



TO THE POINT

SUMMER, 2ND QUARTER 2022



Henry Shaw Cactus and Succulent Society's annual free Show and Sale attracts large crowds with high-quality plants and diverse displays. Photo: David Wolfe.

**CSSA CALENDAR OF
EVENTS 2022**
Full details and updates at
[CSSA Calendar](#)
Click on the event for specific details

Henry Shaw C&SS Turns 80

*David Wolfe,
Henry Shaw Cactus and Succulent Society*

Since 1942, Henry Shaw Cactus and Succulent Society has strived to promote the culture and conservation of cacti and other amazing arid plants. In 2022, the St. Louis-based club is celebrating its 80th birthday with the return of its annual Show and Sale and other activities.

HSCSS was named to honor entrepreneur and philanthropist Henry Shaw, who established Missouri Botanical Garden in 1859. Garden curator Ladislaus Cutak, whose father also worked at the garden, organized the first cactus society meeting in July 1942. The passionate group of 33 charter members has grown into the largest CSSA chapter in the Midwest.

While members no longer donate a penny per year of their age toward an activity fund on their birthdays, today's society still has a monthly digest and a reference library. It gives away attendance prizes at club meetings. And, not surprisingly, good food and good company are still on tap at HSCSS' seasonal picnics and parties.

After a two-year absence due to COVID, HSCSS will bring back the club's annual Show and Sale on July 16 and 17. New construction at Missouri Botanical Garden moved the event to Glaziers Hall in St. Louis this year. All plant fans are invited to browse, buy, and enjoy the beautiful and unusual succulents on display. For more information about Henry Shaw Cactus and Succulent Society and its 2022 sale, please visit <https://hscactus.org>.



**CSSA
SEED
DEPOT**

[https://cssa.myshopify.com/
collections/seed-depot](https://cssa.myshopify.com/collections/seed-depot)

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

**Upcoming
Webinars**

<https://cactusandsucculentsociety.org/>



Parodia penicillata Photo: Irwin Lightstone

CSSA Photo Contest

To celebrate and contemplate the plants we love, the CSSA is holding a photo contest open to CSSA members and the minor children of CSSA members. For the theme of

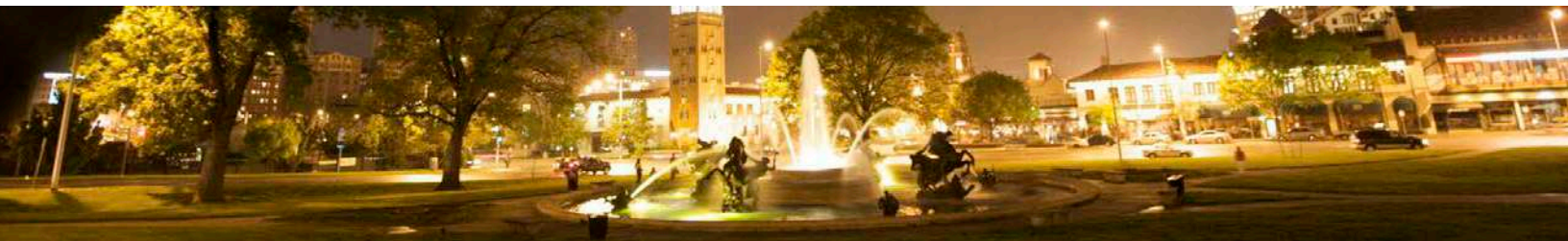
"The Artistry of Cacti and Succulents,"

you are invited to enter up to three images. There are two divisions; adult (16 years and older), and youth (younger than 16 years).

Prizes will be awarded in each of the divisions.

