

Formerly
Essex Succulent
Review

Cactus & Succulent

REVIEW

The online magazine for cactus and succulent enthusiasts Issue 26 September 2020



Contents

Page 6

**Chamaecereus
luisramirezii**
by Ray Stephenson

[➤ Go to article](#)

Page 7

**Growing cacti
for 50 years**
by Jörg Ettelt

[➤ Go to article](#)



Page 11

Uncarina roeoesliana
by Colin C Walker

[➤ Go to article](#)

Page 13

Big Bend
by Jenny Nunn

[➤ Go to article](#)

Page 20



**Echeveria
rosea**

by Paul
Spracklin

[➤ Go to article](#)

Page 21

**Some medium sized
aloes**

by Mike Cullen

[➤ Go to article](#)

Page 26

**Getting a drink from a
cactus**

by Sue Hakala

[➤ Go to article](#)

Page 27

**Some of my
Astrophytums**
by Bill Darbon

[➤ Go to article](#)



Page 30

**Succulents on the
windowsill**

by Alan Tuppen

[➤ Go to article](#)

Page 33

Mammillaria theresae
by Tony Roberts

[➤ Go to article](#)



**Eriosyce chilensis at
Pichidangui**

See the 'A trip to Chile' page 51

Page 35

**Making a plant
support**

by Paul Young

[➤ Go to article](#)

Page 37

Dudleya – a new love
by Simon Snowden

[➤ Go to article](#)

Page 44

Growing in cold frames

by Peter
Berresford

[➤ Go to article](#)



Page 51

A trip to Chile – Part 1
by Al Laius

[➤ Go to article](#)

Cactus & Succulent
REVIEW

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Editor's notes

I am very pleased to welcome a new writer to this issue of the 'Cactus and Succulent Review'.

Jörg Ettelt is President of the Fachgesellschaft andere Sukkulenten e.V a German Society for the 'other succulents' and publisher of 'Avonia'. Jörg will be

writing on 'A celebration of cacti and succulents' a series of articles based on some 50 years of growing these plants.

The first cactus I ever possessed was a small *Chamaecereus silvestrii*, bought at a church fete when I was around seven. Since

then it seems to have gone through a number of name changes. In the 'New Cactus Lexicon' 2006, when everything was in *Echinopsis*, it appeared as *Echinopsis chamaecereus*, although when the revised volume of NCL Illustrations appeared in 2013 I notice it featured as *Lobivia silvestrii*.

Now it seems that the genus *Chamaecereus* has been reinstated to include *C. luisramirezii* and *C. saltensis* (*Lobivia saltensis*). To celebrate I have included an item on *C. luisramirezii* on page 6, which I think will be of interest.

Sheila Cude

Tony Porter's CACTUS CAPERS



Just sit quietly and no-one will notice

The Second Weekend in September

Friday 11- Saturday 13

A series of online presentations celebrating ELK

Usually held in the second weekend in September – ELK is Europe's largest event for cactus and succulent enthusiasts.

Following the cancellation of this year's event due to Covid-19, 'The Second Weekend in September', led by Paul Klaassen, offers a programme of online Zoom presentations celebrating the ELK experience in lockdown.

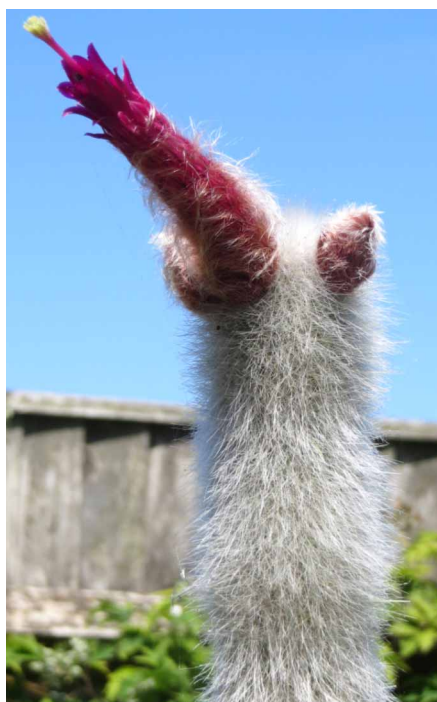
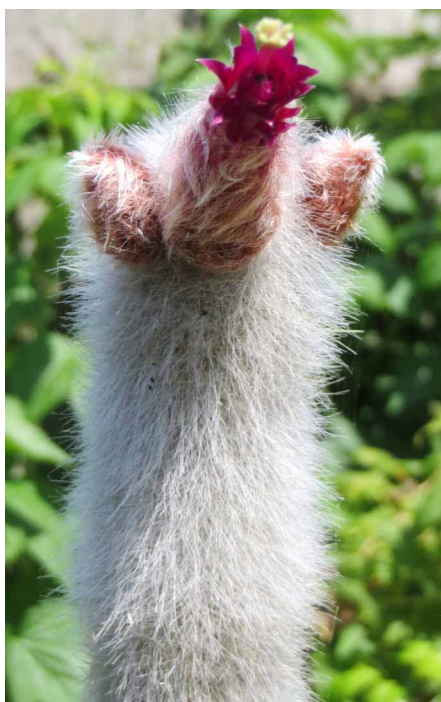
Talks will reflect the times when they would take place at ELK. It's the next best thing to being there.

See the [SWIS website](#) for full information

Please note these presentations will be given via the Zoom video conferencing platform. The app is widely available online.

Succulent Snippets

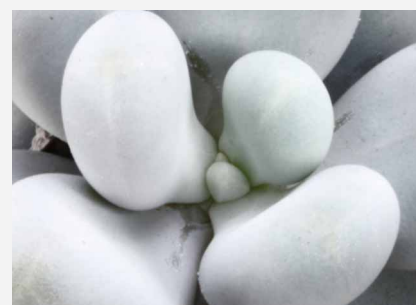
Exotic bird found in Norfolk garden



Well, not really. It's a *Cleistocactus strausii* with six stems – the tallest is about 5 feet (1.5m). It has been living outside (here on the East Coast, one house from the beach) for the last couple of years and taking its chances, as I had run out of greenhouse space and I have others under cover. It has flowered well this year.

Laurie Poulson

What is farina?



Farina, also known as epicuticular wax, is the attractive bloom found on a number of succulent plants including some species of *Echeveria*, *Pachyphytum* and *Dudleya*.

It actually consists of tiny microscopic crystals that form on the cuticle of the plant's surface (epi meaning 'on' or 'upon' because it grows above the cuticle on the epidermis).

Farina is hydrophobic, that is it repels water, which will bead up and roll away. This prevents the plant from absorbing excess water and keeps moisture within it. In addition it will help to ensure that dirt particles adhere only loosely to the plant so that any water which runs off the leaves takes the dirt with them.

It can also help to protect the plant from insect infestations by making it more difficult for insects to walk on the plants or lay their eggs.

Perhaps the most well-known property of farina however is as a sunscreen, by reflecting UV radiation, and so protecting the plant from scorch. A species of *Dudleya* has the most effective reflective power of all. See '*Dudleya* – a new love' by Simon Snowden on page 37 for more details.

Flowers by the (half) dozen

What makes a plant suddenly produce more flowers than ever before? This *Huernia zebrina*, which I have had since 2014, will usually produce three or four flowers spread over the summer.

At the time of writing it has no fewer than six flowers, spread around the plant so I can't photograph them all. It has already produced another three, and there are plenty more buds developing.



Perhaps it was the good weather earlier in the year (now, sadly, no longer with us) or a much needed repot. I would be most intrigued to know.

Sheila Cude

Succulent Snippets

More Succulent Snippets needed

Thank you to everyone who has sent me photographs, or helped with information for the Succulent Snippets feature.

I'm always interested in more pictures or short items though. Please email any contributions to:
> [Sheila Cude](#)

Senecio stapeliiformis subsp. minor

This plant was also known as *Stapelia gregorii*. Gordon Rowley transferred the plant from *S. gregorii* to *S. stapeliiformis* subsp *minor*, although I do not think the change has helped our understanding in any way.

It comes from Kenya and Tanzania, despite which it does not seem to object to normal greenhouse temperatures. It is stated to live in 'dry grassland, especially where disturbed'.

It mainly propagates vegetatively by means of underground stems.

A pot left untended will fill with white underground stems going in all directions including through the hole(s) in the bottom of the pot. Round the edges of the pot those stems that are forced upwards turn green with patterns and become what you actually see. Flowers are terminal on each shoot.

In cultivation at least this plant can become somewhat straggly although in strong sunlight, with limited watering, it keeps its colour and does not grow impossibly leggy.

John Watmough



Have a look at page 35 where we describe a method of making a framework for this or any plant which needs support

Bulbine mesembryanthoides in habitat

B. mesembryanthoides is found in the Northern and Western Cape areas of South Africa. It's easy to see how this plant got its name since it appears to mimic some mesembs. The leaves have translucent glass-like tops with jelly-like contents and may be buried almost completely during times of drought, when light reaches internal chloroplasts in the leaf through windows of unpigmented cells on the exposed leaf tips.



These pictures were taken at a location north west of Robertson at the end of September after considerable rain. There were so many plants it was difficult not to tread on them.

Photos: Alan Rollason

Chamaecereus luisramirezii

by Ray Stephenson

A comparatively recent discovery and a new addition to this reinstated genus

Out of flower, this quick-growing species from both Argentina and Bolivia looks just like the familiar rat's-tail cactus, *Aporocactus flagelliformis*, with its long, thin, dangling stems. This latter plant has zygomorphic flowers and is Mexican. *Chamaecereus luisramirezii* has flowers just like the commonly cultivated peanut cactus, *C. silvestrii*.

For a short while *Chamaecereus*, as a single species (before *C. luisramirezii* was described), was lumped into *Echinopsis*. DNA studies now show clearly this pre-emptive move was not very prudent. *

In cultivation, *C. luisramirezii* seems problem free – just as easy as its cousin *C. silvestrii*. There is some controversy as to whether it is a truly wild taxon. After all, the peanut cactus has been in cultivation for centuries and it has not been found in the wild in modern times.

C. luisramirezii was discovered by Luis Ramirez in 2004. Two habitat locations have been reported, each straddling the border of Argentina and Bolivia, in terrain which is both exceptionally difficult to traverse, and remaining somewhat unexplored. Both clones are in cultivation.

The discoverer's brother, Juan Ramirez, began distributing it to growers free of charge. A friend of Juan Ramirez, a French cactus grower Pascal Femenia, has also made a significant contribution to the distribution of this plant. Pascal has produced hundreds of seedlings which have been given away to friends and

commercial growers. He wants the species to be well-distributed in cultivation. Although he has taken every precaution to ensure the progeny twins are not intermixed, so far, no differences between them have made themselves obvious.

It has been suggested that the whole story is a hoax, especially by those who have spent unsuccessful years searching for wild *C. silvestrii*, but Joel Lodé has published a detailed analysis of the new taxon which appears to be very convincing. ■



* *Chamaecereus* was in fact shown to be distinct by DNA analysis by Schlumpberger & Renner in 2012.

Reproduced from the newsletter of the Northumbria Branch of the BCSS

Reference

Chamaecereus luisramirezii Lodé & Carlier spec. Nov., *Cactus-Aventures International* 2-2018

***Chamaecereus luisramirezii* flowering in their second season from 1.5inch (2.5cm) cuttings**

Photo: Ray Stephenson

Growing cacti for 50 years!

*'You can't buy happiness, but you can buy succulents!
And that is pretty much the same thing.'*

Crazy about cacti and other succulents for over 50 years. And still not perfect, and still looking for another new plant and experience.

However, what I was able to learn very quickly – thanks to some people who supported me and who were so important to me, as I understood later – is that the enthusiasm increases with success in cultivating these plants. And that friends who share their experiences and plants are important.

I was incredibly lucky to be involved in such networks as a teenager. I was a member of the Dresden cactus group, of which my uncle was a co-founder after the Second World War, and a member of the editorial team of the East German magazine for cacti and succulents. My uncle provided the basis for my collection; Dr. Spanowksy, the head of the Botanical Gardens in Dresden and head of the editorial board of the magazine called *'Kakteen – Sukkulenten'*, provided the botanical input.

Over five decades later, I would like to pass on my knowledge and experience of arbitrarily chosen plants and plant groups. You should not expect miracles, but I would like to tell a few stories about our plants, which also contain East German local colour. My wish is to further stir up enthusiasm for our plants and to contribute to cultural success with my suggestions. Let's start with some gymnocalyciums.

Gymnocalycium

Gymnocalyciums were, and still are, sometimes decried as being uniform. This is due to the mostly open spines, which leave the body clearly visible, as well as the predominantly white flowers of the

genus. However, in recent decades, with interesting new discoveries, the variability of many species has become known. For example, a surprise for me was a visit to the Appenzeller Collection in Austria, which has innumerable collections and sowings including many plants which bloomed in a rose colour.

But *Gymnocalycium carminanthum* (Fig. 1) was something of an icebreaker also, because this extremely intense flower colour was hardly believed in the genus. It

Fig. 1
Gymnocalycium carminanthum



was described in 1976. Red-flowering species were previously known, but were difficult to acquire. One of the old and well-known red flowering species is *G. oenanthemum*, to which *G. carminanthum* is sometimes assigned as a subspecies.

It quickly established itself in collections and led to more attention to the gymnocalyciums. The species grows slowly, is easy to cultivate and relatively undemanding. The flowers appear regularly on relatively small plants throughout the summer and show this intense carmine red, which led to the name of the species. It is a very beautiful representative of the genus, blooms at a diameter of about 5cm, but grows larger with age, the body is extremely hard, as are the strong spines.

One of the few red-flowering gymnocalyciums, which had been widely found in collections, was *G. baldianum* (Fig. 2) which was first described almost 100 years ago (1925). It remains smaller than *G. carminanthum*, the spines are shorter and not as hard, but the flower is quite comparable in size and colour. It is a representative with a somewhat soft body. Interestingly, it does not seem to be that variable.

Gymnocalycium bruchii is also very often found in collections. In 1968 I received a bowl from my uncle with about 10 cacti and other succulents planted in it – the start of my passion. *G. bruchii* was one of the plants flowering the next year in my young collection.

Although these plants were later lost in my collection, the species still accompanies me today – thanks to its huge variability and interesting shapes. I collected all the shapes I could get. There are many names under which the species can be found – I know at least 26 names plus the plants which can be obtained with a field number. Very white and very densely spined plants are often referred to as *G. albispinum*. There are also sparsely brown-spined plants, those with white or pink flowers with all nuances!

In addition, the species is easy to cultivate and offsets at a young age. The offsets are easy to remove and root. Therefore, the plant quickly became widespread in collections since it was described in 1926. Once, as a teenager, when repotting on our little balcony in our apartment I knelt on



Above: Fig 2 *Gymnocalycium baldianum*

Below: Fig 3 *Gymnocalycium bruchii* P200



one of these plants without even realising. It is another advantage of this species, and therefore recommends it especially as a plant for beginners, it hardly stings! When I noticed my faux pas, the plant was flat like a flounder. I pushed it back into a cylindrical shape and planted it and it survived without any complaint!

Lophophora williamsii

In the bowl I received from my uncle, there was also a small, separated, and rooted shoot of *Lophophora williamsii*, no larger than a thumbnail. I cannot explain how this plant survived as the only one of all the plants in that bowl. Today it has many heads, the bigger ones flowering regularly, and it fills a deep pot with a side length of 16cm. I have not dared to repot it for years. The problem is not to find a bigger pot, the problem is to find a pot that is deep enough! And repotting plants of such a size also means that they fill the new pot again within a very short time. I fear I must repot it next year.

L. williamsii has become famous for being used by Native Americans for ceremonies. Medicine men or chiefs are permitted to collect and use the plants that are strictly

protected in their homes in Texas and northern Mexico. The plant consumed in different forms creates hallucinations and Native Americans derive predictions from these.

I strongly doubt that plants kept in our latitudes develop enough substances to be used as intoxicants. At least I have been able to protect my plants from such experiments so far. Thefts in botanical gardens that targeted these plants, however, indicate that attempts are being made – but without public reporting on the effects. Unfortunately, this possible use of the species has meant that it is illegal in many countries and must not be kept.

L. williamsii has been known since 1845 and is also variable with numerous varieties and independent names that are more or less accepted. So, some plants remain single for a long time, others offset very early. The flower colour varies, but also the bristles on the areoles, which become elongated when the plants become of flowering size. They can be longer or shorter from white to brownish, see Fig. 5. The epidermis is particularly beautiful in all types! My recommendation – take a close look with a magnifying glass!

Fig. 4 *Lophophora williamsii*





Epithelantha micromeris

The genus *Epithelantha* comprises small species, all of which are distinguished by their spination which is delicate and wraps the body. How many independent species the genus comprises is controversial, the assignment to the genus, which was only created by Britton and Rose in 1922, can be done without any problems due to this peculiar spination. The species to be presented here has been known since 1856, but at that time it was still known as a mammillaria.

