have some work to do in cleaning up broken links but I hope it is now much more useful once again than it had recently become.

I also maintain websites for: the Mesemb Study Group and the International Asclepiad Society.The society is now defunct but back journal numbers and books from the library can be bought through this site.

The Mall also hosts Au Cactus Francophone (see below) and Llifle.

I have noticed that quite a large number of useful websites have gone missing due either to their owners' deaths or their inability to keep them going. I have some spare capacity so if you have a website, or know of one that cannot be continued, I may be able to offer free hosting for it. Let me know.

I would also welcome information on important missing links which can be sent to me at cacti@cactus-mall.com.

Cactus and Succulent Art from the Cactus and Succulent Digital Library

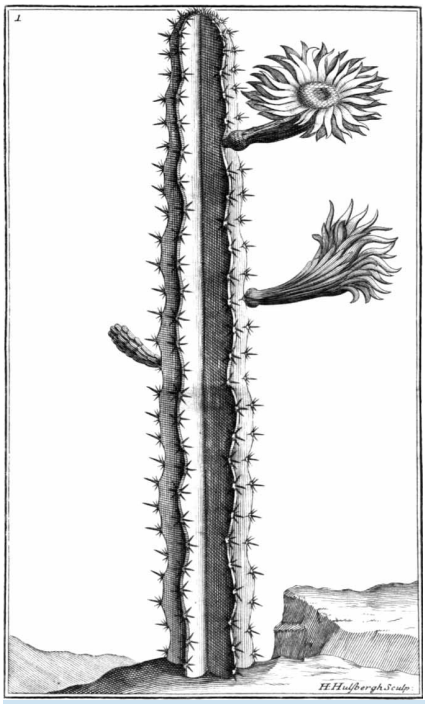
https://www.cactuspro.com/biblio/en:accueil

by Joseph Shaw

The Cactus and Succulent Digital Library is hosted by *Au Cactus Francophone*. It provides access to a wide selection of publications dedicated to cacti and succulents comprising over 200 books, magazines and catalogues etc. written over the past 300 years.

There are books in PDF format, complete with illustrations, freely available to download. These include those in the public domain or ones for which the authors have given permission to make them available to the public.

There are links to other online libraries as well where books and periodicals may be downloaded or viewed online, together with links for 85 current periodicals. The number of offerings, authors, and topics are a delightful smorgasbord.



Great Upright Torch Thistle

Included is one of the first books about cacti and succulents, *The History of Succulent Plants* with 50 illustrations from copper plates (Bradley, 1716). Bradley introduces plants such as the Great Upright Torch Thistle, the Oleander Leav'd Euphorbium and the Larger Perfoliated Fig-Marygold. Additionally, he introduces genera that we still know today such as *Sedum*, *Melocactus* and *Aloe.*

In addition to historical texts, there are modern publications such as the *Fichier encyclopédique des Cactées & autres Succulentes*, actually a series of cards covering genera ranging from *Acanthocalycium* to *Wittia* (Joël Lodé, 1989–2001).

Also of interest is a compilation of materials created by Roberto Kiesling and Daniel Schweich (2020) entitled

Some old Documents About Argentinian Cacti, which is an eBook containing over 100 copies of rare documents by Bruch, R. Leal, Hosseus, Ruiz, Sanzin and Spegazzini and others.

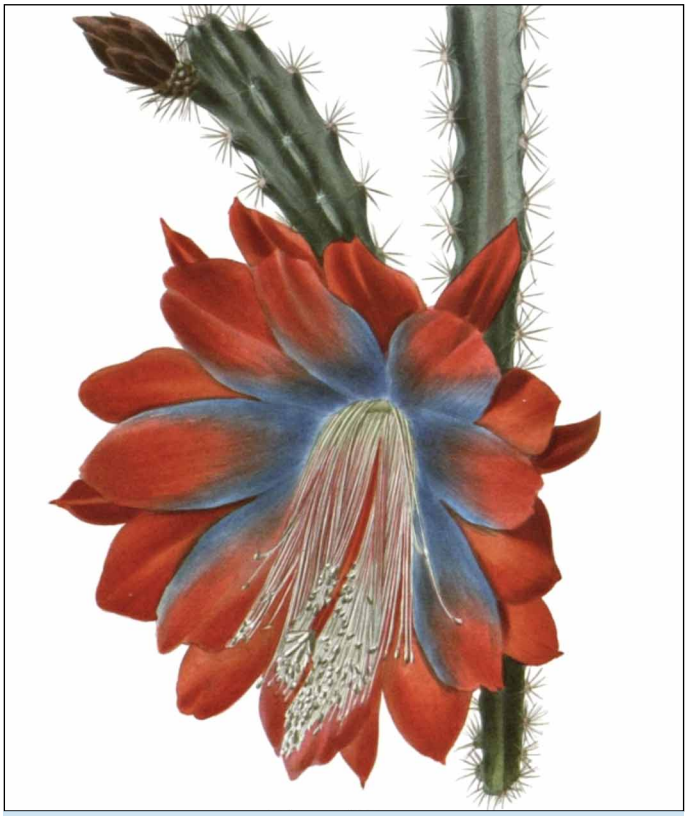
Many of the books and magazines have colour prints to be enjoyed, some of which are shown below. The plants are captioned with the names given in the original publications with their modern names (from POWO) where these differ in parentheses. ■



Mesembryanthemum linguæforme more usually *linguiforme* (*Glottiphyllum longum*). From Loddiges *The Botanical Cabinet* 1817



Cereus repandus from de Candolle *Revue de la famille des cactees* 1829



Cactus speciosissimus (*Disocactus speciosus* subsp. *speciosus*) from Loddiges *The Botanical Cabinet* 1817

The Botanical Cabinet was a series of coloured plates, with plant descriptions and notes, issued as a companion to *Curtis's Botanical magazine*



Echinocactus myriostigma (*Astrophytum myriostigma*) from Lemaire *Iconographie descriptive des cactees*. Sixteen plates were published between 1841 and 1847



Kadenicarpus

by Graham Evans

Sometimes new genera can take a while to become widely accepted. Just as *Rapicactus*, erected by Buxbaum and Oehme as far back as 1942, has only relatively recently, if sometimes begrudgingly, been acknowledged as a good genus, another long-ignored *Turbinicarpus* segregate is now finding traction supported by molecular and other analyses, particularly that of Vasquez-Sanchez et al (2013, 2019) and Aquino et al (2019, 2021). This one is *Kadenicarpus*, originally coined by Alexander Doweld in 1998.

Whereas *Rapicactus* resolves as very separate from *Turbinicarpus*, nested in a distinct clade that includes *Acharagma, Lophophora* and *Obregonia* (the sister group to the complex and controversial mammillarioid clade), *Kadenicarpus* appears to sit somewhat closer to *Turbinicarpus* (itself sister to *Ariocarpus*) but with a separate lineage and having evolved earlier. *Strombocactus* is perhaps its nearest relative.

Morphologically, the differences between *Kadenicarpus* and *Turbinicarpus* are visibly very minor, leading Davide Donati and Carlo Zanovello to include the former as a subgenus of the latter in their estimable *Knowing, understanding, growing Turbinicarpus–Rapicactus* (Cactus Trentino Sudtirol 2005).

All species have a distinct juvenile phase of short, appressed white spines prior to the development of adult spination and there is a neotenous form of one, which reaches flowering maturity while retaining juvenile growth. Young plants also tend to be notably elongate before gaining breadth with age.

Above: *Kadenicarpus pseudomacrochele*. A clump of the type species in full flower



Kadenicarpus often display marked differences in juvenile and adult growth, as shown by this new offset on *Kadenicarpus pseudomacrochele* subsp. *krainzianus*

Biologically, *Kadenicarpus* has different fibres in its cortical bundles but this is of little diagnostic use to the hobbyist!

Doweld named his new genus for a Russian botanist called Nikolai Kaden and originally transferred just *Turbinicarpus pseudomacrochele* and a couple of varieties. Currently, there are three species and three subspecies, all having their original combinations in *Turbinicarpus*.

Kadenicarpus pseudomacrochele

Kadenicarpus pseudomacrochele is a familiar species to many growers. Slow growing with a very sizeable taproot, it normally remains solitary for a good number of years but will make attractive clumps with age to fill a 10cm or even a 12cm pot.

Stems are a dark bluish-green in colour but can have a purple hue in full sun. Cultivated plants can reach 7–8cm tall, about twice the height of their habitat brethren, with individual heads of 4–5cm across. The spines are not apressed but normally bristly and twisted around the body, pale to dark brown in colour, perhaps up to 3cm long.

Young areoles have white wool and from these appear the flowers, which are large for a species in the *Turbinicarpus* complex, up to 3.5cm across. The petals, which can differ in breadth from plant to plant, are whitish with a pink midstripe that can vary from pale to quite dark and narrow to covering most of the surface in width.

Originally described as a *Strombocactus* by Backeberg in 1935, it was one of the original core group of species moved into *Turbinicarpus* when he and Buxbaum erected the genus in 1937.

Literally meaning ‘false macrochele’, with which *Turbinicarpus* it shares large flat tubercles, it is extremely unlikely to be confused with that species in the greenhouse.



Kadenicarpus pseudomacrochele subsp. *krainzianus* is a popular collectors' plant for its yellow flowers

Valid post-1937 combinations exist in *Toumeya* (Bravo & Marshall 1956), *Neolloydia* (Anderson 1986), *Kadenicarpus* (Doweld 1998) and *Pediocactus* (Halda 1998). The type and its subspecies all emanate from the Hidalgo and Querétaro states in northern Mexico.

Kadenicarpus pseudomacrochele subsp. *krainzianus*

The most familiar of the three subspecies is perhaps *K. pseudomacrochele* subsp. *krainzianus*, long grown by collectors as *Turbinicarpus krainzianus*.

It is a smaller plant than the type in most respects except for its greater propensity to offset. The stems are dark green and the spines, again bristly and twisted, tend to be white at the base quickly moving to dark brown or black. The flowers are up to 2cm across and yellowish.

The first description was as *Toumeya krainziana* by G. Frank in 1960, with later valid combinations in *Turbinicarpus* (species: Backeberg 1961; subspecies of *T. pseudomacrochele*: Glass 1997), *Pediocactus* (subspecies of *P. pseudomacrochele*: Halda 1998) and *Neolloydia* (Powell 1999). The current combination in *Kadenicarpus*, where it is only valid at subspecies rank, was made by Vasquez-Sanchez in 2019.

Kadenicarpus pseudomacrochele subsp. *minimus*

K. pseudomacrochele subsp. *minimus* is probably best known to growers as *Turbinicarpus krainzianus* subsp. *minimus*. It is an unusual and fascinating plant with a pronounced difference between its juvenile and adult appearances. Small, thin elongated stems sit atop a large taproot, connected by an often flexible neck.

Most clones offset readily, normally from low down but random ramification from anywhere on the stem is sometimes seen, with the offsets displaying the characteristic juvenile spination of seedlings, ie short, white and appressed to the body. Adult spines are similar to the preceding subspecies but normally a paler brown colour more similar to the type.

Flowers are again yellowish, profuse and normally less than 2cm across. There is a neotenous (perhaps monstrose) form seen in cultivation which makes nice compact clumps of thin white stems and flowers without ever developing adult spines.

G. Frank first described this taxon as a form of *Turbinicarpus krainzianus* in 1989. J. Luthy and Hofer promoted it to a subspecies of the same in 2000 before transferring it beneath *T. pseudomacrochele* in 2002. The combination in *Kadenicarpus* was made by Vasquez-Sanchez in 2019.

Kadenicarpus pseudomacrochele subsp. *lausseri*

The last of the subspecies is *K. pseudomacrochele* subsp. *lausseri*. This is a very pretty miniature with dark green bodies and soft bristly black spines with white bases. It is frequently solitary but sometimes clumps in age. The crowning glory is its delightful flowers which are an attractive pink with paler to white edges and often a lighter greenish yellow centre. Sometimes considered synonymous with the type its size, appearance and colour palette make it a distinctive and highly attractive subspecies for collectors.

The initial description was as a variety of *Turbinicarpus pseudomacrochele* by Diers and G. Frank in 1991. Elevation to subspecies came courtesy of Glass in 1997. Doweld demoted it back to a variety in his new genus *Kadenicarpus* in 1998 but changed his mind and returned it to subspecies rank in 2000. *Kadenicarpus* (or *Turbinicarpus*) *pseudomacrochele* var. *sphacellatus* is thought to be synonymous with this or the type by most authors. Plants in cultivation seem to more closely resemble the latter, perhaps being just a little smaller.



Kadenicarpus pseudomacrochele subsp. *minimus* is an interesting miniature



Kadenicarpus pseudomacrochele subsp. *lausseri*. A pretty subspecies with appealing flowers

Kadenicarpus horripilus

Kadenicarpus horripilus has always seemed to be an outlier. It was very much the giant of the *Turbinicarpus* aggregate, having large more or less globular leaf-green heads of up to 10cm in diameter and capable in cultivation of forming clumps to fill a washing-up bowl.

Aside from its robustness, it is appealing for its stronger spination, which is predominantly white with tips of yellow to mid-brown. The spines are fairly numerous, 10-14 on mature plants, sometimes with a single central. They are sharp and slightly brittle, so plants are best handled with care. The flowers are small for the size of the plant, perhaps up to 3.5cm across, but make up for this with their intense magenta colour.

The species, which has a wide distribution in north-eastern Mexico, has never comfortably sat anywhere but DNA data shows it is definitely closest to *Kadenicarpus*, although a weak argument could perhaps be made for a monotypic genus. Indeed, Doweld himself erected *Bravocactus* to this end when he coined *Kadenicarpus* in 1998.

The species has been known for much longer than most former *Turbinicarpus* and was first named by Lemaire as *Mammillaria horripila* as long ago as 1838. The full list of subsequent destinations for this troublesome taxon is: *Echinocactus* (Lemaire 1839), *Gymnocactus* (Backeberg 1951), *Thelocactus* (Kladiwa & Fittkau 1970), *Turbinicarpus* (John & Riha 1983), *Neolloydia* (Anderson 1986), *Bravocactus* (Doweld 1998), *Pediocactus* (Halda 1998) and *Kadenicarpus* (Vasquez-Sanchez 2019).



Kadenicarpus horripilus. A rooted offset displaying its magenta flowers (Photo: Vicky Davies)

Kadenicarpus horripilus 'Wrobelianus'

Unfortunately, *Turbinicarpus horripilus* subsp. *wrobelianus* has, as yet, no combination at any rank in *Kadenicarpus*. From a collectors' standpoint this is a bit of a shame because the plant is superficially very distinctive for its much smaller heads, which form more caespitose but still quite large clumps, and its more appressed spines. The flowers are identical.



Kadenicarpus horripilus 'Wrobelianus'. A dwarf form with no combination as yet in *Kadenicarpus* but a valid subspecies in *Turbinicarpus*

Kadenicarpus heliae

The final species is a relative newbie. *Kadenicarpus heliae* was first collected by Leccinum García-Morales in Hidalgo state, Mexico in 2014 and described by himself et al. as a *Turbinicarpus* in 2015. It is a very small growing plant reaching no more than 3cm in diameter. In cultivation, this appears to take a considerable time as plants develop an impressive taproot and remain almost spindly, maybe reaching 4cm in height, after some years.

The tubercles are tiny and compacted while the spines are at first all radials, short, whitish and almost pectinate. Two or three longer, bristly, erect and much darker central spines develop as the plants get older. The flowers are small, only about 1.5cm in diameter and are white to pale pink in colour. Cultivated plants offset slowly from the base.

The most recent addition to *Kadenicarpus*, the combination was made by Aquino in 2021.

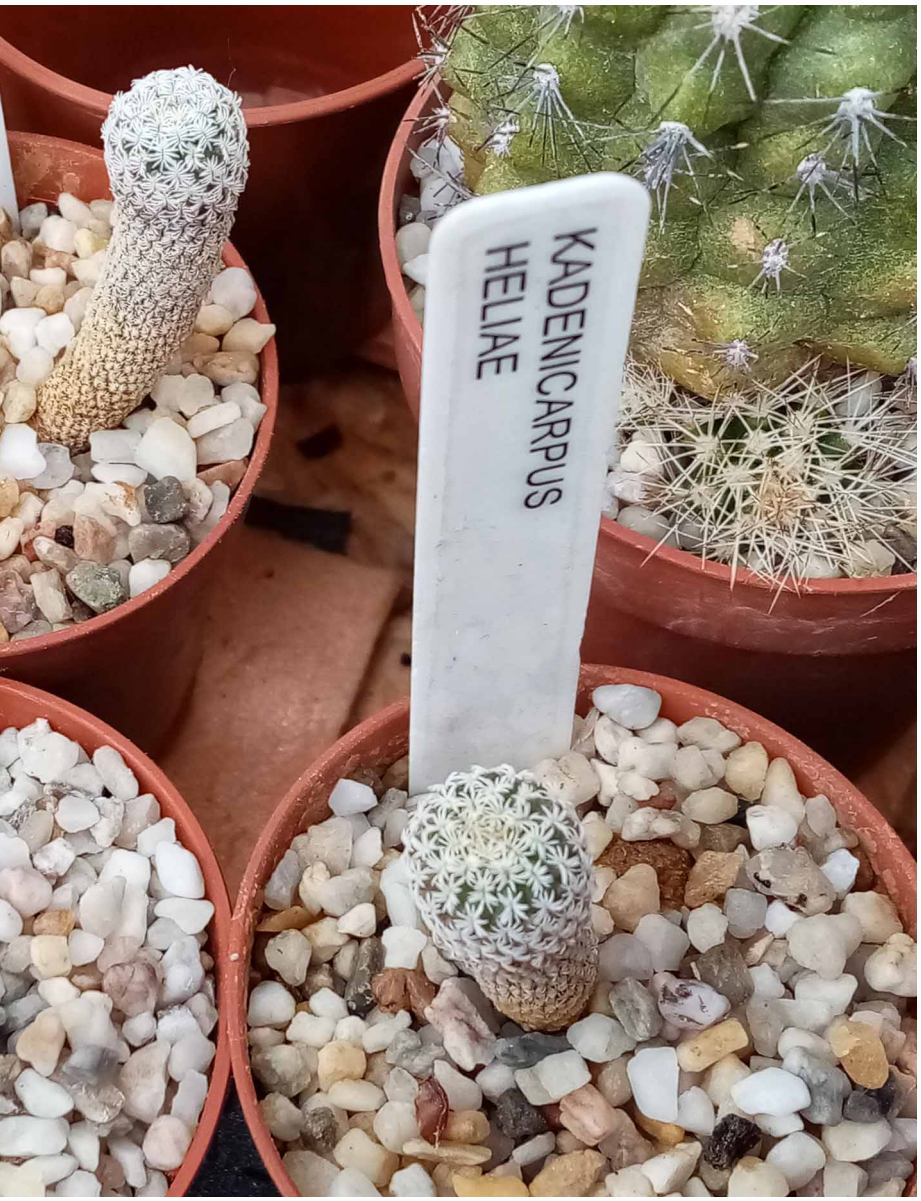
Cultivation

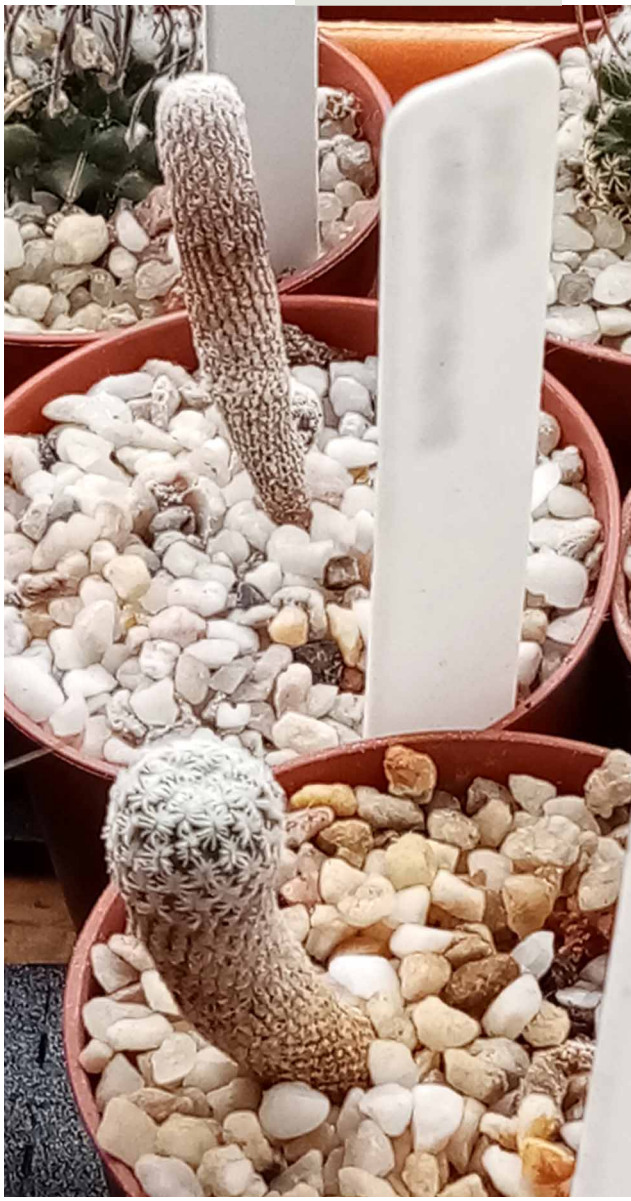
Kadenicarpus species present little difficulty to the grower providing the normal advice for managing Mexican miniatures is followed, ie good light, an open, gritty potting mix with moderate watering (little but often is recommended) in good weather during the growing season. Over watering should be avoided.