- ◆ *First Place: \$100.00 Gift Certificate from B&H Photo – Video, publication of the image in To the Point, and an 8 x 10 inch (approximate) print of the image.*
- ◆ *Second Place: \$25.00 credit toward purchase at the CSSA Seed Depot, publication of the image in To the Point, and an 8 x 10 inch (approximate) print of the image.*
- ◆ *Third Place: Publication of the image in To the Point, and an 8 x 10 inch (approximate) print of the image.*
- ◆ *Honorable Mention: Publication of the image in To the Point.*

As there are no entry fees, you have nothing to lose!



Back on Track: Kansas City Mid-States Conference 2022

After two years of cancellations, the Kansas City Cactus & Succulent Society will host a Mid-States conference that intends to entice enthusiasts to 'the City of Fountains' on June 9–12, 2022. A very special event is planned with a stellar slate of speakers' sessions, quality plant and pottery vendors, a sumptuous dinner banquet, and both a silent auction and a rare plant auction. And a chance to see friends, old and new.

Speakers' topics will range from the diversity of international plant habitats to discoveries of new and

rare species, to the latest in photography tips, and to preventing and treating pests. Other activities include a hardy garden tour, details on building a greenhouse in cold climates, and plant-specific updates on the latest research in cacti and succulents.

The conference includes five plant vendors and three pottery vendors. The hotel rates are \$105 per night, breakfast included. For conference registration details, including a listing of speakers and vendors, visit www.kccactus.com

Photo, above: By Fountains_of_Kansas_City.jpg: Ed Schipulderivative work: Eco84 - This file was derived from: Fountains of Kansas City.jpg, CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=26370405>

Plant Heist

Don't miss the film, [Plant Heist](#), that takes a closer look at *Dudleya* plant smugglers in California and the agents who catch them. While it is hard to witness the destruction these smugglers inflict, the film by Chelsi de Cuba and Gabriel de Cuba, itself is a thing of beauty.

Thank you to [SiblingRivalryCreative](#) and to the Palomar C&S newsletter, [Cactus Courier](#)

Dudleya farinosa in habitat
Photo Irwin Lightstone



THE BEGINNER'S GUIDE TO TYLECODON

Thomas Glavich, Altadena, CA

The Crassulaceae family consists almost exclusively of succulent genera. It is the most primitive of the succulent families and is the most widespread with members on every continent except Antarctica. Many of the most spectacular colors in the succulent plant world can be found in the Crassulaceae, and many of the most collectable and popular succulent plants are from this family. *Tylecodon*, *Kalanchoe*, *Echeveria*, *Sedum*, and *Aeonium* are all members of the Crassulaceae.

Tylecodon are almost all confined to the

winter rainfall region of South Africa, and closely related to three other genera, *Adromischus*, *Kalanchoe*, and *Cotyledon*. These are winter growers and generally look their best from mid-autumn through late spring. *Tylecodon* lose their leaves as the summer heat arrives but generally flower during the summer from otherwise bare stems.

Although the plants have been known for centuries, *Tylecodon* is a relatively new genus, first published in 1978. In books published before this date most plants that we



Tylecodon buchholzianus



Tylecodon reticulatus

know today as *Tylecodon* will appear as *Cotyledon*. *Tylecodon* is an anagram (rearrangement of the letters) of *Cotyledon* reflecting the extremely close relationship between the two genera. In habitat *Tylecodon* are generally deciduous losing their leaves in summer while *Cotyledon* are evergreen. A more important botanical distinction is the structure of the attachment of flowers to the stem.

Some *Tylecodon* are extremely toxic to livestock so farmers and stockmen in South Africa routinely remove every *Tylecodon* they can find. The specific poison (Cotyledontoxin) is found in many of the African Crassulaceae, with *Tylecodon wallichii* appearing to be the most serious threat to livestock. The toxin attacks the nervous system. Stock animals may become partially paralyzed, go into convulsions, and die after eating *Tylecodon*. *Tylecodon wallichii* is in leaf and green at the beginning of the winter growing season, making it an attractive snack for hungry livestock.