When I started looking at cacti, I saw pictures of such plants, but at that time they were still described as delicate. There were also almost no offers of such plants. In order to keep such plants rot-proof, you have to understand that cacti need water, but too much should be avoided. For a long time this has been interpreted – in some cases up to the present day – to mean that succulents require practically no water, which of course is nonsensical.

E. micromeris can stand in water for a few days! But the plant substrate must be designed in such a way that too much water can drain off quickly, especially at the plant neck. And a surplus of water over weeks and months is harmful. When I water it is intensively and almost always

with fertiliser, but in between the plants can dry completely again. If kept this way, they will bloom profusely and fruit throughout the summer.

In a continuation I would like to go deeper into my culture methods. ■

Photos: Jörg Ettelt

Fig. 5 *Lophophora williamsii* var. *texensis* Köhres *samen*



Fig. 6 *Epithelantha micromeris* JM119

Uncarina roeoesliana

First time of flowering

by Colin C. Walker

***Uncarina* is a small genus of 14 species endemic to Madagascar.**

The name is derived from the Latin '*uncus*' meaning 'hook' in recognition of the viciously barbed spines on the fruit that are somewhat like fishing hooks. These

facilitate dispersal as they become attached to passing animals.

It belongs to the small family of the Pedaliaceae with about 100 species of which sesame (*Sesamum*) is the only economically important plant. I currently



Fig. 1 *Uncarina roeoesliana* flowering in a 10cm pot

Photo:
Colin C. Walker

grow three species of *Uncarina*: *U. peltata*, *U. grandidieri* and *U. roeoesliana*. The first of these was featured as a ‘Presidential Potted Plant’ in *CactusWorld* (The Journal of the British Cactus and Succulent Society) (Walker, 2020). Here I report on my first flowering of *U. roeoesliana*. My specimen of this species (Fig. 1) has been in the collection for 19 years and it has just, in June this year (2020), produced its first ever flower. Why it has suddenly and unexpectedly produced this first single flower is a total mystery!

Uncarina roeoesliana forms a large shrub, up to 1.5m tall, with usually a single stem arising from a large globular subterranean tuber which in habitat is buried below the soil. However, as you can see from the photo, my plant is grown with the tuber partially exposed above the soil. During the 19 years in my care this plant has produced little overall additional growth. Indeed the original stem has died and the stem shown in Fig. 1 was only produced last year.

Like all species of *Uncarina* it is deciduous. In the spring it produces variously shaped lobed leaves up to 10cm long and around 8cm across which are borne on petioles of up to 8cm long. All parts of the plant are covered in hairs (technically termed trichomes), especially the leaves which have a soft downy feel to them. Rauh (1998) says that “the glandular trichomes of the upper leaf surface are 2-4 celled while the trichomes below are 3-8 celled”. Following on from this Ihlenfeldt (2002) in his synopsis of the genus observes that the large hairs of the undersides of the leaves of this species are unique in the genus and even in the family as a whole. However, without access to a microscope, I have been unable to confirm this.

The flower is held horizontally and has a narrow tube about 5cm long and, like the leaves, is covered with downy hairs. At the mouth it is about 4cm across with five short curved lobes. Rauh (1998) says that these flowers are the smallest of all species in this genus. As in the majority of the 14 species the flowers are yellow, which in this case is a uniform light buttercup yellow. This contrasts with the flower of *U. peltata* which is a vibrant golden-yellow with a contrasting deep purple-red throat (Walker, 2020). There is no detectable scent. (In contrast *U. abbreviata* and *U. stellulifera* have purple-violet flowers whilst those of *U. leptocarpa* are white.)

Uncarina roeoesliana was described as a new species in 1995 by Werner Rauh, the renowned succulent explorer of the Madagascan flora and named for Walter Rösli, the Swiss succulent plant explorer, who also specialises in Madagascan plants.

Uncarina roeoesliana has a very restricted range in southern Madagascar east of Toliara where it grows in compacted sand dunes and is considered to be a highly endangered species by Ihlenfeldt (2002).

My specimen of this species has been in the collection for 19 years...Why it has suddenly and unexpectedly produced this first single flower is a total mystery!

Uncarina roeoesliana is easy to grow in cultivation. In the winter when it is leafless I maintain it in a conservatory with a minimum temperature of 10°C where it also receives the occasional very light watering. In the spring when the new leaves start to grow I water weekly. In warm or hot weather all uncarinas can take plenty of water and indeed their leaves will start to wilt rapidly if under watered. As the leaves die back in the autumn I gradually reduce the watering.

Now that I have managed to flower two of the three species of *Uncarina* that I grow the question is: when will my plant of *U. grandidieri* also oblige with flowers? This plant is my largest *Uncarina* being a single, currently unbranched, stem around 1.4m tall. Rauh (1998) says that this species forms well-branched small trees or shrubs up to 2.5m tall so perhaps my plant is still too small or immature to flower. ■

References

- Ihlenfeldt, H.-D. (2002) Pedaliaceae in U. Eggli (ed.) *Illustrated Handbook of Succulent Plants – Dicotyledons*. Springer, Berlin, etc.
- Rauh, W. (1998) *Succulent and Xerophytic Plants of Madagascar*. Vol.2. Strawberry Press, Mill Valley, California.
- Walker, C.C. (2020) Presidential potted plants – *Uncarina peltata*. *CactusWorld* 38: 24.

Big Bend

by Jenny Nunn



Left bank - Mexico
Right bank - USA

This article highlights one week out of a month of our travels of over 3,500 miles from Albuquerque to New Orleans, taking in the National Parks including White Sands, Carlsbad Caverns, Guadalupe Mountains and Big Bend. Having travelled much in recent years to the cactus heartlands of Arizona and Utah, we had yet to explore the wonders of the Big Bend National Park in Texas.

The popular National Parks such as the Grand Canyon, Yosemite and Yellowstone are extremely busy during the spring break and the summer months, so January always seems a good time to visit when temperatures are pleasant and fewer visitors are around. However Big Bend, probably because of its remoteness and vastness, undoubtedly attracts fewer visitors in a year, (under half a million), than its more famous counterparts which have upward of five-six million each.

Big Bend, named after a bend in the Rio Grande, lies in the northern part of the

Chihuahuan Desert and follows the river for 118 miles along the Mexican border with Texas. Established in 1944, the National Park extends over 800,000 acres and is home to 1,200 different plant species. The altitude rises from river level 1,880 ft to 7,832 ft in the Chisos Mountains.





It is here that you can find the most abundant number of cactus species of anywhere in the United States from *Ariocarpus fissuratus* (Living Rock Cactus) to the rare and endangered *Echinocereus chisoensis* (Chisos Mountain Hedgehog) which is only found within a 30 mile radius in Big Bend National Park itself.

From whichever direction you approach the National Park, whether from Terlingua, Alpine or Marathon, you cannot fail to be awed by the sight of the Christmas,

Rosillos, Santiago and ultimately the Chisos Mountains where we were fortunate to stay in one of the park's lodges for a week. The road to the lodges is steep with sharp curves and a speed limit of 10mph. Signs warning of bears and wildlife crossings are juxtaposed with awesome, treacherous views if you are the driver. One morning we happened upon a family of javelinas and mule-deer taking advantage of the early sunshine before darting hastily back into the wilderness of the scrub.

Soto Vista Desert Overlook

A note on US common names

I thought it would be useful to include the US common names of the plants mentioned in this article as they are mostly highly descriptive, colourful and fun but more importantly, as we experienced, often it's the only way to communicate botanically-speaking with locals or park rangers to locate plants.

Of course, the local names differ depending where you are and are not always one hundred percent accurate in trying to match with the scientific nomenclature.

Take for example the 'Strawberry Cactus'. Are we talking about *Echinocereus stramineus* or *Echinocereus enneacanthus*, the 'Pitaya' or 'Strawberry Hedgehog'?

Another example from further afield in the State, which is potentially very exciting because it is outside the documented distribution area in Texas of Starr and Zapata counties, is *Astrophytum asterias* (the 'Star', 'Sand Dollar' or 'Sea Urchin' Cactus). When a State Park Ranger described nearly treading on one while bird-watching I ran back to the car to grab my Texas Cactus Guide, thinking he could also be thinking of its look-alike, *Lophophora williamsii* ('Peyote'), equally difficult to find. However, on showing him the pictures, he confirmed it was indeed *Astrophytum asterias*, the 'Star Cactus', and a big one at that! Unfortunately, the area was closed due to heavy rains and work on the access road, so I was unable to visit to verify the ranger's story.



St Elena Canyon

Setting off to explore on our first day we pulled in at the unassuming Castolon/St Elena Junction to check the map. This proved to be a treasure trove: *Echinocactus horizontalonius* (Turk's Head) large and small, *Echinocereus enneacanthus* (Pitaya), *Ferocactus hamatacanthus* (Texas Barrel), *Grusonia aggeria* (Dog Cholla) along with lots of *Opuntia* including *O. rufida*. Of course, after the first wave of euphoria, it gets harder to seek out the more choice species so armed with lots of motivation, we continued along Ross Maxwell Scenic Drive to Castolon and then on to St Elena Canyon which begged the question from the American visitors gathered here: 'why on earth was the Government going ahead with its plans to build a wall along the border when nature does it quite spectacularly?' From here the choice is to back-track along Ross Maxwell Scenic Drive or take the Old Maverick Road to Terlingua. Being mavericks, we took the unpaved, dirt road in splendid isolation for 13 miles, stopping off at wash-outs and limestone outcrops to hunt down elusive species.

Back on the metalled road, the approach to Terlingua is like a scene from a movie. Mountain vistas and desert scrub interspersed with crumbling ghost-town houses and the odd sign of 21st century life in the form of a convenience store, gas

*Mammillaria pottsii*



station and restaurants. The Starlight Theater, I had heard, was the place to start the search and here we were not disappointed to find *Mammillaria pottsii* (Rattail pincushion) and *Echinocereus dasyacanthus* (Texas Rainbow Hedgehog).

Before leaving the UK, we had read that it may be possible to cross the Rio Grande to Mexico by rowing boat and on foot. I checked this out at the ranger station and indeed the crossing was open for day visits to the village of Boquillas. The rangers man the border control office on the US side and, as we were the only two people crossing, had time for a very informative chat about how the crossing provided much needed tourism for Boquillas and how reciprocal conservation work was going on between the two countries protecting the two bio-diverse regions of both Big Bend and Sierra de San Vicente in Coahuila. The ranger also explained how the Mexican Fire Brigade assisted in a joint operation during the wildfires in 2019 which ravaged historic buildings in Castolon.

The Rio Grande runs rapidly but our Mexican oarsman had done this trip thousands of times and we were safely dispatched on to Mexican

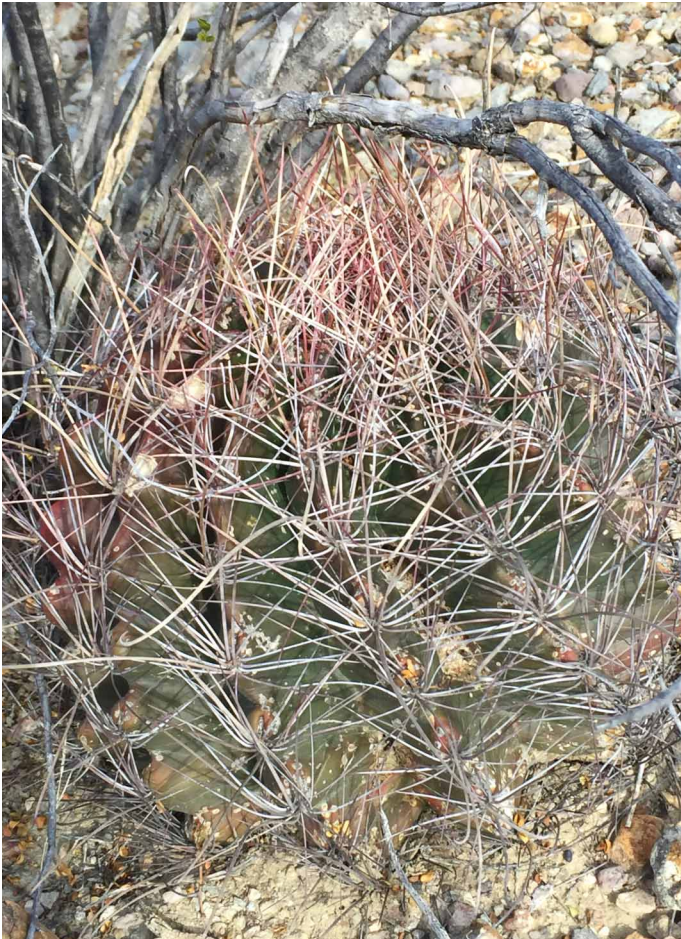
soil after the five minute crossing with a choice of truck or donkey shuttle to the nearby village a mile away. Opting for the truck, we soon realised that a donkey may have been more reliable or comfortable. Our 16-year old driver spoke no English and my pidgin Spanish failed to hit the spot, so as always the ubiquitous sign language came into play and we arranged to meet the driver in two hours to take us back to the ferry.

The idyllic village with its brightly painted houses and local handicraft street vendors was a delight. On spotting a *Ferocactus*

Crossing the Rio Grande

Boquillas village





Ferocactus hamatacanthus



Echinocactus horizonthalonius



Ariocarpus fissuratus



Echinocactus texensis

hamatacanthus and an *Echinocactus grusonii* growing by one of the pitches we crouched down to photograph them, which no doubt caused some hilarity over the crazy 'gringo' woman. Here we savoured one of the best breakfasts ever at Jose Falcon's famous restaurant with awesome views over the Rio Grande; chili rellenos, a cheese-filled poblano chilli with refried beans and coriander rice washed down with cold Mexican lemonade.

Heading back over the border to the US along a dusty desert path, you have to sign

back in by speaking with a border control agent by phone in El Paso. No drugs, firearms or endangered animal products to declare and we were on our way again back officially in the US. The border control ranger had also kindly given us some tips for new cactus hunting grounds and on leaving here we headed for the Marufo Vega Trail. Here we found *Mammillaria lasiacantha* (Golf Ball), *Escobaria tuberculosa* (Corn Cob), *Ferocactus hamatacanthus* and some impressive *Echinocactus horizontalis*.



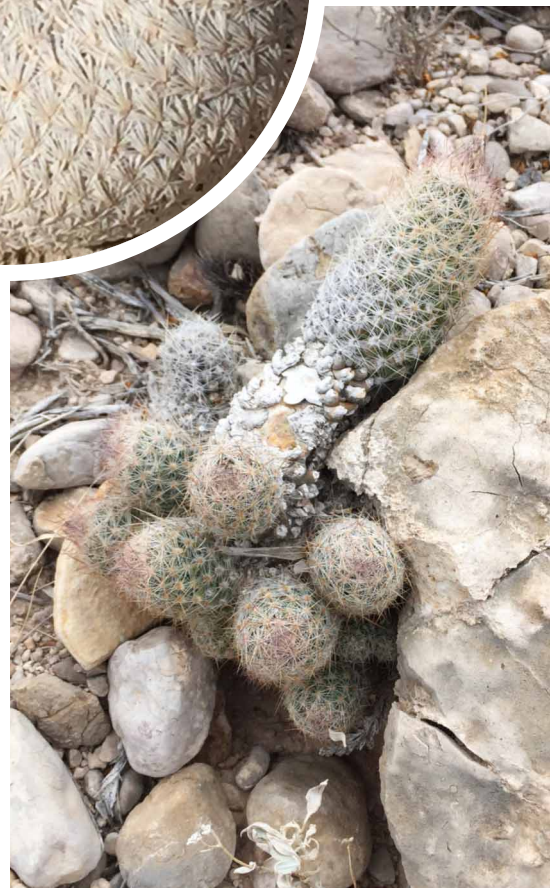
Hot Springs is not far from here. We entered a two mile, winding dirt road, which ended with the abandoned bathhouse building from J.O. Langford's ambitious project to build a resort back in the early 1900s. A short walk takes you to a hot spring in the



Left and insert:
Epithelantha bokei

Below left:
Mammillaria lasiacantha

Below right:
Escobaria tuberculosa



Big Bend continued

Rio Grande river where plenty of people were enjoying the health benefits in the 105°F waters. Along the road there are *Coryphantha macromeris* (Big Needle Beehive) and numerous *Echinocactus horizonthalonius*.

Dagger Flats was another great tip for seeing Horse Cripplers or *Echinocactus texensis*. As the name suggests Dagger Flats is a relatively low lying area heading north towards Persimmon Gap. It takes a while to get your eye in but then they appear in profusion growing low in the sun-baked, cracked desert floor. Having photographed the horse cripplers to excess, I headed for a limestone outcrop to the north and climbed to the top through the hazardous loose scree. But I was to be rewarded with my first habitat spot of *Ariocarpus fissuratus* (Living Rock) and *Mammillaria lasiacantha*.