Regular repotting or occasional feeding with a low nitrogen fertilizer seems to keep the plants in clean growth. They will tolerate fairly low temperatures if completely dry in winter, down to almost freezing. A small group of plants well worth seeking out. ■

Photos: Graham Evans unless indicated otherwise

Left and below: *Kadenicarpus heliae*. Four-year old seedlings of this tiny and slow growing new species





Two special crassulas

by Chris Rodgerson

Crassula mesembryanthemopsis is widespread over a huge range in South Africa from eastern Bushmanland to the Atlantic coast and north into Namibia. Perhaps surprisingly there is minimal variation in plants I have seen across this vast area.

By comparison *Crassula susannae* is much rarer being restricted to its type locality, which is a very small area of the north-western Knersvlakte in South Africa. Even as a local endemic it shows some similar if subtle variation in leaf shape and size.

Crassula mesembryanthemopsis grows in quartz-clay soils amongst quartz gravels and is usually seen in small populations.

Crassula susannae grows in compacted sandy-clay among scattered quartz stones and also in small groups of a few dozens of plants.



Fig. 1

A large, old plant of *Crassula mesembryanthemopsis* below Gamsberg in Bushmanland



Fig. 2

Often wholly or partially submerged, *Crassula susannae* is protected from the relentless sunshine and wind with summer temperatures into the 40°C range

The plants are growing on an open and exposed quartzite plain which is patrolled by Nature Conservation rangers on a regular basis

Both are small, low-growing and often level with or retracted sub-surface which makes them equally difficult to find. Both species mostly grow in full sun where the surrounding quartz reflecting light and heat helps to protect them from damage.

Sadly the plants shown in Figs 1 and 3 no longer exist. Despite many objections and studies pointing out the irrevocable damage which would be caused by doing so, a mining concession was granted for the mountain and a car park and offices built where these plants once grew. I am confident, however, that this often cryptic plant exists on the flats and other hills all around here

Bushmanland is dotted with inselbergs – isolated mountains which rise up from the desert-like floor. Many are granitic quartzite and have plateaus such as the one shown below.

Growing on these plateaus one can find different miniature succulents, including *Conophytum*, *Adromischus*, *Anacampseros*/*Avoni*a and various crassulas including *C. mesembryanthemopsis*.



Fig. 3

A group of individual *Crassula mesembryanthemopsis* below Gamsberg in Bushmanland

Figs. 4 and 5

A young plant of *Crassula mesembryanthemopsis* in quartzite gravel on a Bushmanland inselberg plateau

Rain, when it comes, is minimal but potentially year-round and the mountains occasionally get brushed by low cloud from which moisture sustains the plants.

Although closely related (Tölken places them both in the section *Argyrophylla*) and both being rosette-forming, the leaves and flowers of these two species are very different.

C. mesembryanthemopsis carries a terminal cluster of a dozen or so small, white flowers growing almost within the rosette of blue-grey truncated leaves. *C. susannae,* on the other hand, has a small cluster of tubular-shaped flowers atop a short 1–3cm stem which arises centrally from rosettes of thin, greener leaves.



Fig. 6

Flush with the surface of quartz grit, *Crassula mesembryanthemopsis* near Kliprand is well-disguised, pulling itself down for protection during a period of drought. Both this and Fig. 7 were taken in the late afternoon in shade



Fig. 7

The flowers of *Crassula mesembryanthemopsis* near Kliprand showing the frost-like cilia and hairs on the sepals



Fig. 8

West of Heioab in the Namibian Sperrgebiet, *Crassula mesembryanthemopsis* has somewhat paler and larger leaves than its South African form

The flower of *Crassula mesembryanthemopsis* west of Heioab in the Namibian Sperrgebiet. The plant is growing on an east-facing quartz gravel slope

Fig. 9





Fig. 10

Crassula susannae in flower in April during the South African autumn
(Photo: Karel du Toit)

The roots are very different too with thick, almost tuberous roots on *C. mesembryanthemopsis* compared to woody and fibrous ones on *C. susannae*.

Their names are often misspelled, such as *C. mesembrianthemopsis* with an ‘i’ instead of with a ‘y’. The original description (the protologue) of *C. mesembryanthemopsis* was by Dinter in 1919, but he redescribed it in 1923 as *C. mesembrianthemopsis*, citing similarities in leaf shape with *Mesembrianthemum schwantesii*. As the earlier name takes precedence, this later description with the 'i' spelling is invalid.

It is Tölken who is responsible for perpetuating the wrong name. He erroneously cited the 1923 publication as the protologue in both his 1977 *Revision of the Genus Crassula* and his 1985 *Flora of Southern Africa* Vol.14.



Fig. 11

A single flower emerges from the sand from an almost invisible plant of *Crassula susannae*



Fig. 12

*Crassula mesembryanthemopsi*s in cultivation at the end of a three-month dry summer rest



Fig. 13

Crassula susannae in cultivation at the end of a three-month dry summer rest

Adding further to the confusion there is also the similarly named *Crassula mesembrianthoides* which is a totally different species.

Crassula suzannae with a 'z' is often used erroneously. *C. susannae* was published in 1962 for John Lavranos' second wife who discovered it while accompanying him on a field trip. When she drew his attention to it he thought it was lichen. Suzanne was commemorated in the name *Crassula susannae* Rauh & Friedrich (1962). The spelling here is not an error because the name Suzanne had been Latinised to Susanna.

In cultivation, *C. mesembryanthemopsis* and *C. susannae* are a pleasure to grow but both can pose difficulties in many ways.

Both have been in cultivation for many years although neither species is considered easy to grow. Both will rot quickly if left wet for too long or watered at the wrong time, by which I mean when



Fig. 14



Fig. 15

Cuttings of *Crassula susannae* ready to grow after being left to callous for two months. Note the root nubs which will soon establish them as new plants

there is not enough differential between night and day temperatures. I used to struggle with them until I discovered this and now they do well watered in spring and autumn under my UK natural light conditions and left dry during summer and winter.

Propagation is not particularly difficult. I have had success growing *C. mesembryanthemopsis* from seed and leaves but I had no luck rooting the much thinner *C. susannae* leaves and have not had any seeds to try. Both species can be broken up to root as cuttings of individual rosettes but it's easier with *C. susannae*.

The thicker roots of *C. mesembryanthemopsis* when cut are vulnerable to infection and can take a long time to callus and even longer for new roots to start growing.

Both species can suffer with mealy bug and from rust and mildew, both of which will burn leaving unsightly brown marks. All these issues can be successfully treated (or even better prevented) with proprietary brands of insecticide and fungicide.

Neither of these species are often offered commercially but both have common hybrids which may be, either mistakenly or deliberately, sold as the true species. There are the quite similar looking 'Celia' which is *C. mesembryanthemopsis* × *C. susannae* and 'Dorothy' which is *C. deceptor* × *C. susannae*. Less common are 'Fernwood' which is *C. namaquensis* subsp. *comptonii* × *C. susannae* and 'Claudia' which is *C. susannae* × *C. ausensis*. ■

Photos: Chris Rodgerson unless indicated otherwise



Fig. 16

Crassula mesembryanthemopsis at two-years old. In the hands of a skilled grower with ideal conditions, it can be pollinated and grown from seeds easily.
(Photo: Giacomo Paonessa)



Fig. 17

Crassula 'Celia' at two years old. Such plants are often seen offered online as pure *Crassula mesembryanthemopsis*
(Photo Giacomo Paonessa)

Cumulopuntia chichensis

by Phil Crewe

Cacti have many different features that endear them to growers. Hybrid echinopsis are a great choice if you're floored by fabulous floral displays. *Rhipsalis* might be better for those who appreciate gracefully pendant stems. *Mammillaria* offer spirals with hidden intrigue for the mathematically minded and there are a host of miniature plants with almost spineless stems that are perfect for anyone who enjoys looking closely at their varied plant bodies.

Despite the drawback of glochids, the opuntias have their admirers too. Some are worth growing for their flowers and a couple might fit into the miniature-and-almost-spineless category but surely the main attraction for many growers is their spines, which are sometimes colourful or patterned and frequently fierce and eye-catching.

South American plants, such as *Tephrocactus* and *Maihueniopsis*, are a little easier to accommodate in climates where a greenhouse is necessary and are deservedly popular. One very well-armed plant that should be more widely grown is *Cumulopuntia chichensis*.

There are 10 to perhaps as many as 20 *Cumulopuntia* species, depending on whether you separate out some closely related but geographically or altitudinally distinct plants. They are found on both sides of the Andes in north Chile and southern Peru and also western Bolivia and into northern Argentina.

C. chichensis inhabits a comparatively small area straddling the Bolivia-Argentina border near Tupiza. *C. boliviana*, which has a huge range, grows close by and assigning some plants to one or other species can be tricky (Fig. 1).

The segments are matt grey-green and larger than those of most cumulopuntias. Although the plants are hummock-forming in habitat, my plants have a tendency to produce longer chains of stems that sometimes lean and sprawl.



Fig. 1

Cumulopuntia chichensis GC 64.04 from north of Tres Cruces, Jujuy, Argentina grows some way south of the main distribution and may be closer to *C. boliviana*

The long, white spines are produced from the upper half of the cladodes and are this plant's main attraction. On some plants the spines are sufficiently curved so as to form an untidy tangle hiding the stems somewhat.

None of my plants has flowered but this species is generally recognised as being fairly easy to flower and has yellow blooms.



Fig. 2

A different clone of *Cumulopuntia chichensis*

C. ferocior, published very shortly after *C. chichensis*, is generally regarded as being its synonym. Plants I have encountered bearing this name on the label have smaller, less tuberculate segments and few spines, these being 10-15mm and curved downwards (Fig. 3).

I find that when opuntias like this are propagated repeatedly from small plants, the segments struggle to reach the size you would expect of a mature plant. In theory, if grown on to become a large plant, new segments might develop properly but there's little evidence that this plant behaves in this way, so perhaps it's just a naturally small form.

If you like spiny plants, *Cumulopuntia chichensis* is worth looking out for but, as is often the case, some variation between plants means it's worth seeking out a good clone.

Photos: Phil Crewe



Fig. 3

A small or juvenile clone received as *Cumulopuntia ferocior*



Fig. 1

Three caudiciforms

Three caudiciform succulents from different continents which have given me much pleasure over the years

by Ray Stephenson

***Sinningia macrorhiza* (Dumort.) Wiehler 1975 (now considered to be a synonym of *Sinningia bulbosa* (Ker Gawl.) Wiehler**

The only member of the Gesneriaceae commonly encountered by cactophiles is *Sinningia leucotricha*, the state flower of Rio Grande do Sul in Brazil. In collections it is often seen labelled *Rechsteineria*. I have encountered such plants with a 30cm diameter caudex.

Sinningia macrorhiza, despite its name, does not manage a caudex as large as that.

Above: *Sinningia macrorhiza* in a 15cm pot during its resting period (March)



Fig. 2

The undersides of the leaves of *Sinningia macrorhiza* are a pleasing colour



Fig. 3



Fig. 4

Figs 3 and 4 (right) Flowers of *Sinningia macrorhiza*. In habitat these attract humming birds

These plants are very closely related to *Gloxinia* which are not generally considered succulent.

My plant, which is about eight years old, was grown from seed collected in Santa Catarina state, Brazil. For me, it is a winter grower, flowering in January – welcome at that time of the year when little else, except epiphytic cacti, is in bloom.

It is said that these plants grow in relatively rich soils but I grow mine in my usual succulent compost as I have killed similar species by overwatering in winter. I try to keep winter temperatures above 5°C.

***Hydnophytum moseleyanum* Becc.**

This plant was purchased labelled *H. papuanum,* a synonym for plants originating in Papua New Guinea. It is also native to the Philippines, and Cape York Peninsula in Australia. Commonly known as the smooth ant plant, it is a member of the coffee family.

H. moseleyanum is an epiphyte that inhabits mangrove forest and rainforest, and forms a symbiotic relationship with certain species of ants. One does not need a colony of ants to provide formic acid in return for chambers within the caudex but I do regularly spray with a slightly acid solution.

As a tropical plant it is fine in a house with dappled shade and temperatures above 12°C. I spray plants regularly to make sure they do not dry up altogether.

Specialist growers of these 'ant-plants' recommend no repotting and I have seen some top-heavy specimens on the internet that are much larger than their tiny pots.

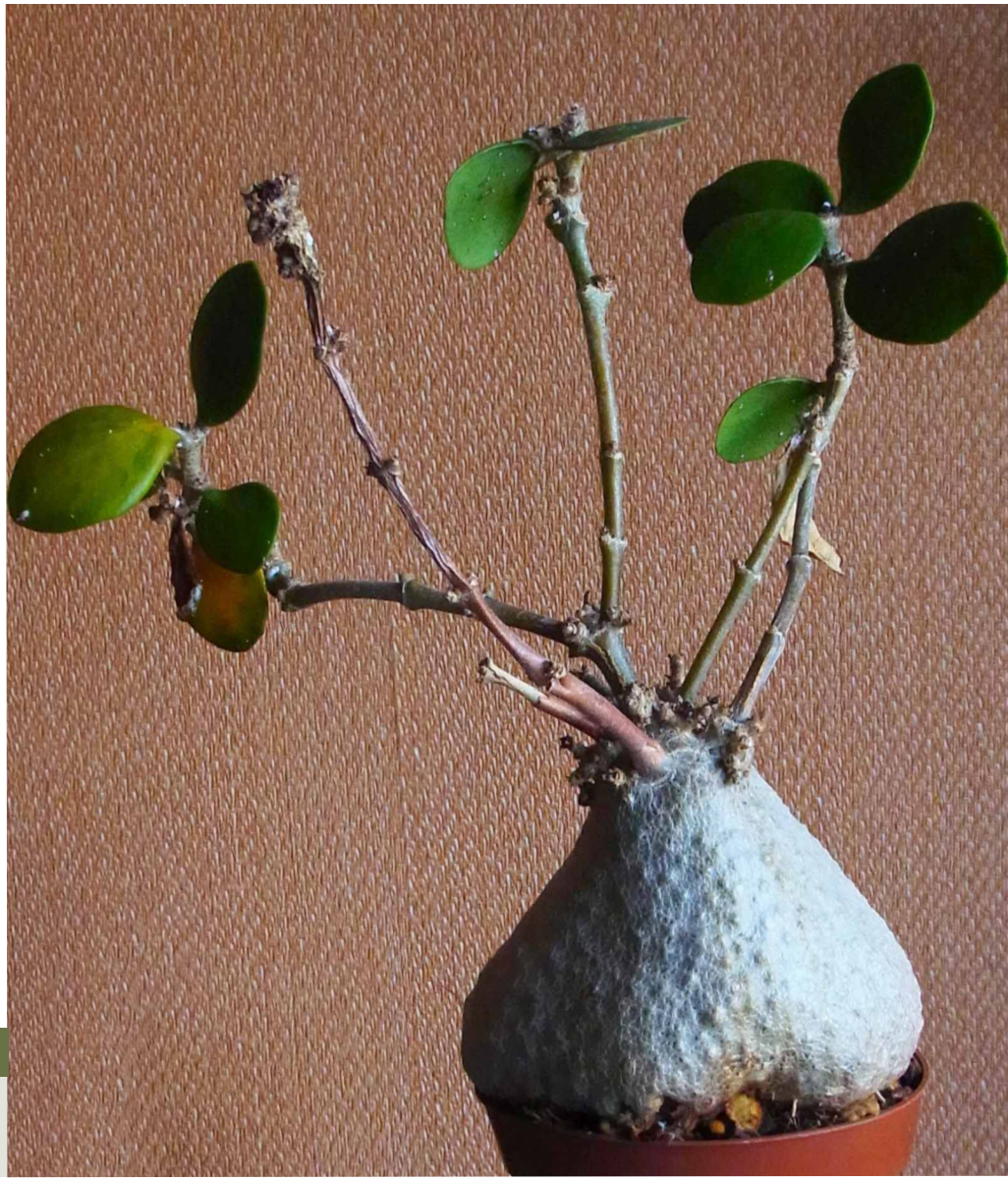


Fig. 5

Hydnophytum moseleyanum in a 12cm pot



Fig. 6

An 'ant hole'

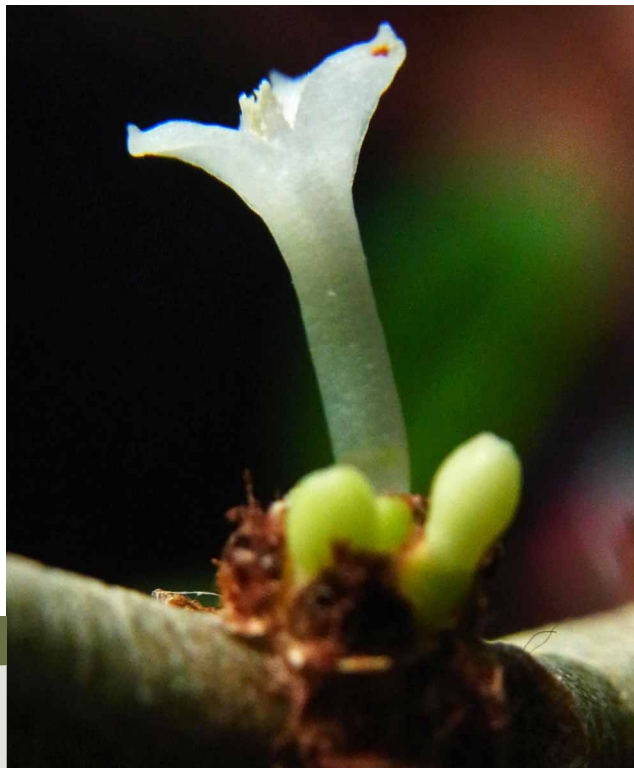


Fig. 7

The flowers of *Hydnophytum moseleyanum* are small (4-5mm long) and insignificant

Stephania rotunda Lour.

