Cactus & Succulent Society of America
To The Point
Fall, 3rd Quarter 2022

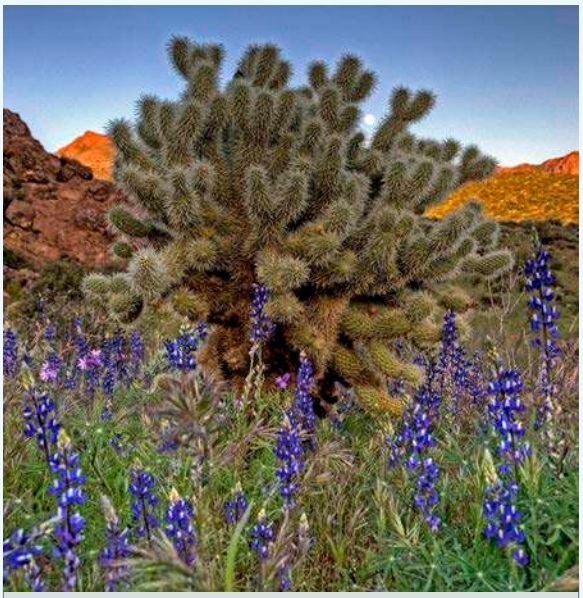
CACSS Cactus Rescue Program May Be Revived

Lee Brownson
Reprinted from Central Spine, Newsletter of Central Arizona C&SS June 2022

The Central Arizona Cactus and Succulent Society (CACSS) has been approached by a representative of a major national land developer inquiring if our society has a cactus rescue program similar to the one that the Tucson Society has conducted for many years. This was announced at the last CACSS monthly meeting to determine if there is any interest from the membership to start up the long dormant rescue program our group had twenty years ago. It was stressed that this is an opportunity in its very earliest stage of possibility. At least half of the members at the meeting indicated they would be interested.

Many people think that native plants, especially saguaros, are protected by law. With some exceptions, they are not. Arizona state laws only protect crested saguaros and plants that are already protected by the Federal government (endangered plants). Some municipalities in Arizona, mostly around Tucson and Phoenix, have adopted protective regulations. Aside from those exceptions, if a native plant is on a property that is not state or federal land, the owner can destroy that plant. This means a lot of native cacti can be destroyed, especially if it is a large property owned by a land developer for whom the plants are merely a bother. Rescuing the plants is labor intensive and time consuming, both things that are not attractive to a for-profit company.

This is where a CACSS rescue operation can arise. If the process is initiated early in the development process, many plants can be "saved from the blade." Depending on the location, certain rules need to be followed, but once the proper steps are completed, the plants are moved off of the site, and they become the property of the CACSS.



Plants in the Arizona desert – March 2010

John Fowler from Placitas, NM, USA, https://upload.wikimedia.org/wikipedia/commons/5/5c/Plants_in_the_Arizona_desert_-_March_2010_%284471590175%29.jpg

Participation at a cactus rescue is a wonderful experience for several reasons. It conserves the plants we all love. It is an opportunity to enjoy being out in the desert. It is a great way to meet other members of the society. It can be another source of money for the society. And, last but not least, member participants can purchase the plants that are rescued at ridiculously low prices, from $1 to $8, depending upon the species.

First Place - Rob Skillin's image of *Gethyllis namaquensis*, Richtersveld, South Africa

2022 CSSA Photo Contest Results

This photo contest was born during the height of the Covid lockdown out of the desire to create a fun, safe event for our members. At the time, club meetings were either canceled or zoomed, conventions postponed, plant shows and sales a memory, and field trips a hope. We wanted an activity that was challenging and emphasized the plants we love. We also wanted it to be a free benefit restricted to CSSA members and youths.

The contest committee thanks all of the participants for making this contest an overwhelming success. The number of entries (136) was impressive and the number of members who wrote to say they enjoyed the contest was gratifying. Most importantly, fantastic images were submitted from our worldwide membership with one of the winning entries submitted from Germany. Having so many interesting images made it difficult to choose among the top entries. Before the entries were submitted, we anticipated having a single honorable mention in the adult category. As we reviewed the images, we thought it fair to include an additional meritorious image as an honorable mention.

The winners In the Adult category are:

Honorable Mention - Navid Ahmadian's image of *Euphorbia* spines (**right**) taken at the Ruth Bancroft Gardens, Walnut Creek, CA

Honorable Mention - Robin Brower's image of *Opuntia erinacea* (**top, left**) taken at The Desert Botanical Garden's plant sale

Third Place - Robin Brower's close-up image of her *Echinocereus rigidissimus* bloom (**top, right**)

Second Place - Dr. Detlev Metzing's closeup image of an areole of *Gymnocalycium borthii* subsp*. nogolense* with bud and spines (**bottom, right**)

First Place - Rob Skillin's image of *Gethyllis namaquensis*, Richtersveld, South Africa (pictured on **page 2**)

We hope you appreciate how the unique subject, great composition, sharp focus and leaves that seemed to dance make such a strong visual statement in Rob Skillin's winning picture. Similarly, Dr.Metzing's unusual perspective shows the relationship among the tiny spines and creates a visually compelling statement of a world that most of us would have passed by without noticing. Unlike the winning images of Rob Skillin and Dr. Metzing, Robin Brower took a common subject in this contest, a closeup of a flower center, and handled it with a rare sense of delicacy and balance that set her image apart.

Because of the limited number of entries in the youth division, only a first and a second place were awarded. Those photographs were quite amazing and well-deserving of their award, particularly given the ages of the entrants. The winners in the youth category are:

Second Place - Ivan Reynolds' (8 yrs. old) dichotomous division of a *Mammillaria rhodantha* (**top photo**) (part of his "eyes" series)

First Place - Annika Chan's (15 yrs. old) image of *Echeveria* 'Etna' (**bottom photo**)

In many respects, Annika Chan's image was the most notable success of the contest. As one of the judges noted, her image would have done well in the adult contest. To discover that depth of vision in a 15- year-old has to put a smile on your day.

We hope that you enjoyed the 2022 photo contest and will join us next year.

The 2022 Photo Contest Committee
Irwin Lightstone, contest administrator and judge
John Martinez, judge
Nils Schirmacher, judge
Sue Hakala, judge
Gunnar Eisel, advisor

A dedicated team of 18 volunteers work hard to keep the plants at the San Diego Zoo Safari Park's Baja Garden and Old World Succulent Garden plants alive through the summer.

We even occasionally add plants (when we think we can keep these watered and nurtured).

We want to thank the following for donating plants to the Gardens: Pam Badger, Rick Bjorklund, Ken Blackford, Ron Chisum, Candy & Jerry Garner, Don Jones, Julie Kort, Jean & Bill O'Daniel, Rick & Cheryl Negus, Mike Nelson, Gnosis Nursery, Tom Osborne, Mary & Jim Reiser, Herb Stern, Botanic Wonders, and Tina Zucker.

We have also been buying quite a few specialty aloes from Tom Cole, ISI of Huntington Botanical Gardens, and the Institute of Aloe Studies, to add to our aloe collection. We have more than 250 species!

Baja Garden and Old World Succulent Garden Update

May Fong Ho
Reprinted from Espinas y Flores, October 2021; San Diego Cactus and Succulent Society
Photos courtesy of San Diego Zoo and Safari Park

TTP contacted May Fong Ho to find out more about this Partnership. We asked and she answered.

- **What is your group's partnership with the Zoo?**

San Diego CSS is the project lead for the Baja Garden and Old World Succulent Garden projects at the San Diego Zoo Safari Park. As of now, we have 18 volunteers working on these two gardens. These volunteers come from the San Diego CSS, Palomar CSS, as well as through volunteering directly to the Zoo.