Not far from here is a turn-off for Dagger Flat Auto Trail, a challenging five mile off-road dead-end route with views to the Sierra del Caballo Muerto Mountains. Stopping at various points along the way and using instinct and pure guess work only, we found some of the best *Ariocarpus fissuratus*, *Escobaria tuberculosa* and *Ferocactus hamatacanthus* so far.

Now the challenge remained to seek out the elusive *Epithelantha bokei* (Boke's Button). Having already seen many *Epithelantha micromeris* on our way south in the Guadalupe Mountains and Carlsbad area of New Mexico, we were running out of time to find this most beautiful of the genus which only grows in the US here in Big Bend. So after a chat with a cactophile ranger during one of the park's evening lectures, we set out the next day for a limestone crop near the Hot Springs road.

Our perseverance paid off and, along a high limestone ridge, there they were, large specimens growing alongside *Mammillaria lasiacantha* and *Echinocactus horizonthalonius* in the most extraordinary conditions and impossible positions between the rocks.

So, our last day in Big Bend was most fruitful and we got to see some of the most elusive cacti we had set out to photograph in habitat. Whereas it's lovely to have a plant growing at home in a pot, it's such a different experience and privilege viewing plants in habitat and understanding the extreme conditions they have to endure.

I am not sure if we managed to see the most elusive of all, *Echinocereus chisoensis* as the locations are religiously safe-guarded against poachers and quite rightly so but could this be one of them? ■

Photos: Jenny Nunn



Further reading

Benson, L (1982) *The Cacti of the United States and Canada* (1982) Stanford University Press, California.

Bowers, N & R, Tekiela, S (2009) *Cactus of Texas Field Guide*. Adventure Publications Inc, Cambridge, Minnesota.

Loflin, B & S (2009) *Texas Cacti*. Texas A&M University Press.

Powell, A M, Weedon, J F & Powell, S A (2008). *Cacti of Texas, a field guide*. Texas Tech University Press.

➤ [Big Bend National Park website](#)

Echinocereus chisoensis?

Echeveria rosea

by Paul Spracklin

An attractive and extremely hardy *Echeveria*

The species *Echeveria rosea* (not to be confused with a frilly hybrid, *Echeveria* 'Rosea') is a colourful plant enjoying a wide distribution throughout much of Mexico where conditions are right. That is to say, in the mid to high elevation cloud forest zone where it is generally seen growing as an epiphyte

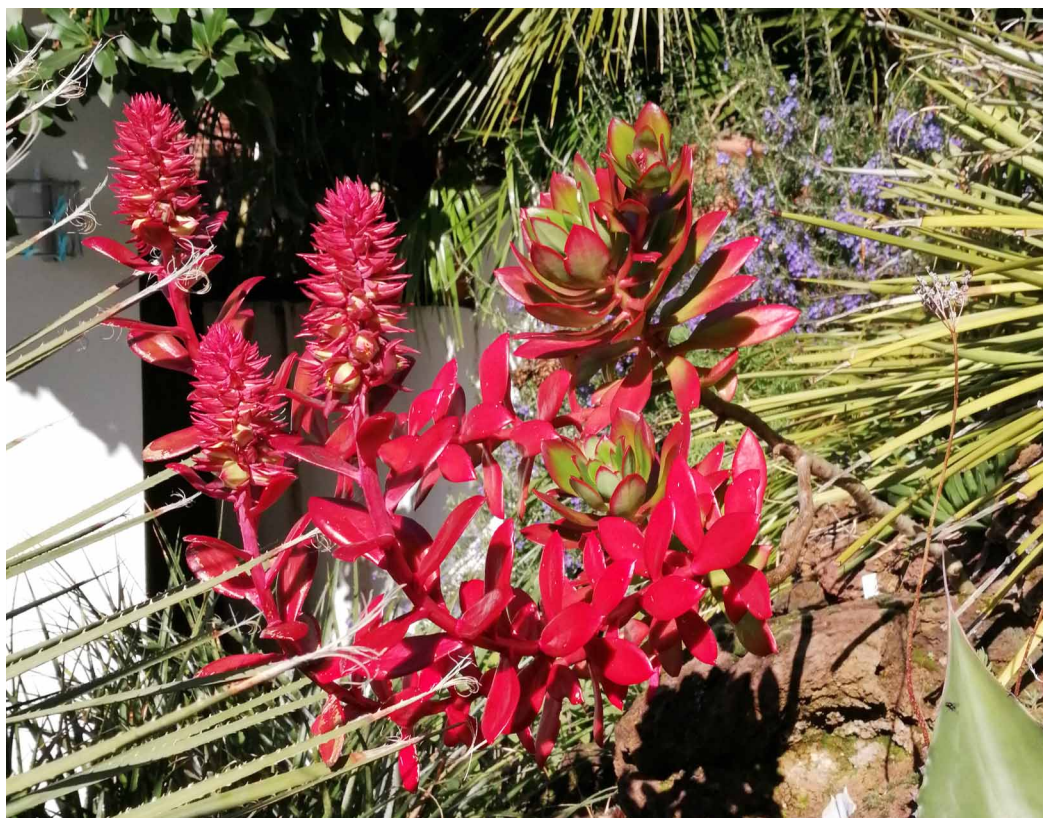
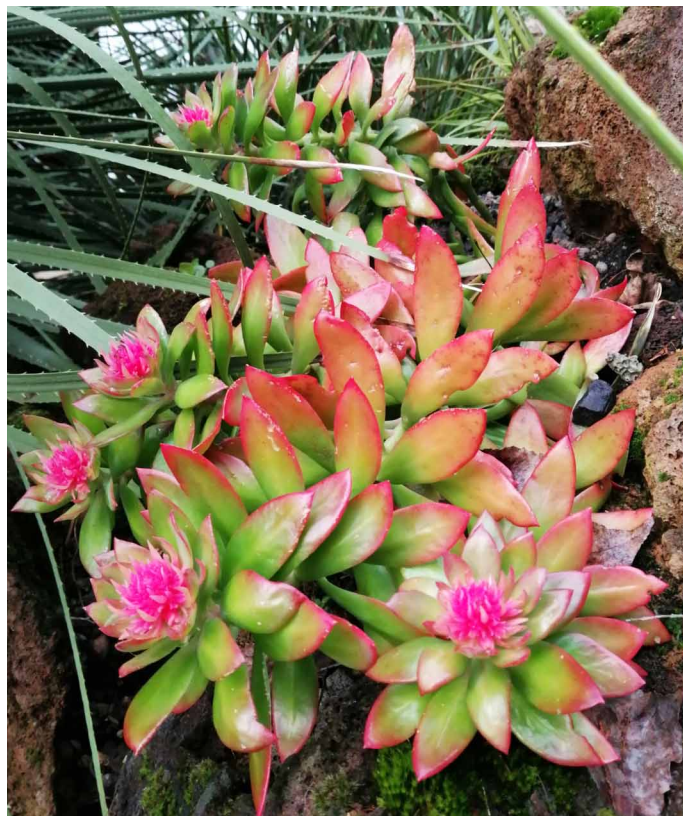
Typically the plant grows as a sparsely branching stem, perhaps to 60cm, with glaucous grey-green leaves that are generally tinted pink around the leaf margins forming open rosettes of perhaps 10cm in diameter. Flowering shoots arise from the side of the stem, initially clothed in leaves (although these can be lost quickly in drier growing conditions) and arch upwards ending in a densely packed 'Christmas tree' of bracts interspersed with yellow-ish flowers. During flowering, which for me is usually March, the whole plant flushes intensely with strong pink tones – stronger light gives stronger colour. A recent clone has appeared where the leaves are more apple green than glaucous grey and the pink is much stronger to become a rich crimson colour.

It is a remarkably cold-hardy plant, one of the most cold-hardy *Echeveria*, taking lows of perhaps -10C. It seems to grow better outside in stronger light and cooler, more humid air than it encounters in the greenhouse. I grow mine in the tiniest of cracks between rocks and also in a pocket of debris in the crotch of a yew tree and, in SE Essex at least, it actually does far better in wetter years, needing some extra irrigation most of the summer.

For pot culture an open, well-drained medium – perhaps even a fine bark mix – with frequent watering would suit it best. A hanging pot would be ideal.

Propagation from leaves is the easiest way, either from the main rosette or the flowering shoot. ■

Photos: Paul Spracklin





Some medium-sized Aloes

by Mike Cullen

Some more attractive aloes which are well-worth growing

It's not easy to define a medium-sized aloe. Medium at maturity is obvious but what about slow-growing large aloes that take many years to get to full size? I think they can be included. Also, what about clumping aloes that form large plants eventually? The easy

answer there is to remove the offsets and keep it to the size that you want.

Here are some of mine, most of which came from cuttings some 11 years ago.



◀ Aloe jucunda (Somalia)

This has it all. Compact, shiny colourful leaves and dusky pink flowers (shown above) throughout the summer.



◀ Aloe erinacea (Namibia)

A favourite aloe closely related to *Aloe melanacantha* which I also have. It normally stays solitary in cultivation but can clump in habitat. Indeed, I have seen a clump exhibited at the Oxford BCSS show which needed two people to carry it in, and I would say that plant is the most beautiful aloe I have seen.

It is a winter grower but I water it through summer and a little later and a little earlier in the year if the weather is favourable. I would certainly give nothing from mid November to mid February. Grown from seed some 15 years ago but yet to flower.

No special cultivation tricks are needed but they get full sun all the time to bring out the colours and a number go outside in full summer sun for that reason.

For winter they all share space with my Stapeliads, so my greenhouse is about 10°–12°C, but many of them are on the floor so at about 7°C I would guess.

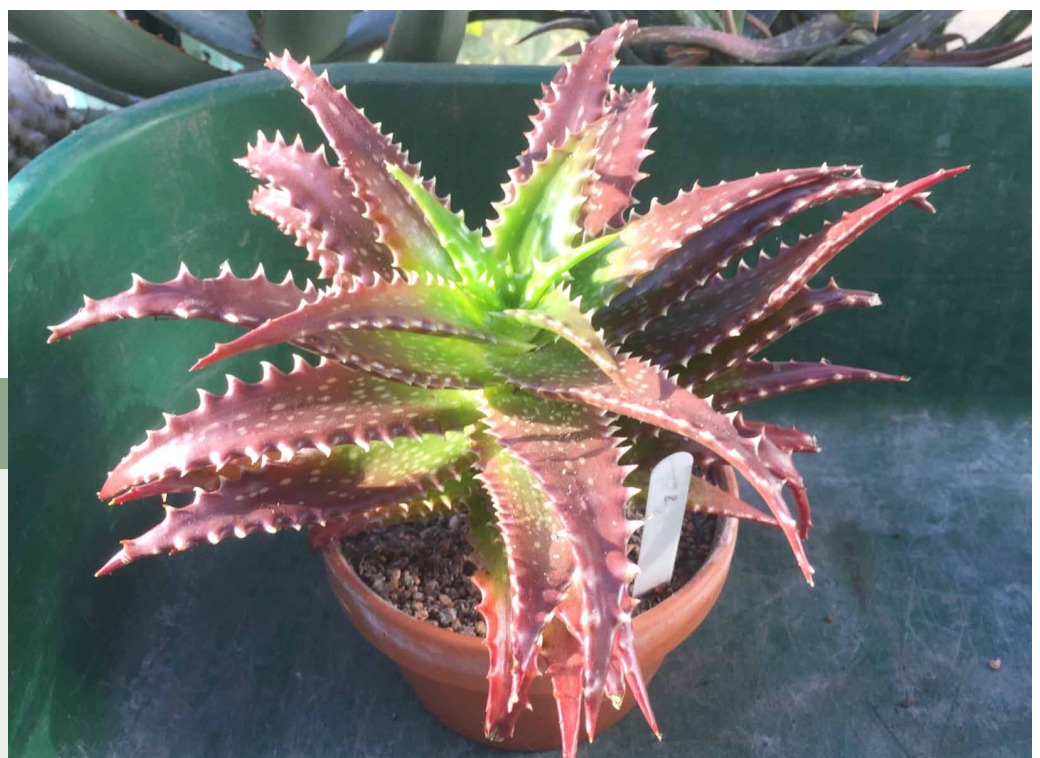
Certainly the East African and Madagascan species need a bit more warmth.

I have a number of other medium-sized aloes and a fairly modest growing space, but somehow I find room in winter for them all. If you are considering aloes I hope these suggestions will be of help. ■

Photos: Mike Cullen

▶ Aloe dorotheae (Tanzania)

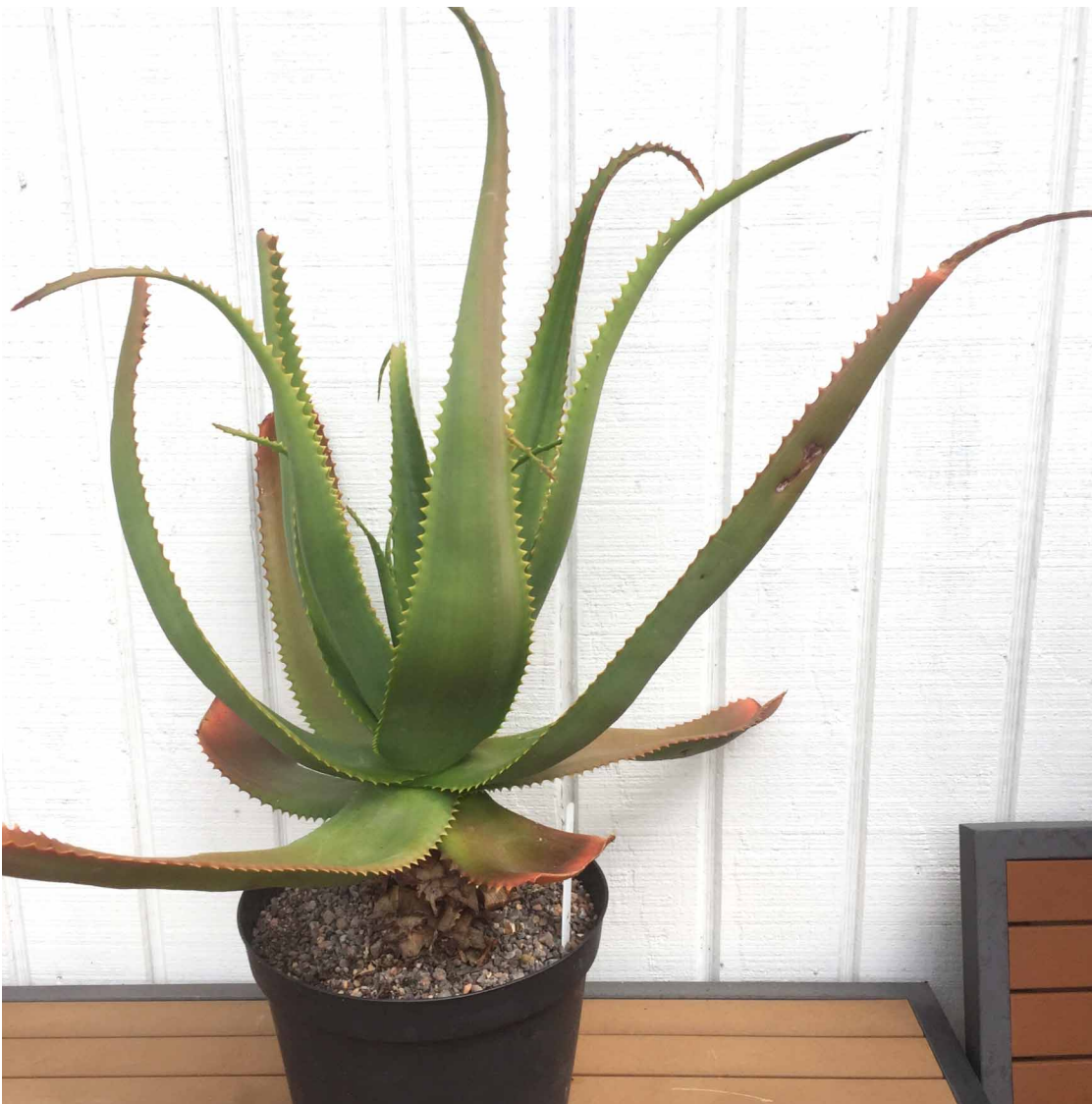
If you want colour then this is the one. Keep in full sun for the best colour but I find it to be a little tender so not too cold in winter. This is from a cutting about four years ago but I had one before for some 10 years.





◀ Aloe peckii (Somalia)

Lovely leaf colours and an unusual off-white striped flower with greenish-yellow buds.



◀ Aloe bulbillifera (Madagascar)

Something different. No highly coloured leaves but a lovely fresh green and after flowering no seed pods but plantlets instead and if these are left on the flower stalk for long enough they can be planted up. This is the only aloe I know that does this. Stays out all summer.