Purchased as *S. rotundifolia,* which is a commonly seen misnomer, this plant starts growing in spring and can reach two metres in three weeks. It clambers over vegetation and, for me, tries to cover a window with foliage.

Often sold as the 'Himalayan Turtle Plant' the species is widespread in semi-forested areas in south-east Asia, where a caudex can be as big as an armchair.

I water regularly when the plant is in growth and keep temperatures above 10°C. For me, it is much safer as a house plant than in the greenhouse where temperatures have been known to plummet.



Fig. 8

Stephania rotunda a ten-year old plant in a 20cm pot

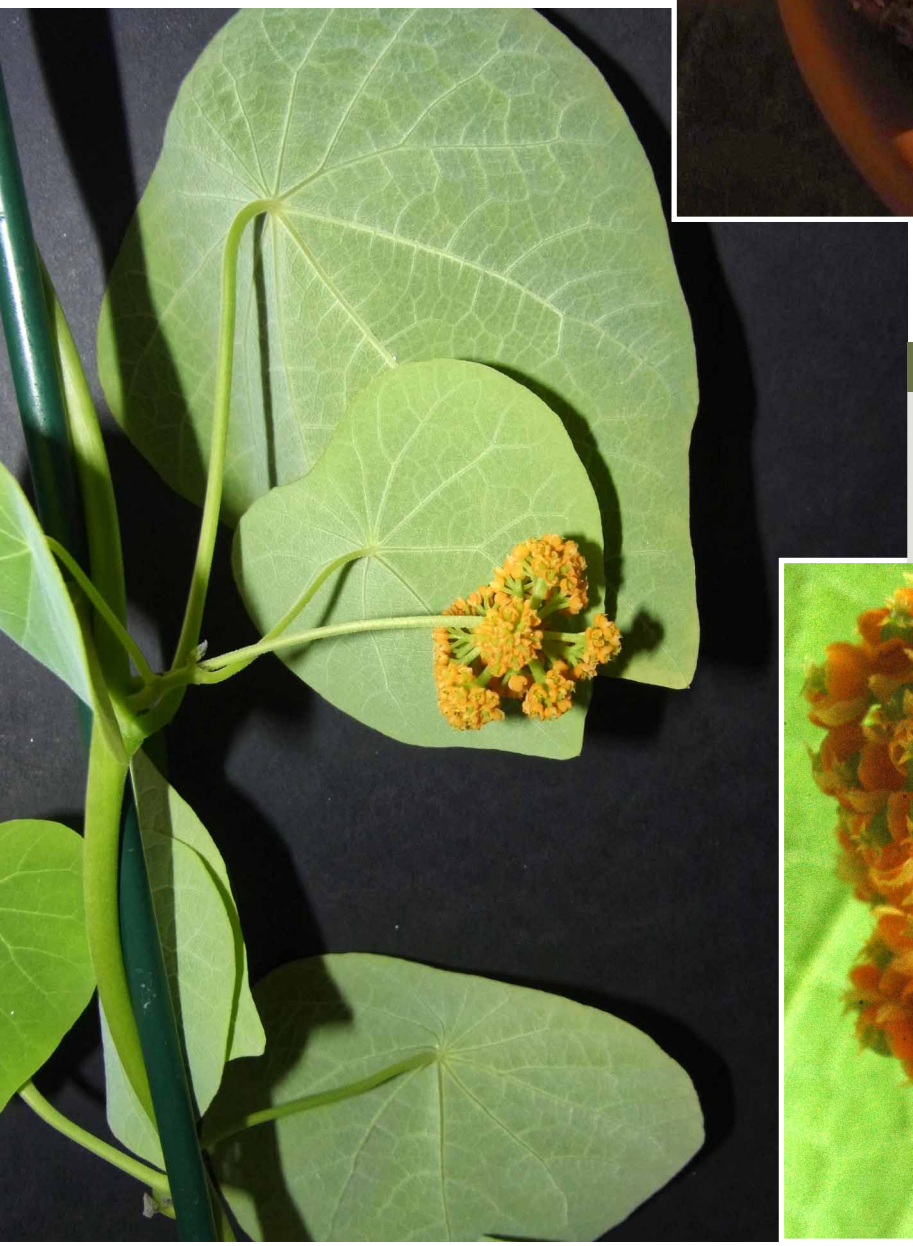


Fig. 9

Stephania rotunda has heart-shaped foliage and a cluster of rather insignificant flowers in mid-late summer. The flowers are single sex, these are female.

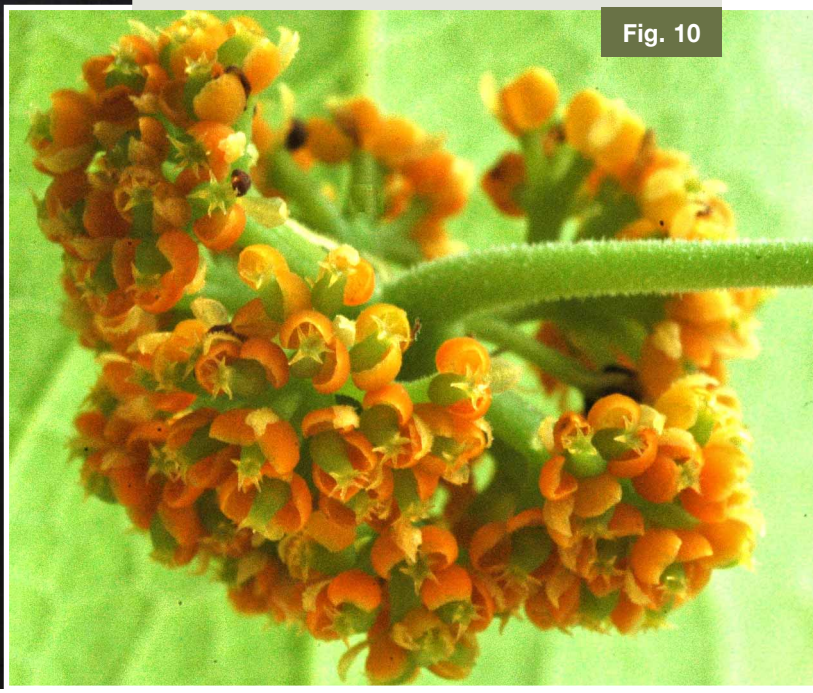


Fig. 10

The Good, the Bad ...and the Ugly

by Paul Spracklin

I am not that keen on opuntias – there, it is said!

Mostly I find them scruffy and difficult to live with. Under glass their brittle pads soon invade their neighbours and planted outside (my favoured choice), they generally collapse. And don't get me started on glochids.

Occasionally I reconsider and feel I am being unnecessarily dismissive about them. So it was that in October 2023 I found myself returning home from meeting up with Martin Edwards of the Harrow Branch of the British Cactus and Succulent Society with a job lot of around 20 unwanted opuntias stowed safely in my boot.

My intention was to plant them all outside and see how they fared.

All were labelled, many were duplicates.



The opuntias as they arrived home in October 2023

October is far too late in the year for new cactus plantings so I squeezed them into my small unheated greenhouse for attention in the spring. Sadly, not all of them made it that far. I admit that one particularly scruffy pair went straight into the compost bin.

A few rotted. The teetery temporary shelving I had put them on fell over when I clumsily brushed past, sending plants, pads and – annoyingly – labels flying in all directions.

April 2024 saw the dozen or so remaining conscripts ready and waiting for a new life in the sun. All were planted in my recently constructed south-west facing slope – an area that is composed entirely of rubble and all-in ballast, giving perfect drainage, and receives sunshine from early morning until dusk.

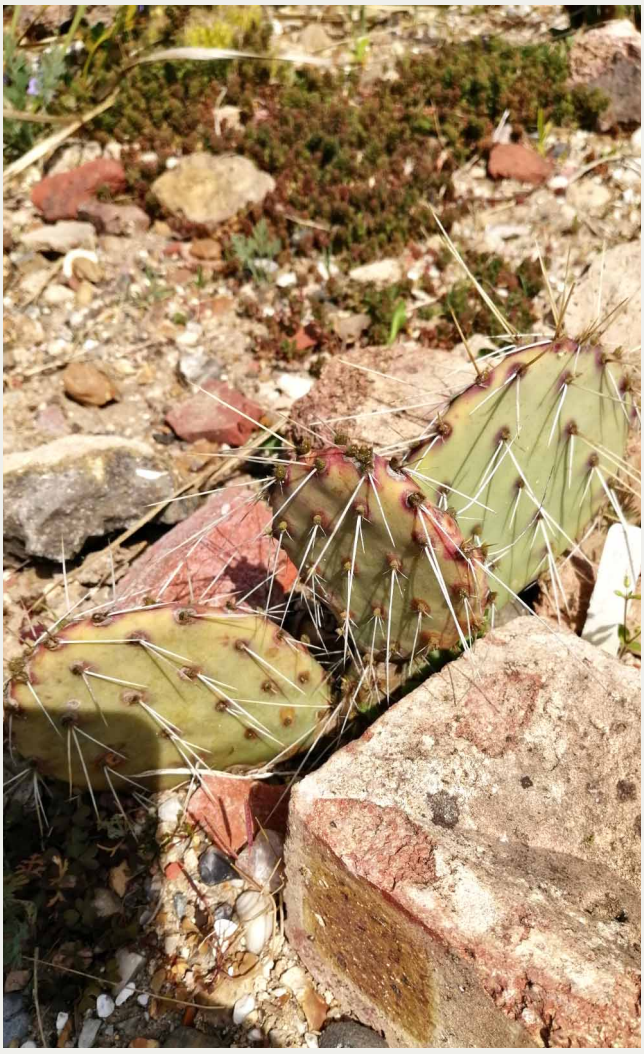
I would say that here in my corner of Essex the growing season was average – with the usual mix of hot spells, lengthy dry spells and occasional heavy rain.

My winter was fairly mild, with my coldest temperature on the rubble bed being a brief dip to around –5°C in December with no extended freezes. All the new opuntias were kept uncovered for the duration.

The Good

April 2025 has arrived and I would say results are mixed. Starting with the good – a pair of *Opuntia phaeacantha*, evidently twins although the provenance on the label reverse is now unreadable. I am pleased to have finally found a good clone of this species as my past experiences with it have been poor.

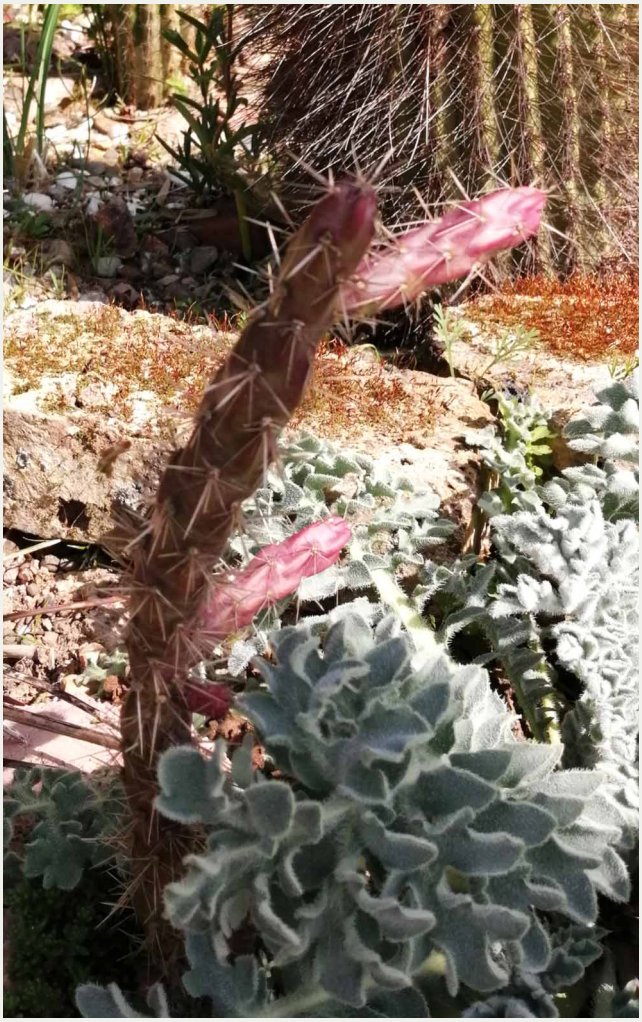




The Good A pair of *Opuntia phaeacantha*. These two look promising, in pristine condition with bluish pads edged nicely in red.

The Good *Cylindropuntia imbricata* – triples this time – all flushed a good red in the strong spring sunshine we have had this year. I grow this taxon already but these additions are most welcome.





The Good I found *Opuntia fragilis* to be looking happy, once I rediscovered where I had planted the little thing.



Moving on to the Ugly

The Ugly *Maihueniopsis darwinii* var. *hickenii* is not something I would ever have chosen to buy but it was there in among the others.

It shows slight damage but has new growth, maybe even a flower bud waiting to burst and is trying hard to impress.



The Ugly of the next four – *Cylindropuntia molesta*, *Opuntia santa-rita*, *Opuntia basilaris* and another clone of *O. phaeacantha* – I think the most I can say is that they are still alive. Hopefully this year will bring a change to their fortunes otherwise they will be replaced.



Cylindropuntia molesta



Opuntia santa-rita



Opuntia basilaris



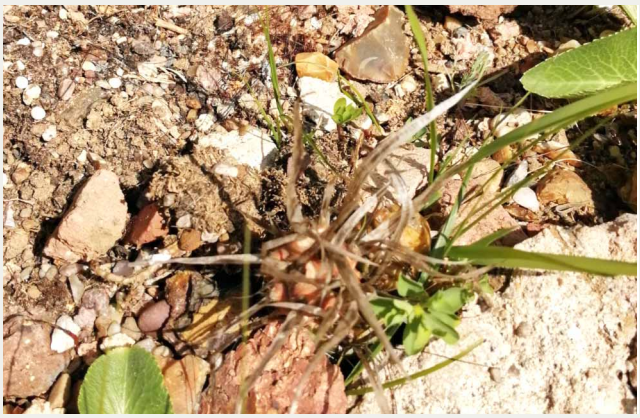
Opuntia phaeacantha

Finally, the Bad



The Bad Disappointingly, *Opuntia microdasys* and the final clone of *Opuntia phaeacantha* simply died.





The Bad *Tephrocactus articulatus* also succumbed (although, in truth, I will not mourn its passing). It could be that these three plants were not in the best of health when I acquired them.

Overall, I am pleased: pleased to have some new potentially attractive additions to my garden and pleased to have given some unwanted plants a new lease of life.

Indeed I am pleased to have tried more opuntias.

Will I seek more out in future? Probably not. ■

Photos: Paul Spracklin

Euphorbia canariensis

The Canary Island Spurge

by David Ilett

Fig. 1

Euphorbia canariensis is endemic to the Canary Islands where it can be found throughout, with the exception of Lanzarote. It has also been introduced to Tunisia.

The species was first described in 1753 in the first edition of Linnaeus's *Species Plantarum*, in which binomial nomenclature was initially introduced.

In habitat *E. canariensis* can grow up to 3m tall and branch freely from the base (less frequently higher up the stems) and can form clumps of up to 10m across (Fig. 2).

Fig. 2

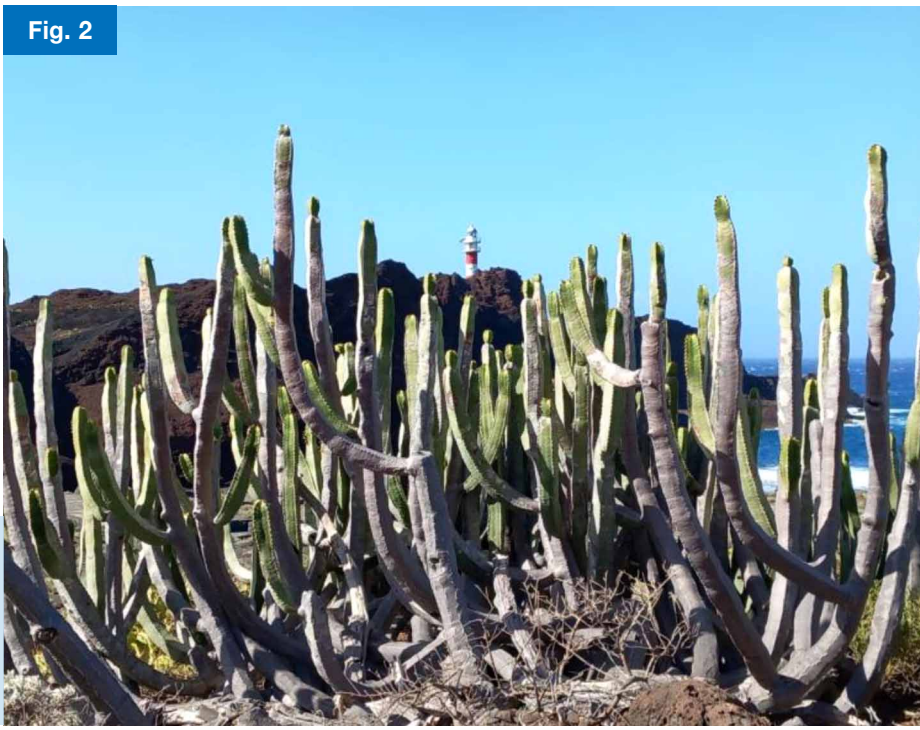


Fig.1 above: *Euphorbia canariensis* in habitat on the Teno peninsula, Tenerife among some *Euphorbia balsamifera*

Fig 2 left: A large clump of *Euphorbia canariensis* growing on the Teno peninsula

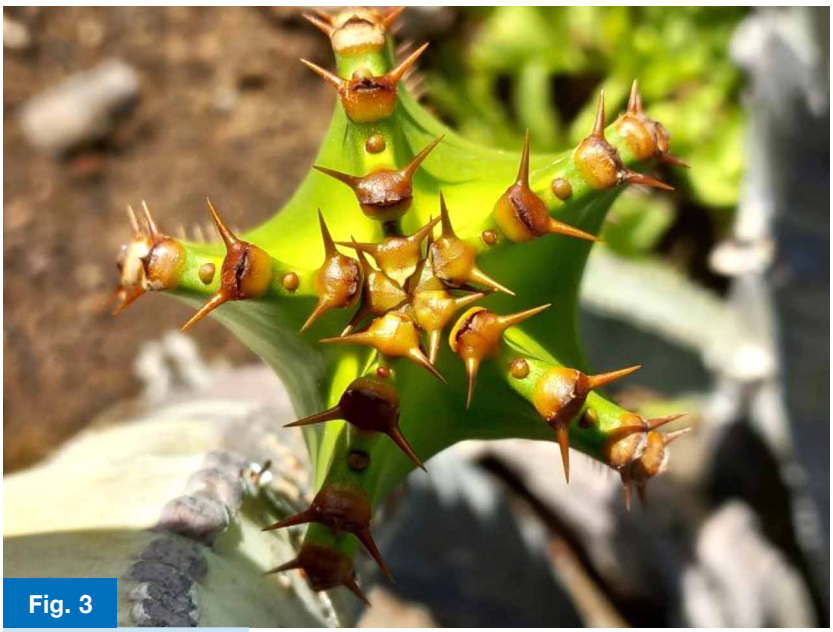


Fig. 3

A five-ribbed stem

The stems have 4–6 ribs (Fig 3) and while new growth is a fresh green older growth tends to be a greyer green (Fig 4).