Tylecodon range in size from the giant *Tylecodon paniculatus* which can grow to 10 feet or more, to the miniatures like *Tylecodon*

occultans, which rarely gets more than an inch above ground. The larger shrub types are easiest to come by. They all have wide distributions and have been propagated by many growers from cuttings. Many of the small species are geophytic with most of the succulent portion of the plant underground during dormancy. They are often confined to relatively small geographical areas. New geophytic species are still being found. All of the plants prefer some afternoon shade, particularly in hot dry climates. The larger species typically grow on South facing hillsides, giving a little relief from the hot African sun.

Cultivation of *Tylecodon* is easy. They are all winter growers, dormant in the summer. During dormancy *Tylecodon* prefer little or no water depending on size. If the larger species are watered regularly once they lose their leaves rot can easily set in, particularly in humid environments. The skin of many *Tylecodon* shrubs is a yellow green or brown and often peeling allowing some sunlight to penetrate and photosynthesis to continue even without the presence of leaves. The peeling



Tylecodon schaeferianus

skin accommodates a trunk that might change in diameter by an inch or more depending on the season and rainfall. The smaller species need water occasionally as they would get in nature. They would normally grow under larger shrubs or in cracks in rock, and some residual soil moisture will always be present. No place in nature is as dry as pot left in summer sunlight. A light touch with fertilizer is needed, or plant growth will get long and leggy very quickly. If this happens, the leggy growth should be cut back, and the cutoff stems allowed to dry, and then propagated.

Propagation is also easy, they all root from cuttings. *Tylecodon* root best at the beginning of the growing cycle, but if a branch is broken off, it can be replanted at any time of year. The cut end needs to be completely dry. There is no rush to root the large ones, waiting a month won't hurt them at all.

Seed is sometimes available for some species. Best results are obtained by sowing the seed in mid-Autumn and getting a full

winter and most of the first summer before dormancy. The seed is very small and care in watering is required until the seedlings are established and rooted. As with all plants, growing from seed has particular rewards. The plants you raise will be genetically different from each other and will show variations in growth, leaf structure and color.

Plants of Note:

Tylecodon atropurpureus, is one of the best of the dwarf species. The small caudex looks dead for most of the year, sprouting outsize leaves when the first fall rains come. This is one of the species that needs a small amount of summer moisture, even though there is no visible growth.

Tylecodon buchholzianus is unique among the *Tylecodon*. It can grow branches without evidence of leaves. Microscopic leaflets perform the function of normal leaves, allowing the branches to grow. It is also capable of setting normal leaves in the spring. Once



Tylecodon wallichii

fairly rare, this has been propagated from cuttings and is now fairly easy to find.

Tylecodon paniculatus is notable for its fast growth rate, thick trunk and peeling yellow bark. Easy to grow, with annual pruning to shape the growth this can become an amazing specimen in just a few years. A four or five foot specimen can be grown in 10 inch pot, with just a little patience.

Tylecodon reticulatus is a medium size species with brown stems, dense branches, and persistent flower stalks. It makes an

excellent smaller bonsai. It is easy to grow, and easy to come by. It propagates very easily from cuttings. It sheds small branches easily, and almost all of these will root if given time.

Tylecodon wallichii has persistent leaf bases that dry to knobby spine like structures. This is one of the most poisonous of all the *Tylecodon*, and one most quickly removed by ranchers and farmers. Nonetheless, it is a great species to grow- easy, tolerant of poor care and rough treatment, and dormant during vacation season.



Sun Matters

Timothy J Malinich

Reprinted from The Spine, Spring 2022, newsletter of the Midwest CSS, Cleveland, OH

Even from over 93 million miles away, our massive sun provides enough radiation to keep our planet thriving.

I came across a really neat statistic a couple months ago: if you add up all of the known mass (weight of stuff) in our solar system, including the planetoids in the Kuiper Belt and comets in the Oort cloud, the total would be less than one quarter of a percent of the mass of our sun (*Astrophysics for People in a Hurry*, DeGrasse Tyson, 2017). That is one massive nuclear fusion engine providing light to our little planet. Speaking of our sun, by the time you read this, we will be at our Vernal Equinox, when the length of our days become longer than 12 hours. With the light comes warmth and the opportunity to start our growing season.