◀ Aloe lineata subsp. muirii (Western Cape)

This is a very unusual aloe. When I acquired it, it was labelled *Aloe glauca* which it certainly was not with the strange bushy growth. Eventually, somebody who knows far more about aloes than I do identified it as this plant.

It is one of those aloes which has distinct juvenile and adult growth, like *A. arenicola* and *A. suprafoliata*. At maturity it is quite a large rosulate plant, but my plant took on that form only about three years ago and is slowly developing.

▶ Aloe bakeri (Madagascar)

This was originally labelled as *Aloe fragilis*, which is similar, but the flowers gave it away. These are probably the most colourful of all aloe flowers ranging from apricot – scarlet at the base becoming orange and then yellow at the mouth. They really glow!



▼ Aloe perfoliata (Western and Eastern Cape)

Some of you may have this as *Aloe microstigma* but I acquired my plant from Colin Walker who has *microstigma* as a synonym and he should know! Another aloe that spends the summer outside.





◀ Aloe deltoideodonta (Madagascar)

This is a clumping species so to keep it within bounds remove offsets at repotting. I also have the varieties *candicans* and *fallax* which are lovely plants but look nothing like this! This goes out all summer to get the best colouring.

Getting a drink from a cactus

by Sue Hakala

A great fable of desert survival is that barrel cacti and other cacti are water reservoirs. Most of us could not get water from a cactus if our lives depended upon it. Some have died trying.

The first problem is cutting a plant open. A pocketknife would not work; a tire iron may be effective on a barrel cactus. The labour of cutting into a plant with formidable spines on a hot day would cause great water loss from sweating, not to mention probable bleeding.

Secondly, have you ever tasted cactus pulp? Cactus tissue is made to hold water and resembles a cucumber, minus the seeds. It's not something you could scoop or wring water out of. When propagating cactus plants, I used to run my tongue across the flesh (of the part I was throwing away) to taste it. It can taste very bitter, although I have never sampled a barrel cactus. One time, the bitter taste had me running to the house for something to get rid of the awful taste that was puckering up my mouth. Some cactus flesh has toxic

levels of oxalic acid and alkaloids and that may be what I was experiencing. These elements in small quantities can cause vomiting and diarrhoea – not a big help when suffering from dehydration.

State laws protecting Arizona native cacti make it illegal to take or destroy them.

Cutting open a barrel cactus would most likely kill it. Cacti have spines and sometimes glochids (tiny, awful, itchy spines) designed to discourage desert animals from doing the very same thing. Contrary to what you may have seen in some old Western movies, you really cannot scoop out water from a cactus. ■



Mammillaria lauii subsp. *subducta* inside

Photo: Sue Hakala

Reproduced from 'Central Spine' the newsletter of the [Central Arizona Cactus and Succulent Society](#)



Some of my **Astrophytums**

by Bill Darbon

For a long time since I have been collecting succulent plants and particularly cacti, I have been drawn to the many different plant forms of the *Astrophytum* group mainly for their aesthetic shapes, distinctive markings and wonderful flowers. I have been fortunate to obtain some lovely specimens over the years, (some unfortunately now no longer with me).

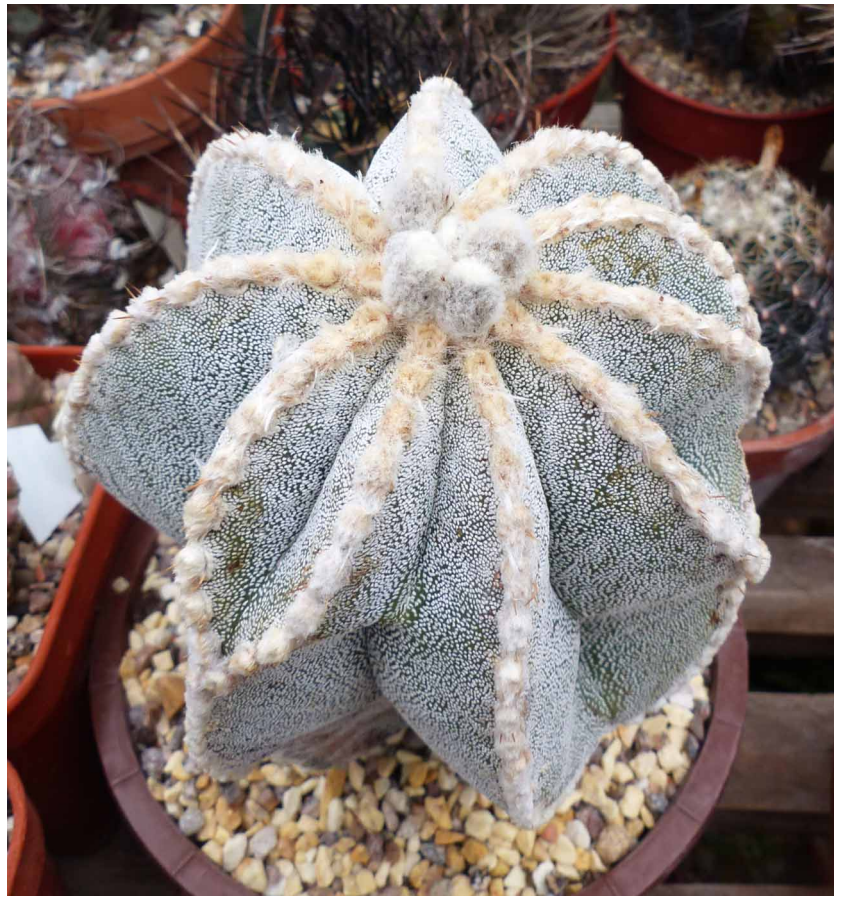
I have not yet had the experience of seeing these wonderful plants in their native habitat, however pictures from a number of speakers have whetted my appetite to do so – perhaps sometime in the future.

Some of my *Astrophytums* continued

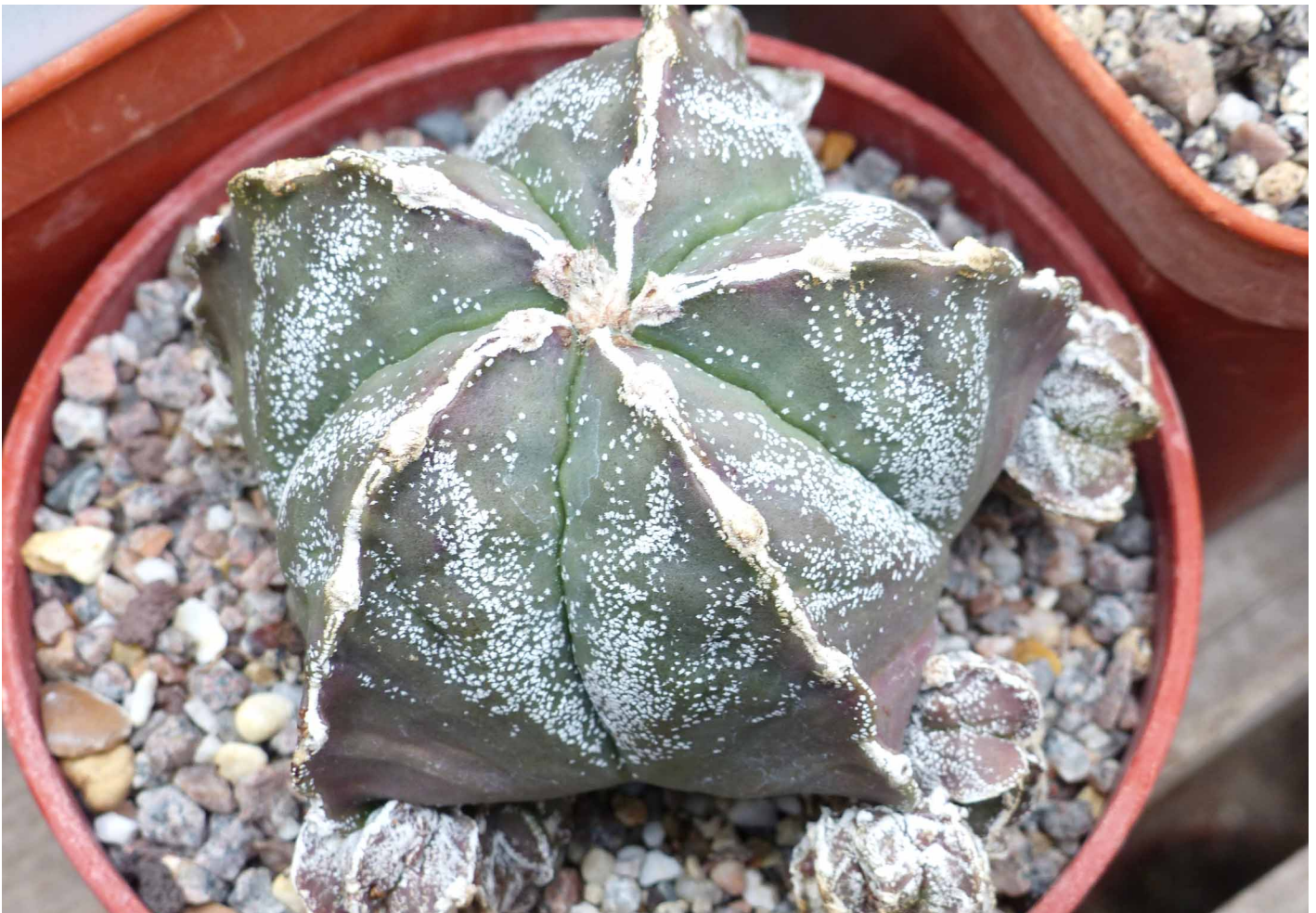
One of my first plants was an *A. asterias* from Bungart in Germany bought when I visited him over 35 years ago. I found this was on a small graft, and I managed to keep it for about 10 years. Sadly, after this it was relegated to the compost heap when the graft went rotten and I was not able to save the main plant body.

Ever since I have been picking up various different plants of the genus from a number of nurseries and plants sales I have visited. I suppose if I had a favourite it's either the super kabuto forms or *A. capricorne*. BUT how can you choose when they are all so lovely in their own way, I always seem to be able to find room for just one more.

I find with most of the forms of *A. asterias* crosses that, once they start to shrink at the base, they are very difficult to bring back, so I tend to perhaps water them more than the other species, and keep them in a very open compost. I have been reasonably successful in growing most of the species, but still find the 'Onzuka' form more difficult to maintain in good growth and prevent from shrinkage.



Astrophytum myriostigma x



Astrophytum asterias x *myriostigma*

Some of my *Astrophytums* continued

My cultivation methods over the years have varied in different types of soil mixes and I have skipped between terracotta and plastic pots. More recently I have introduced some limestone in a much more open mix and water a little more frequently, but never in full sun.

I was able to find two nice *Digitostigma* (*Astrophytum*) *caput-medusae* at ELK a couple of years ago, which I have managed to flower beautifully. This is clearly very different from *A. myriostigma* or other species in the genus, but with a typical *Astrophytum* flower. I have not yet been able to set any seed on this plant although I have tried crossing the flowers and with other species of the group, but still no success; I suspect I may need two different clones to be successful. I also keep this plant in a small saucer so as not to let it dry out so much.

I find that all other species appear to set seed quite freely and produce numerous seeds for propagation.

I was fortunate to acquire a very old plant of *A. ornatum* (Ex John Warwick) some years ago, which is a real beauty and has won me some prizes at shows.

The many forms are quite varied and a small group of plants in the greenhouse can give a collector a lot of pleasure with the different forms and marks on the plant bodies, and the spectacular flowers in the summer are wonderful. I would encourage any collector interested in cacti to perhaps make room for at least one or two of this rewarding genus. ■

Photos: Bill Darbon

Reproduced from 'Oxotica' the newsletter of the Oxford Branch of the BCSS



**Flowers of
Digitostigma
(*Astrophytum*)
*caput-medusae***



Astrophytum ornatum



Astrophytum capricorne

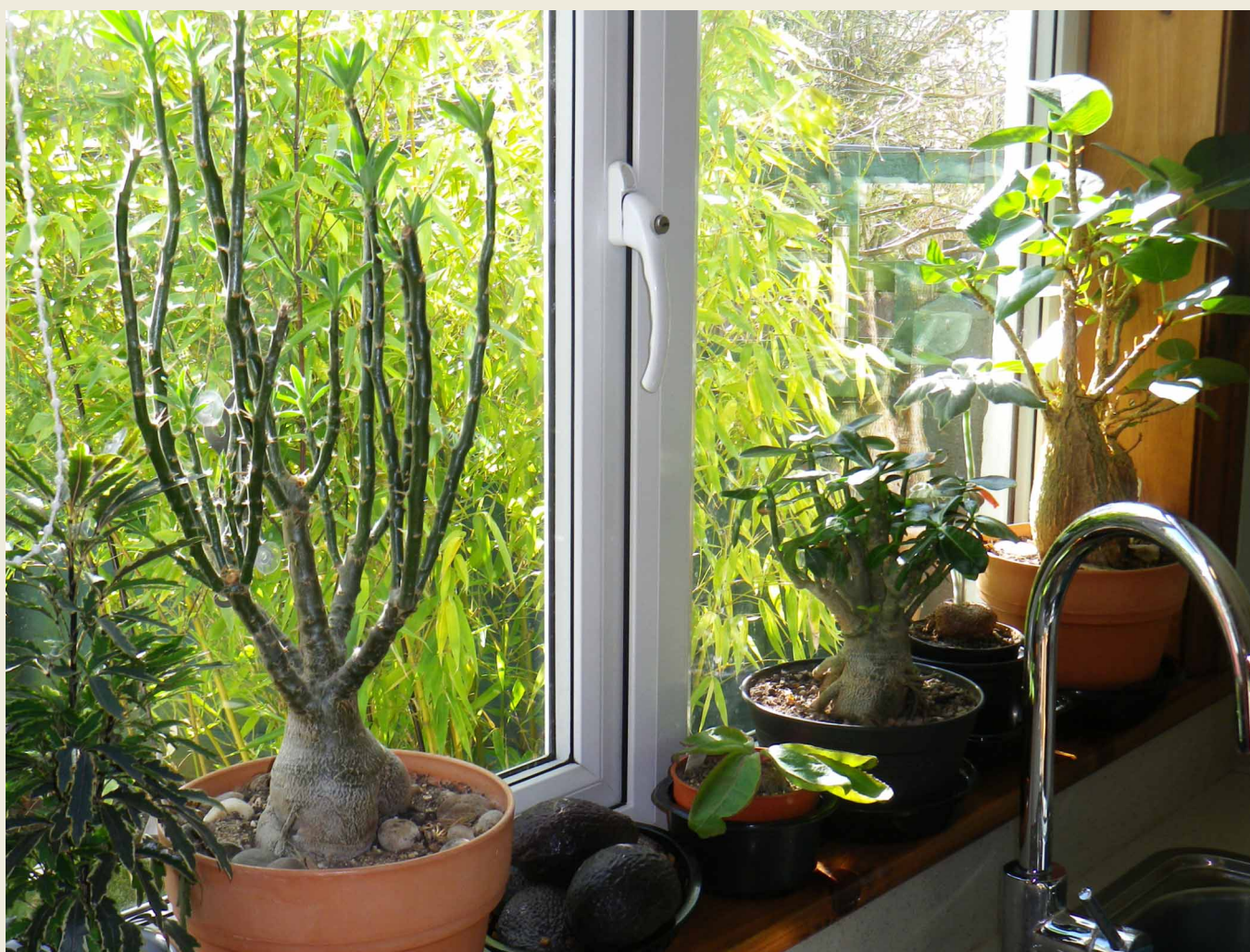
Succulents on the windowsill

by Alan Tuppen

Some unusual candidates for windowsill culture

Until a few years ago I did not grow many of the other succulents, but concentrated on cacti. I had a few *Lithops*, that lived rather than thrived and still do, because I keep them in the greenhouse. Then a few years ago, through pressure on space in the

greenhouse, I brought some of the larger succulents into the house, at that time *Ficus palmeri* and *Pachypodium succulentum*, which live on my kitchen windowsill. The rear of the house faces south, so I have three suitable sills.



From left: *Schefflera elegantissima*, *Pachypodium succulentum*, *Aeollanthus subacaulis*, *Adenium obesum*, *Ficus palmeri*



From left: *Fenestraria rhopalophylla* subsp. *aurantiaca*, unnamed shrubby *Crassula*, *Ornithogalum thyrsoides* 'Milky Way', *Titanopsis schwantesii*, *Conophytum ernstii*, *Conophytum x marnierianum*, *Aloinopsis rosulata*

These were followed by *Adenium obesum*, *Aeollanthus* (*Plectranthus*) *subacaulis*, and now *Sinningia leucotricha* which is flowering at the time of writing, late February 2020. I still keep the *Adenium* and *Pachypodium* dry over winter to avoid any risk of root rot and also so that they do not grow weak, etiolated stems.