Day to day garden design and maintenance is done by the volunteer team. The Safari Park Horticulture Department provides assistance as requested by the volunteer team. The team is responsible for plant selection, planting in ground, plant health, plant propagation, some educational displays, and tours.

- **Was this project the San Diego group's idea?**

The Baja Garden was born out of the enthusiasm of the Park's first horticulturist, Jim Gibbons. He made the arrangement with the Baja and US governments that allowed the Park to bring in a collection of plants from Baja California, Mexico, as an educational exchange. The Park allocated about 5 acres to showcase this collection. This was the beginning of the Baja Garden.

Baja Garden and Old World Succulent Garden, San Diego Zoo Safari Park
https://sdzsafaripark.org/animals/baja-garden-old-world-succulent-garden

- When did the garden first open?

In the 1970s for Baja Garden, and in the 1990s for Old World Succulent Garden

- What are the future goals for the garden?

The Baja Garden has mature Baja plants, mainly from the Bahia de Los Angeles area. As the plants collected have done very well getting established in the Baja Garden, we are starting to add more species from the large Baja Peninsula.
The Old World Succulent Garden has been collecting and growing nearly a thousand species of succulents. Aloe is our largest genus in our collection; we hope to add as many aloe species as we can source. The garden also has a large collection of pachypodiums and euphorbias. The goal is to educate the public of the beauty and diversity of plants from Baja and Old World areas.

- What sets this garden apart from other cactus display gardens?

The Baja Garden has the largest collections of mature Baja plants outside of Baja. The garden is over 35 years old with large and mature plants.
The Old World Succulent Garden is planted with aloes, euphorbias, pachypodiums and other succulents from Africa, Madagascar, Arabia, and Canary Islands areas. It is a newer garden, but still has some very mature specimens. The Old World Succulent Garden is a work-in-progress.

Old World Garden Treasures https://stories.sandiegozoo.org/zoonooz/old-world-treasures/

Building the Baja Garden https://stories.sandiegozoo.org/zoonooz/building-baja/

San Diego Zoo Safari Park Garden Update - May 2022

Reprinted from Espinas Y Flores, June 2022
Newsletter of the San Diego Cactus & Succulent Society

← ***Uncarina peltata*** – This was planted in 2015. It should have been growing into a nice big bush, with beautiful yellow flowers. However, as you can see, it's in a cage. The deer love it and will munch on it till nothing is left. After several years of losses, we finally built a cage enclosing the whole plant. We hate to do this. Hopefully, when it gets big enough, we can liberate it from solitary confinement. Last year, the gophers did their dirty work and ate half of the fat caudex. We cleared the ground around it so we can detect the advance of gophers in the future.

← ***Adenium arabicum*** – This plant had been sitting in the greenhouse for years because we were afraid of it rotting in our cold winter rain, if we planted it in ground. It's such a beautiful plant and it's a shame for it to sit in the greenhouse. We finally decided to display it in a nice big pot in the garden. Keeping it in a pot means that we can move it to shelter if the weather hits one of those long spells of cold rain. It has survived its first "winter".

Did you know?

CSSA has been funding research grants for decades!

Both Academic and
Private Grants solicited.

Please request a proposal packet from:
Phuc Huynh
Huynhphu7@gmail.com

http://cactusandsucculentsociety.org/Grant_Application_Pkt.pdf

On the CSSA Website

...NEW CSSA Membership Levels
https://cssa.myshopify.com/collections/join-cssa

...Register for Upcoming Webinars
https://cactusandsucculentsociety.org/

...Stay up-to-date!
2023 CSSA Convention*
in Colorado Springs
https://cssaconvention.com/cssa2023/index.html

...Find an Affiliate Club to attend
https://cactusandsucculentsociety.org/Affiliates/affiliates.html

...Seed Depot*
https://cssa.myshopify.com/collections/seed-depot

*Convention attendance and Seed Depot are available only to paid members.

Copiapoa and the Atacama Desert

Cliff Fielding

Reprinted from *Central Spine*, Newsletter of Central Arizona C&SS
June 2022

To stay alive in the very harsh environment of the Atacama Desert, copiapoas employ stem sacrifice. This means that the plant keeps only smaller and smaller amounts of chlorophyll at the top because there are not enough resources to sustain more.

The *Copiapoa* with the black sides and 10 heads is near terminal stage (photo 1). Most of the heads have shed their spines, and there are no new spines growing in the center of the wool. The chlorophyll containing parts of the skin are now greatly reduced to minimize moisture loss. There have been reports of attempts to revive plants like this in greenhouse conditions, with little success. It would be great to return in ten years to see if it has turned around. I was amazed at how tough the plants were when I visited them in habitat.

The plant in photo 6 is also demonstrating stem sacrifice, as most copiapoas will do because of the harsh conditions. However, if you look closely, there are still spines on the cactus and signs of new ones arising in the middle. This cactus is as healthy as any you might see on the coast. It is not in the terminal stage. Where the chlorophyll cells have disappeared, there is the incredibly beautiful skin that looks like polished mahogany.

Photos are from my visit to the Atacama Desert. 1-*Copiapoa columna-alba:* 2-*C. cinerea;* 3-*C. dealbata;* 4-*C. haseltoniana* on Mt Perales; 5-*C. columna-alba;* 6-*C. cinerea* var *albispina*

Visit YouTube.com and search for *Copiapoa* Habitat Chile 2019 for a drone flight over the Atacama Desert along the Pacific coast of Chile. You'll feel like you're there. It's amazing!

An Agave's Finale

For 35 years an *Agave guiengola* (nicknamed Guien), has been growing at the Garfield Park Conservatory in Chicago, IL. When a bloom stalk first started to grow in early 2022, Ray Jorgensen, floriculturist at the Conservatory, checked Howard Scott Gentry's book, *Agaves of Continental North America*. The book stated the spike would grow to "1.6-2m tall" (5–6+ ft). Guien blew past the 6 ft mark in just a few weeks.

At times, Guien's flower spike grew up to 5 inches a day. An online search found a grower who stated that, with supplemental watering, spikes can reach 10–15 ft. Guien surpassed that mark as well! The bloom stalk stopped growing at around 21 feet 2 inches.

The blooms began to open at the bottom of the stalk and then moved slowly towards the top. While this is a spectacular process, it is also bittersweet- agaves like Guien die after blooming one time. After the blooming stops, it will be several weeks of slowly saying goodbye. The leaves relax and collapse, almost melting down and wrinkles start to show in the once taut leaves.

Watch this time-lapse video of Guien's flower stalk as it grows. Thanks to Matthew Barrett of the Chicago Park District for this Facebook video. https://www.facebook.com/GarfieldParkConservatory/videos/742319916791897/?extid=CL-UNK-UNK-UNK-IOS_GK0T-GK1C&ref=sharing

For more information, spectacular photos and videos, check out Chicago's WTTW coverage of Guien the *Agave*. https://news.wttw.com/2022/02/08/guien-agave-nearing-garfield-park-conservatory-s-glass-ceiling-she-s-trying-be-skyscraper?fbclid=IwAR1bt-bIANOt1CtuhOZTXObI3i7IzVE-s5fZc8jhyjJxM0u-jUZTdJ53XI9G8

Garfield Park Conservatory, 300 N Central Park Ave, Chicago, IL 60624; https://garfieldconservatory.org/