The cyathia are dark red in colour and about 8mm in diameter (Fig 6).

Most of the examples we observed were seen in Tenerife and La Gomera and, although some were seen on Fuerteventura, these tended to be planted-out specimens in gardens (Fig. 5). In habitat they are usually found growing in dry, rocky areas, and do not seem to be put off by growing over the edge of a rock face (Fig. 7).



Fig. 4

New and older growth



Fig. 5

An attractive clump of *Euphorbia canariensis* photographed at a petrol station



Fig. 6

The red cyathia

On the Teno peninsula there was plenty of evidence of the attempts to clear the area of invasive *Opuntia* species (including a big pile of dead pads on some rocks away from the main path) to give the native plants a better chance, although there were still plenty of opuntias alive as well.

I have since acquired a specimen of *E. canariensis* for my collection and, even though it will never reach the impressive size of the habitat plants we saw, it is still an attractive addition. ■

Photos: David Ilett

Videos of the trips are available on YouTube at
The Prickly Pair channel
The BCSS YouTube channel



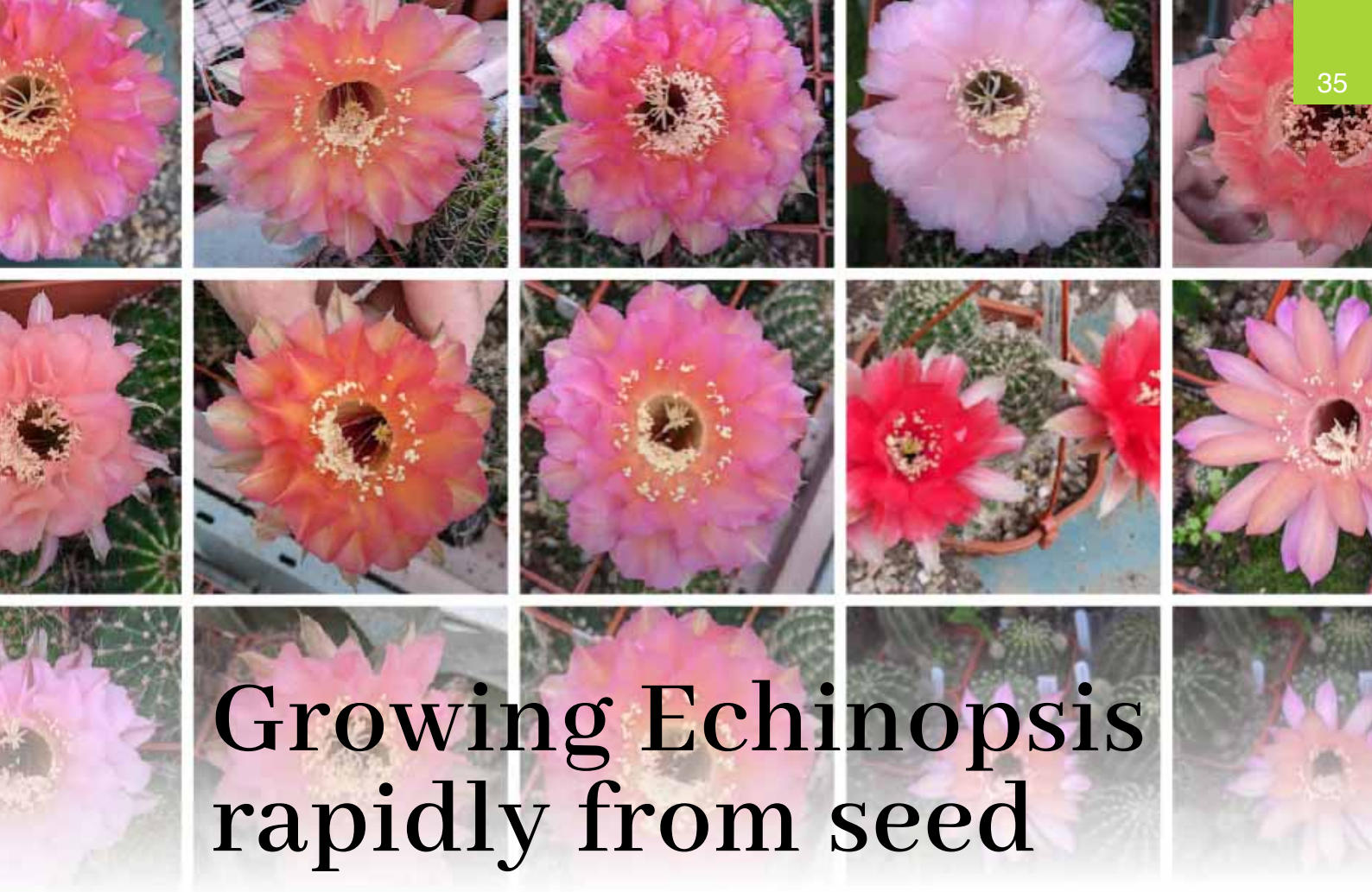
Fig. 7

Hanging over a cliff on La Gomera

Another mature specimen of *Euphorbia canariensis* on the Teno peninsula, Tenerife

Fig. 8





Growing Echinopsis rapidly from seed

by Ed Seeley





Like many others in this hobby I find that a key part of my enjoyment is growing plants from seed. Having been a keen gardener all my life, sowing seed is second nature and it almost feels wrong if I'm not doing it each year!

Cacti, however, can be frustrating things from seed as the time it takes them to grow and look impressive or flower is measured over many years for some species. Hopefully the methods outlined below might help others grow a range of cacti more rapidly but please note I only use them with *Echinopsis*, *Trichocereus, Chamaelobivia* and similar hybrids. I have had some instances of rotting with more delicate species so you might need to moderate these methods for them.

Some of the first cacti I grew from seed were hybrid *Echinopsis*. I ordered seed from Abbey Brook and from a breeder in Germany. I also bought a few larger echinopsis and got properly hooked on *Echinopsis* hybrids which led to me starting a more serious breeding effort. My primary aims are to try and breed longer-lived, large flowers and also breed large multicoloured flowers. At all stages I am selecting for large bloom size (10cm plus) and I am always a sucker for rich magenta colours!

I have a good understanding of genetics from my academic life many years ago and keeping and breeding various tropical and coldwater fish for much of my life. I have also picked the brains of Brian and Gill Fearn during a good number of visits to Abbey Brook Nursery to get their tips. So I think I have a clear understanding of how I am planning to conduct my breeding project – or at least a decent idea of where to start!

The first principle in my breeding effort is that I start with a range of plants from different breeders to cross their breeding lines. This is to try and bring new gene combinations together to hopefully combine the best from various different breeders such as Abbey Brook, Schick, Southfields and others.

The second important principle to me is that I am trying to flower every single plant I grow before discarding it. I am doing this as I know that the genes across a range of offspring will have a normal distribution and, if I want that one-in-a-thousand, exceptional flower, I need to flower every possible plant to select the very best. I have already found some crosses where I have 15 or so nice blooms but then one plant flowers which is that little bit larger, or flatter, or slightly richer coloured. I also like to keep promising plants for a second season at least to see them flower again when they are slightly larger to see if they are still as good.

I find that a key part of my enjoyment is growing plants from seed...it almost feels wrong if I'm not doing it each year!

So why bother trying to accelerate the time to flowering when many others have not done so? Well, quite simply it is to decrease something called the mean generational time or interval. This is the time from seed to seed (or any stage of the life cycle to the same point in the next generation). Brian Fearn in his book *The Echinopsis hybrids of Abbey Brook* says that it generally takes four years from sowing for the first *Echinopsis* to flower. If you only bred with these precocious flowerers you would have two and a half generations each decade. With the methods I outline below, I have had a good number of plants flower in around two and a half years, which means I can get four generations in a decade, not quite doubling the number of generations and crosses I can do, but not far off.

Possibly more importantly, plants that might take six or more years to flower if



grown conventionally will hopefully flower in four or so years. This means I have a wider range of seedlings that I can use in future crosses. It allows me to take promising offspring and backcross or repeat productive crosses much more quickly than might otherwise be the case. Also, in many organisms, those that are earliest to reproduce often produce disappointing outcomes when compared to slower maturing siblings (they are called 'tobies' in koi breeding and race ahead of their siblings but never achieve the size and quality of their slower growing peers).

At the other extreme, you do not necessarily want the slowest growing or runts. If they have an exceptional quality it might be worth crossing these with a very strong growing plant (either an unrelated hybrid or back-crossed to species) to offset their poor growth while trying to retain the qualities you were after; but you will never produce that one-in-a-million plant that will be worth sharing.

Harvesting and sowing

The first step is trying to harvest the seeds promptly and clean them. I wait for fruits to split or fall off the plant, so the timing can vary and later crosses may not ripen until the late autumn. I wait until I have all crosses cleaned and sow everything together, as it would be a nightmare following the protocol below if they had all been sown at different times.

In the summer as they are flowering, every cross is tagged with the mother and father and date of cross. On my database I also log the cross and then track it to see if I get a successful set (or not). At the point of harvesting the seed I then log the approximate number of seeds and date of sowing. I only give the cross a breeding code when I have collected the seeds and all the plants are tracked and labelled using this code until they flower. For my crosses they get an ES prefix followed by the year and then a digit – for example ES25/3. For seed given by other breeders I either use their codes (if they have them) or assign a similar code based on their name.

I will then sow the seed as soon as I can in the autumn. To do this I need to provide two things through the first winter: heat during the day and light. Both of these are a lot cheaper and easier than you might think. I do it via a simple plug-in windowsill seed tray with LED lights above it. The change of temperature from day to night seems to be beneficial for encouraging or at least not suppressing germination and a simple timer performs this well. Just make sure you use a reliable one which will cope with the current load at switch on – I use old-style, compact timers with pins as I find they run for many years without failure.



Newly sown seed

The seed tray has a raised floor made of egg crate lighting diffuser which allows all the excess water to drop below the pots and then be heated to create a humid atmosphere which I find aids germination.

Seeds are sown into either 4cm, 6cm or 8cm square pots or quarter seed trays for really successful crosses. Anything up to 25 or so are sown in 4cm pots, 60 or so in 6cm, up to around 100 in 8cm and more than that in the quarter seed trays. This does depend on how many crosses I have to sow, however, and I have squeezed more into pots on many occasions! (In an ideal world, where I was not limited by propagator space, I would step these pot or tray sizes up to allow more growth at this stage.)

The potting medium is John Innes No 2 with about a third perlite added to improve drainage. This is sterilised in the microwave before sowing. After sowing the seeds on the surface, I add a very light, almost single, layer of grit to help stabilise the seedlings when they emerge but still allow light to get to the seeds.



After germinating, seedlings are left to grow in this propagator with heat during the day and light all the way through the winter.

Pricking out

As the days start to lengthen in the spring the seedlings are usually around 4mm or so across (but this depends on how crowded they are in the pot!) and ready to be pricked out to move into more space. A key part of accelerating growth is to ensure you are always giving the plants space to grow. As soon as they fill a pot or tray and are squashing against their neighbours then growth will be slowed or bigger plants will start hampering the growth of the smaller ones – and remember these smaller ones may be the ones with the most exquisite flowers!

The seedlings are pricked out into full or half seed trays. I usually put around 48 seedlings in a half tray.

When growing other plants (hardy perennials mainly) I prefer to prick plants out into divided modules in trays. I find these improve growth down the line as you are not disturbing roots again and causing checks in growth when plants are potted on. They also maximise space in the growing areas compared to growing straight into larger pots.

When I tried pricking cacti out into modules, however, I found these were a nightmare to keep evenly wet while also allowing them to dry out. Plants that grew well caused their module to dry out quickly, needing watering to keep them growing, while the slow-growing ones were then kept constantly wet as they were not using the water as quickly in their module. This caused some to slow as they lacked water and some to die as they got too wet. By switching to larger trays and growing them together there seems to be a much larger reservoir of water in the compost and the plants growing well ensure the cycle of wet and dry is maintained for all the seedlings.

The trays are then placed in the next growing space. This is a well-lit, heated space (which also happens to be my



Seedlings ready to be pricked out



The seedlings are pricked out into full or half seed trays



office). It is a large space with a conservatory roof which means it has excellent light levels and, being set within a building, it is also nice and warm all year round. They get a spot with only a couple of hours direct light for the next six or so months and are watered at least weekly over this summer. By the end of this time, the seedlings now usually average around 2cm across and are starting to touch each other.



Seedlings placed in a tray and now beginning to touch each other

Their own pots

At about 10–11 months from sowing these plants are usually ready for their next move which is into individual 6cm round pots. I found this size allows the plants a degree of independence and allows me to look after the slower growing plants a bit more if needed. I really try to resist putting smaller plants from a batch into smaller pots but have, with very small seedlings, potted them up as multiple seedings in a 6cm pot. Each pot gets a tiny label with the cross code to prevent confusion.

After this repotting they go back to the office for the next winter. I can fit 54 to a waterproof tray and these now move to a sunnier spot where they get six or so hours direct light in the summer but only an hour or so in the middle of winter. Because I have to work in there, my office is heated throughout the winter. Most of the time it is at least 16°C or warmer during the day meaning plants grow right through the winter and can be watered and fed regularly. It does get down to 8°–10°C overnight and I stop watering a couple of weeks before the Christmas holiday just in case we have a really cold snap when it can drop down to around 4°C.



Seedlings in 6cm pots



The final move for most

Under this regime these plants are usually ready for their next move towards the end of that summer. Again, the key trigger for this is when the plants start touching in the 6cm pots meaning the bigger plants are 6cm diameter or more. This move is into 7cm square pots. I really prefer square pots but I also use the 6cm round ones as they are robust, relatively cheap to buy and seem to work well for the small seedlings.

Once in the 7cm pots, the plants move into my greenhouse at home. This is an unheated greenhouse and the square pots allow me to stack these in nice and close together, maximising the numbers I can fit in the space.

I feel that this move to my greenhouse is an important part of my success here. Some plants will flower even with the temperatures in the office, but some crosses need a colder rest and getting this after growing to a decent size so quickly is a key part of triggering the flowering earlier.

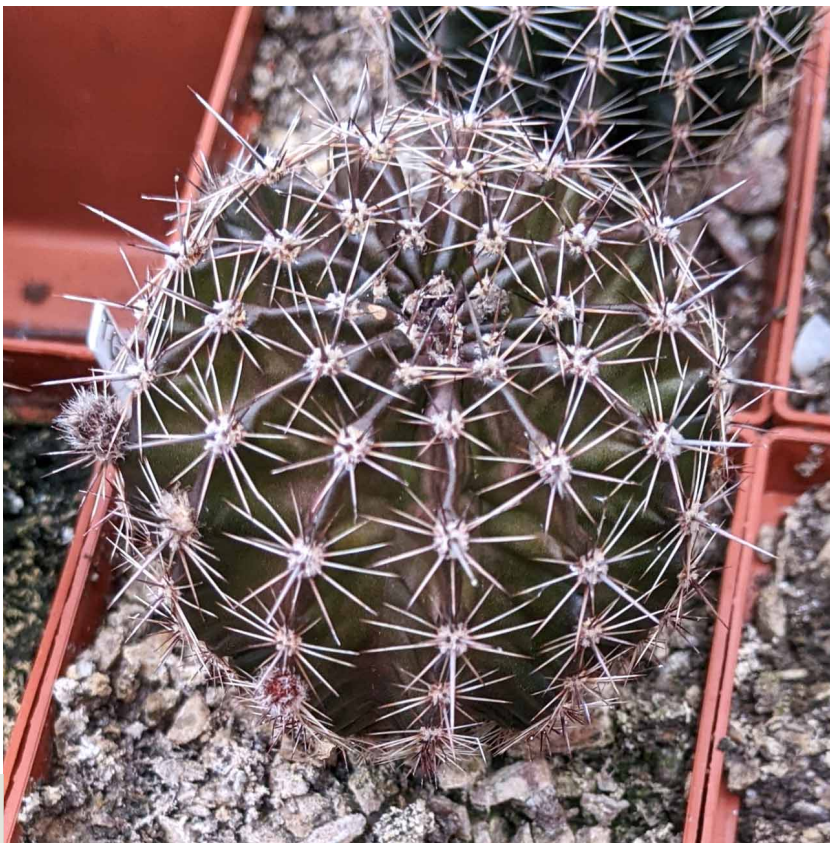
At this point the plants' care reverts to a more normal pattern and watering stops in autumn so they can dry out and survive their first proper winter. My greenhouse is unheated and does drop below freezing but I have very few losses with this regime and they are usually plants that were damaged or struggling before the winter.

If I have space and time, these plants may then get potted on again into 9cm square pots but I have now found that I can flower most seedlings in the 7cm pots and that some plants will even flower in the 6cm round pots at around 4cm diameter. So currently, only the later flowering seedlings or possible keepers get potted on again.

Come the start of the next year, buds will start to form on many of the plants. I find around 40% of some crosses will flower in that second summer under this regime. The majority have all flowered by the end of the next summer. My record is an echinopsis flowering in 21 months from sowing to flower. Most are around two and a half years.



Seedlings in 7cm square pots



A seedling with its first bud



Selection

The next step is possibly the toughest – selection! I give every plant the final bit of the breeding code and number them in order of flowering (e.g ES25/3-01), photograph every flower and log date of flowering, size, colour(s) and any other notable features on my database. The last bit of the code is added to the original label by pencil and for keepers I have now started adding a pencil written larger label with a brief description to allow me to know which is which more easily in the greenhouse.