One year I also had *Cryptocereus anthonyanus* growing up a cane in the corner of the same sill. It can be a fast grower given the right conditions and, being a plant that climbs trees into the canopy, forms adventitious roots from the centre rib of the stem. These grew behind the window aperture boarding so that, when the plant got too big, I had to remove the boarding to remove the plant!

A number of years ago I acquired a plant of *Conophytum ernstii* that I put in the greenhouse and watered in milder spells in the winter as one is supposed to do. For a couple of years it gradually dwindled until it was just a few miserable, wizened

...for slow-growing plants or those that stay naturally compact, such as *conophytums*, windowsill culture can be ideal.

heads. At this point I brought it into the house and started to treat it as a houseplant, watering it carefully in the summer too. I got other *conophytums* and brought them indoors, finding I can water them most of the year, except when the old heads are shriveling and the new ones forming. I get good growth and flowering.

I followed these with *Aloinopsis rosulata*, *Titanopsis calcarea*, *Frithia pulchra* and *Fenestraria rhopalophylla* subsp. *aurantiaca*. More recently I have added *Faucaria tigrina*, and now *Titanopsis schwantesii* and *Aloinopsis malherbei*, both of which I grew from seed. The *Frithia* seldom flowers and is now 5.5 inches (14cm approx) across, and not as compact as it should be, so I am probably watering it too much.

Previously another *Fenestraria* and a *Trichodiadema densum* grew too big for the windowsill and had to be returned to the greenhouse. This threatens to be a regular occurrence for mat-forming Mesembs, but I think it shows that for slow-growing plants or those

Succulents on the windowsill continued

that stay naturally compact, such as *conophytums*, windowsill culture can be ideal.

With the *Ficus* the higher indoor winter temperatures mean the plant can be kept in leaf all year round. It would also be ideal for those plants that need a higher winter temperature, such as *Monadenium* – I have lost two of these in the greenhouse due to low temperatures.

It might also be good for *Tylecodon*, although the *T. striatus* I had in the house grew over a foot high in one season and broke in half when I moved it.

My *Cyphostemma bainesii* would also be a candidate, but it is now too big when in leaf, although I do bring it indoors for the winter when it sits on top of a bookcase in our spare room.

I would say that almost certainly plants will not get the light levels they should have, and will not grow as compact as they should, especially considering that most people now have double glazing, so light has to pass through two layers of glass with the inevitable

drop in intensity. It also means you will have to turn your plants regularly to get even growth.

I would not recommend it for *Lithops* – we have all seen the poor elongated plants on garden centre plant tables. I think this is because *Lithops* grow in summer when in habitat light levels are very high. If they are watered in winter they will grow then too and will not be compact at all.

Most cacti will have the same problem of trying to grow in winter if it is warm enough – they need to be kept cool and dry. *Conophytums* grow in winter when light levels,

even in South Africa are lower, so they will not grow too leggy.

Do look at your windowsills and, if they get enough sun, give them another try. You may not be able to grow plants to show standard, but you will still get a lot of pleasure from them. Windowsills are where most of us started and are not such a bad place to be. ■

Photos: Alan Tuppen

Windowsills are where most of us started and are not such a bad place to be.



From left: *Aloinopsis malherbei*, *Frithia pulchra*, *Faucaria tigrina*, *Conophytum ficiforme*, *Conophytum pellucidum*, *Conophytum gratum (jucundum)*, *Titanopsis calcarea*, *Faucaria tigrina*

Mammillaria theresae

by Tony Roberts

A beautiful, but challenging, species of *Mammillaria*

This wonderful species was described in 1967 by Ladislaus Cutak, a horticulturalist at the Missouri Botanical Garden – his article is well worth a read (Reference 1).

The first plants were discovered almost accidentally by John and Theresa Bock from Pennsylvania while they were holidaying in Mexico. The species is of course named in honour of Theresa. Fifty years on, it has become one of the favourites and must-haves of all mammillaria enthusiasts and lovers of small choice cacti.

Mammillaria theresae is often a solitary plant or can form small clumps of two to ten heads. Magnificent clumps of up to 100 heads are occasionally seen in cultivation and may have arisen from grafting at an earlier age.

It is not the easiest species to grow well – it has a large tuberous root, often as big as the plant above the soil – so benefits from a very well-draining soil. I use a 1:1 mix of John Innes No. 3 and horticultural grit.

Water it well between late March and September, but let it dry out properly between each watering. The plants will

Fig. 1. Two single-headed plants flowering in June





shrink to perhaps half their size in winter but, after their first watering in spring, they will swell again and produce several successive sets of flowers in the late spring and early summer (Fig. 1). I do not need to describe the unique body of this most attractive plant; a picture tells the full story (Fig. 2).

The fruits of this species are retained in the body of the plant. The seeds are best carefully extracted several years later by the judicious use of, for example, a needle and white saucer. The seeds give variable germination, but with several re-sowings a high success rate can be obtained.

If a plant dies and rots (yes, they do from time to time!) then do not just discard the plant – dissect it and you will find intact seed capsules within. In my experience, seed obtained in this way will germinate even more readily. Fig. 3 shows some small plants grown from such

seed – this is an example of what makes our hobby so rewarding. ■

Photos: Tony Roberts

Reference

L. Cutak, Cact. Succ. J. (Los Angeles), 1967, 39 (6), 237.

Fig. 2. The most attractive bodies of *M. theresae*



Fig. 3 Four small seedlings of *M. theresae*, about one year old

Making a plant support

by Paul Young

How to turn some ordinary kebab sticks into a support for climbing or sprawling plants

The support is made from wooden kebab sticks, commonly available from supermarkets. They are flexible and make a sturdy, durable support for climbing or sprawling plants which is not too obtrusive. As the sticks do not sit in the compost there are no problems with rot.

In this instance the support was made for a *Senecio stapeliiformis* subsp. *minor* and was designed to fit into the rim of a 6 inch square BEF pot. The support slots into holes in the pot rim and can be removed if needed.

Construction

Drill a hole in each corner of the BEF pot using a 3mm drill bit. The hole should be on the inside rim so the stick will protrude on the outer side of the pot.

Please refer to the picture on the next page for a more visual explanation.

Essentially the frame comprises two 'ladders' – placed on opposite sides of the pot. Assemble these first, fit into the pot and connect the two sides at the back edge with cross pieces. We found it is best to use Superglue for the initial fixing. The addition of cotton thread binding with UHU glue makes the structure more secure.

One side of the pot is left open for access.

'Ladder' uprights

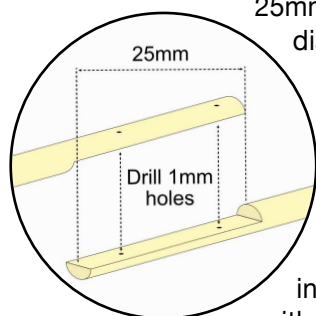
First make the two verticals for each ladder. Each vertical is made from two sticks.

For each vertical cut the pointed end off one stick. This will be the top. The pointed end of the other stick will fit into the pot.

On the uncut ends of both sticks make a cut 25mm from the end to half the diameter of the stick. Use a craft knife to slice off the upper segment. Superglue the two ends of the sticks overlapping the join.

For additional security we drilled two 1mm holes in each stick, inserted wire and pinned together with Superglue, but this is optional. If

not pinned, smear the joints with UHU glue and bind with cotton thread to secure.

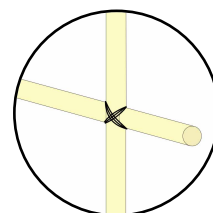


Ladder cross-pieces

Insert the two verticals in the pot and measure the length of sticks required for the top and bottom cross pieces.

Lay out the verticals on a flat board and secure them with masking tape while you measure the remaining cross pieces.

Note that the ladder should be wider at the top so the verticals will have to be angled to account for this when measuring the cross pieces.

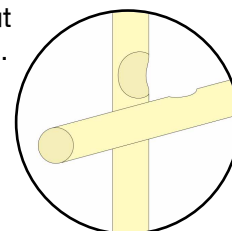


Cutting recesses

Mark the verticals and cross pieces at the points where they are going to join. Use a scalpel to hollow shallow recesses in the sticks where they will cross over. This provides more surface area for the glue to adhere and helps keep the sticks in place.

Cut and fix the top and bottom cross pieces first. When secure cut and fix the remaining pieces.

Cut over-long lengths and trim with pincers when secured after gluing.



Back cross pieces

The two ladders are connected at the back edge of the pot.

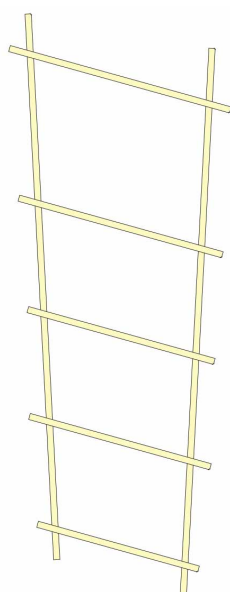
When both ladders are assembled insert into the pot and measure the length required for the top and bottom cross pieces.

Note that the ladders will tend to pull inwards so when measuring the cross pieces pull out the ladders 10mm or so to compensate.

With the ladders in place in the pot, stick the top cross piece first with Superglue.

When secure enough to hold do the same with the bottom cross piece. Note that the bottom sticks rest on the top edge of the pot and must overlap by 5-10mm. Cut and glue the remaining cross pieces.

Put a cross piece across the front top of the ladders for more strength. You could also do this on the bottom edge over the pot.



Making a plant support continued

Final assembly

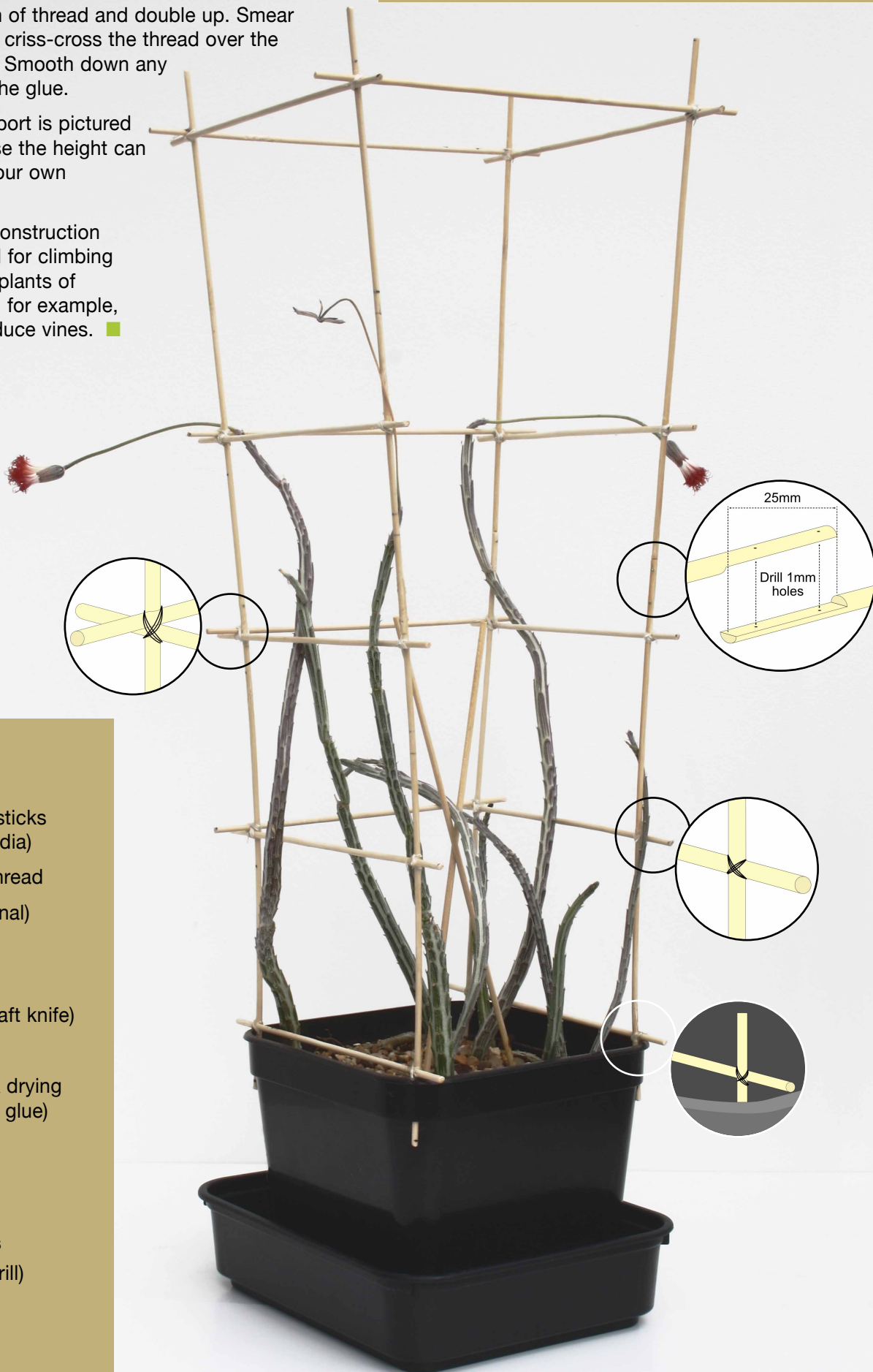
When the ladders and cross pieces are all glued it's a good idea to bind each joint with cotton thread and glue.

Cut a long length of thread and double up. Smear glue on the joint, criss-cross the thread over the joints and tie off. Smooth down any loose ends into the glue.

Our finished support is pictured here but of course the height can be adjusted to your own requirements.

This method of construction can also be used for climbing frames for other plants of course including, for example, those which produce vines. ■

See 'Succulent Snippets', page 5, for more information on *Senecio stapeliiformis* subsp. *minor*.



Materials

Wooden kebab sticks
(300mm x 3mm dia)

Reel of cotton thread

1mm wire (optional)

Tools

Scalpel

Stanley knife (craft knife)

Super glue

UHU glue (quick drying
general purpose glue)

Pincers

Fine-tooth saw
(hacksaw)

Optional tools

Pin vice (hand drill)

Dremel drill

1mm drill bit



Dudleya

A new love

by Simon Snowden

I don't really 'do' the other succulents. Yes, I grow a handful of *Aloe*, *Agave* and *Euphorbia* and the like but, as a friend once commented, give me a *Copiapoa* that looks like a 'rubbish *Trichocereus*' (no offence to *Trichocereus* enthusiasts – or *Copiapoa* fans for that matter) and I am as happy as Larry. However, my interests have definitely changed of late. I really enjoy *Crassula* these days and, in particular, another member of the Crassulaceae, *Dudleya*. It's a genus that is not to everyone's taste as plants go through a scruffy period of dormancy each year, but I think they are things of beauty and are far from demanding.

Figs. 1 and 2 Beauty is in the eye of the beholder – dudleyas out of season.
Above: *D. pulverulenta* growing at Point Loma
Right: *D. abramsii* subsp. *bettinae* on the coastal bluffs of Cayucos



Dudleya – a new love continued

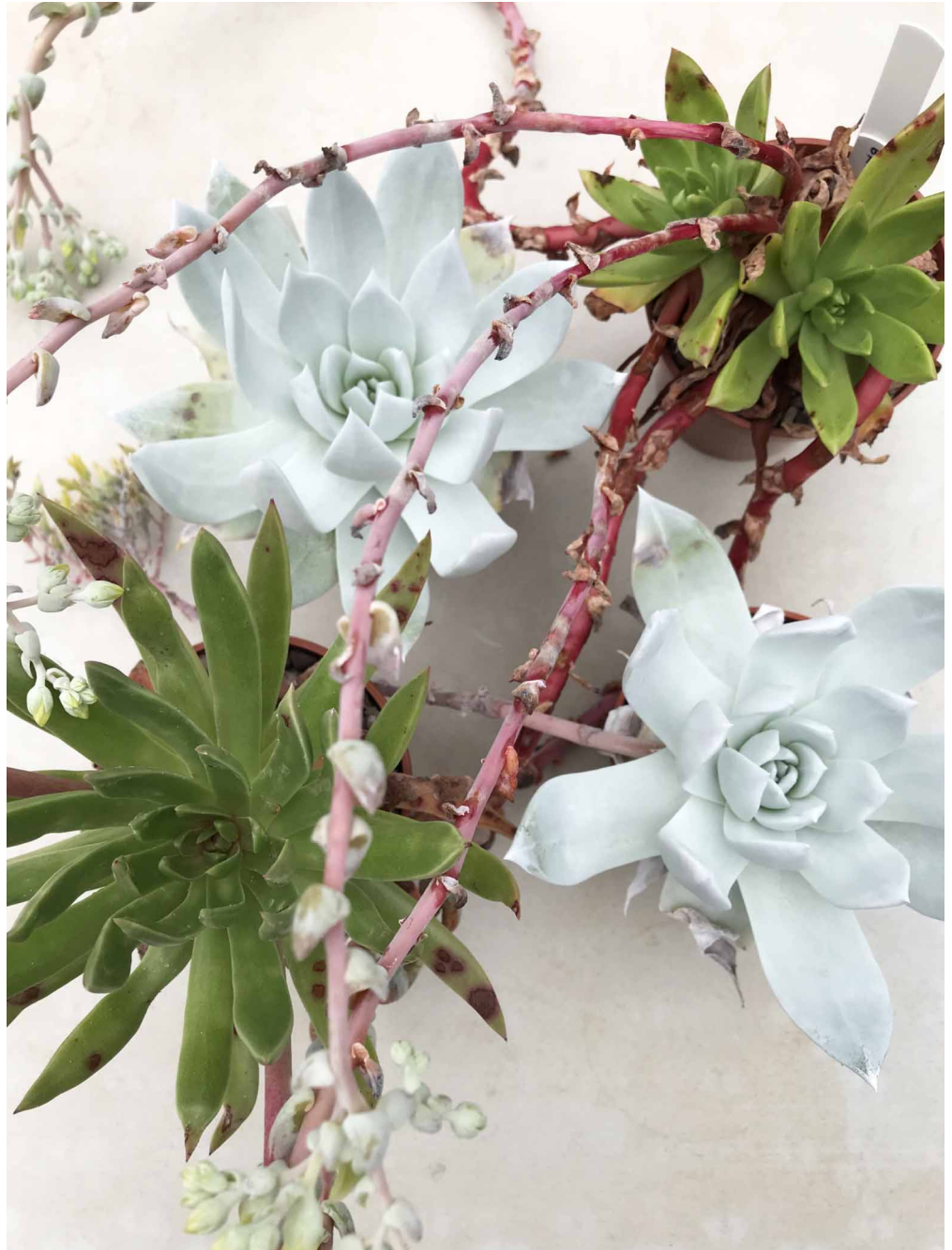
My family and I visited California and Nevada for a second time in 2018. Our children were old enough to allow me to search for plants in the spectacular countryside as they enjoyed the more commercial side of life. We were there in August, which is not the best of times to see succulents in flower, but several encounters with dormant, wizened dudleyas made me want to learn more about them (Figs. 1 and 2). This curiosity took me by surprise and has evolved into a new love.