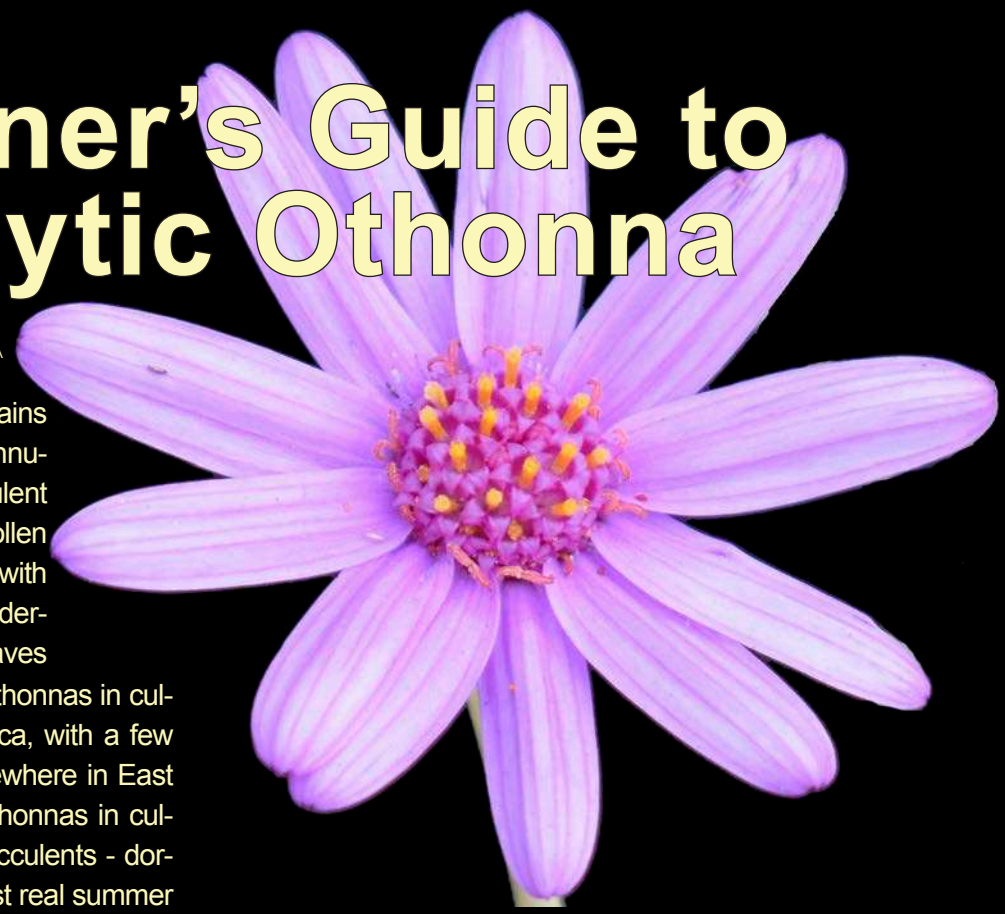
Flower stalk of *Agave guiengola*, aka Guien, (top) reaching for the ceiling at the Garfield Park Conservatory in Chicago, IL.

After blooming, this *Agave* slowly moves towards its demise (bottom). The leaves appear to be melting away.

Information and photos: Ray Jorgensen

Beginner's Guide to Geophytic Othonna

Thomas Glavich, Altadena, CA

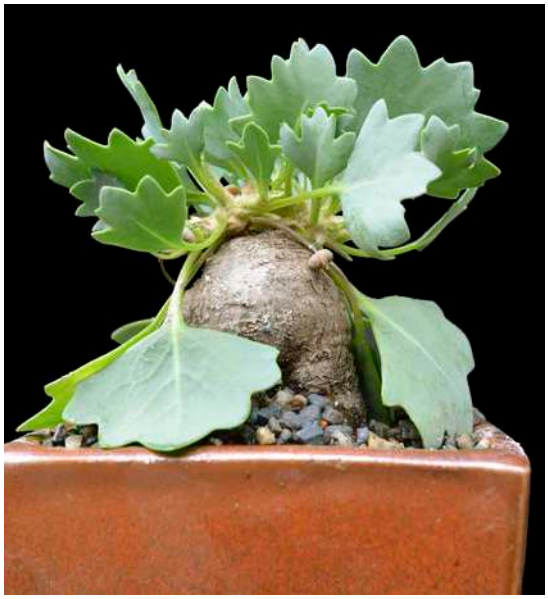


Othonna incisa flower (above)

The genus *Othonna* contains members that range from annuals to shrubs to semi-succulent shrubs to pachycauls with swollen trunks and to true geophytes, with most of the plant safely underground and only the annual leaves and flowers exposed. Most Othonnas in cultivation come from South Africa, with a few from Namibia, and a few elsewhere in East Africa. All of the geophytic Othonnas in cultivation are winter growing succulents - dormant and leafless from the first real summer heat until nighttime temperatures get into the low 50's. *Othonna* are members of the Asteraceae with garden asters, sunflowers and dandelions as distant relatives.

Cultivation of *Othonna* is relatively simple. They are winter growers that start to develop new leaves in late September or October. They are more sensitive to night temperatures than they are to day temperatures and will start to leaf out when night temperatures are near 50°F for a week or so. This is the time when they need water and at least a little fertilizer. Some species flower almost as soon as the leaves appear but most wait until late winter or early spring. The flowers are pollinated by bees and anything that will pollinate a dandelion. Some natural and grower hybrids exist however hybridization is fairly rare. Othonnas do best when never allowed to get bone dry. A little water in summer particularly when grown in very dry climates will prevent complete desiccation and loss of roots. A little water is a little water, not flooding and without fertilizer. The plants are dormant and leafless and the roots should never be consistently wet. If this happens then the plants may get root rot, with the rot spreading through the plant. Many growers use pure or nearly pure pumice as a growing medium to help prevent this. Pure pumice goes a long way towards preventing rot and greatly eases the difficulties of summer watering but requires some fertilization during the growing period.

Othonna propagation by seed is not difficult. Bees and other insects do most of the pollinating if the plants are exposed. If controlled pollination is desired, then a small brush or even a fingertip will transfer pollen from one plant to another. Female flowers are ray flowers located around the edge of the inflorescence. The center (disc) flowers are either male or perfect, depending on the species. Most species are not self-fertile, and two plants will be required to produce seeds. If successful pollination occurs, the flowers



will fade fairly quickly. After the flowers fade the floral stem will gradually turn brown. The seed is enclosed in a small fruiting body and comes with a small wind-catching appendage (pappus) much like a dandelion. These should be removed as soon as seen or they will blow away in even a small breeze. Small coin envelopes work well for seed storage. Commercial seed companies and the CSSA seed bank often have *Othonna* seed available. When planting seeds, the pappus should be cut off as it is often where molds and fungi start. Seed should be sown about the same time as the plants leaf out and can be kept for at least a year.

Othonnas can be propagated vegetatively. Cuttings should be taken during the early part of the growing season and then left to dry for a few days before being potted up in pure pumice or any other coarse material. After potting up, cuttings should be lightly watered as they set roots. A second watering and a light misting a few days after the first will keep the cutting from drying too fast. After a few weeks new roots should form. With care, even relatively small cuttings can be induced to set roots.

Othonna filicaulis is a geophyte that produces thin trailing vines from a usually subterranean tuber. It needs a little water all year around, particularly in hot weather, but shouldn't be soaking wet. The picture shows the normally buried tuber. At left in the picture, where the vine was pressed into the potting mix, roots are beginning to form. This section can be separated, and will grow a new tuber.

Othonna hederifolia is one of the more interesting tuberous members of the genus. The tuber can be raised as in the photo, with the amount of tuber showing increased slightly each year. Multiple growing tips are common and yellow flowers appear in

Othonna filicaulis (above, left)
Othonna hederifolia (above, right)
Othonna incisa (bottom)

mid-winter. The tubers can get fairly long, requiring deep pots for best plant health. The bottom of the tubers should not be flattened or bent by being jammed into a pot that is too small.

Othonna tuberosa is a similar species that flowers at the same time as *Othonna hederifiolia. Othonna tuberosa* generally has a better caudex. Attempts at hybridizing the two species have not met with success.