What are your plans for this succulent season? Typically, I make sure I have my cactus seed ordered and get them planted so I can take advantage of the warmer months to grow up the seedlings. Pots of seedlings I started last year are ready for transplanting this year. Spring is the best time for transplanting most of our plants. Transplanting at the beginning of the growing season gives the plants not only plenty of time to recover, but also the entire season to put on some size, and hopefully flower. However, for those of you with winter growers such as *Conophytum*, don't forget that their growing season begins in fall, and they will be summer dormant.

Solar spring also brings warmer weather. If you move your collection outdoors each spring, don't jump the gun just because we have a warm week or two. The average hard frost for northern Ohio is May 16. That means in a typical year we still have a 50:50 chance of getting a hard frost before that date. If we have a warm spring, you can get your plants out earlier, but be prepared to move them into a protected area if we have a cold snap.

Some plants tolerate cold temperatures better than others; many of our cacti grow at higher elevations and tolerate cold temperature fairly well. One of my favorite photos is of giant saguaro, *Carnegiea gigantea*, covered in snow. My *Opuntia* are the first plants to move out in spring and the last plants to come inside. I have actually stored them in my unheated garage for most of winter. *Opuntia* can handle cold temperatures, and some are winter hardy in our area. On the other side of that coin are the *Euphorbia*; they do not handle cold temperatures very well. In fact, once temperatures drop below 50°F, *Euphorbia* will pretty much shut down. They don't die, but they will start to show signs of stress—yellowing, leaf drop and necrosis (dead spots). Cool soil temperatures can also lead to root rot problems if soil remains wet for long periods of time, so having plants out early means keeping a close eye on watering.



Most *Opuntia* can handle cold weather and cool nights. I move them outdoors early in the Spring. *Hoya* (top) and *Euphorbia*, on the other hand, will perform poorly in cool temperatures so they are moved outside only when night temperatures are consistently above 50°F.

A long warm season provides the best conditions for seedlings—start them early in the season to take advantage of spring and summer heat (center).

Mammillaria are a bit more robust than *Euphorbia*; they don't seem to mind temperatures below 50°F but I still wait for night temperatures to be near 50°F before they begin to go outside in our area.

Dealing with Difficult Seeds

Peg Spaete, former Seed Fund Coordinator
Reprinted from Fresno CSS, Cactus Corner News, February 2022

Some seeds that cactus and succulent hobbyists try to grow require some pre-treatment, meaning they have to be shucked, nicked or filed, soaked or a combination. When soaking, leave the seeds in clean water overnight. If they are quite large you may want to give them 24 hours to soften. Some seeds that need to be nicked and soaked are *Ipomea*, *Adansonia*, *Jatropha*, *Bursera*, and *Kedrostis*. Among the seeds that should be shucked and soaked are *Pelargonium* and *Beaucarnea*.

A treatment for the hardier cacti and succulents is to sow the seeds in a moist soil mix, cover with clear plastic. Put them in the refrigerator at 35 to 40°F for six to eight weeks simulating a mock winter. After you remove the seeds from the refrigerator, keep them in a warm, lighted place to germinate. Seeds that respond to this treatment include *Sclerocactus*, *Pediocactus*, *Opuntia*, *Maihuenia* and *Tephrocactus*. If you live in a cold climate put the containers outdoors in a cold frame during the real winter. This last is recommended by Steven Brack, former owner of Mesa Garden. He knew that repeated cycles of freeze and thaw were required to crack hard seed coats and overcome germination inhibitors.



Adansonia grandidieri, Giant Baobab or Madagascar upside-down tree, seeds germinating in Puerto Rico.