Then I get rid of the ones that did not make the cut! I try to pass them on in some way but some end up on the compost heap! I have only had one truly awful flower out of all the seedlings that have flowered so far, many of them are nice but just not necessarily special enough to keep! The name of this game for me is finding the exceptional – not just the nice!



The only plant I have flowered so far that I feel may warrant a name is this one – *Echinopsis* 'Raspberry Crush'. It has large (11cm) flowers with richly coloured and veined petals that have a slightly redder edge. The plant itself is also relatively attractive with strong spines and an upright type of growth. It's currently in further growth to see how it performs over the next couple of years. If it continues to flower and grow well I will start to share its pups if anyone wants them!



I have also had another promising candidate flower this year – TG58-01. This shows strong multicoloured flowers. It is a little too small to get a name straight away (at currently 86mm across). It will get grown on for another year as it is flowering in a 6cm pot and, who knows, it might get up to a better size next year. I have also saved pollen to cross it to a larger flowered hybrid this year and see if that improves the size while retaining the colours.

If you would like to try growing hybrid *Echinopsis* from seed I would really recommend getting a pack of mixed seed from somewhere like Abbey Brook. By buying a pack of mixed seed you are getting seeds from multiple crosses which will give you a much greater range of flower colour and shape in your plants than growing a bunch all from a single cross. Good luck! ■

Photos: Ed Seeley

The marginate agaves of section Heteracanthae

Part 2

By Colin C. Walker

Introduction

This article follows on from my earlier introduction (Walker, 2025) to the marginate agaves of section *Heteracanthae* (formerly known as group *Marginatae*), which is the largest section in the genus with around 30 species. To recap: this section is characterised by having rosettes of stiff, straight leaves, usually bearing continuous horny margins with conspicuous marginal teeth and prominent leaf bud imprints. Terminal leaf spines are also usually very prominent and sharp. Their flowers are relatively uniform being usually small, short and openly funnel-shaped. I have not flowered any of the species discussed in this part.

What follows is a discussion of a further 10 species in this section, together with two additional popular cultivars: a variegate and a hybrid. Several of the plants discussed here are very rare or as yet unknown in cultivation, at least in the UK. Two of the species were only described as recently as 2024. One other species is very popular and common in cultivation but it is now generally seen with an incorrect identification.

Agave horrida, *A. perotensis* and *A. yucuanensis*

Of *A. horrida* Starr (2012) wrote that "Apparently Charles Lemaire [who described the species in 1864] fancied this a horrible-looking agave – while others find the bizarre and wicked teeth on some of the plants to be fascinating". Indeed, this is a fiercely-toothed and spined agave that does not deserve to be considered horrible at all!

I have very limited experience of this species in cultivation since my lone specimen is currently either misplaced or it may actually no longer be part of my collection. So, to illustrate this species, I

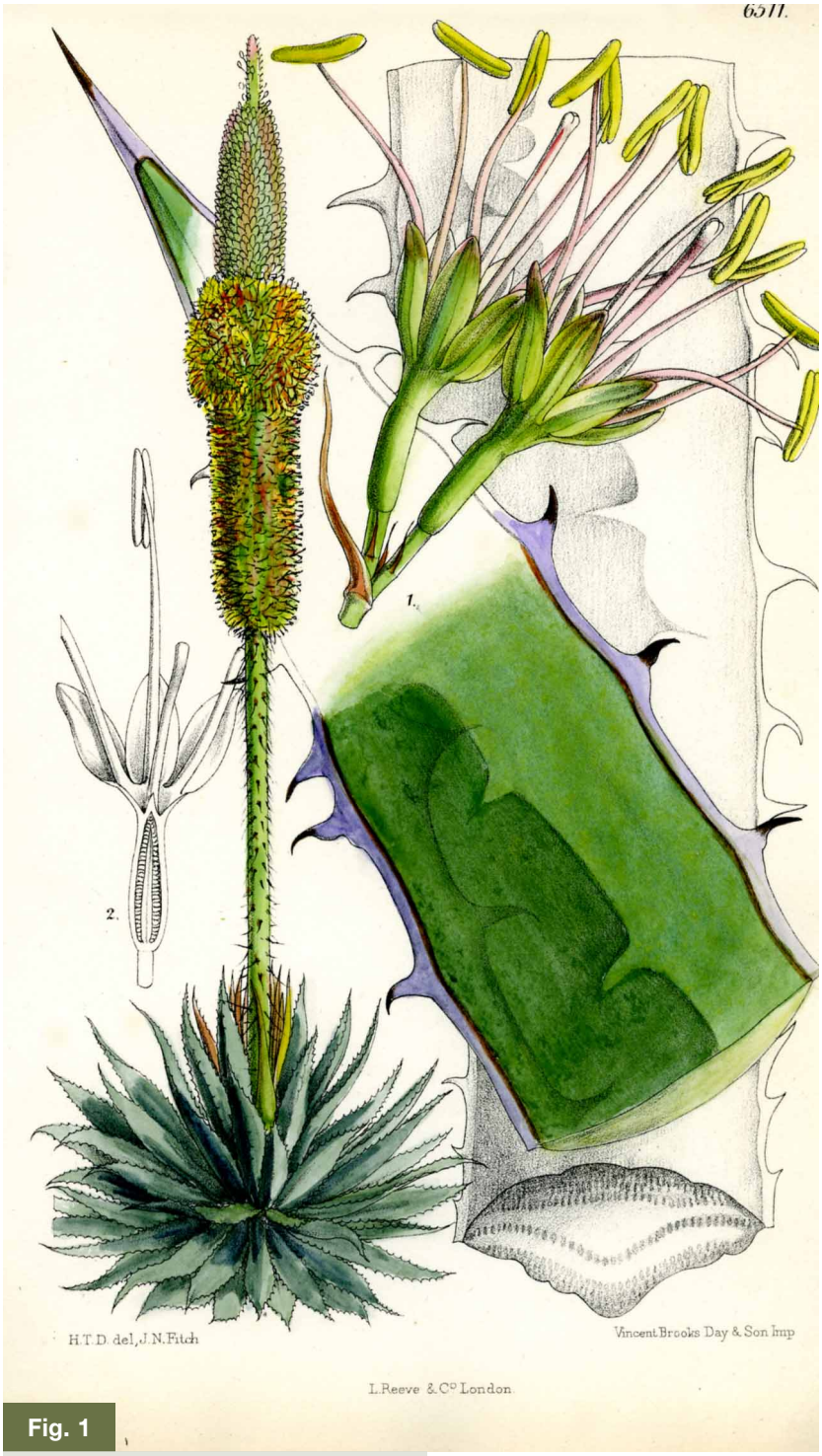


Fig. 1

Agave horrida from Baker (1880)

am using the hand-coloured plate from Baker (1880), who wrote that "this is one of the best known of the smaller Agaves with a distinct continuous horny border to the leaf. It was introduced from Mexico by Verschaffelt [a Belgian nurseryman] in 1862" (Fig. 1).

Agave horrida forms compact solitary rosettes up to 90cm across that are formidably armed with marginal teeth that are either straight, variously curved or sometimes hooked, light grey, up to 15mm long, whilst terminal spines are very pungent, flattened rather than grooved above and up to 4cm long.

The inflorescence and flowers as shown in Fig. 1 are typical of those in *Agave* section *Heteracanthae*. The densely-flowered, unbranched, spicate (spike-like) inflorescence is 3–5m tall, bearing paired flowers 35–46mm long, yellowish green to reddish in colour; flowering occurs in habitat in February to March (Starr & Juárez García, 2024).

This species occurs in the southern Mexican states of México, Morelos, central Puebla, central Guerrero and north-western Oaxaca, where it grows on volcanic rocks and rocky slopes in mountainous regions, pine-oak forests and scrub at altitudes of 1,600–2,440m. It is recorded as being pollinated by a species of nocturnal bat and two species of diurnal hummingbirds (Thiede, 2020).

Two recently named new species are close relatives of *A. horrida*. Starr & Juárez García (2024) elevated *A. horrida* subsp. *perotensis* to specific status as *A. perotensis*. This was initially described as a subspecies in 1990, named for the town of Perote in north-western Veracruz. This has had a very confused taxonomic history since it was misidentified by Howard Gentry (1982) in his monumental monograph of North American agaves as *Agave obscura*, a very different species from another section in the genus that truly lives up to its obscure name! Now *A. perotensis* is viewed as a close relative of *A. horrida* but it differs, among other features, in its larger rosettes of larger leaves, longer terminal spines and flower colour.

Secondly, a completely new species in this section has been described as *Agave yucuanensis*, named for the municipality of San Bartolomé Yucuañe in Oaxaca. This species differs from *A. horrida* and *A. perotensis* in its even larger rosettes composed of a significantly larger number of leaves and in its especially tall inflorescences bearing longer flowers of a different colour.

Unsurprisingly, I have no experience of either *A. perotensis* or *A. yucuanensis* in cultivation.

Agave impressa

This species was first collected in 1974 and later described by Gentry (1982). It has a very restricted distribution in western Mexico in the states of southern Sinaloa and central Nayarit, where it grows in tropical semi-deciduous forests on volcanic rocks in the hot lowlands at altitudes of 150–700m (Thiede, 2020).



Fig. 2

Agave impressa in cultivation. (Photo: Jeff Moore)

It was named '*impressa*' for the prominent bud imprints on the leaves which make the plant an impressively attractive specimen when fully mature (Fig. 2). Its solitary rosettes are openly spreading up to 1.6m across, consisting of leaves that are spreading, thickly fleshy, up to 60cm long and 9cm across. The leaf margins are horny, continuous, light to dark grey bearing straight or slightly curved blunt teeth up to 5mm long. The terminal spines are stout, sharp to blunt at the tip and up to 5cm long.

My plant, however, has proved to be very troublesome and exceedingly slow-growing in cultivation and after 14 years in the collection its impact is underwhelming and far from impressive (Fig. 3). I will continue to persevere with it in the hope that it might eventually reach maturity and live up to its name!

It is a distinctive species without close relatives since its very symmetrical rosettes are quite unlike those of any other *Agave*. Thiede (2020) reports a cultivar named 'Green Giant' which apparently has longer leaves and hence larger rosettes.



Fig. 3

Agave impressa in a 14cm diameter pot

Agave lechuguilla

This is one of the earliest species in section *Heteracanthae* to be described, being named in 1858 from the diminutive of the Spanish '*lechuga*' meaning 'salad', perhaps from the vernacular name and use of the plant in Mexico. As a consequence of its relatively long history it has acquired many synonyms.

It is the most widespread of the 30 species in this section and the only one that is native to the USA, ranging from southern New Mexico, west and south-west Texas through the Mexican states of Chihuahua, Coahuila, Nuevo León, Tamaulipas, Durango, Zacatecas, San Luis Potosí, Guanajuato, Querétaro, Hidalgo and México. It grows in a diversity of environments ranging from gravelly to rocky calcareous places in desert scrub and the Chihuahuan Desert at altitudes of 500–2,500m. Indeed, this is the dominant *Agave* species in the Chihuahuan Desert and a characteristic component of several desert communities. It hybridises with several other species, notably with *A. nickelsiae,* and hence is probably one of the parents of the renowned cultivar *Agave* ×*pumila* (Thiede, 2020) discussed below.

Agave lechuguilla in a 23cm diameter pot

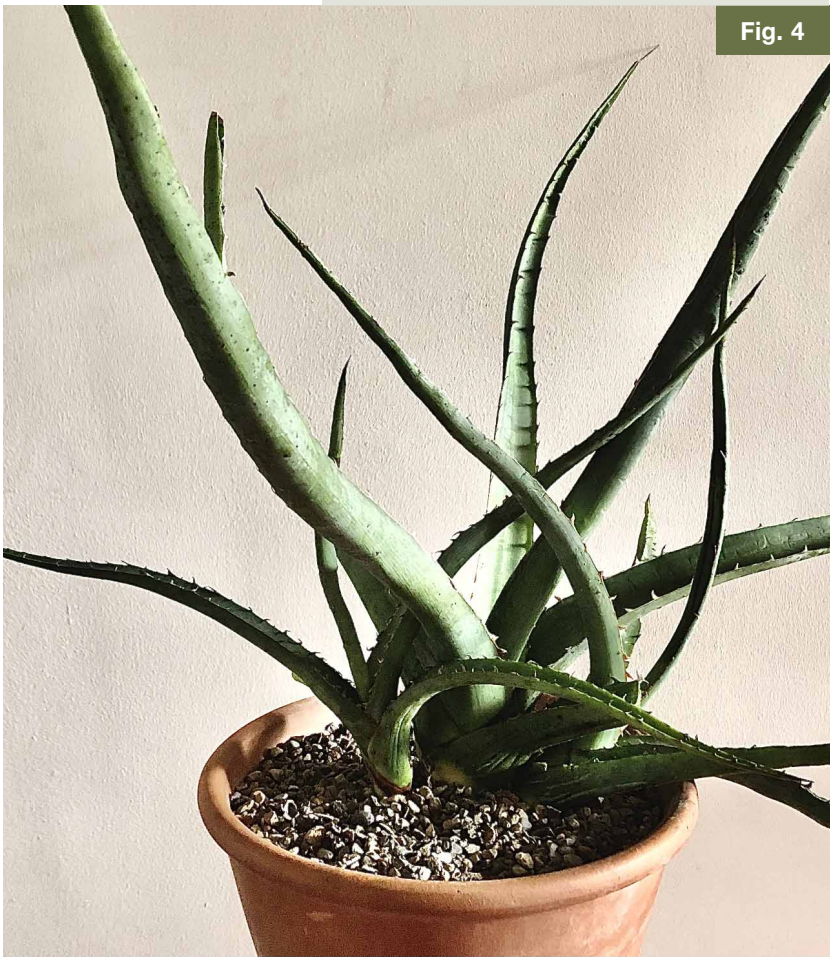


Fig. 4

The plant (Fig. 4) is stemless with open rosettes that are freely suckering to form extensive clumps. Its leaves are few, stiff, linear-lanceolate (long and narrow), erect to spreading, deeply gutted on the upper surface and striped on the lower surface, up to 50cm long and 5cm across, light green to yellowish-green, sometimes marked with darker green. The leaf margins are straight and continuous, light brown to grey, easily separable from the dry leaves. Marginal teeth are typically deflected, weak and friable, brown or mostly light grey; terminal spines are strong, pungent, grooved, greyish and up to 4.5cm long (Thiede, 2020).

This species is usually easily recognised by its widely suckering habit and narrow leaves with downward slanting teeth on straight margins. It was an important source of hard fibres known as 'istle'.

In pot cultivation it is relatively fast-growing and readily offsetting but it is one of the least appealing of this large section of the genus.

Agave lophantha

When fully grown this species has a rosette up to 60cm in diameter and 1m tall and when mature it has a short stem. The rosettes have an open, spreading appearance with prominent greyish horny leaf margins bearing smallish teeth; the terminal leaf spines, being no more than 1cm long, are relatively short compared to those of other agaves (Fig. 5). The leaves are predominantly dark green in colour but



Fig. 5

Agave lophantha in a 30cm diameter pot



Fig. 6

A clump of *Agave lophantha* roughly 2m across growing in the Duthie Park Collection, Aberdeen

many clones such as the one illustrated here have a prominent pale green mid-stripe. This distinct colour contrast together with the symmetrical rosettes are in my opinion its most appealing features.

My plant has been in the collection for around 25 years. It offsets prolifically and I have removed more than 50 of these to maintain the symmetry of a single rosette and to provide propagating material which has been widely distributed amongst interested growers. In all this time it has not yet flowered so I have not personally witnessed the flower spike which is reported to be up to 4.5m tall.

When bedded-out to provide free root room and space to grow to its full potential, *A. lophantha* can form extensive clumps (Fig. 6).

Gentry (1982) records its natural distribution as extending "from south-eastern Texas southward in Mexico along the east coast to central Veracruz. It is frequent on limestone, as on cliffs and rocky outcrops". My experience in cultivation is that this is an easy species to grow. It has survived over winter in an unheated greenhouse in southern England when kept completely dry.

The origin of the species name '*lophantha*', first published in 1829, is somewhat obscure; when translated from the Greek this means 'crested flower' for which no plausible explanation has yet been provided.

In contrast this species is often identified under the name *Agave univittata*, whose species name means 'having a single longitudinal stripe'. This name characteristically describes my plant, so it is regrettable that *A. univittata* is now considered to be a redundant later synonym, dating from 1831 (Thiede, 2020).

Agave lophantha is most closely related to the common and widespread *Agave lechuguilla* with which it is often confused and with which it hybridises and intergrades in the wild. The two species can be distinguished by the broader flat leaf of *A. lophantha* with little or no striation and a weak terminal spine (Thiede, 2020).

In addition to the typical species, I also grow a variegated form named *A. lophantha* 'Quadricolor' (Fig. 7). This also offsets freely, so again to maintain the symmetry of a single rosette and also to provide propagating material, I routinely remove the pups. This plant is especially attractive and is aptly named for having leaves with different coloured stripes. The leaves have stripes in three shades of green with a broad yellow to cream margin (in the older leaves the yellow changes to become cream). I am not aware that the origin of this cultivar has been recorded.

Agave lophantha 'Quadricolor'

Fig. 7



A. titanota, *A. oteroi*, and *A. quiotepecensis*

Agave titanota was first described by Gentry (1982). Plants are medium-sized, usually single rosettes which occasionally offset, having glaucous white leaves with a gently undulate horny margin. It is the teeth that make this species so attractive; these are very variable in size, shape and pungency. The teeth and spines start off dark but with aging they become pale brown and finally grey. The species was named *titanota* from the Greek '*titanos*' meaning chalk or gypsum, for the alabaster-white leaves.

This species is a very narrow endemic, known only from the Mexican state of Oaxaca where it grows on limestone faces and rocky hills (Thiede, 2020).