Othonna incisa is a relatively rare species and one of the few with purple flowers. It grows from a long carrot-like tuber and prefers very deep pots. The pot in the picture is an eight inch deep tree pot. The potting mix is pure pumice, with the bottom of the pot resting in about a half inch of water during the growing season. As it goes into dormancy with the heat of summer, the pot is removed from the water and the plant gets a dry rest.

Othonna rechingeri is a sprawling, mat-forming species. The picture of the species shows the sprawling growth habit, with small tubers and roots forming wherever the stems touch soil. It is capable of rooting into nearby (and not so nearby) pots if left to its own devices. It is an interesting curiosity, but requires constant pruning to keep it under control.

Geophytic species include *Othonna armiana* and *Othonna cacalioides*; both are hard to come by and even harder to keep. They do best in the ground in their native habitat.

Othonna rechingeri

Winter Hardy Beds

The evolution of my winter hardy C&S beds over 40 years

Bob Stewart

Reprinted from the Eastern Spine, June 2022,
Newsletter of the National Capital
Cactus & Succulent Society

My First Hardy Bed (right) was created in 1981and located in my sister's backyard due to the fact I was living in an apartment. Although it was 45 minutes from my apartment, it faced SE with lots of sun and allowed me to visit my sister on a regular basis.

My Second Hardy Bed (left) was created in 1987 and located at my place of work, which was an old elementary school converted into an office. It faced due south, with lots of sun and a nice white wall background. The tall plants in the back of the bed are *Cylindropuntia leptocaulis.*

Both of these locations above had water available but required some soil preparation that involved loosening to a depth of 12 inches and the addition of soil drainage and aeration amendments.

My Third Hardy Bed (right) was created over a four-year period between 1991 and 1994. It was located on the south side of a gentle slope on a section of the three acres of land where we built our new house. It was much larger than my first two hardy beds and gave me the opportunity to plant larger growing cacti and other succulents.

My Newest Hardy Bed Under Construction (below) at my home in Southern Maryland. This bed is being developed both as a C&S bed and as a landscape feature for the house. The plants will be, and stay, relatively small in order to keep the overall bed the primary feature. I also have incorporated pathways to allow access to interior parts of the bed for viewing and plant maintenance.

A few C&S that are hardy or semihardy in the Washington D.C. area. Taken from https://www.washington-dc.cactus-society.org/Gallery.html

- *Echinocereus baileyi*
- *Delosperma cooperi*
- *Opuntia phaecantha*
- *Cylindropuntia imbricata*
- *Agave havardiana*
- *Echinocereus triglochidiatus*

Multi-Colored Splendor: *Loxanthocereus hoxeyi*

Tristan Davis
Reprinted from Central Spine June 2022, Newsletter of
Central Arizona Cactus & Succulent Society

In 2010, Paul Hoxey discovered populations of a small cactus in southwestern Peru in the dry lomas of Arequipa. These were subsequently determined to be a distinct new species, and it was described in 2013 as *Borzicactus hoxeyi.* Later research into the relationships of *Cleistocactus, Haageocereus, Loxanthocereus,* and *Borzicactus* has demonstrated that the correct name is *Loxanthocereus hoxeyi* (*Loxanthocereus* being more closely related to *Haageocereus* than it is to *Borzicactus*).

Even though determined to belong to *Loxanthocereus*, the species was quite distinct from any known species in being quite small of stature with actinomorphic flowers (that is, radially symmetrical from above) as opposed to zygomorphic (only symmetrical in one plane) as are other species of the genus. Also, the flower is distinctly multi-colored, ranging from yellow to orange and red in the same flower.

All of these characteristics—newly described, small, colorful flowers, and a *Cleistocactus* relative—made it reach my "Must Grow List" quite rapidly! Like many new species, availability in the U.S. was nil, so I went afar to locate a source. I finally found a source for seeds and purchased a few (I have all the proper import permits from the USDA). I first sowed seeds in 2017 with limited success, but managed a couple of seedlings that have since flowered for me. More recent sowings have had more success.

Luckily, *L. hoxeyi* is very easy to grow from seed and fairly rapid. Some plants have reached flowering size at only 2 years of age (mine have taken 4 years). Once they reach a decent size, they do wonderfully and reward me with flowers each spring and summer. Flowers last for 3–4 days depending on heat/sun conditions, but alas, are typically not self-fertile. I grow mine both in pots and in the ground, and they all seem to thrive here in the valley as long as they are provided some protection from the afternoon sun in the summertime.

Top: Left, *Loxanthocereus hoxeyi* in 2017, and right in 2019.
Bottom: Left *L. hoxeyi* in 2020 and right, in 2021.

In 2020, a new population was discovered in southwestern Peru not far from the original populations, but was distinct, especially in size. This new population was described as a new subspecies: *Loxanthocereus hoxeyi* ssp*. grandis*. The name refers to the stems, which are quite a bit larger than the nominate populations. Another important difference between the two subspecies is that *L. hoxeyi* ssp*. grandis* appears to be self-fertile. I have not been able to locate a source for the new subspecies, yet. I hope to track it down soon and add that one as well to my collection.

As more growers propagate the species, it should become more available in the near future. If you grow from seed, you can obtain seeds easily from various international sources. So, if you run into one, be sure to nab it for your collection. You won't regret it.

Melocactus

Sue Haffner
Reprinted from Cactus Corner News
Fresno Cactus & Succulent Society
July 2022

Melocactus is a very old genus. These plants were among the first collected by early explorers and sent back to Europe. They are usually globular and solitary, with flowers produced on a terminal cephalium, which gives them a distinctive appearance. The genus ranges from the West Indies, Mexico, Venezuela to Brazil. They are tropical growers, requiring protection from temperatures below 60° F.

Top: *Melocactus* fruit, looking like a miniature chili pepper. The succulent, translucent fruit is eaten by birds and lizards, helping to disperse the tiny black seeds.

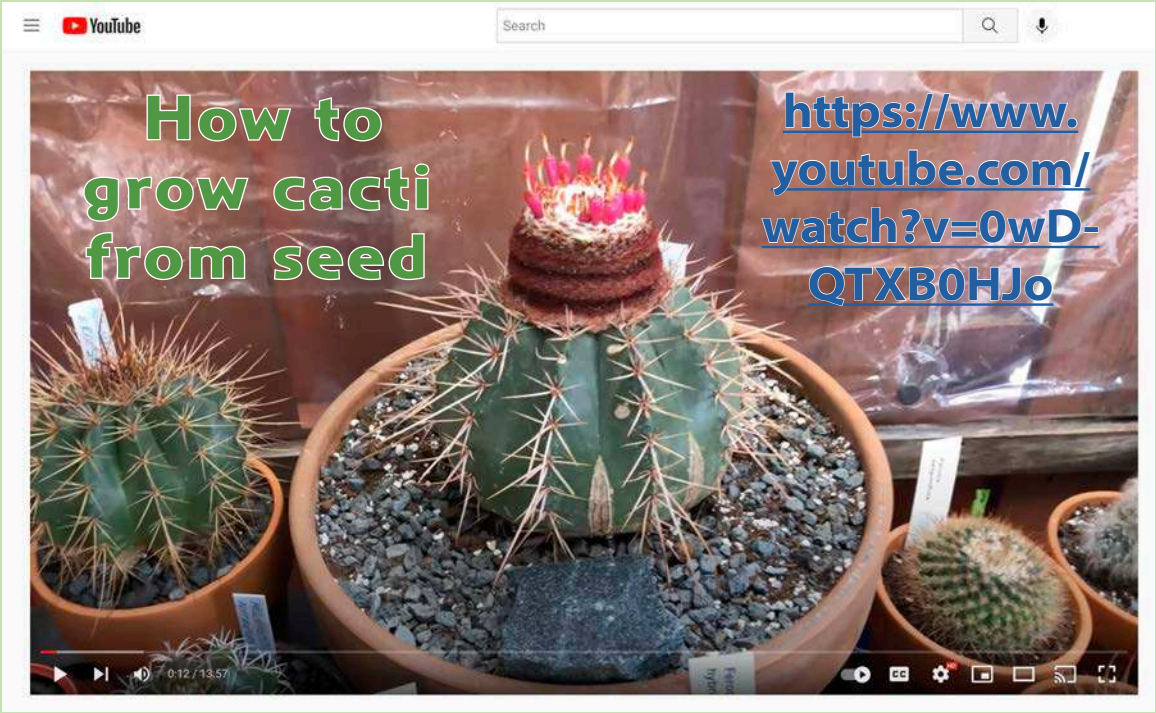
Left: *Melocactus azureus* sporting its impressive cephalium. The common name, Turk's Cap, derives from the resemblance of the cephalium to the fez, a cylindrical hat worn by men in the Ottoman Empire. The flowers mimic the tassels that topped the cap.