Onitnelav, CC BY 3.0 <<https://creativecommons.org/licenses/by/3.0/>>, via Wikimedia Commons

***Schlumbergera* 'Enigma'**

When this plant was purchased in 2020, it was three squat, mishapen segments. Now, in April 2022 it has been growing and blooming since December.

This plant grows inside all winter, staying in areas of the house that don't drop below 50°F. The humidity ranges from 60% down to 20%. Since this *Schlumbergera* grows in a grouping of other plants, a little extra moisture is likely available. With the house temperature hovering around 55°F–70°F, the plant gets watered lightly every couple of weeks. Light fertilization continued through the winter because it never stopped showing healthy growth.

This cactus is still in its original pot, since it is showing no signs of distress or underpotting. Leaving plants rooted into their pots as long as possible is a strategy that has worked well for my plants that make a major move twice a year. Having a healthy, undisturbed root system has been a key to getting plants through less than ideal winter conditions.



Schlumbergera 'Enigma' just home from the nursery in 2020. This little plant has never stopped growing.



During winter the *Schlumbergera* 'Enigma' lives in a west window, with filtered shade and supplemental lighting for about 11 hours a day. In the summer it gets lightly filtered sunshine with an eastern exposure. Temperatures can rise into the 90s.

Culturally, it's been quite an accomodating plant. Its small twisted habit and the profuse and dazzling blooms make it a

The name 'Enigma', comes from the mystery of not knowing what the blooms may look like in any given year, according to online chatter. So far, for this plant (above), its flowers look like Las Vegas showgirls. This is the same plant, shown earlier, that was purchased in 2020.

plant with bang for the buck. Finally, the ease of care for this little *Schlumbergera* make it a favorite in my collection. -Ed

Plants Grown Under Artificial Lighting

Bob Stewart, Reprinted from The Eastern Spine, February 2022, National Capitol C&SS

Few succulent enthusiasts own a greenhouse, or even have plenty of sunny windows where plants that require lots of sunlight can grow. However, there is substitute sunlight with light provided by several types of electrical lamps. Many succulents can be grown quite successfully under artificial lights. Here are a few plants that I am currently growing under lights.

- A look under my (4) tube T5 fluorescent light unit (Fig 1). The flower belongs to *Astrophytum asterias* that was outside for the summer and now spending the winter inside under lights. Many small succulents can be grown under a unit like this.
- *Delosperma cooperi* (Fig 2) is primarily a low growing, winter hardy, succulent for outdoor in-the-ground use, but artificial lights are excellent for rooting cuttings of it. And, I have learned that *D. cooperi* will also grow and flower under fluorescent lights.
- Cactus grafts under lights (Fig 3). I have used fluorescent lights for many years as a propagating environment for growing from seed, rooting cuttings, and grafting. The photo shows several of my large *Astrophytum* cactus grafts. Under lights, they get adequate light and are out of the outside weather. I use T5 fluorescent tubes with the light on for 16 hours and off for 8 hours.





Senecio hebdingii

Synonyms: Kleinia hebdingii, Notonia hebdingii

Karla Halpaap-Wood
Reprinted from
January/February 2022,
Kaktos Komments,
publication of the Houston C&SS

Senecio is a genus of flowering plants in the daisy family (Asteraceae).

There was very little I could find about this plant in literature, but it was first published as *Notonia hebdingii* in *Kakteen And. Sukk.* 38: 274 (1987)

When Werner Rauh found this plant he first thought it was *Notonia descoingsii*, because it was known to grow in that area of Madagascar. He took some plant material to the Jardin botanique “Les Cèdres” in Saint-Jean-Cap-Ferrat, France, which also grew *N. descoingsii*. René Hebding, the botanist there, was a very good observer and realized this was a different species, so the plant was named after him.

Habitat/Distribution:

This plant is native to Madagascar. It grows in limestone in the Fiherenana river valley near Anjamala village.