Plants identified as *A. titanota* have become relatively common in cultivation. Controversy has raged, however, as to

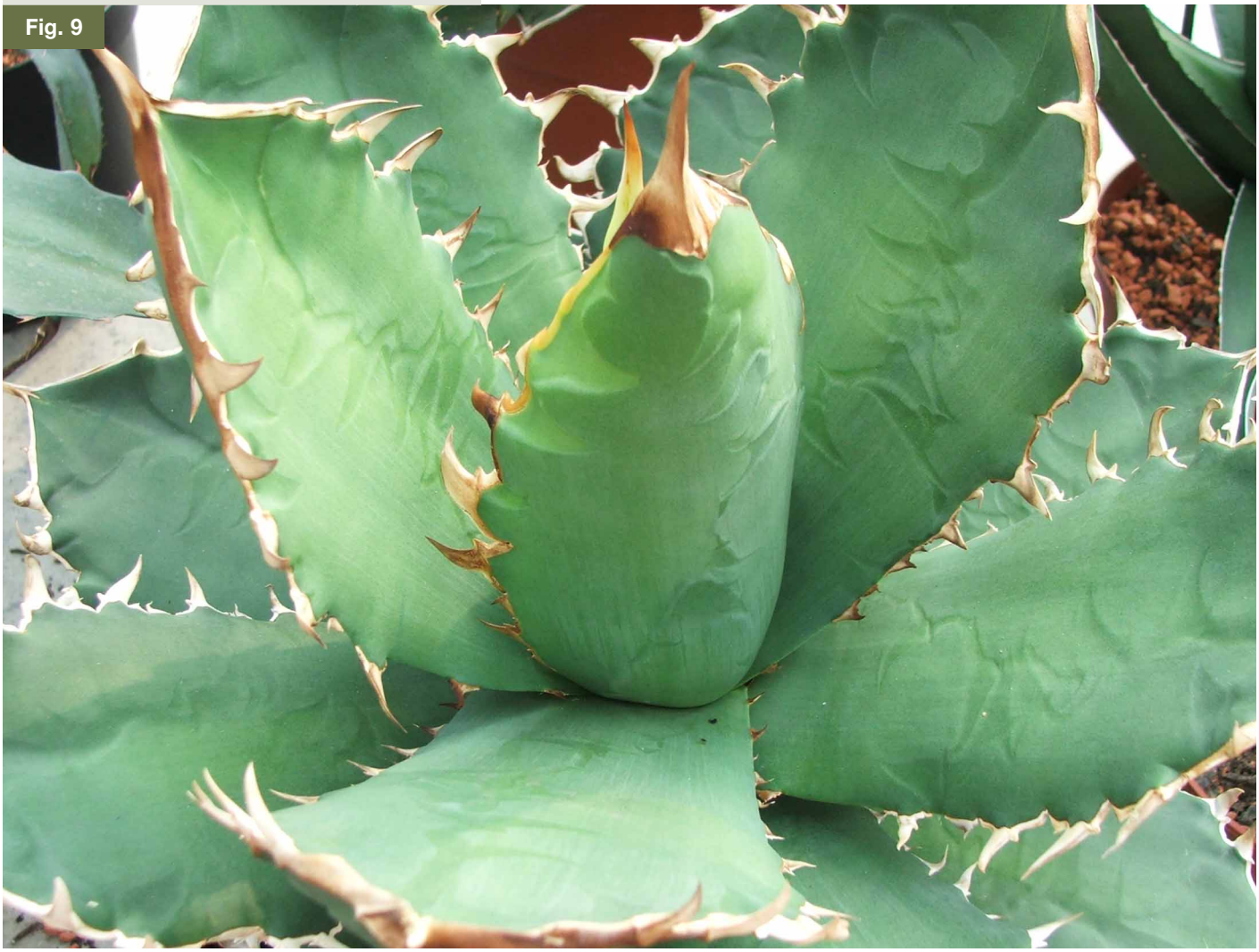


Fig. 8

A young plant of *Agave oteroi* in a 15cm diameter pot

An older plant of *Agave oteroi* photographed in the reserve collection at Kew

Fig. 9



whether or not such plants are truly *A. titanota*. Starr & Davis (2019) reassessed the status of *A. titanota* and determined that the plants so labelled do not match the original description of this species. Fig. 8 shows one such plant (FO 076), first collected by Felipe Otero from the Sierra Mixteca, Oaxaca. Starr & Davis have described these as the new species *Agave oteroi*, commemorating Felipe Otero.

Consequently, plants commonly cultivated as *A. titanota* (as shown in Figs. 8 and 9) are actually *A. oteroi* while the true *A. titanota* is apparently not in general cultivation.

Agave oteroi is endemic to the Rio Hondo drainage system in the Sierra Mixteca, Oaxaca. It has smaller rosettes than *A. titanota* of dull green, pale green to dark green leaves, whereas the true *A. titanota* has glaucous white to blue-white leaves (Starr & Davis, 2019). Whether or not these two species are truly distinct or merely disjunct populations of a single species remains to be determined.

A third species in this group is *Agave quiotepecensis* that was also described as recently as 2019. This comes from the municipality of Santiago Quiotepec in northern Oaxaca, growing at altitudes of 525–845m on sandy reddish soils in tropical deciduous forests. It is closely related to *A. titanota* from which it differs in its longer leaves with long acuminate (pointed) tips, straight margins with more distant teeth and larger flowers (Thiede, 2020). I have yet to encounter this new species in cultivation, so if anyone has a spare seedling, please contact me!

Agave pelona

This is another of Gentry's new species, first described in 1972 but only now is this wonderful plant coming into wider cultivation. It has, however, apparently been grown at the Desert Botanical Garden in Phoenix, Arizona since 1966.

This stunningly attractive plant is beautiful and distinct since it has no close relatives within section *Heteracanthae*. Rosettes are solitary and up to 80cm across and up to 60cm tall. My relatively small specimen has been troublesome and slow growing, such that as yet it does not do justice to the appeal of this species (Fig. 10). The narrow, linear-lanceolate, rigid, dark green leaves, are often tinged brightly with red or purple, are strikingly outlined by the white, smooth toothless margins bearing an impressively fierce, strong, white terminal spine up to 7cm long making the leaves dagger-like.

It has a unique wine-red flower colour, whereas most agave flowers are white, cream or yellow.

Agave pelona in an 18cm diameter pot

Fig. 10



Agave pelona is endemic to north-western Sonora where it occurs in just four small solitary mountain ranges where it inhabits dry limestone rocks and cliffs in arid deserts at altitudes of 500–1,220m (Thiede, 2020).

It is known locally as '*mescal pelon*' in reference to the bald or toothless leaf margins, hence the origin of its specific name. The plants are used for making moonshine or mescal.

Agave ×pumila

This is a very enigmatic and difficult plant in many ways. It was first described by Baker in 1888 using the name *pumila* which means 'dwarf' and it has long been known only as a juvenile form in cultivation. The Kew plant on which Baker based his description came from De Smet, the Dutch nurseryman, in 1879, who presumably obtained it from Mexico, so it appears to have a wild origin.

Growers in southern California such as Ed Hummel, Charlie Glass and Myron Kimnach planted this out and it changed form to produce larger rosettes. Its leaves can grow up to 40cm in length, giving a rosette up to 70cm across. It therefore seems to be dimorphic (Thiede, 2020). This plant grows slowly in pot culture and only achieves its full potential when grown bedded out with unrestricted root room.

The narrow detachable margin with weak teeth and the check-marked striping on the underside of young leaves indicate a relationship to *A. lechuguilla* according to Gentry (1982). Flowers and flowering are unknown and undescribed, possibly suggesting a sterile hybrid.

Gentry records hybrids between *A. nickelsiae* and the widespread *A. lechuguilla* where these species grow sympatrically (together) east of Saltillo, Coahuila. It therefore seems most likely that one product of such hybridisation, *A. lechuguilla* × *A. nickelsiae*, appears to be the now popular cultivar *Agave* ×*pumila* (Fig. 11). This plant, like *A. impressa* and *A. pelona*, has proved very difficult to grow well in a pot in my collection, such that it always looks neglected and far from thriving.

Agave ×*pumila* (*Agave lechuguilla* × *nickelsiae*) photographed in the reserve collection at Kew

Fig. 11



Corrections to Part 1

Paul Spracklin has pointed out that the identification of two species discussed in Part 1 of this article is incorrect. Apologies are in order and further information is supplied below.

The identity of the plant shown as *A. xylonacantha* is uncertain but it might be a toothy form of *A. lophantha*. The true *A. xylonacantha* is shown here in Fig.12.

Paul says: "compared to the imposter it is much bigger: these plants are probably 1.5m in diameter with sparse rosettes, non- or barely-suckering and extremely asperous, but the rip-saw teeth are similar, which is where the confusion starts".



Fig. 12

Agave xylonacantha in habitat near Zimapan, Hidalgo, Mexico (Photo: Paul Spracklin)



Fig. 13

Agave funkiana in habitat south of Jacala, Hidalgo, Mexico. (Photo: Paul Spracklin)

Similarly, the plant identified as *A. funkiana* might also be a form of *A. lophantha*.

Paul says: "I have seen something very similar to the imposter along a road where the 'real' *A. funkiana* grows in Tamaulipas". What he identifies as *A. funkiana* is shown here in Fig. 13.

Acknowledgements

I am deeply indebted to Paul Spracklin for his advice and use of photos. I am also grateful to Jeff Moore for use of his photo. My wife Marjorie is also thanked for comments on an earlier draft of this article.

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The Flying Garden

A series by Zsolt Varga

Pfeiffera

A unique lineage of South American epiphytic cacti



Pfeiffera ianthothele (Photo: Shacarah Gagnon-Kvale)

Pfeiffera has long been one of the most controversial genera of epiphytic cacti

Introduction

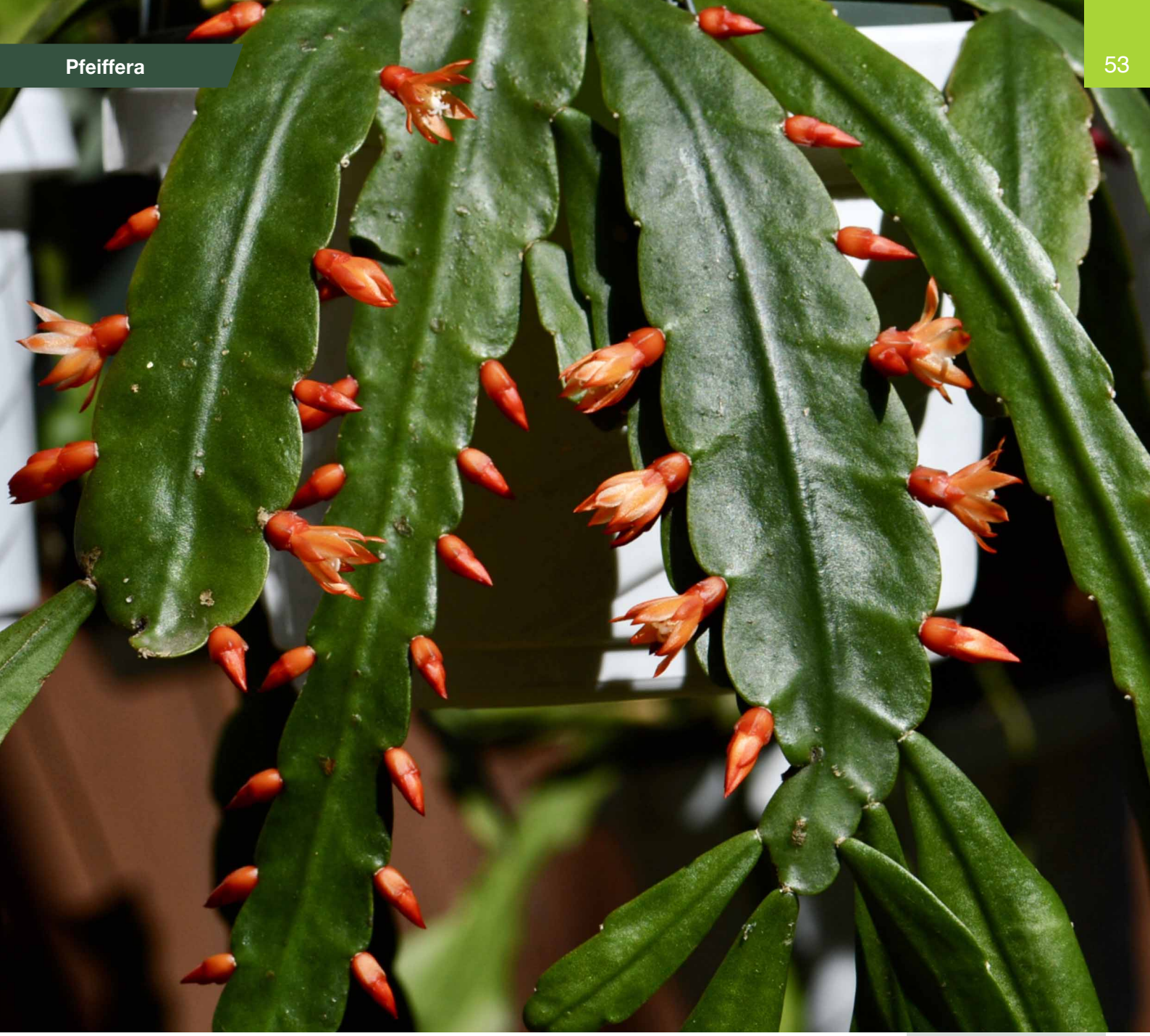
In this series of articles I am trying to summarise for the cactus collecting community the works published in recent years by Korotkova and her colleagues.

In this particular article I would like to introduce a completely independent genus from Central America, which only resembles the better known epiphytic cactus genera in terms of its epiphytism.

For this I also refer to the study of Alice Calvente et al. to help us understand the results of genetic analyses and the history of the evolutionary development of this genus in depth.

Pfeiffera ianthothele (Photo: Shacarah Gagnon-Kvale)





Pfeiffera monacantha subsp. *kimnachii* (Photo: Shacarah Gagnon-Kvale)

History

Pfeiffera has long been one of the most controversial genera of epiphytic cacti. Its circumscription and hypotheses regarding its relationships have attracted the attention of many taxonomists.

The genus was first described by Prince Joseph Furst zu Salm-Dyck (1845) as a monotypic genus distinct from *Cereus* Mill., which included only *Pfeiffera cereiformis* Salm-Dyck (now *Pfeiffera ianthothele* (Monv.) F. A. C. Weber).

Salm-Dyck (1850) and Schumann (1899) assigned *Pfeiffera* to the tribe Rhipsalideae, while Britton and Rose (1923) placed it in the subtribe Rhipsalidanae, and Berger (1926) proposed a new subtribe Pfeifferae solely for the monotypic genus *Pfeiffera*. He justified his position by the fact that the branched funiculi (which anchor the ovules within the fruit) differ from those of Rhipsalideae together with the lack of accessory aerial roots. Berger was therefore the first to assume, ahead of his time, that the morphological similarities between *Pfeiffera* and members of the tribe Rhipsalideae were simply the result of convergent evolution.

Although Berger admitted that the closest relatives of *Pfeiffera* were unclear to him, he suggested *Erdisia*. The terrestrial genera *Corryocactus* and *Erdisia* (most species are now included in *Corryocactus* as the *C. squarrosus* group) consist of bushy, slender, erect cacti from Peru, Bolivia, and Chile, which are still considered to be the closest relatives of *Pfeiffera* due to similarities in floral morphology.

Although Backeberg (1959, 1966) considered Hylocereeae to be otherwise the only epiphytic tribe, in which he included the Rhipsalideae, and he followed Berger's view by accepting *Pfeiffera* as a good genus in Pfeifferae he placed them in the tribe Cereeae. He also agreed that Erdisia and Corryocactus were closely related and thought that these genera formed a morphological link with *Pfeiffera*, itself a transitional form from corryocactoid ancestors to *Acanthorhipsalis* and the Rhipsalideae.

Buxbaum (1962), meanwhile, placed Pfeiffera in the Hylocereeae subtribe Rhipsalinae. He considered Pfeiffera to be close to Rhipsalis, hence is positioning of it in that subtribe. Again in line with Berger's views, Barthlott (1988) and Barthlott and Hunt (1993) considered that Rhipsalideae, including *Pfeiffera*, evolved from terrestrial cacti similar to *Corryocactus* and *Erdisia* so that these genera are the closest relatives.

As the general concepts of Rhipsalideae have continued to change, some subsequent authors have recognised up to eight genera, while others have combined most taxa into *Rhipsalis* Gaertner. (Barthlott 1987; Barthlott and Taylor 1995).'

Recent studies

New hypotheses regarding the genus *Pfeiffera*, according to Reto Nyffeler (2002), come from the results of molecular phylogenetic studies. In his study, three species were sampled, all cited under *Lepismium* Pfeiff: *L. ianthothele* (Monv.) Barthlott, *L. miyagawae* (Barthlott & Rauh) Barthlott and *L. monacanthum* (Griseb.) Barthlott.

The very unexpected finding following the results is that *Pfeiffera* and Rhipsalideae are genetically separate from each other. *Pfeiffera* is clearly supported as a genus distant from Rhipsalideae, but located close to Pachycereeae, Leptocereeae and Hylocereeae. It is placed within the tribe Echinocereeae.



Pfeiffera boliviana (Photo: Shacarah Gagnon-Kvale)

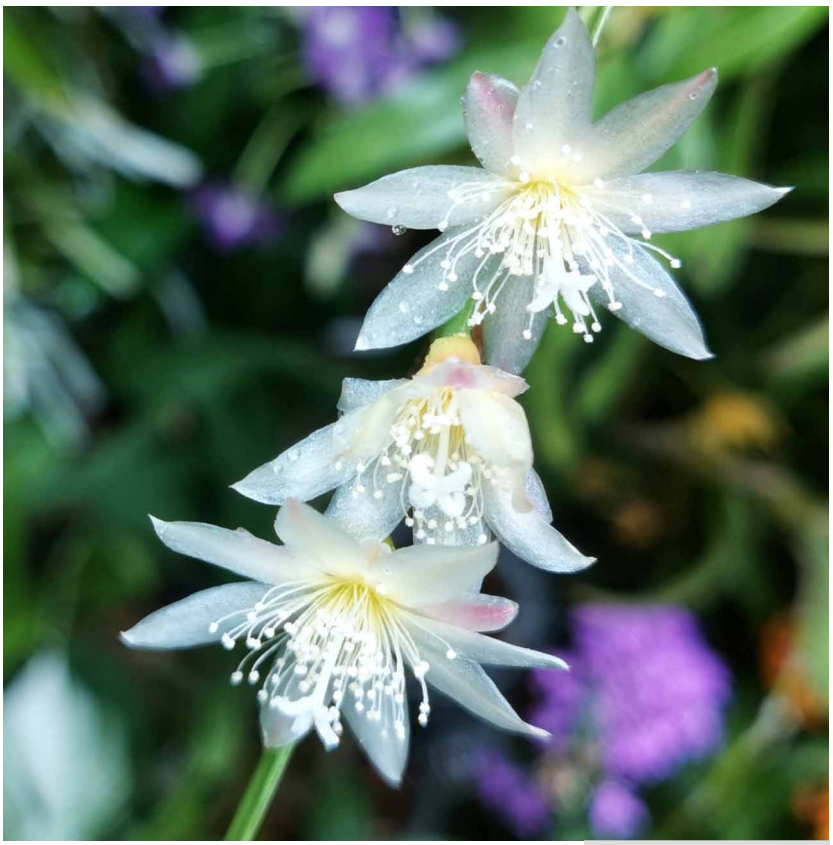
This newly confirmed and distinct epiphytic genus includes *Pfeiffera ianthothele* as the type species and is included in *The New Cactus Lexicon* (Hunt et al. 2006). Although the clade itself is well defined, its relationships within Echinocereeae are unclear, although its remote location from Rhipsalideae confirms previous assumptions regarding the relationships of *Pfeiffera* including the presumed close relationship to *Corryocactus*.