Melocactus photos: Irwin Lightstone

Center: Fez outside Casablanca Carpets shop located in Morocco Pavilion in World Showcase at EPCOT Center. Photo: Sam Howzit, https://commons.wikimedia.org/wiki/File:Fez_(32301476593).jpg

Watch this YouTuber share his process for growing a *Melocactus* from the seed harvest to baby cactus popping out of the soil. He demonstrates the seed sowing process with several types of C&S seed.

Courtesy of: East Coast Camanchaca; info@eastcoastcamanchaca.com



Adenium obesum seedling, 2-days old, growing out of the seed husk.

Photo: Timothy Gonslaves https://upload.wikimedia.org/wikipedia/commons/f/fa/Adenium_seedling_2day_Uthandi_Aug21_D72_20609-21_ZP.jpg

String of Pearls
(Senecio rowleyanus)

Wally Wolfgang, Pennsylvania
Reprinted from Hobby Greenhouse Association Newsletter, Spring 2022

String of Pearls, *Senecio rowleyanus* (top), works beautifully in a hanging basket.

This carpet of String of Pearls (bottom) started out as individual 2-inch pots with one plant per pot. Two-inch pots filled with growing medium were placed around the pots in the growing flat. The pearls spread over the post and rooted easily.

Wanting to grow something new, I found the plant "String of Pearls" at one of the wholesale greenhouses I do business with. They were growing them in 2-inch pots for growers such as myself. I had seen them in retail greenhouses occasionally and never really gave them another look. Worth a second look I was thinking then, and they would look great planted in 8-inch baskets. Checking my reference books on the shelf, I found out that the green pearls are indeed called leaves.

This is a succulent plant that loves bright light but not direct sunlight, and dry indoor air conditions. String of Pearls is ideal for growing indoors during the winter months and can be moved outdoors during the summer months to a protected location.

During the growing season, feed the plant monthly watering thoroughly- as in water coming out the drain holes- then let the soil dry out before the next cycle. A slow-release indoor plant food also works well. The plant likes a well-draining growing medium (not those heavy black soils on the market at discount stores). If the plant has yellowing leaves, or pearls, the soil is too wet. Allow it to dry out completely.

The plant does produce a small, cream-colored flower (1/4-inch) on a stem about two inches long in my greenhouse January through March. Not a spectacular flower, but nevertheless welcome to the dreary winter months. This summer I will be waiting for the bloom of white flowers that the experts state in their articles.

Seeds? I did not see any seed in the bloom this winter but perhaps that is because it was winter temps in the greenhouse of 50–55°F. Of course, there was no pollination of the blooms going on in the winter greenhouse either. However, they do apparently produce seed that can be purchased on the market.

It is classified as a succulent trailing plant that basically grows to a height of 2–3 inches. Being a trailing plant, it is well suited to hanging baskets and can achieve a length of several feet. I trim the plant stems to keep it uniform and will try propagating the removed pearls.

String of pearls likes warm weather above 70°F where they thrive, growing and reproducing offsets. They grow well in the winter months in 50–60°F temperatures but again, they like low humidity so do not place them in bathrooms, kitchens, or other rooms with high humidity. I propagated them this winter in the greenhouse with 50–55°F temperatures.

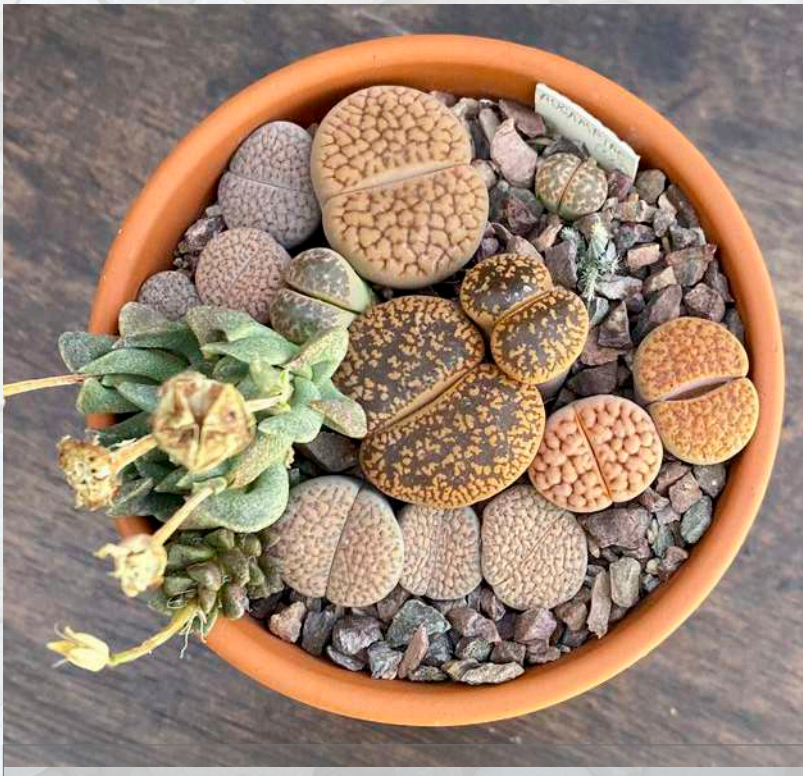
Like many succulents, String of Pearls can be toxic to children and pets causing an upset stomach and vomiting. I recommend properly feeding children and pets rather than allowing them to chew on the plant. Just kidding here.

I placed the 2-inch pots into every other cell in a cell flat with another 2-inch pot of soil placed next to and around them in the other cells. As the stems grew out of the mother pot, they clambered over the other pots and rooted easily. If there was a problem with this system, it was that when the time came to pot them into the 8- inch hanging baskets, they had grown so much they were intertwined in every pot producing what looked like a carpet of pearls!

I wiggled each pot out of its cell, pulled it out of the flat, trimmed the pot and placed three of them into each 8-inch basket. Within two weeks the plants in the baskets were producing new stems and pearls. The two starter flats of 2-inch pots produced 24 baskets of plants.

Top Dressing

Cliff Fielding,
Reprinted from The Central Spine, April 2022,
Newsletter of Central Arizona Cactus and Succulent Society



Here is an excellent example of having a top dressing that is receptive to germinating other seeds. The only original plant is the orange *Lithops* in the center. Six different *Lithops* and three different mesembryanthemums, including a hard to grow *Avonia quinaria,* liked the topping enough to germinate.

Why Do You Use Top Dressing?

I use top dressing for moisture retention. My soils dry very rapidly in the dry growing seasons of spring and fall. The roots of the mesembs, copiapoas and eriosyce plants are very shallow. The right top dressing will help them stay moist long enough for them to absorb water before the pot dries out. With new seedlings, top dressing can be the difference between success and failure.