Description:

Senecio hebdingii

is a small bushy plant, growing up to 40 cm in habitat, even taller in cultivation. The round branches are 7 mm thick and have a waxy look. Branches are a gray green color with three darker veins that radiate downwards from the leaf base. Clusters of small cream colored flowers are similar to




other senecios are daisy-like. It also has tiny deciduous leaves.

Cultivation/Growth: This summer-dormant succulent is native to Madagascar, and loves bright, direct morning sun. They are winter growers and typically don't need much watering through the summer. They are mildly cold-hardy (down to 40°F) and produce yellow powder-puff blooms.


My experiences: I got this plant many years ago from Dave Thomas at the Houston Home and Garden Show which is always in February. It must have bloomed at the time, because I liked it a lot and thought I had never seen anything similar. And for me the flowers are the prettiest of this plant. It blooms in winter, mostly February, but I think will be maybe a little earlier this year. It is relatively slow growing. I normally kept it in the greenhouse also in the summer months, it did not do very much, but never failed to bloom in February. Then last summer I took all plants out of the greenhouse. It was outside in full sun and got lots of rain. This made it green up a lot and I think it really liked the rain. I do not totally agree with it being a winter grower, because the wet summer made it grow. For the winter it is in the greenhouse again and already shows signs of blooms coming up in December. I fertilize rarely, repotted it once or twice in the years I had it.

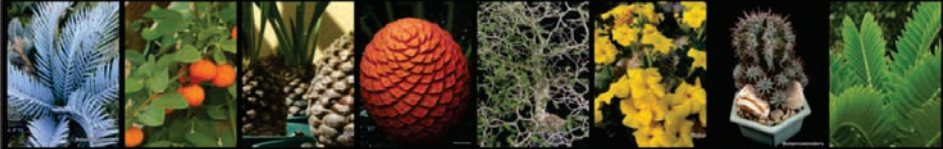
References: Werner Rauh, *Succulent and Xerophytic Plants of Madagascar Vol 2 Illustrated Handbook of Succulent Plants: Dicotyledons* p. 34 *Kakteen und andere Sukkulente*, 38 (11) 1987, p. 270



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POTS: WHY DO YOU USE THE ONES YOU USE?

Sue Haffner

Reprinted with permission from the Fresno C&SS newsletter, *Cactus Corner News*

Have you ever thought about why you use the pots you do for your plants? Here are some factors to consider:

- Standard pot - this type is as tall as the diameter of the pot (4 inches across and 4 inches tall);
- Azalea or 3/4 pot this is three quarters the height of the diameter (4 inches across and 3 inches high, for instance);
- Bulb pan - this is one half the height of the diameter (4 inches across and only 2 inches high).

Many succulent growers prefer the azalea pot size, chiefly for aesthetic reasons, as many specimen plants display better in such pots. The standard pot, especially for smaller plants, may taper too much and prove to be unstable. You run the risk of knocking over and damaging a prized plant. Watering is also affected by the type of pot used. When you pour water onto the surface of your pot, the force of gravity will act longer on the taller column of water and pull more water out of the pot. This is needed for aeration and for pulling excess salts and fertilizer out of the pot, rather than collecting on the soil surface.

To restate the watering situation: if you have two pots that hold the same volume of soil and one is tall and skinny and the other is short and wide, more water will remain in the soil of the shorter pot. You won't have to water as often, as the short pots don't dry out as fast.

The pot should be large enough to provide a comfortable finger width between the edge of the pot and the plant (spines included), for globular plants. Tall, columnar plants should have a pot whose diameter is about one half their heights. A cluster or clump of plants generally has a shallower root system than a single plant of the same diameter. It is also growing more laterally than vertically, so you should allow more space between the pot and plant.



Clay, plastic, or other materials? Well, clay pots, of course, allow water to evaporate out from all sides. Clay will also allow water in from all sides (such as by overhead spraying or from capillary matting). This exchange works to keep the roots cool, as well. Plastic keeps the soil wetter longer by allowing evaporation to occur only from the soil surface. Also, plastic pots stay free of salt build-up and algae growth longer than clay pots do.