Pfeiffera previously contained nine epiphytic, ground-dwelling or epilithic species, ranging from southern Ecuador to northern Argentina, with a centre of biodiversity in the eastern Andes of Bolivia. The genus is mainly characterised by its mesotonic branching pattern, by which it is easily recognised. This means that secondary shoots typically arise from the middle of the primary stems of the plant.

The stems are 3–8-ribbed or flattened and generally do not produce aerial roots. The spines are often well developed, the flowers can range from whitish to intense orange and the fruits are spiny.

Some of these characteristics are also found in Rhipsalideae genera, however, especially in the genus *Lepismium*. The main differences, according to current interpretation, are the spiny stems and fruits of *Pfeiffera*, while in Rhipsalideae the spines are usually absent or reduced, and the fruits are glabrous.

Korotkova et al. published their paper as part of an ongoing study of the phylogenetic relationships and classification of epiphytic cacti, in which they attempted to explore the relationships of the *Pfeiffera* genus and clarify the morphological similarities shared with Rhipsalideae. In the long term, their work will also contribute to a better understanding of the conditions under which epiphytism arose by understanding the phylogeny and evolution of *Pfeiffera* as a lineage independent of Rhipsalideae.



Pfeiffera boliviana (Photo: Zsolt Varga)

Korotkova et al.found that *Pfeiffera* as a genus was not monophyletic but was split into two distinct clades. They found that the second clade, which consisted of:

> *P. micrantha* (Vaupel) P. V. Heath,
> *P. brevispina* D. R. Hunt and
> *Lepismium incachacanum*
> (Cardenas) Barthlott

is distant from the Pfeifferae, so the generic name *Lymanbensonia* Kimnach has been reinstated.

As a result *Pfeiffera* is currently limited to six species (and their subspecies). These are divided into two subclades, see below.

The genus Pfeiffera

P. ianthothele
P. monacantha
P. miyagawae
P. paranganiensis
P. boliviana
P. asuntapatensis

***P. ianthothele* subclade**

P. ianthothele
P. *monacantha*
P. *miyagawae*

***P. boliviana* subclade**

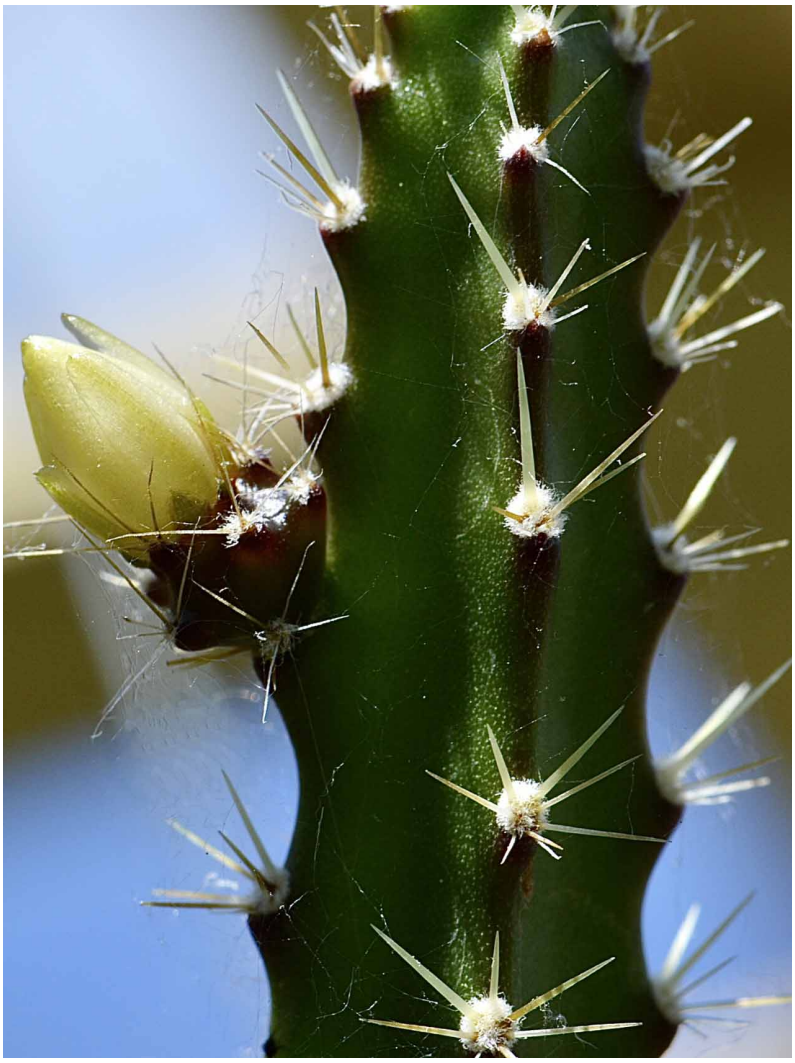
P. boliviana
P. paranganiensis
P. asuntapatensis

Pfeiffera ianthothele

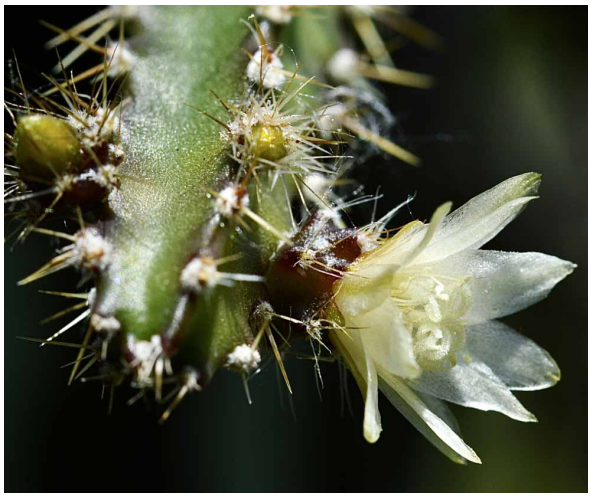
P. ianthothele is a species with ribbed stems, well-developed spines and spiny fruits from the highlands of Argentina and Bolivia, where it can be found at altitudes of 600–2000 metres above sea level.

It is relatively common in collections, although its propagation and maintenance have proved surprisingly difficult for me (in Central Europe) due to its slow growth.

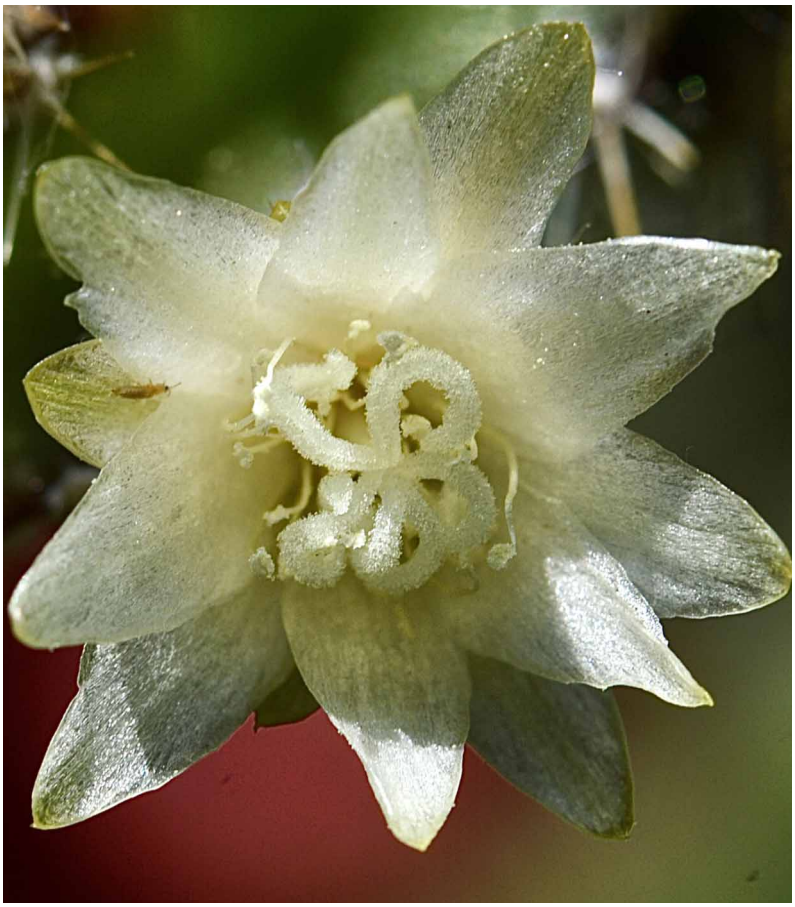
It bloomed for the first time in my collection in the summer of 2023. Its flowers are white; the plant is usually decorated with white berries after flowering that remain for a long time. It loves high light conditions, contrary to other pfeifferas.



Pfeiffera ianthothele, stem, bud and flower
(All photos: Shacarah Gagnon-Kvale)







Pfeiffera monacantha

P. monacantha is a relatively common plant in collections, a generously flowering and easy-to-maintain, hardy species.

It is found in Bolivia (Cochabamba, Santa Cruz and Tarija) and Argentina (Jujuy and Salta provinces) at an altitude of 300–2000 metres above sea level, in mountainous forests.

It tends to bloom in several cycles throughout the year, influenced by the cooler early summer days and warmer nights. Its pink berries adorn the plant for months.

Since they are medium-sized plants, many collections also include beautiful old specimens. Unlike most epiphytic cacti, however, the spines of pfeifferas are a force to be reckoned with!



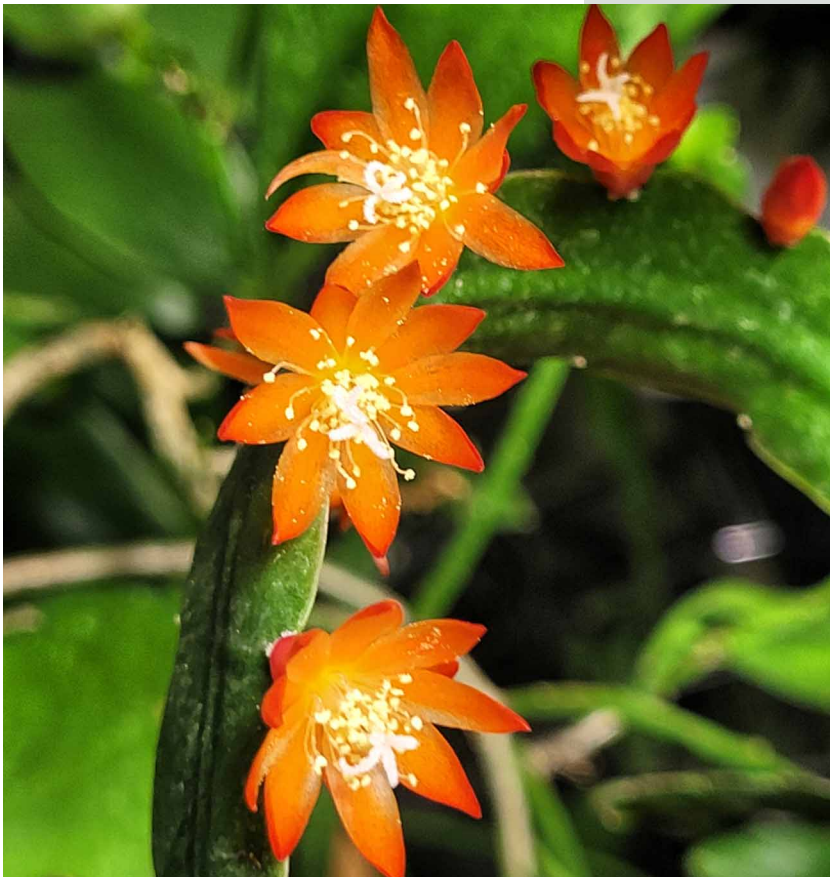


Pfeiffera monacantha subsp. *monacantha*
(Both photos: Shacarah Gagnon-Kvale)

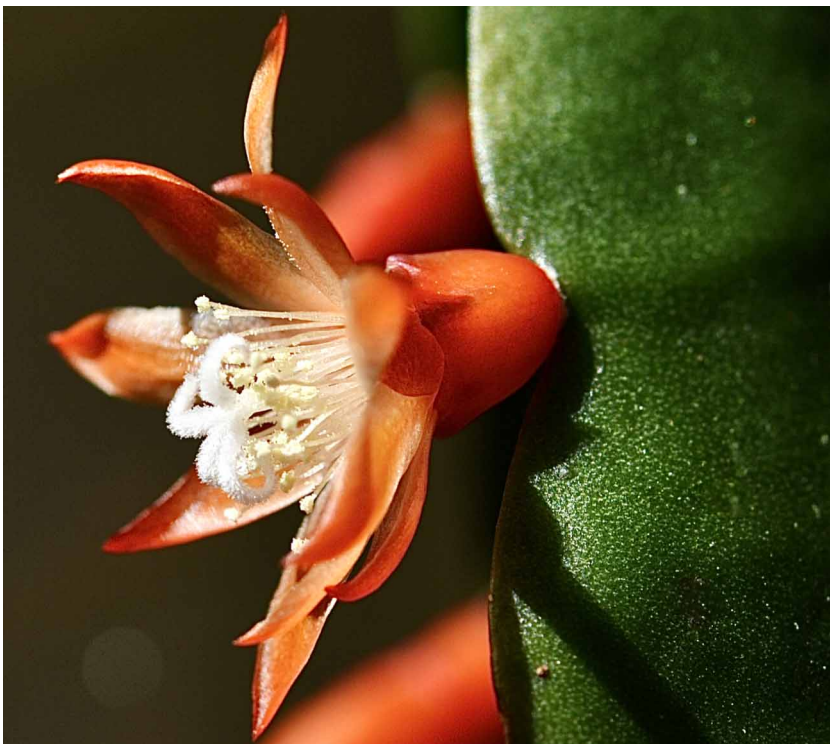


A rarer subspecies is *P. monacantha* subsp. *kimnachii*, which is a spineless form with darker, more reddish berries than the type species. It is known from only one place, in the ravine forests of Bolivia, near the road between Cochabamba-Chaparé and Sierra Tabla.

Pfeiffera monacantha subsp. *kimnachii* (Photo: Zsolt Varga)



Pfeiffera monacantha subsp. *kimnachii* stem and flowers (Photos left and below: Shacarah Gagnon-Kvale)



Pfeiffera miyagawae

P. miyagawae is a rare plant in cultivation and is also similar to *P. ianthothele*. It was known from only one collection from Bolivia in 1974 between Cochabamba and Santa Cruz at an altitude of 600m above sea level, but later Wolfgang Krahn collected neotypes of the species in the La Paz province, between La Asunta and Chulumani.

In my collection it shows slow growth, likes abundant watering and cool to warm temperature fluctuations. It is grown in almost full shade at my place because, in my experience, its stems burn easily in strong light. It can be acclimatised to grow in higher light conditions, otherwise it responds with spindly growth, a problematic one with transitions from wintering indoors to outside conditions.

Since it grows with strongly succulent stems, it is more susceptible to rotting, similar to the *Disocactus speciosus* forms so good air circulation is essential for its winter maintenance, when it can be kept a little drier for this reason. It is said to be problem free in foreign collections under greenhouse conditions.

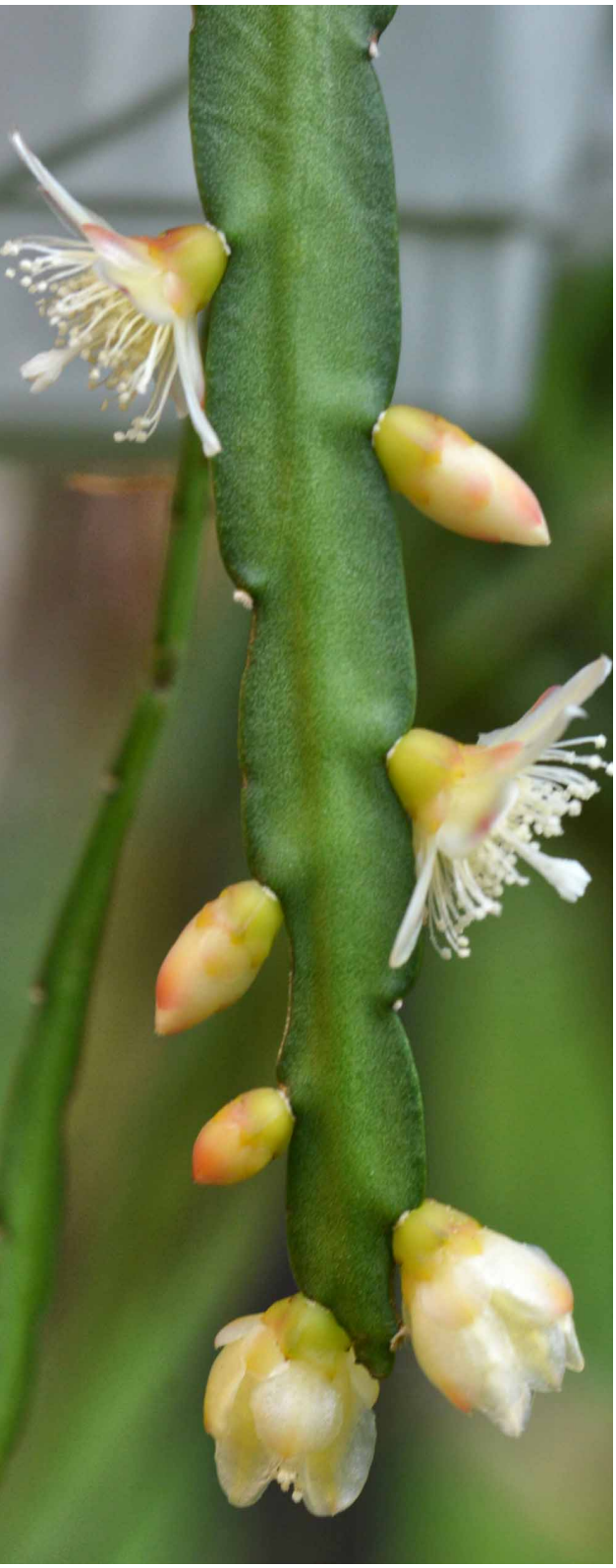
Pfeiffera miyagawae (All photos: Shacarah Gagnon-Kvale)







The second subclade includes *P. boliviana*, *P. asuntapatensis* and *P. paranganiensis*. The *P. boliviana* clones so far examined, however, are still not confirmed to be monophyletic, which may explain the diversity of the species and the variety of flower colour forms that are unique within *Pfeiffera*. All species of the clade are endemic to Bolivia, and are characterised by flat, usually spineless stems (except *P. paranganiensis)*, and glabrous fruits.



Pfeiffera boliviana

P. boliviana is a common species in collections, easily available and is spectacular with its long, thin, pendulous stems. Its original habitat is the Bolivian provinces of La Paz and Cochabamba, where it is epiphytic at altitudes of 1050–1800 metres above sea level.

In my collection, both the white and yellow flowered forms have proved to be easy to keep. The only problem, which many fellow collectors have also reported, is that during winter the cladodes may dry up from the tips, often accompanied by brownish rot, that can result in serious damage to the plant.