I use top dressing to promote the growth of volunteer seedlings. I do not always have success raising plants from seeds. I am always dropping a few seeds of harder to grow plants in the pots of other plants and leaving seeds on cactus in the hopes they will germinate when the time is right. For this to work, you need a coarser top dressing (sifted decomposed granite) so the seeds will find their way to the soil bed. Conversely, a tighter top dressing (river gravel only sifted for sand) will prevent the growth of unwanted weeds.

Top dressing complements the pot and plant. I keep on hand many types of top dressing so I can match the color and style to the plant and pot. Often, the top dressing for a show will be different from what I use every day. Lithops look great with a shiny fine black sand to help the intense colors stand out. In Arizona, the shiny black sand used on the lithops will generate extra heat in the summer sun that will kill them. I have found that using a lighter colored topping with more sensitive plants, is beneficial in helping them survive our intense sunlight during the summer.

What Kind of Top Dressing Do You Use And Where Do You Get It?

Always be on the lookout for top dressing. You never know when you will see a great color, size or texture.

Sifted from washes where there is coarse decomposed granite or smooth river gravel high in quartz makes a great topping.

Nurseries may have sifted 1/8″ gravel of different colors in buckets.

Do You Wash/Sterilize Your Top Dressing?

I only wash and sterilize top dressing when using in seed cups. If you get gravel from a wash, be careful there are not weed killers in the gravel from agriculture run off.

Do You Think It's Important To Use Top Dressing When You Show A Plant?

I consider it the final step in preparing a plant for show. As a past judge, in my experience, your dressing should help display the plant at its best. The size, color and texture of the dressing should complement the pot and plant, not distract from the plant. One of the best I ever saw was a huge, short bonsai pot full of smooth pale green argyrodermas with smooth slightly paler and slightly smaller green river stones. It was amazing how the plants stood out while, at the same time, blended with the dressing. If two plants are equal, the better staging will always win the award.

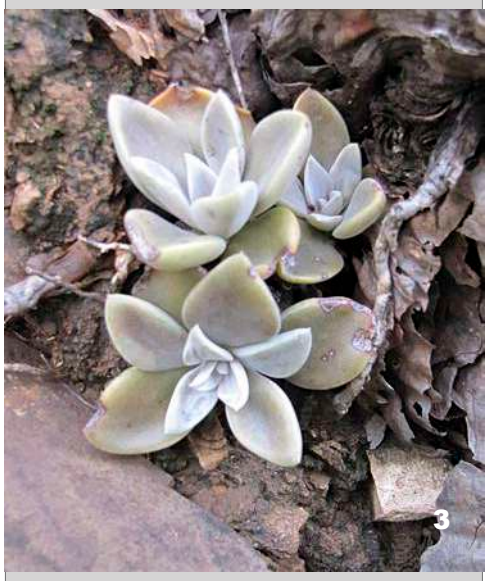
Thompsonella minutiflora

Brian Kemble
Reprinted from San Francisco Succulent & Cactus Society Newsletter, March 2021

Fig. 1 *Thompsonella minutiflora* flowering in habitat alongside *Coryphantha pallida*, near Santiago Quiotepec, Oaxaca.

The family Crassulaceae occurs widely in Africa, Europe and Asia, as well as in the Americas. In the Old World, the area with the greatest concentration of species is South Africa, while in the New World it is Mexico that holds this distinction. Some of the genera of New World Crassulaceae are well represented in horticulture, with *Echeveria* being a prominent example, but others are largely unknown except to specialists. One of the seldom-encountered genera is *Thompsonella*, with six described species, all of them native to southern Mexico.

The first species in Thompsonella to be described was *Thompsonella minutiflora*, and it was initially considered a species of *Echeveria* when named by Joseph Nelson Rose in 1903. Not long afterward, Rose and his botanical collaborator Nathaniel Lord Britton determined that



it should be classified separately, so in 1909 they created the new genus *Thompsonella*, with *Thompsonella minutiflora* as the type species. They also included a second species in the new genus, *Thompsonella platyphylla*, but there is doubt as to whether this is really sufficiently distinct to warrant another name. Four additional species were described in the 1990's, bringing the total to 6 (or 5 if *T. platyphylla* is regarded as a synonym of *T. minutiflora*).

Florally, the genus *Thompsonella* is distinct, although it has some affinities with other Mexican genera in the Crassulaceae. The erect spike-like inflorescence is reminiscent of the genus *Villadia*, but the latter differs in having smaller flowers and monocarpic rosettes. The spreading petals with red blotches show some similarity to *Graptopetalum*, but this genus has much-branched inflorescences with flowers that face upward, rather than to the side as with *Thompsonella*. Without the flowers, the rosettes of leaves in *Thompsonella* might be mistaken for plants in *Echeveria*, and this is precisely what occurred with Rose in 1903.

Of the species in *Thompsonella*, *T. minutiflora,* has much the largest distribution, with populations in five states across southern Mexico: Guerrero, México, Morelos, Puebla and Oaxaca. As befits a species with such a wide area of occurrence, it is quite variable, with rosettes of leaves anywhere from 1.2 to 6.7 inches in diameter (3 to 17 cm). Plants shrink in size during the dry season, often going completely deciduous until the arrival of the rainy season causes them to put out a new set of leaves. They have large carrot-like roots that enable them to survive during dormancy.

The leaves of *T. minutiflora* range from short and oval to long and canoe-shaped or tapering to a point. Though always succulent, they vary considerably in how thick they are. The leaf edges may be straight or wavy, and the upper surface is channeled or trough-like. When the leaves first emerge, they have a glaucous waxy coating, but this diminishes over time. Mature leaves are often green with a purple tinge, but they may be milky-gray or various dusky shades. Sometimes plants may have red-margined leaves, though this is not usually the case.

Thompsonella minutiflora flowers at the end of the summer or in the fall, sending up narrow inflorescences which may be as much as 14 inches in height (35 cm). The stalk is glaucous and bears flowers along the greater portion of its length, and below this it has bracts which resemble small leaves. At a glance, the inflorescence

Fig. 2 The inflorescence of the plant in Fig. 1.
Fig. 3 A young plant in the same area, showing how pale the leaves are at this stage.
Fig. 4 A plant from the Puebla-Oaxaca border, to the south of Tehuacan.

appears to be spicate (with the flowers attaching directly to the stalk), but in fact the flowers are held on very short side branches, with two or more flowers crowded together on each branch. The lower branches are a little longer and tend to have more flowers, while the uppermost ones may sometimes have only a single flower. The five fleshy sepals look much like the bracts, which are present on the side branches as well as on the main stalk. At the bud stage the flowers are pale like the sepals, but when the flowers open the five petals spread widely to expose their inner surfaces, which have a base color of pale yellow or pale greenish-yellow, with red markings. The markings are sometimes dense enough to cover most of the face of the petal, except for the margins, but they may be less conspicuous. Each flower is .24 to .4 inch in diameter (6 to 10 mm). The five stamens, surrounding the central column of the style, have white filaments topped with cream or reddish anthers. The five follicles, or seed-bearing chambers, split open at maturity to spill the tiny yellowish-brown seeds.

Fig. 5 A plant from Jolalpan in the far west of Puebla, near the borders of Guerrero and Morelos. Plants here have extra-long inflorescences.

Fig. 6 A close-up of the plant in Fig. 5. Note how long the leaves are and how wavy the leaf margins are in this population.