Live forever

The genus *Dudleya* was named in honour of Professor William Russel Dudley (1849-1911), the first head of systematic botany at Stanford University. The earliest species, which we now call *Dudleya caespitosa*, from the Californian coast was described by Haworth in 1803 as *Cotyledon caespitosa*. Thereafter, it was revised to *Sedum cotyledon* (Jacquin) in 1811, followed by *Echeveria laxa* (Lindley) in 1849. It was not until 100 years after the first description that the genus *Dudleya* was erected in 1903 by Britton and Rose as part of their revision of the North American Crassulaceae. The three sub-genera *Dudleya*, *Stylophyllum* and *Hasseanthus* were also established at this time primarily due to differences in petal orientation, yet have subsequently been merged into the single *Dudleya* genus; a treatment which is now followed by most, if not all, devotees. Despite the fact that dudleyas have been recorded to grow for upwards of a hundred years, the common name of 'live forever' relates to their longevity in a different way. In the late 1800s Scottish botanists were apparently amazed to discover that pressed herbarium specimens miraculously survived ocean voyages back to Britain.

There are around 47 species of *Dudleya* and 17 sub-species (The Plant List, 2020)

ranging from the state of Oregon (*D. cymosa* subsp. *cymosa* and *D. farinosa*) on the west coast of the United States, down to California, a brief foray east into Nevada and Utah (*D. pulverulenta* subsp. *arizonica*), Arizona (*D. pulverulenta* subsp. *arizonica* and *D. collomiae*) and over the border into Baja California. Some dudleyas are also endemic to California's Channel



Islands and Baja's coastal islands. Recent discoveries include *D. crassifolia* in 2012 and the endangered *D. hendrixii* in 2016; the latter species named in honour of Jimi Hendrix as its co-author was listening to 'Voodoo Child' when he discovered the plant (McCabe et al, 2016). There are potentially around eight species that are waiting to be described (S. McCabe,

Fig 3: The same species – the sympatric green and white forms of *D. brittonii*

Contrary to assumptions based on the convergence of rosette-forming species, Dudleya is not related to Echeveria and does not hybridise with the genus.

pers. comm.), yet their whereabouts remain guarded due to small population sizes and the scourge of poaching.

The identification of species is challenging as many dudleyas are recognised by their flowers and hybridise readily in both habitat and cultivation. The majority of taxa grow along coastal bluffs and up to 15 to 30 miles inland in coastal ranges and mountainous regions. Indeed, there is a fascinating paper that suggests that the genus *Dudleya* evolved in geographic and geological isolation from its closest relatives some 5.5 million years ago on what is now the Pacific plate, west of the San Andreas fault and Gulf of California, with relatively recent immigrants spreading in directions mentioned above (Uhl, 1994). Another beguiling feature of dudleya evolution is the sympatric growth of green and white forms commonly seen in taxa such as *D. formosa* and *D. brittonii* (Fig. 3).

Contrary to assumptions based on the convergence of rosette-forming species, *Dudleya* is not related to *Echeveria* and does not hybridise with the genus. It also differs from *Echeveria* by seed surface structure, phytochemistry, aestivation (the petal and sepal arrangement in a bud before it opens), basic

chromosome number and geographical distribution (Thiede, 2004). Molecular data currently suggests that *Dudleya* is actually most closely related to the genus *Sedella* in the ancestral *Leucosedum* clade of *Sedum* in Europe (‘t Hart, 1995).

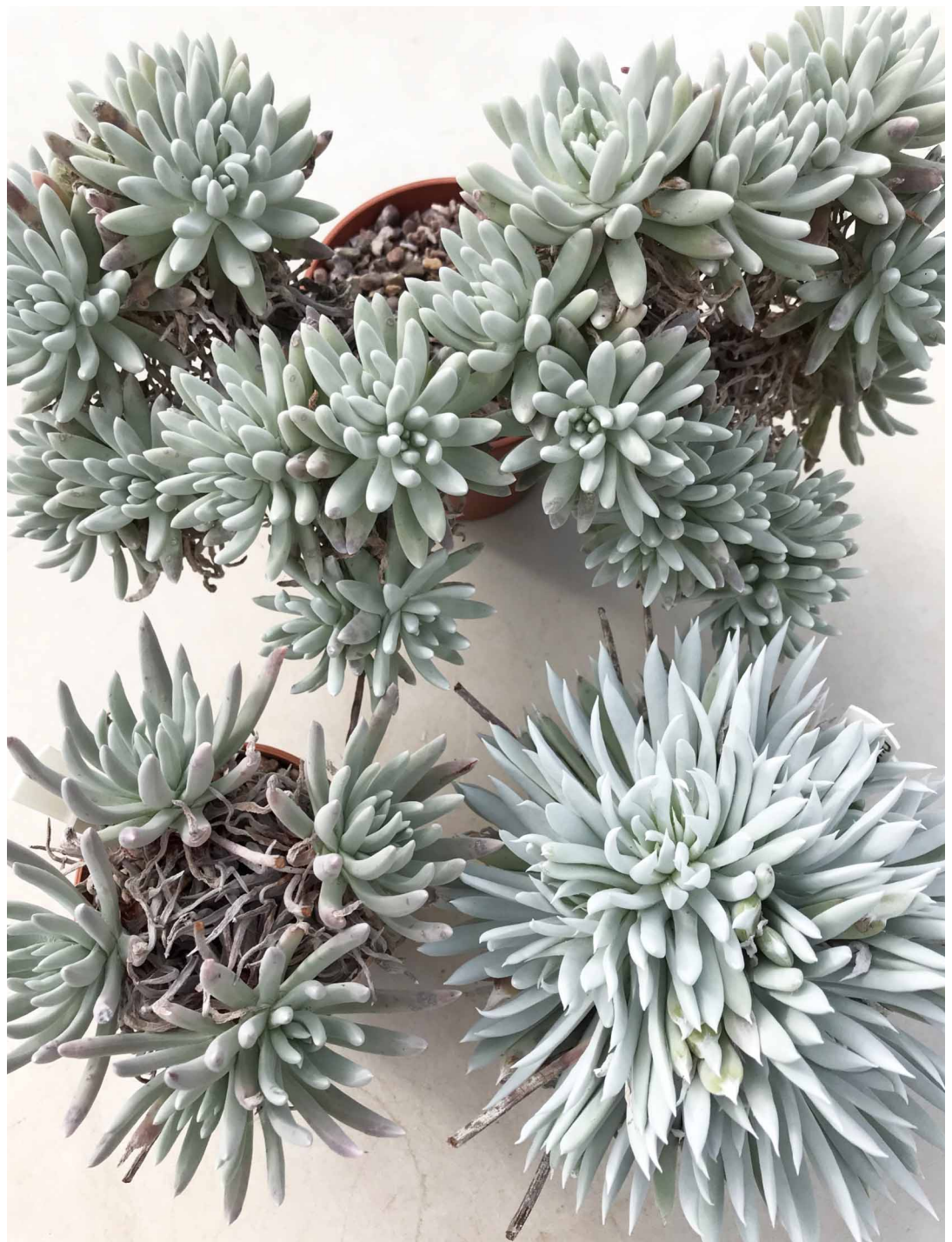


Fig. 4 Non-broad leaved examples
D. virens subsp. *virens* (top), *D. edulis* (bottom left) *D. candida* (bottom right)

Growing dudleyas

Dudleyas are winter growers, having evolved in the winter-rainfall Mediterranean climate of western North America. They come into growth in habitat around late autumn, triggered by the rise in precipitation and colder nights. Photosynthesis during the rainy season follows the most common C_3 mode which is carried out during the day and allows for fast growth. Throughout the summer time, when dudleyas become dormant, photosynthesis shifts towards the Crassulacean Acid Metabolism (CAM) mode where plants open their stomata at night to reduce water loss and then store CO_2 for use in daylight. Many *Dudleya* taxa have round, finger-like or spoon-shaped leaves (Fig. 4), yet perhaps the most well-known taxa form rosettes which fold up to bud-like structures during drought conditions.

Flowering, in the form of inflorescences which can grow up to a metre high, takes place from around April to late June and is characterised by a cyme of orange, white, yellow or red petals (Figs. 5–8). (A cyme is a structure where central flowers open first, followed by those that develop on the periphery from lateral buds.) A further feature of *Dudleya* (specifically the *Dudleya* and *Stylophyllum* sub-genera) is that plants leave their old, dried leaves behind each year. The dead leaves are often called a ‘skirt’ and can be considered unsightly, yet it is difficult to detach them cleanly. For showing purposes, at least in the UK, the skirt should ideally be left intact.

I am a bit of a traditionalist and grow my plants in nothing special beyond equal amounts of John Innes No 2 compost and various sizes of grit. It’s imperative that the growing medium for dudleyas is very well drained and they are usually cultivated outside at 45° angles in climates that can accommodate them. A further crucial aspect to dudleya cultivation is light, particularly in the relative dim of wintry northern Europe. For this reason I grow most of my plants on shelves that hang from the eaves of my greenhouse. While I believe that this is advantageous (and also benefits from rising heat), a definite downside is that plants have to be taken down to be watered individually and I may not see the onset of any problems as early as I would ordinarily like. I also feel there is much to be said for trying to ensure that

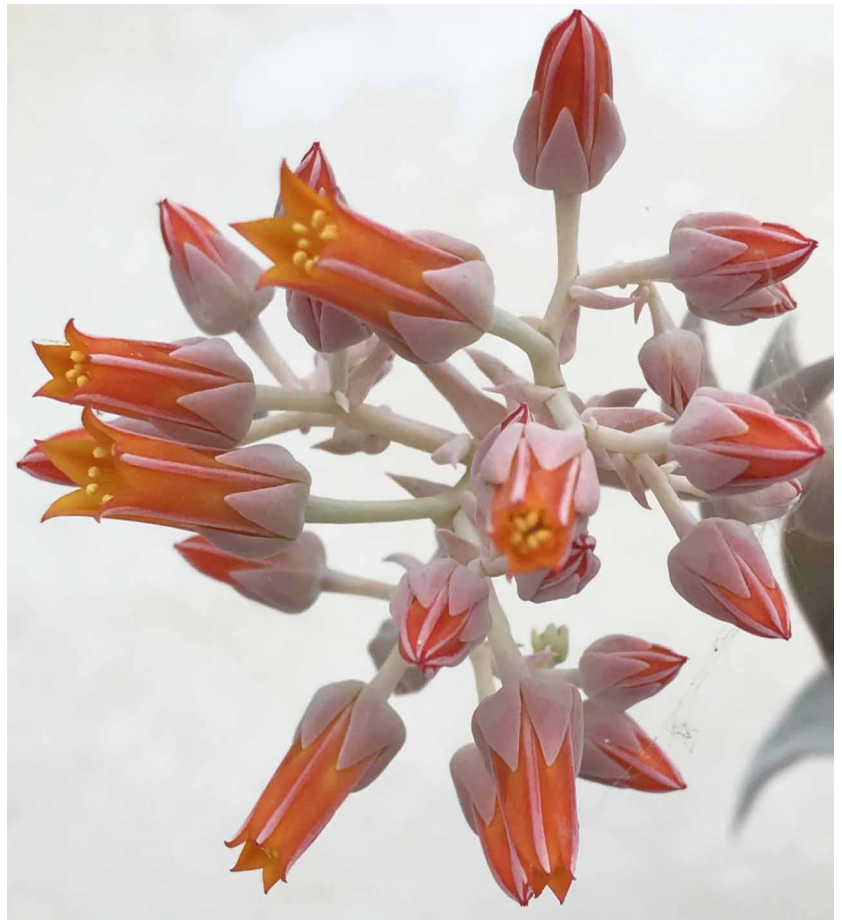


Fig. 5 *Dudleya lanceolata*

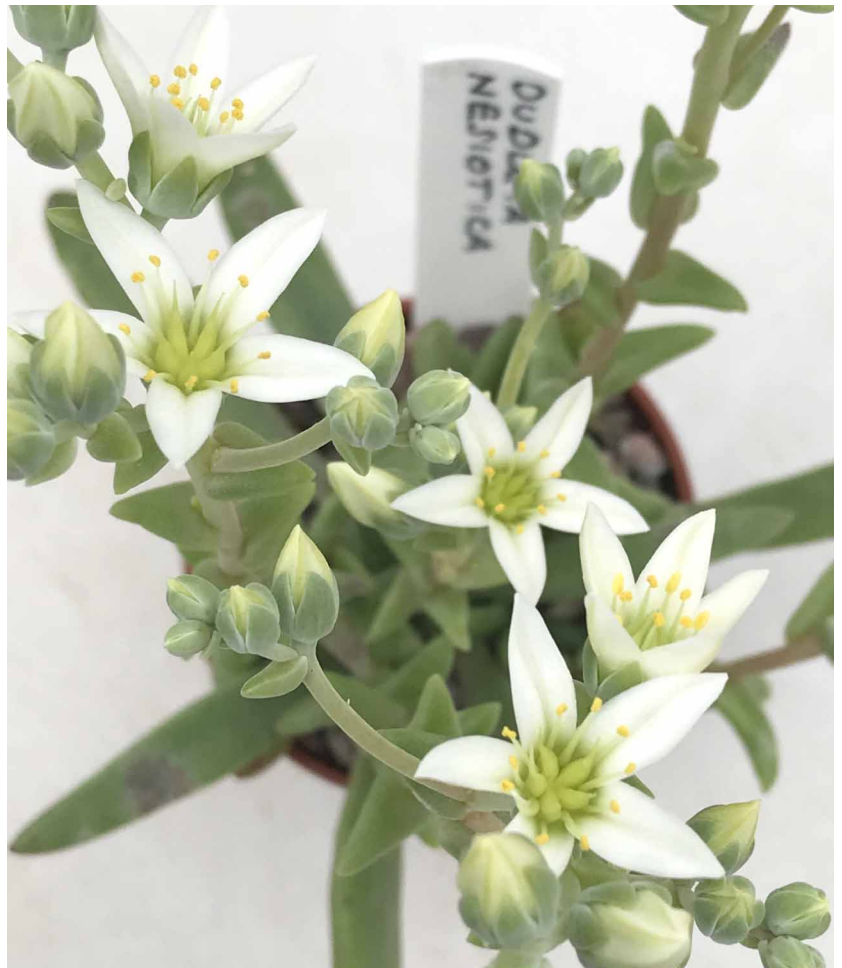


Fig. 6 *Dudleya nesiotica*

the roots of our plants do not get too hot. In terms of pests and diseases, there are the usual suspects. Mealy bugs are perhaps the number one culprits and it is often difficult to differentiate between the real thing and the farinose wax of white plants. I would recommend never spraying white, chalky leaves with insecticide as it permanently ruins the epicuticular coating (as do human fingers). While systemic insecticides certainly help to control infestations, I have been known to ‘enjoy’ many an hour or two carefully extracting mealybugs with a pin or needle.