Collectors usually try to treat this with fungicides and by keeping the plant dry, although the main cause is the lack of humidity and too little water! Outdoors, after heavy rains, the phenomenon stops and the plant starts to grow again. This is why it can be watered much more during winter than expected! In my experience flowers can appear at any time of the year, given a lot of filtered light and balanced temperatures but usually towards the end of winter and early summer.

Pfeiffera boliviana stem and flowers (Photos: Shacarah Gagnon-Kvale)



Pfeiffera asuntapatensis

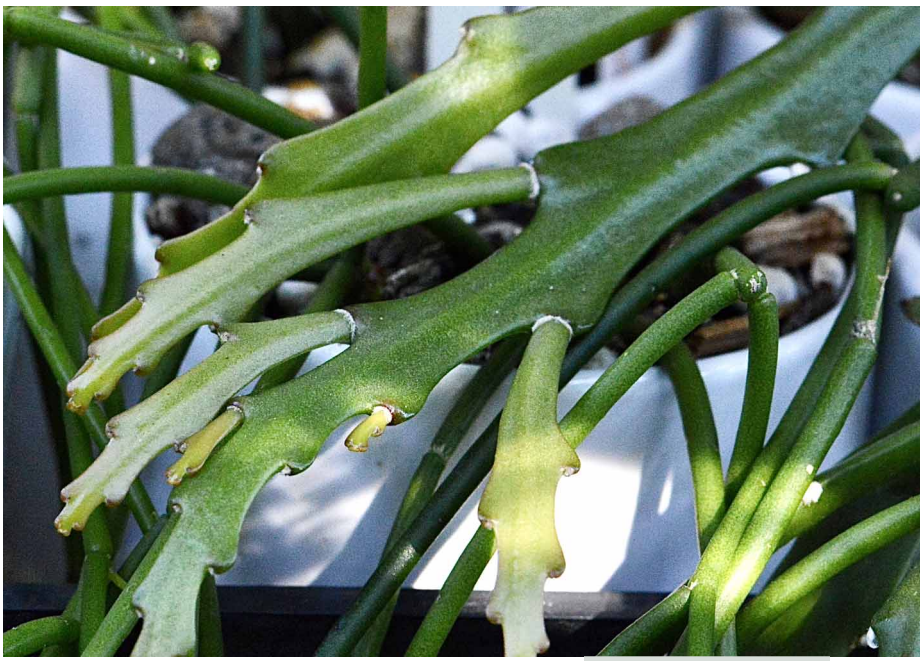
P. asuntapatensis is a species endemic to Bolivia. It is known only from the montane rainforests of the Asunta Pata and Calabatea mountains, between Apolo and Charazani (La Paz) at 1000–1350metres above sea level.

The Cochabamba department is a very rainy region with relatively low average temperatures and accordingly the altitudinal distribution of vegetation zones is strongly limited.

P. asuntapatensis coexists with *Rhipsalis baccifera*, *Rhipsalis cuneata* and *Epiphyllum phyllanthus*. Its closest relative is *P. boliviana*, to which it is very similar in habit, but the most common clone has woolly areoles and bright orange flowers.

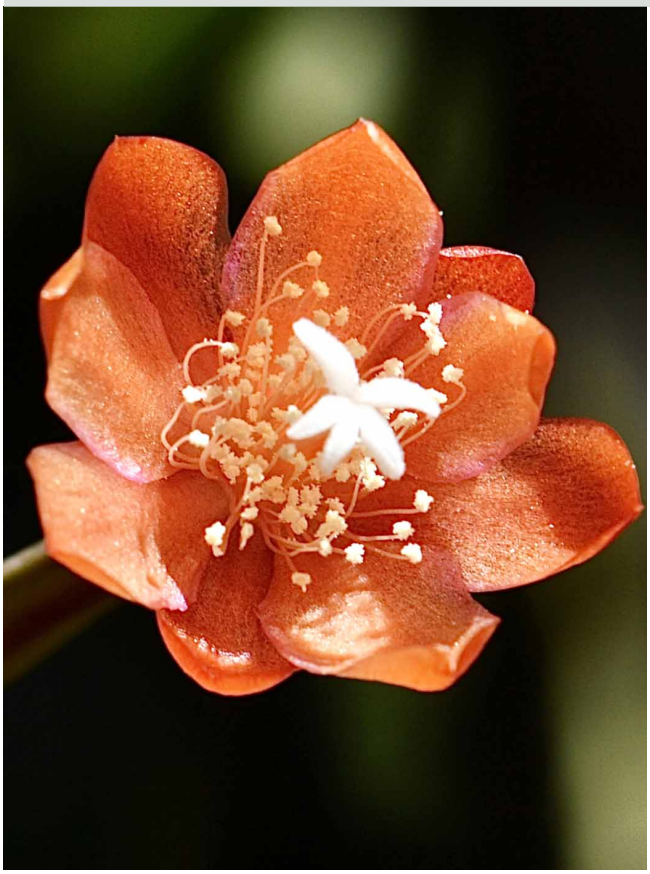
Its flowering period is from November to December, which does not overlap with that of *P. boliviana* and in La Paz department *P. boliviana* is only found at 1800m above sea level, which also means an altitudinal separation between the two species.

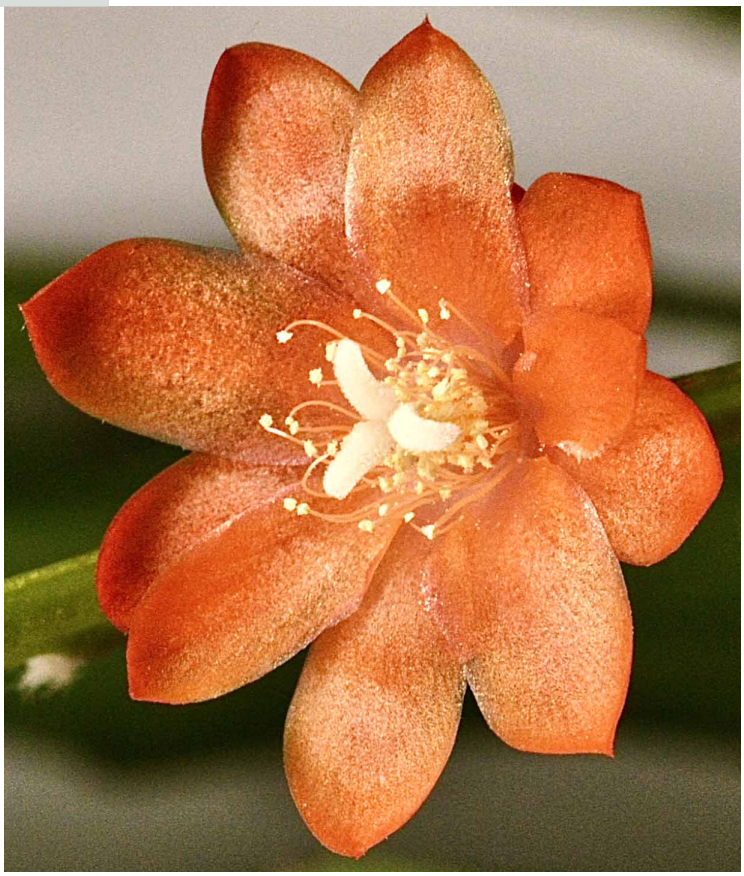
In my experience *P. asuntapatensis* is an easy species but it is very sensitive to light stress or sunburn, from which it (like other pfeifferas) cannot recover. Stems that turn yellow from the light wilt first and are much more prone to dying off from the tip of the cladode. The plant usually deteriorates irreparably and finally dies. I have lost a big flowering plant in this way, so I keep this species in shade and water it abundantly.



Pfeiffera asuntapatensis (Photo: Shacarah Gagnon-Kvale)

Pfeiffera asuntapatensis flowers (Photos: Shacarah Gagnon-Kvale)





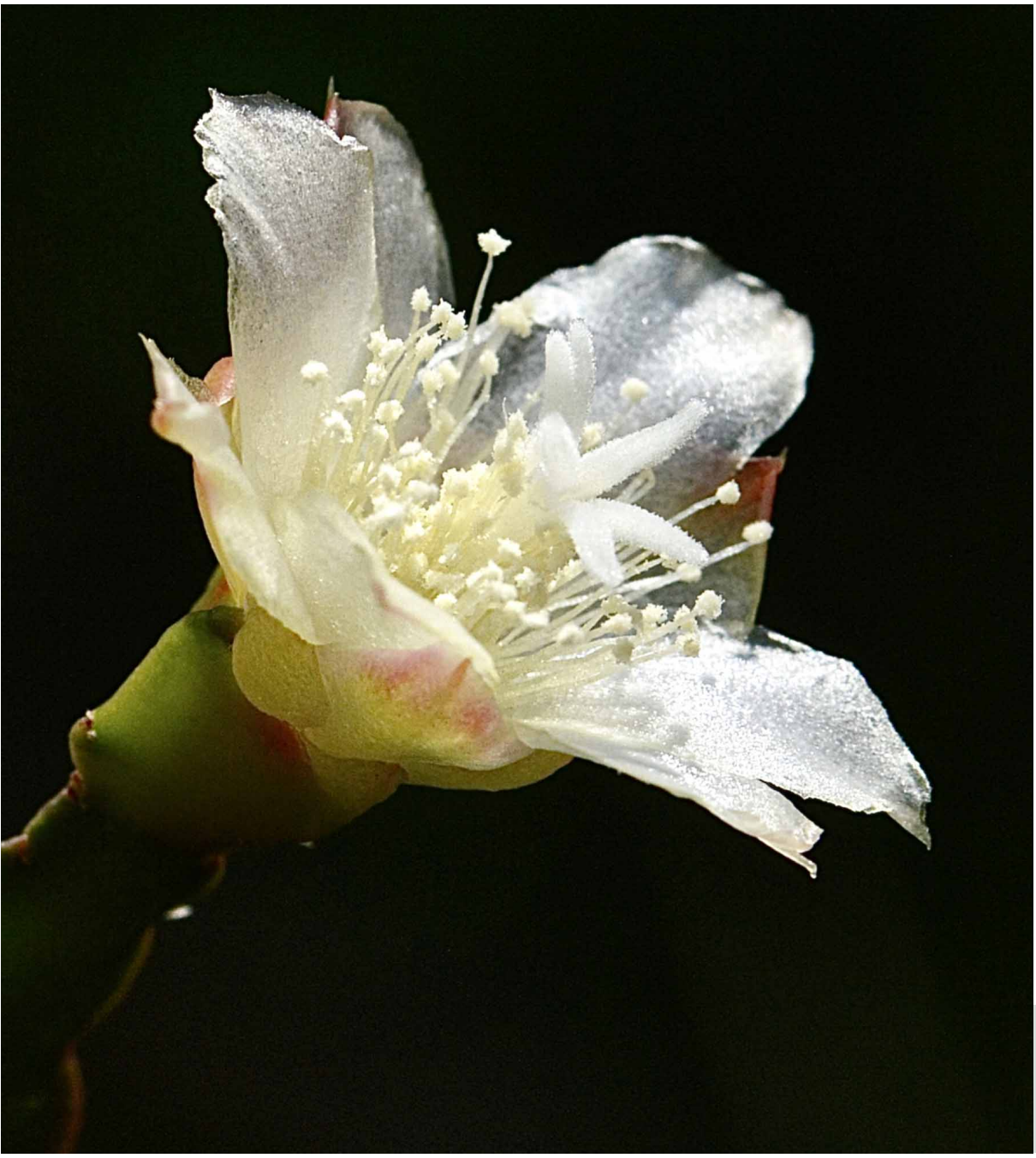
Pfeiffera paranganiensis

P. paranganiensis is a special ground-dwelling or facultative epiphytic pfeiffera, which also grows aerial roots. It has never flowered in my collection and I have received information from other collectors that it does not like to flower and needs to reach a large size before doing so.

With its robust, upward-shooting stems it shows many similarities to *Selenicereus*, so unlike other pfeifferas, it can be grown well on trellises. The conventional wisdom among collectors indicates it needs to be pointing upwards to flower. Based on habitat photos it appears that this species leans on woody vegetation and grows upward in most cases. Also unlike most pfeifferas, such as *P. boliviana* or *P. asuntapetensis*, it tolerates the sun very well and can even be grown in full sun.

It is important to emphasise, however, that most of the pfeifferas do not tolerate full sun. Shade or even deep shade is suitable for them but they need to receive filtered light for several hours during the day.

In my collection, they spend their summer hanging under other leaf cacti mostly in shade, only *P. miyagawae* and *P. paranganiens*is (and its hybrids) receive more sun. Also you can water them freely during the growing season.



Pfeiffera paranganiensis (Photo: Shacarah Gagnon-Kvale)

Finally I should mention *Pfeiffera* hybrids too. Yes, they exist and there are quite a few out there, although they are very uncommon in collections.

One of the most famous is a somewhat controversial *Pfeiffera* hybrid, which goes by the name 'Neue Petersen' It was originally registered by Kurt Petersen in 2011 as 'Inca's Golden Dream', but in the registration one of the parents is given as a *Disocactus* which, having reviewed the lineage of pfeifferas, we know is biologically impossible.

So this interesting cultivar is currently registered as a cross between *Pfeiffera miyagawae* and *P. paranganiensis* (?). This is probably the case as it resembles both parents and has inherited their best qualities.

This plant is decorative with its large orange flowers that can differ in size a lot, depending on the position and general health of the plant itself. Also, due to the *P. paranganiensis* parentage it can even withstand full sun. It can grow huge and its spines must be reckoned with! ■

Photos: Zsolt Varga and Shacarah Gagnon-Kvale as indicated

Translated and summarised by the author from the original article:

Zsolt Varga. Betekintés az epifiton kaktuszok rendszerezésébe- Epifita Kaktuszok 6.rész. Kaktusz-Világ XLVIII/ ISSN 0209-9152 2024





Pfeiffera 'Neue Petersen' (Both photos Zsolt Varga)

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Korotkova, N., Borsch, T., Arias, S. A phylogenetic framework for the Hylocereeae (Cactaceae) and implications for the circumscription of the genera https://doi.org/10.11646/phytotaxa.327.1.1



Cactus at the Castle returns

Much more than a mart once again

by Graham Evans

6 & 7 September 2025, Lullingstone Castle, Eynsford, Kent

Cactus at the Castle, presented by the *Cactus and Succulent Review*, returns for another festival of flora and, in this 20th anniversary year for Tom Hart-Dyke's World Garden of Plants, we are hoping to make the biggest and best annual cactus and succulent event in the UK even bigger and better.

The headline mart is, of course, back and this year we have more sellers than ever before. We look forward to welcoming back all of our regular plantsmen plus some interesting first-time attendees and, with no clash with ELK this year, we are delighted that those who were in Blankenburg in 2024 can return. In all, we are expecting 40 stalls with plants, books, sundries and memberships to tempt cactophiles and succulentists of all levels to add something to their collections.

Also appealing to all levels of interest and experience, we are pleased to be offering another Bring and Sell auction on Saturday. If you're selling, lots are charged at £1.50 each and if you're buying perhaps you can grab a bargain or find that missing rarity! Cactus at the Castle is happy to assist with the transportation of larger numbers of entries, collection dispersals, etc. Please do contact us to ask if we can help.

As ever, there will be talks and demonstrations, including those by Graham Charles and Mellie Lewis, while the irrepressible Tom Hart-Dyke will be giving his hugely entertaining tours of the World Garden on both days. The castle will also be open to visitors throughout the weekend.

We are hoping to further develop Sunday's independent open show this year and to this end we are very pleased to welcome Stirling Baker to the team, who will be our Show Manager. Stirling has extensive experience of running shows, including several iterations of the BCSS National Show, and will be introducing some new

Above: geese over the gatehouse. The site before set up early on Saturday last year

features, including plant sales vouchers as prizes to the winners. Sponsorship of awards is being sought from nurseries and Ian's Haworthia Store has already made a generous contribution, as has Stirling and the other organisers. More information will be available soon on the Cactus at the Castle website, from where the show schedule can also be downloaded. As an independent show it has its own classes and legally imported plants remain welcome regardless of origin.

There will, of course, be plenty of food and drink available, including mouthwatering Mexican street food from T's Tacos. Following its success last year we will be giving a very warm welcome to Christian Hamilton (and family) with his expanded Blue Agave Bar. As well as traditional Harvey's ales once again, there will be a range of Mexican beers, tequila, G&Ts and wines to pleasantly ply those not driving, of course! The bar will be open both days.

On Sunday, there are several new attractions to mark the anniversary, such as Mexican mariachi music and the opportunity to meet alpacas and rheas! Saving the best to last, however, we are delighted to announce a special attraction to mark the 20th anniversary of the founding of the World Garden.



Finally we would like to introduce our new website:
www.cactusatthecastle.co.uk

Please do visit us there and if you need any more information please email us at:
info@cactusatthecastle.co.uk

We look forward to seeing you in September

Cactus IN THE Chapel

The Lullingstone 20th Anniversary Convention

Planned as a one-off event this will be a ticketed convention restricted to 60 people.

Tickets are priced at £16, including an unavoidable booking fee, and will be available to purchase from the Cactus at the Castle website from Sunday 8th June.

Admission includes:

- privileged early access to Cactus at the Castle and the World Garden from 10:30am, which should allow plenty of time for browsing and shopping and also for forward parking.
- attendance at the talks plus coffee and cakes in the interval.

The convention will run from 1:00pm to 5:30pm.

We are extremely grateful to our visiting speakers:

Graham Charles will be presenting '*Matucana* in Habitat and Culture', providing insights into this genus of beautifully flowered cacti and doubtless offering titbits from his much anticipated forthcoming book on the subject;

Roger Ferryman is creating a bespoke talk for the occasion, marking the anniversary with a guided tour through the last 20 years of his extensive explorations in Chile and Argentina;

Ian Woolnough will be regaling the audience with images and anecdotes from his many trips to Mexico, doubtless presented with his customary observation and humour.

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BACK ISSUES

Cactus & Succulent REVIEW

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

Cactus and Succulent Review





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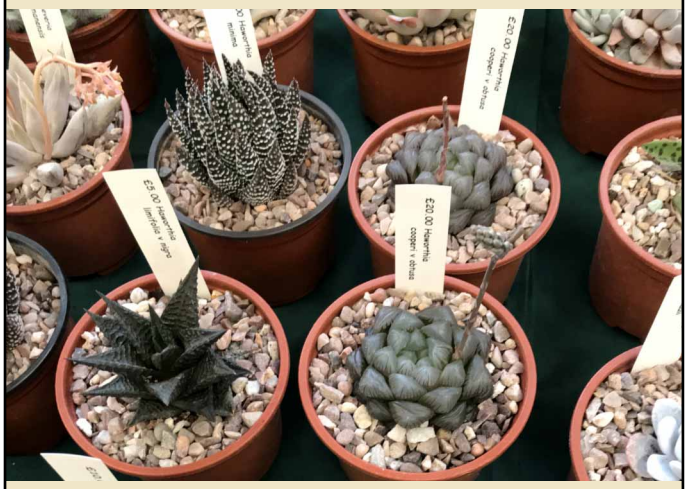
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