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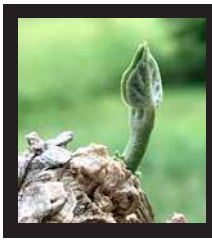

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Aloe "Hellskloof Bells"

Sue Haffner

Reprinted from Fresno Cactus & Succulent Society
Cactus Corner News July 2022 Page 8

In the summer of 1991, Brian Kemble, curator of the Ruth Bancroft Garden in Walnut Creek, and a noted aloe expert, created this hybrid of two species from South Africa's Mediterranean climate. The seed parent was the red flowered form of *Aloe pearsonii*, a species many find difficult to grow and flower. In the Hellskloof, a montane region of the Richtersveld in the North Cape, it forms spectacular colonies of erect, columnar branches covered with red-blushed leaves. The pollen parent, the related *A. distans,* is an easier species from the coast with more freely produced, larger heads of flowers.

When the seedlings were young, Brian sent several of them to John Trager at the Huntington Botanical Garden who grew and propagated them vegetatively. As to the cultivar name, John Trager writes, "I suggested the 'Hellskloof Bells', a play on the term "hells bells." Webster's defines the term as "an interjection to indicate vexation or surprise." The surprise was mine, as this was the first hybrid of *A. pearsonii* I had seen. Another allusion suggested by the cultivar name is to the beautiful, romantic tune from *The Music Man*, which Paul McCartney re-recorded for a younger generation: "There were bells in the hills, but I never heard them ringing" (until Brian made the cross). These are two species that would never have come together except by the hand of a creative hybridizer. A final allusion is to the pendent bell-like flowers.

In 2007 this clone was offered by the Huntington via the International Succulent Introductions (ISI) program (ISI-2007-13). And from there has made its way into the commercial trade.

Aloe 'Hellskloof Bells' has an upright growth habit but with leaves larger than *A. pearsonii* and held perpendicular to the stem, rather than curved back against the stem, as in the species. The flowering period is late June to July. Some of the clones bloom red and some have paler flowers.

My plant of 'Hellskloof Bells' sprawls like its parent *A. distans*. Could it be an oddball clone?

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//agaveville.org

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Trager, John. "2007 ISI offerings" (2007) Cactus and Succulent Journal. 79:2, p.78.

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Photos: Brian Kemble

Workshop Corner: Grafting Hybrid Epiphyllums

Lois Burks, SDES Honorary Life Member,
Reprinted from San Diego Epiphyllum Society, EpiNews[1]
July 2022

Grafting a hybrid *Epiphyllum* cutting (the scion) onto another type of stronger growing cactus (the stock) is done for a number of reasons; 1.) To improve the vigor of a weak growing variety. 2) To propagate a great number of cuttings as quickly as possible, which is usually done for commercial purposes by an *Epiphyllum* nursery. 3) To speed up the usually very slow development of a hybrid *Epiphyllum* seedling in order to have it produce flowers sooner. And 4) Just for fun! It is pure pleasure to see that a new graft has 'taken' and to watch how fast it grows.

I will not write about all the possible methods of grafting or all the possible combinations of cactus stocks and scions, and there are many. Instead, for the sake of brevity and simplicity, I will simply describe the method of grafting hybrid epiphyllums onto *Opuntia ficus-indica* root-stock that has worked for us at California Epi Center[2] in the past, and that we used most frequently. The grafting method we used is not the only way to graft. It is simply a method we had developed that is satisfactory to us in terms of efficiency and speed.

Before I go into the actual mechanics of grafting, I would like to tell you about some of the conclusions we have reached as a result of our grafting experience. Of course, there can be exceptions to any of the following statements, but generally speaking, we have found these conclusions to be accurate.

[1] SDES Editor's Note: During a volunteer event at the San Diego Safari Park a few months back, two members were discussing grafting epiphyllums. I have always been fascinated with grafting, as my grandfather once grafted three varieties of apples on one tree. The next week I happened upon an interesting article on the topic written by Lois Burks. I reached out to Lois to ask if we might reprint the article. Lois graciously agreed and this is the article as it was published. -JK Hendershot

[2] California Epi Center operated in Vista, California from 1978 to 1987

Lois Burks at the California Epi Center, Vista, CA.

Photo: Chuck Everson

1. Of all of the variable factors that can influence the success or failure of a graft, the time of year seems to be the most important. We have found that grafts made in the warm months of May through September stand a much better chance of taking. This is true for several reasons. First, the *Opuntia* is in a growth cycle. Secondly, the weather is warm and usually dry (at least for those in Southern California). Thirdly, there seems to be an abundance of actively growing hybrid *Epiphyllum* branches that are suitable for use as scions during these months.
2. The genetic affinity of the scion to the stock affects the success or failure of the graft. We have found that hybrid epiphyllum scions that have large red flowers take almost immediately and literally grow like 'weeds' when grafted onto *Opuntia ficus-indica*. We assume this is because the heliocereus parentage of most red-flowered hybrid epiphyllums is very compatible with *Opuntia*. Conversely, some of the small-flowered hybrid epiphyllums that have *Pseudorhipsalis*, *Chiapasia* or *disocactus* in their background, do not graft as readily to *Opuntia*, nor do the successful grafts grow as vigorously as do the red-flowered hybrids. For this reason, we have tried *Hylocereus*

undatus stock when grafting some of the smaller flowered hybrid epiphyllums with, to my way of thinking, unexciting results. As *Hylocereus* is not as strong or vigorous a plant as *Opuntia*, the growth rate of the scions was not as fast as we would have liked.

Epiphyllum hybrids grafted onto *Opuntia* pads.
Photo: SDES Archive

3. A scion from a hybrid *Epiphyllum* that grows cleanly (without blemish) on its own roots will sometimes spot when grafted. Apparently the scion does not adapt to the forced rapid growth resulting from grafting. It is impossible to predict which hybrid epiphyllums will spot when grafted. The flower color or size does not seem to be a factor, at least not with any discernible degree of consistency. Interestingly, when the spotted growth from these grafts is cut and potted, the resulting side growth from the cuttings will be as clean as it would have been if the parent cutting had not come from spotted grafted material.
4. A scion taken from a hybrid *Epiphyllum* that spots on its own roots always spots when grafted. In fact, the spots are bigger and better than ever.
5. Grafts made late in the fall, from October to early December, will often show absolutely no signs of side growth until spring, and then not until after they have bloomed! Apparently, when bud formation is underway, though invisible to the naked eye at the time the scion is grafted, the scion somehow directs the energy of the stock plant toward flowering rather than making side growth. Fascinating!
6. Old woody *Opuntia* pads that have a thick rough bark-like epidermis (outer layer) are not the best pads to use for stock. We have grafted successfully on such pads and have found that invariably the scion shrivels up from having lost contact with the vascular layer of the pad after a few months. The best stock for grafting seems to be large young pads that have achieved full growth and hardened off. The pads should have been rooted for a minimum of six months for best results.
7. An *Opuntia* pad that has already been used as stock for a large graft should be allowed a rest period of at least a month after the original graft has been removed before grafting onto it again. A large graft takes much of the strength out of an *Opuntia* pad, and the rest period will help it recover. If the *Opuntia* pad has become old and woody, let it make secondary growth on which subsequent grafts can be made. Better still, discard it and replace it with a fresh young pad.
8. Hybrid *Epiphyllum* cuttings taken from vigorous grafts are always stronger and produce side growth more quickly than cuttings taken from plants. We have compared the growth rates of the two types of cuttings and proved this to ourselves time and time again. Aside from the rapid growth rate, which has to be the number one benefit derived from grafting in the mind of the commercial grower, the sheer beauty, quality and vigor of the resulting cuttings would be reason enough to graft hybrid epiphyllums.