With the exception of a handful of plants, my collection is extremely immature. Plants of reliable parentage are hard to source, particularly in the UK and Europe more widely. White species such as *D. brittonii*, *D. greenei* and *D. pulverulenta* are relatively common – and possibly rightly so, as their glistening farina catches the eye. In fact, the epicuticular wax-covered leaves of *D. brittonii* have the highest measured ultraviolet reflectivity of any plant on earth (Beggs et al, 2013).

I have found seed to be an excellent way to obtain less common species and increase my collection. Dudleya seed is dust-like, yet in my experience it is incredibly easy to grow, as long as it is fresh. (Fig. 9). Good germination is guaranteed with your usual seed-raising regime; I use a simple mix of sieved John Innes seed compost and moler clay (such as cat litter) in equal parts. I sprinkle a thin layer of grit on the top of my seed pots and settle the seed down by spraying with cooled, boiled water. I do not sterilise the compost as I find that the top grit keeps moss down to an acceptable level before the seedlings are ready to be pricked out, but I do use cooled, sterilised water to first soak the compost in the customary ‘baggy method’.

Ideally, I find it best to sow dudleya seed when adult plants come into growth around October. Not only does this give them a good chance of putting on weight over the winter months, autumn-sown seedlings are often of sufficient size to transfer them into grittier surroundings around late spring the

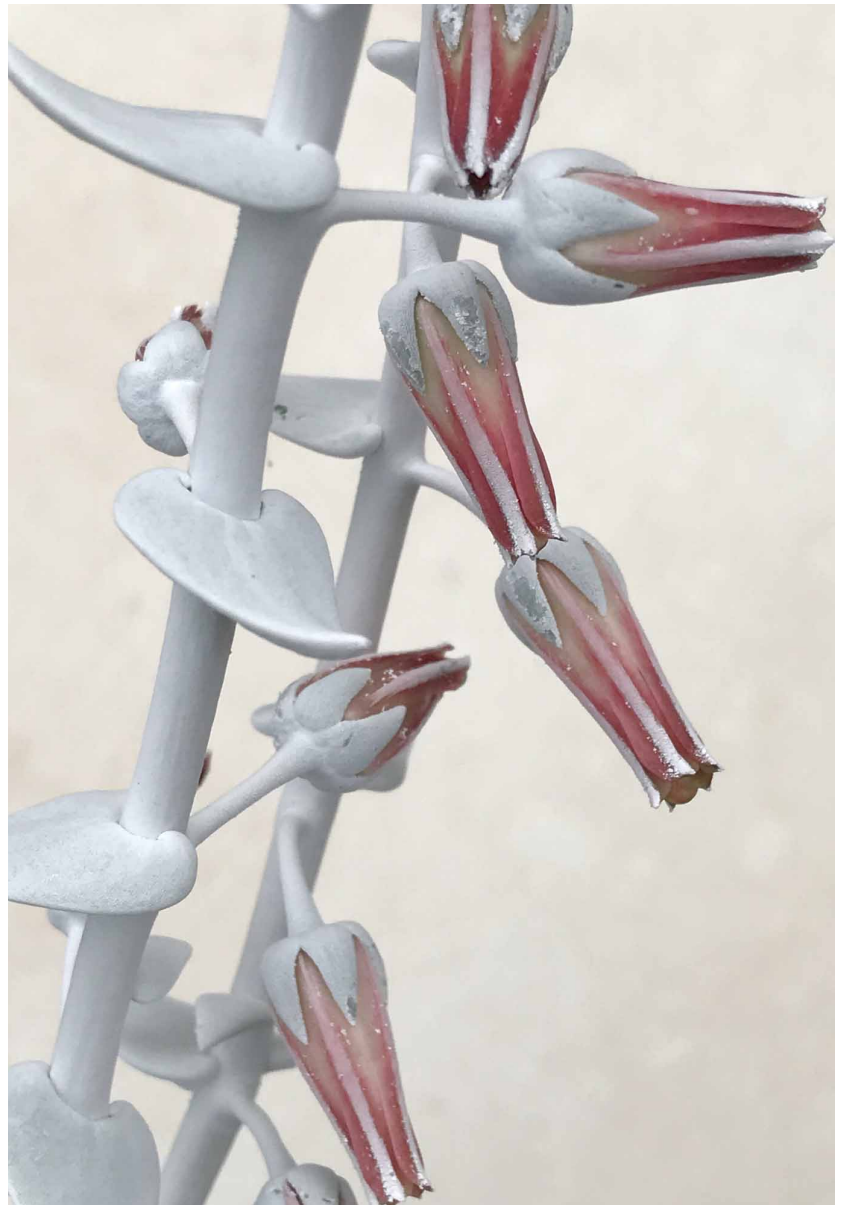


Fig 7 *Dudleya pulverulenta*

following year. I would advocate watering young adolescents during what would ordinarily be the first summer dormancy period, simply to ensure they have a good start in life. Seeds grown at later times throughout autumn and winter still do well, but I would certainly not chance the viability of seeds during the hot summer (evening) temperatures. Calloused vegetative cuttings also root readily in damp, gritty compost or moler clay, especially when planted at the start of the winter growing season. Unlike many other members of the Crassulaceae, however, dudleyas cannot be propagated from leaf cuttings.

In fact, the epicuticular wax-covered leaves of D. brittonii have the highest measured ultraviolet reflectivity of any plant on earth

Dudleya – a new love continued

I have to admit I was fearful of trying to raise winter growers for the first time. I did not realise that additional heat is not required beyond the general minimum temperature maintained to keep the plants from freezing. I heat my greenhouse to around 5°C during the colder months and the dudleyas seem happy. In fact, taxa such as *D. cymosa* subsp. *cymosa*, *D. calcicola* and *D. abramsii* subsp. *affinis* are all reported to survive mountain snow up to 8,000 feet, and many dudleyas experience frost (McCabe, 1994a).

The biggest foe to dudleyas cultivated under glass in cold, winter climes is stagnant humidity leading to mould. I therefore took the advice of a friend who has cared for winter-growing succulents for many years and bought an oscillating fan, which is never turned off throughout the year. I must admit, being a thrifty northerner, I winced at the thought, but have not looked back and wished that I had installed a fan a long time ago. Despite having automatic vents, greenhouse glass extracted and doors open whenever possible, I think the improved air circulation has benefitted all my plants, especially cactus genera that are prone to scorch.



Fig. 8 *Dudleya cymosa* subsp. *cymosa*



Fig. 9 *Dudleya* seeds are incredibly easy to germinate. Some of these five month old seedlings are ready to be pricked out

Dudleya – a new love continued

Dudleya Conservation

Due to their resemblance to lotus flowers, dudleyas have suffered immeasurable harm from poaching over recent years.

Predominately destined for the Asian market, huge swathes of dudleyas have been stripped from habitat and posted overseas. Indeed, I have a friend who bought a species of *Dudleya* from a South Korean nursery via a well-known auction site and it arrived wrapped in Californian newspaper. Despite coming to the attention of the United States Fish and Wildlife Service, a quick Google or YouTube search shows the immense and alarming devastation that smuggling has caused, particularly to coastal populations. The more appealing white *Dudleya* taxa often die when they reach the mass market and poorly-lit windowsills of foreign shores. Not only is the trade in dudleyas illegal, it's

wholly unnecessary as plants readily grow from seed and are self-fertile.

A further threat to dudleyas is the increase in land development, grazing and natural (and unnatural) fires which have led many to become rare over recent decades. Nine *Dudleya* taxa are described as endangered or threatened in California alone and constitute almost 5% of all federally listed plants. In terms of the entire distribution of the genus, over half the species and sub-species are rare and/or endangered (McCabe, 1994b). With many of the newer, and possibly undescribed taxa, hailing from narrow and sometimes endemic ranges, field locations are thankfully not in public circulation. However, this is sadly not the case for many established *Dudleya* taxa as co-ordinates of often rare, uncommon and potentially threatened plants are readily available online. ■ **Photos: Simon Snowden**

Resources

If you would like to find out more about dudleyas the following resources are terrific places to start.

Cactus and Succulent Journal (2004) 76:
The Dudleya Issue; Dudleya and Hasseanthus (1993)

Paul H. Thomson; *Illustrated Handbook of Succulent Plants* (2003) Urs Egli (ed.);

Cacti and Succulents of Baja California (2015) John Pilbeam

➤ [Dudleyas from the new world](#)
(Facebook group – private)

Finally, I'd love to correspond with any dudleya lovers out there, so please drop me a line if interested:

➤ [Simon Snowden](#)

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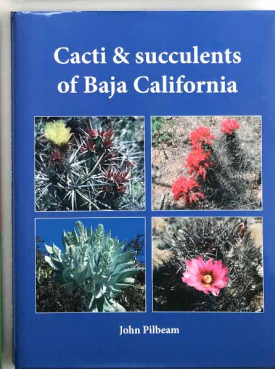
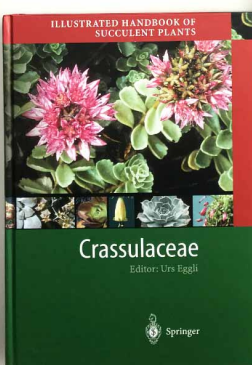
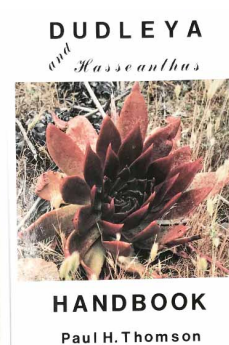
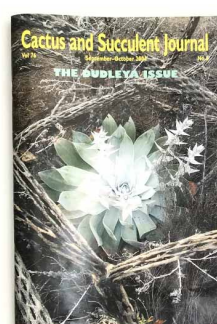


Fig. 10: Despite the convenience of online media there is beauty in the printed word

Thiede, J (2004) The genus *Dudleya* Britton and Rose (Crassulaceae): its systematics and biology. *Cact Succ J* (US) **76**: 224-231.

Uhl, C (1994) Intergeneric hybrids in the Crassulaceae II. *Dudleya* (and plate tectonics). *Cact Succ J* (US) **66**: 74-80.

➤ [The Plant List \(2020\) Dudleya](#)



Growing in cold frames

by Peter Berresford

Using cold frames to grow cacti, especially cold-hardy *Echinocereus*

It was in the mid-1980s that my partner, Marie-Anne, and I moved to a small hamlet not far from Thaxted in Essex and, while there, acquired a four foot (1.2m) aluminium cold frame. This was a budget model probably purchased from a DIY-based supermarket. I cannot remember whether its original purpose was for cacti or non-succulents but it came with us when we moved to the North Yorkshire Dales 20 years ago.

The glazing was horticultural glass and because there was no soft 'beading bed' for the glass, this had a tendency to break and need replacement, especially if moved intact. There was no way of removing glass other than unscrewing the relevant part of the frame. The metal was not 'treated' which meant that a slight corrosion over the years made the roof panels awkward to slide in and out. Each of the two roof panels consisted of two panes of glass

mounted horizontally and joined by a plastic glazing bar which created a potential drip and a rotting plant wherever the water landed.

Above:
E. triglochidiatus
subsp. mojavensis f.
inermis



Old faithful



Above: E. triglochidiatus subsp. mojavensis Jacob Lake AZ

Below: E. triglochidiatus S. Colorado





By the early 1990s my mixed collection of cacti had gained a more specific focus on what proved to be (somewhat excessively) based on Hedgehog cacti. Having taken the advice of David Parker, when I visited the Netherlands and Germany in 1996, I looked up Jan Essers and Jos Huizer.

At the time Jos was living west of Leiden not far from the coast and had an allotment to which we walked from his house. As we walked through the plots, we saw people growing vegetables and flowers and some even keeping chickens and then we came to Jos's plot. He had a small greenhouse in which he over-wintered tender echinocerei but the bulk of the allotment was covered by two cold frames. These had been hand-built from old sash window frames. The roof panels were consequently heavy and awkward to remove and were pinned in place below by a six inch (15cm) nail 'peg'. Inside, as I recall, was very little else but flowering echinocerei – a testament to the success of this particular method. He had other issues with the local acid, poor soil but his plants looked well. Needless to say a few accompanied me back to the UK on this and subsequent visits.

Our move 'up North' was a complicated affair involving planning permission for a new greenhouse in the Dales and temporary accommodation in Leeds University glasshouses for the contents of a 'Luton' hired van full of the denizens of

the Essex greenhouse. A 30 foot (9.1m) greenhouse was chosen with an interior door for a 10 foot (3m) cold section located closest to the entrance. Armoured cable was laid all the way down the garden and into the croft where the building was situated. This provided power for the

**Jos Huizer's
allotment with cold
frames
November 1997**

Inside, as I recall, was very little else but flowering echinocerei – a testament to the success of this particular method.

summer fans and for winter heating for the 20 foot section. The company chosen was Elite Greenhouses and I have been very happy with the product. Robust two-tier staging eventually spread through most of the structure.

At the time of buying we also ordered two new green anodised cold frames which colour-matched the greenhouse. These were situated on the leeward side of the greenhouse avoiding the prevailing westerly winds. A row of bird cherries, *Prunus padus*, endemic to the Yorkshire Dales also help as a windbreak on the windward side and provide shade in the late afternoon.

On the same side of the greenhouse as the frames is an apple tree that keeps us in russet apples for about three months of the



year. It was a condition made by the Yorkshire Dales Planning Department that this was planted to screen the greenhouse from a footpath some half a mile away! This tree provides local shade for part of the greenhouse so I have adapted the arrangement of plants in the greenhouse to suit. One cold frame is also affected so smaller plants are situated in this frame.

The new six foot (1.8m) three-panel cold frames are an excellent design and the roof panels slide easily to left and right on the anodised coating. Each panel is a single pane which avoids leaks and the toughened glass sits on a bead of rubber which reduces the possibility of breakage. At the time of purchase automatic roof vents were bought for the central roof section to help protect plants against scorch in summer. Finally the design uses glazing clips to secure the glass which means that each pane of glass can be easily removed using a pair of long-nosed pliers to 'unspring' the clips. This allows easy access through the roof or sides to plants and interior glass cleaning.

The frames are situated on a base of concrete paving slabs laid on the ground.

Inside, the frames are 'carpeted' with polystyrene sheets which reduce slug incursion and stops pots taking up water from the paving slabs below.

Each summer the side panels are removed and replaced with half-panels which are

The apple tree near the entrance to the main greenhouse and shaded cold frame



The end of one of the cold frames with *E. triglochidiatus* subsp. *mojavensis*

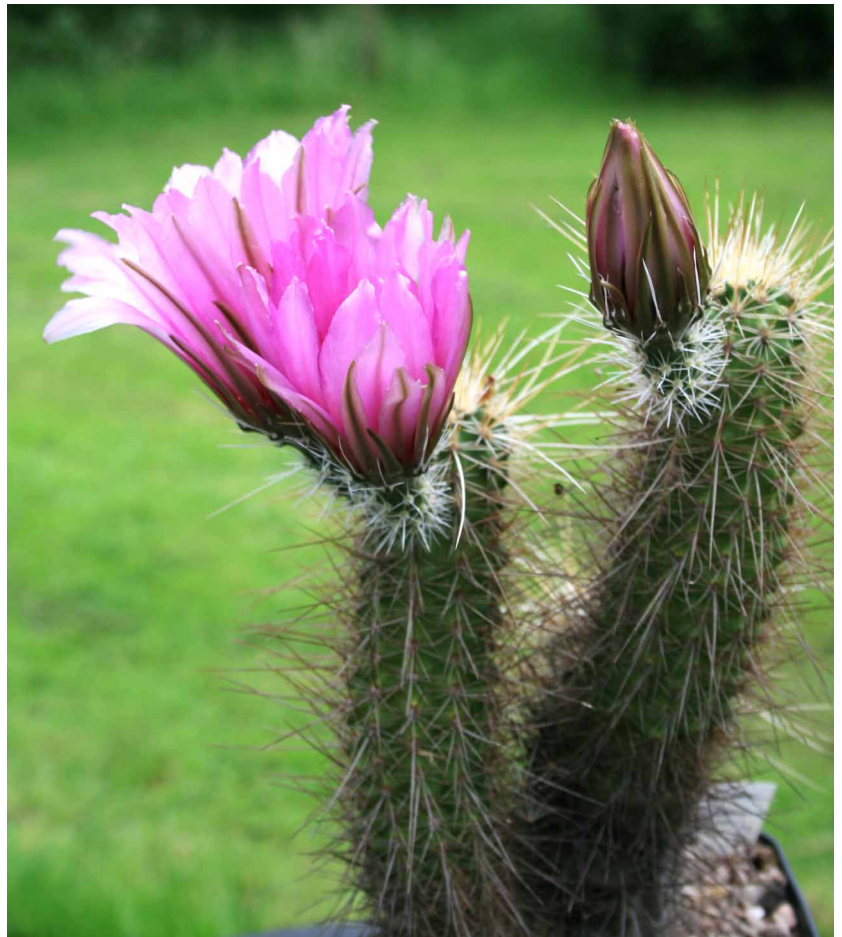
Growing in cold frames continued

topped with copper adhesive tape. These increase air circulation and prevent molluscs crossing the lower barrier (at least that is the theory).