Pots made of styrofoam, glass, or glazed ceramics tend to act much like the plastic pots.

Pot colors? Dark colors absorb most of the light that hits them, while white or light colors reflect a lot of light. Algae may grow on the insides of white pots if they sit where they are hit by direct sunlight. If your plastic pots are subject to the vagaries of temperature throughout the year, they will deteriorate grow brittle and crumble at your touch. Green pots seem to last longer than white pots.

Round or square? We have more aesthetic considerations here. If your plant is more-or-less

round, put it in a round pot. Still, many succulents defy classification as to shape, which no doubt has led to the many free-form artist's pots you see used for specimen plants.

How about the drainage? We all know that it is possible to grow succulents in containers without drainage holes because we've seen this in the collection of one of our members! Still, most of us use pots with holes. Most commercial plastic pots have large drainage holes, so large, in fact that your soil mix escapes through them. Some of us use pieces of paper towel, used clothes dryer sheets, squares of hosiery material, squares of window screening, etc., in the bottom of the pot to hold in the soil. The paper will eventually deteriorate, but, by then, the plant's root ball may have grown enough to hold the soil.

Top dressing: most succulent growers use gravel of various sizes and colors to top dress the soil in the pots. This can also keep a tippy plant supported; can keep the base of the plant drier, thus reducing the possibility of rot. Also, the gravel is decorative. Bear in mind that the top dressing also can make it difficult to judge whether the plant needs watering. Figure out a means whereby you can check the soil under the gravel.

Should you water newly repotted plants? The standard advice you read in all the books and articles is that you need to let your plant sit for several days to a week while any root damage that may have occurred will heal. Generally, the authors of these books are writing from climates unlike ours, where plants may be subject to extended periods of dark, cold, damp weather when they are in danger of attack by fungi. Some growers in our area water-in their newly repotted plants just a bit, to settle the soil and have never noticed any ill effects. You can decide for yourself which is the better course to take. Also, don't put a newly repotted plant directly out in the sun. Let it rest for awhile in bright shade.

Remember that there is no perfect system that works for everyone. Experiment a bit and develop your own best technique. Good luck!



Decorative pots. Round pots. Plastic pots. Clay pots. Green pots. SO many pots. Which pots will work best for your collection?

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Cactus in Gaza: Horticultural contemplation amidst hardship and war

Chaden Yafi, Houston, TX

Cacti are unusual plants in their ability to inspire a world of meanings to various people in the world. The resiliency and endurance of these spiny plants resonate with many Palestinians. In the last two decades, a growing interest in cacti found its way to the hearts of many habitants of the small city of Gaza, which has been often time a conflict zone and is still subjugated to harsh economic sanctions. Many Palestinians are finding solace and companionship in these plants, and are increasingly collecting them, caring for them, and learning about their unique beauty.

Saef Aziz Daher (29 years old) a cacti grower who started collecting cacti a decade ago says:

“I admire these patient plants and their ability to endure thirst. They come in various shapes, they have a long life and produce extremely beautiful flowers. They bring comfort and calmness because when you see their flowers emerging from spines you feel they are saying that life is full of thorns, but we have to continue the path



1. A collection of *Echinocactus grusonii*, Golden Barrel cactus
2. Saef with his blooming *Aeonium*
3. *Cleistocactus winteri*
4. *Lobivia* sp.
5. *Astrophytum* sp.
6. *Notocactus* sp.
7. *Echinopsis mirabilis*

Photos: Saef Aziz Daher

and when we do, there will be something as beautiful, as these flowers, waiting for us.” He notices: “when a cactus feels sick it gives many offsets to continue its existence. They are also similar to the Palestinian people in their ability to endure hunger, thirst, poverty, and suffering.”

Mr. Daher started college and wanted to study marketing but the circumstances of the city prevented him, and now he is content to work in construction. He dreams to have his own nursery and acquire the types of cacti that are unavailable in Gaza such as *Ariocarpus* and *Discocactus*.