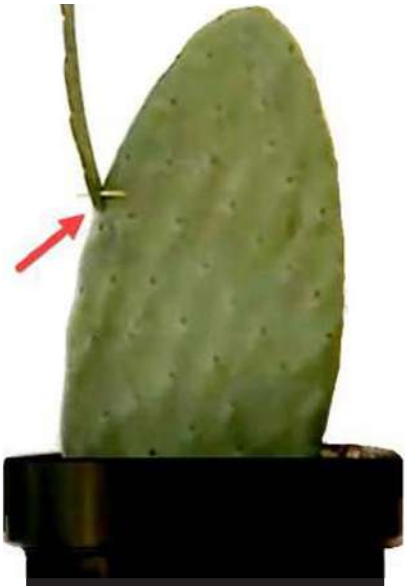
You may be wondering what the light requirements are for successful grafting. Although *Opuntia* can be grown in full sun, hybrid epiphyllums should be raised in filtered light. How does one reconcile these factors? We raised our *Opuntia* grafting stock in shade structures covered with 73% density shade cloth. Although this is not an ideal situation for the *Opuntia*, the pads do seem to get enough light to perform well as grafting stock and the light is perfect for the hybrid epiphyllum scions. We have decided that when we recover the graft house, we will use shade cloth that lets in even more light, probably 60% density. This would give the *Opuntia* pads additional light and the epiphyllums would not suffer. We have found that because of their exceptional vigor, hybrid *Epiphyllum* grafts seem to be able to tolerate a great deal more strong light without discoloring or burning than plants do.

Opuntia pads supporting large hybrid *Epiphyllum* grafts will not live forever. The graft takes a great deal of strength out of the stock. We've found that after three or four years of supporting a large graft, the *Opuntia* pad will generally rot and die. We watch our grafts rather closely for signs of pad rot and remove the graft immediately when rot is detected while the *Epiphyllum* cuttings are still salvageable.

If the graft is left on a dying pad too long, the branches will shrivel, and cuttings made from these branches take much longer to root and grow.

And now, on to the mechanics of grafting.

1. Make sure all of your tools are sterile. You will need a sharp knife, a pair of cutters, plastic plant tie, toothpicks (or long cactus spines), and a tag with the name and date of the graft.
2. Select a large well rooted *Opuntia* pad (as mentioned we use *Opuntia ficus-indica* "Luther Burbank Spineless Hybrid") for the stock plant. The pad should be tied between stakes or to some type of trellising for support.
3. Cut away all secondary growth from the rooted pad on which you intend to graft. Wear gloves. Although the pads we use are supposedly spineless, the areoles are full of small clusters of golden spines called glochids that are very painful when imbedded in your fingers.
4. Use a newspaper or disposable cloth to wipe away as many of the glochids as possible.
5. Cut your hybrid *Epiphyllum* scion. Mark the name on the scion with a waterproof marking pen. Select an actively growing scion that is from 8" to 12" in length with a good strong midrib if possible. Although we have grafted old hardened off scions and young weak scions when there was no choice, our success rate has been much higher using young strong scions.
6. Cut an "L" shaped wedge in one side of the stock. The cut can be made anywhere along the side of the pad and should be deep enough horizontally to expose the growth layer and at least ½" of the inner core of the pad. The cut should be long enough vertically to provide at least l½" to 2" of flat surface against which the scion can be tied.
7. Cut off ¼" from the lower end of the scion. This will ensure that freshly exposed vascular bundles in the scion come in contact with those in the stock. Strip away at least l" of the epidermis from the midrib of the scion, taking care not to break the midrib.
8. Placing the scion against the vertical surface of the wedge you have cut in the pad, insert the exposed midrib down into the horizontal surface of the wedge. If you have a scion with a good strong midrib, it will be strong enough to be inserted into the *Opuntia* pad by grasping the scion above the exposed midrib between your thumb and forefinger and applying downward pressure. If you have selected a very young scion with a weak midrib, and are worried about breaking it, make a hole in the horizontal surface of the wedge with a toothpick. Then insert the midrib of the scion into the hole.

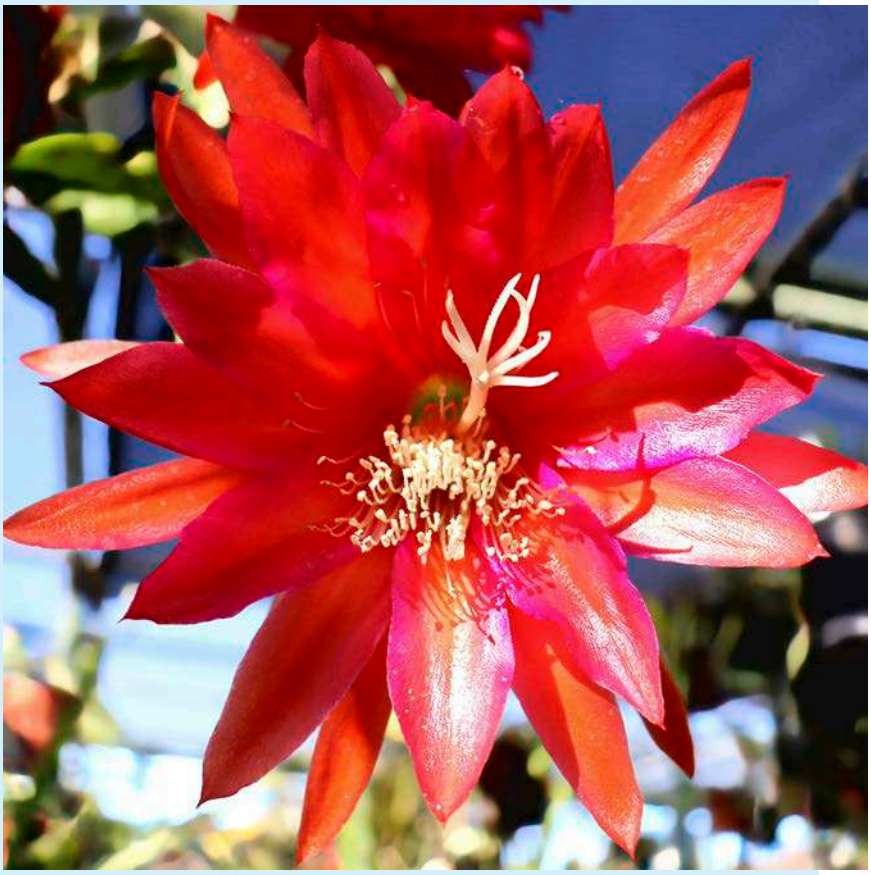


Above: Red arrow indicates where *Epiphyllum* was grafted to *Opuntia*.

Photo: SDES Archive

9. Secure the scion to the stock by inserting two toothpicks or cactus spines through the scion, one on each side of the midrib, into the pad about ½" above the horizontal part of the wedge. For additional stability, tie the scion to the pad with plastic plant tie. Attach the label showing the date and name of the graft.
10. Should there be a possibility of rain, protect your new graft by draping plastic sheeting over the pad. It is essential that moisture be kept away from the freshly cut surfaces of the stock and scion.
11. Now all you have to do is wait. If the weather is warm, you may see evidence that your graft has taken in as little as two weeks. A month would be the norm, however. If the weather is cool, your wait could be considerably longer, up to several months. And if the weather is cold, don't worry about whether your graft has taken until spring.
12. Once your graft starts to put out fairly long side branches, the growth will need to be tied to some sort of support such as stakes or trellis. And now you can start to wait again, this time for flowers!

Thanks to Lois for allowing the use of her article. Lois and her husband Bob, co-owned the California Epi Center, in Vista, CA. Lois joked that their grafting method should have been called the "Hack and Stab Method"—which is what it was!



Two knockout hybrid epiphyllums. These are examples of epis that lend themselves to grafting on an *Opuntia* pad. **Top**: *Epiphyllum* 'Magi's Gold'; **Bottom**: *E.* 'Striped Beauty'

Photos: JK Hendershot

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