It might be possible to use the cold frames for non-hardy plants in the summer but frankly I have enough cold-hardy plants to populate the cold frames so there is no need for this. There is little doubt in my mind that cold frames are better than greenhouses for cold-hardy plants. I have had no incidence of mealy bug in cold frames, presumably because the insects prefer a drier, warmer environment. There are no fans operating in the frames either which, in the greenhouse, can saturate the plants with the dust like mealy bug eggs.

I know you are keen to know what happened to our original, venerable cold frame! A few years ago we built another greenhouse (exclusively for non-succulent plants) and outside this, we located the old cold frame. This was also sited on paving

Right: *E. engelmannii* Black Canyon City AZ
Below: *E. apachensis* Fish Creek AZ





slabs but I used some surplus ‘Kingspan’ insulation board to line the base. The site is shaded for a lot of the day but in mid-afternoon the sun illuminates the frame.

In here were placed seedlings of *Echinocereus engelmannii* as you might expect for a cold-hardy choice and mature plants of *E. arizonicus* subsp. *matudae*. This is a plant from a Chihuahuan desert environment so not, perhaps, an obvious choice until you learn that it lives at considerable altitude, some 7,200 feet (2,200m) asl. More importantly the plants are subject to frost.

It is not always the case that altitude correlates with frost (for example *Morangaya pensilis* in the Sierra Laguna of Baja California grows at 5,900 feet (1,800m) and never freezes, so make sure this is kept warm over winter! (If you visit the location in Baja you will be amazed at the palm trees that surround one of the sites). Back to the ‘*matudae*’ – these were languishing in the warm section of my greenhouse but since being in the cold frame, the stems have put on fresh growth and I am hoping for some of the scarlet flowers to appear in early May 2021.

In early June this year, we purchased another six foot (1.8m) anodised cold frame. Dubbed ‘The Simplicity’, this came from The Greenhouse People. At two foot (64cm) it is slightly taller than those from Elite and uses capping rather than clips to secure the glass which will be awkward to remove as the beading for the glass is

double-sided adhesive foam. This has co-opted the site and plants of the original cold frame which has been moved to a sunny semi-retirement site, behind the ‘other plant greenhouse’ for hardening off seedlings of bedding plants and vegetables. So life continues after 35!

I mentioned molluscs earlier which are pests both in the cold frame and greenhouse. When retiring the old cold frame, I removed a sheet of Kingspan which lined the bottom and underneath were several huge slugs. When I looked these up it turns out they were ‘Green cellar slugs’ (*Limacus maculatus*) which eat decaying wallpaper and pet food which has been left out. They were methodically stripping the wet lining paper off the underside of the insulation!



The snail found in many greenhouses which eat chunks out of your prize *Epiphyllum* is the common garden snail (*Helix aspersa*). I can add nothing to the number of deterrents against this other than the previously mentioned copper tape.

The newest cold frame

Green cellar slug *Limacus maculatus* loves dog food not cacti

Jos Huizer writes:

Jos Huizer has extensive knowledge of which cacti thrive in cold frames and has sent me these notes based on his experience.

What did well

1. *Echinocereus*. Everything except for *E. leucacanthus* (which I did not try) and *E. barthelowanus*. The rest did very well (as you might remember). The only problem is that if the plants get too tall, you have to move them to the middle of the cold frame. This became a problem for some plants, such as *E. viereckii* which were too close to the glass, and I had some scorching.
2. *Ferocactus* (and *Echinocactus grusonii*) do very well in a cold frame. On sunny days it can warm up very quickly and get very hot. Naturally, being desert plants, they thrive in it. Nobody believes the plants I could grow there without heat. I had two ferocacti which were sulking in the heated greenhouse in a potting soil mixture. When I transplanted them in pumice to the cold frame, they practically exploded. I never knew ferocacti could grow that fast.
3. *Thelocactus*. Very forgiving plants, and they also did very well.
4. *Ancistrocactus/Glandulicactus*. Considered to be tricky on their own roots, these thrived in the cold frame, but this may have been due to the same repotting treatment given to the ferocacti.

5. *Coryphantha*. Some did very well, others not so, depending on the species, I guess it was too cold for some of them during winter.
6. *Helianthocereus (huascha, crassicaulis)*. They are just weeds in the cold frame (and in the greenhouse).
7. *Lobivia* usually did very well, but scorching could happen.
8. *Stenocactus*. Be careful though as some can take less cold than others.
9. Various genera (*Hamatocactus, Neobesseya, Lophophora, Escobaria, Denmoza*) also grew quite well.

What did not do so well

1. *Ariocarpus*. Since they flower late in the season, the flowers do not dry well, and plants can rot because of it. I lost plants like *A. kotschoubeyanus* because of it. The summers are no problem.
2. *Gymnocalycium*. For some reason the plants grew well or even very well when young. But the older plants always died in the cold frame perhaps due to temperatures?
3. *Austrocactus*. It was too hot for them. They need more air, and do not like being close to the glass.
4. *Austrocylindropuntia*. I could not keep them alive there, so eventually I gave up.

One of the problems which Jos experienced using cold frames was in the winter of 2012 when temperatures plummeted to -19°C and were still -12°C in the cold frames. By this time he had stopped using the small greenhouse on site for over-wintering. The old wooden frames had deteriorated by then to such an extent that they froze solid and he could not get in them for two weeks, by which time most of his non-globular plants had died. He used an extra layer of bubble wrap inside the glass which was kept away from the glass using a wire structure. Jos has since moved to a new house with a huge greenhouse so no longer has to struggle so much with the harsh continental winters.

For growing frames, I would also rule out the epiphytic cacti partly on grounds of cold intolerance but also because, as tree canopy plants, they do not like full sun. Another issue is, of course, their predisposition to behave like an inconsiderate sleeping partner throwing out their 'arms' in random directions and

potentially creating knots of intertwining stems impossible to move without breaking them – not to mention the space they absorb. These are not greenhouses but cold frames with their own limitations! ■

Photos: Peter Berresford



Not for the cold frame, *Epiphyllum* cv. *Knebels Farbenwonder*

A trip to Chile

November 2019

by Al Laius

Fig. 1 Eulychnia castanea at Los Molles

It was probably not the best time to go to Chile, as the demonstrations against President Piñera had intensified and there was talk of curfews and martial law.

But as I had already bought my air tickets months in advance, before any civil disobedience had even begun, there was no way out – I just had to go. So together with a few friends (Paul Klaassen, Angie Money and Ian Thwaites) we picked up our hire car at Santiago airport last November and hit the road for another cactus adventure.

I was expecting to see lots of copiapoas on this trip, as well as various genera such as *Thelocephala*, *Neoporteria*, *Neochilenia*, *Pyrrhocactus*, etc. which have all been sunk into *Eriosyce* these days, and I was not disappointed. However, what impressed me most of all, were the different species of *Eulychnia* that we encountered. Though I should add, I was not disappointed by the copiapoas.

We thought it best to head out of the capital as quickly as possible, as that was where the main troubles were. Just over 200km later we had arrived at Pichidangui, our first overnight stop. We had however, made a brief stop en route at Los Molles as we were all desperate to see some cacti, and here we saw *Eulychnia castanea* at its type locality (Fig. 1). The plants were clinging precariously to the cliffs and the surrounding land had almost all been developed for tourism, so it remains to be seen whether this small population can survive. We found plenty more of this species at Pichidangui including plants in flower (Fig. 2).

The rocky coastline at Pichidangui (Fig. 3) is still largely undeveloped at the moment, and here we were easily able to find three different species of *Eriosyce*. *E. chilensis* (see front cover) and *E. curvispina* were in flower but not *E. subgibbosa* which flowers around May.

After lunch we drove up to the Fray Jorge National Park, where we saw *Eriosyce aurata*, *Eulychnia acida* (Fig. 4), *Echinopsis (Trichocereus) chilensis*, *Cumulopuntia sphaerica* and our first *Copiapoa* which was *C. coquimbana* (Fig. 5) near the beach at El Sauce.

An added bonus was that there were plants in flower. Another hour's drive up the coast took us to Guanaqueros where we had difficulty finding accommodation as it was a long holiday weekend, and the civil unrest taking place throughout the country also meant that folks had left the larger cities for more peaceful coastal resorts.

After a couple of nights at Guanaqueros, we were finally fully acclimatised and over any jet-lag. A day trip to Totoralillo revealed more *Copiapoa coquimbana* populations, though here there were no open flowers. *Eriosyce subgibbosa* and *Eulychnia acida*, or was it *E. breviflora*, or maybe a hybrid,



Fig. 2 *Eulychnia castanea* in flower at Pichidangui



Fig. 3 Pichidangui coastline

were the other main species seen. Relaxing that afternoon with a few beers, we soon became less calm when we experienced an unexpected earthquake (6.1 on the Richter scale) which rattled our wooden seaside cabin. It was both frightening and exciting at the same time.

Back on the road again, we continued heading north towards Punta de Choros. To get there we had to pass through the cities of Coquimbo and La Serena, and there was ample evidence of where the roads had been barricaded during demonstrations as there were still smouldering piles of burning tyres and other debris lining the roadsides. Our first stop, once we were away from urban areas, did not reveal anything new apart from *Miqueliopuntia miquelii* (Fig. 6). However once we had turned away from the coast and headed inland a bit, we were rewarded not just with some cacti but also incredible scenery. We encountered masses of *C. coquimbana*, including a few of the unusual red-flowered ones. Growing alongside the copiapoas and resembling them, was *Eriocyce* (*Horridocactus*) *simulans*. *Eulychnia chorosensis* was also

Right: Fig. 4
Eulychnia acida at
Fray Jorge

Below left: Fig. 5
Copiapoa
coquimbana at
El Sauce

Below right: Fig. 6
Miqueliopuntia
miquelii at
El Sauce



present. In this remote area we also saw wildlife in the form of guanacos and a pack of foxes who were happy to see us, and even more delighted when we poured out some water for them into a plastic trough that some kind soul had placed by the side of the dirt track some time ago. The area was incredibly dry.

We had hoped to take a boat ride to some nearby islands to see penguins and bottlenose dolphins, but it was far too windy and the boatmen refused to go out

in such weather. There was only one thing for it – go look for more cacti!

We headed inland again on a fairly new tarmac road towards Domeyko. First, we came across the fabulously-spined *Eulychnia chorosensis* (originally described by Paul Klaassen) (Fig. 7). Further along and almost in Domeyko, was where we hoped to find *Copiapoa domeykoensis* which is said to be just a large form of *C. coquimbana* at the northern edge of its distribution. And find it we did (Fig. 8). The



Fig. 7 *Eulychnia chorosensis*



Fig. 8 *Copiapoa domeykoensis* at Domeyko



Fig. 9 *Thelocephala lembckeii* (*Eriosyce napina* subsp. *lembckeii*) at Ojo de Agua



Fig. 10 *Copiapoa echinoides* at Quebrada Barracota

other new cactus for that day was near Maitencillo where after much searching *Thelocephala (Eriogyne) lembckeii* was found, dried up and shrivelled and almost buried in the sandy gravel (Fig. 9).

We based ourselves in Vallenar for a couple of days because they had an excellent cake shop there, as well as being central to some lovely cactus habitats. *Copiapoa echinoides* (Fig. 10) at Quebrada Barracota was a delight to see as it was a gorgeous green colour in contrast to the dark and dusty-grey copiapoa we had seen so far.

But even better was to come in Quebrada Mala where we did not know which way to turn as there were huge clumps of *Copiapoa dealbata* all around us (Figs. 11 and 12). The natural variation between plants was great to see, as some had long spines, others had black spines and some had a much greener body. There were also plenty of plants in flower.

Although that was the first time that we saw *C. dealbata*, it turned up quite often during the next few days as we explored the area looking for other species of *Copiapoa* and *Thelocephala*. I do not know whether it was because of the protests but the roads were almost deserted and it was a pleasure to drive around, stopping whenever we wanted without worrying about passing traffic. Heading east of El Donkey we came across *Copiapoa andina* (*C. coquimbana* subsp. *andina*) and I was astounded yet again at how these cacti can survive in such arid conditions – OK, they did not look their best, but they were still alive and that's all that mattered. We returned to the Llanos de Challe National Park where the previous day we had failed to find *Eriogyne napina* subsp. *challensis* (*Thelocephala challensis*) (Fig. 13). This time, on all fours and even lying down completely, we



Fig. 11 *Copiapoa dealbata* at Quebrada Mala, with daypack for scale



Fig. 12 *Copiapoa dealbata* at Quebrada Mala

managed to find quite a few, but they were very localised – plenty on one small hill, but none on the adjacent hills, or maybe we just couldn't see them!

It was time to leave the delights of the cake shop behind and continue northwards. Reaching the coast again we burst into our usual refrain of “Oh we do like to be beside the seaside” and at Morro Copiapo we soon found *C. marginata* (Fig. 14) and a few *Eulychnia breviflora*, all looking very dry. We overnighted in the pretty coastal resort of Bahía Inglesa and continued heading north towards Chañaral. Our first

stop at Quebrada El Leon showed again just how dry the area and the plants were. *Copiapoa leonensis* was almost dead as it was so dry and the *Thelocephala* (*Eriosyce*) *odieri* subsp. *krausii* (Fig. 15) were almost underground as they had shrunk back so much. *Copiapoa calderana* and



Fig. 13 *Thelocephala challensis* (*Eriosyce napina* subsp. *challensis*) at Llanos de Challe NP



Fig. 14 *Copiapoa marginata* at El Morro



Fig. 14 *Thelocephala krausii* (*Eriosyce odieri* subsp. *krausii*) at Quebrada El Leon

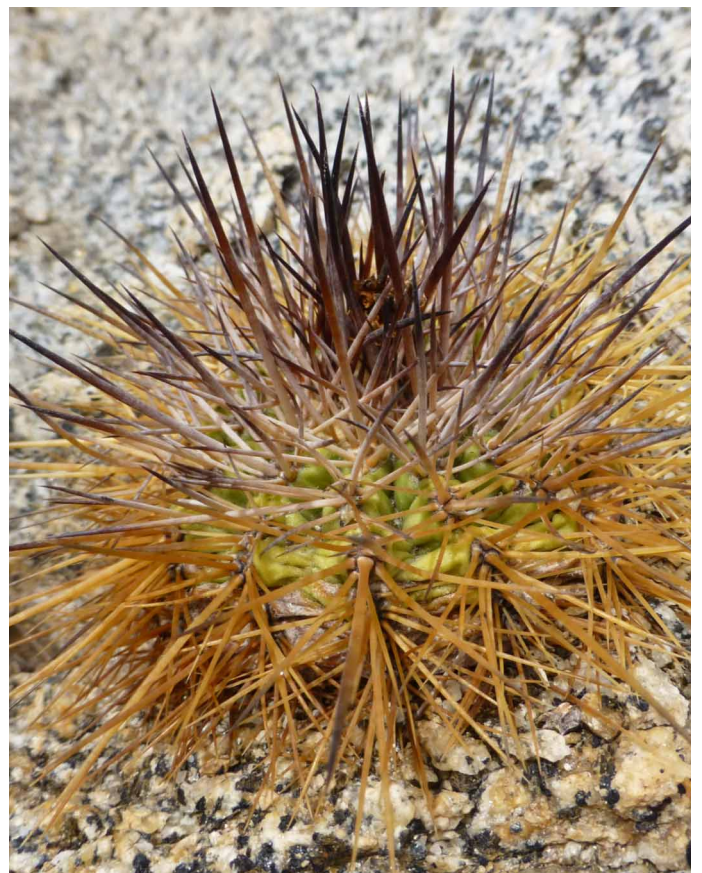


Fig. 15 *Copiapoa calderana* var. *spinosior*

C. calderana var. *spinosior* (Fig. 15) were looking much better and more hydrated no doubt because of the Camanchaca clouds/fogs which roll down from the nearby hills and provide some moisture.

On the way to the Pan de Azucar National Park we came across some healthy clumps of *Copiapoa cinerascens* growing not far from the roadside, and the ones growing on black rocks looked particularly photogenic (Fig. 16). Once we had passed by the ranger station and introduced ourselves, we proceeded to what was probably one of the highlights of the trip – a huge area covered with leaning *Copiapoa cinerea* subsp. *columna-alba* (Fig. 17). Some of these plants were up to half a metre tall and must have been hundreds of years old.

Photos: Al Laius

In the next issue Al heads north to Taltal, sees stars in the Elqui Valley and photographs huge specimens of *Eriosyce aurata*.



Fig. 16 *Copiapoa cinerascens* on the road to Pan de Azucar



Fig. 17 *Copiapoa cinerea* subsp. *columna-alba*