Another cactus grower, Rami Ali, who also lives in Gaza, grows about 2500 individuals of 800 different types of cactus.

Mr. Ali says that the sanctions affected many growers. Importing seed is almost impossible, and importing plants requires laborious paperwork and takes a very long time. He dreams about obtaining *Ariocarpus fissuratus*, 'Godzilla' cacti. He also dreams about having his own nursery- not just to sell cacti, but to educate and help his customers with any problem they encounter in cultivation.

Not only do Palestinians love cacti, but it seems that cacti

also love Palestinians, as the photos show in acres of healthy and happy cacti of a nursery called “Cactus Forest” in Gaza. (Figs 13–14). The climate of the city provides a perfect environment for cacti. Temperature doesn't go above 100° F in the summer or below 50°F in the winter. Hail could be problematic and damaging but Daher says he uses a metallic filter roof that allows the rain to penetrate without the hail.

The cacti are mostly living outside in the small yards of houses, since greenhouses are rare and pricey.

Learning about Cacti in Gaza informs us that the hobby of collecting cacti is not related to any culture, age, nation, or religion. The beauty and character of these American plants can have a healing effect on people all over the world, and help them endure hardship and temper the ugliness of politics and wars.



8. *Echinopsis* sp.

9. *Echinocereus* sp.

10. Rami's backyard

11. Blooming *Pleiospilos nelii*

12. *Thelocactus* sp.

13 & 14. The Cactus Forest nursery in Gaza

Photos figs 8–12: Rami Ali

Photos figs 13–14: <https://samanews.ps/ar/post/402710>



Fig. 1. These *Avonia quinaria*, on CITES Appendix II and probably well over a century old, were illegally collected and subsequently confiscated. Removing such plants from habitat cannot be justified. Photo: Adam Harrower

The CSSA Conservation Policy- Live Links

The article on conservation in the Spring 2022 issue of the *Cactus and Succulent Journal* contained many links to websites, videos and documents on the internet. Here, they are provided in a more accessible version (hotlinks). Sadly, the poaching continues, and was recently the subject of an article in *National Geographic* which appeared after the Journal was published.

1. CSSA conservation policy. <https://www.cactusand-succulentsociety.org/conservation.html>
4. Abuse of online data. <https://e360.yale.edu/features/unnatural-surveillance-how-online-data-is-putting-species-at-risk>
5. Details of how threatened Cactaceae are. <https://www.nature.com/articles/nplants2015142>
6. IOS Code of Conduct. <http://succulentresearch.org/wp-content/uploads/2019/01/IOS-CODE-OF-CONDUCT.pdf>
7. Cactus rescue in Arizona. <https://tv.azpm.org/p/season8/2022/1/18/205839-rescuing-cacti/>
8. CITES appendices. <https://cites.org/eng/app/appendices.php>
9. Illegal collection of cactus seeds. <https://qz.com/1657884/us-border-security-busts-german-smuggling-endangered-cactus-seeds/>
10. Plant poaching in South Africa. <https://www.nytimes.com/2021/07/31/world/africa/south-africa-poachers-tiny-succulent-plants.html>
11. Plant poachers convicted. <https://www.timeslive.co.za/news/south-africa/2020-02-01-koreans-fined-r5m-as-poachers-target-sas-succulent-treasure-chest/>
12. Plant poachers convicted. <https://www.iol.co.za/news/south-africa/czech-plant-poachers-get-massive-fines-238226>
13. Plant poachers convicted. <https://www.timeslive.co.za/news/south-africa/2020-04-01-american-fined-r500000-banned-from-sa-for-stealing-protected-plants/>
14. Plant poachers arrested. <https://www.news24.com/news24/southafrica/news/five-arrested-for-allegedly-poaching-western-cape-succulents-20211022>
15. Coronavirus effect on poaching. <https://www.theguardian.com/world/2020/sep/14/coronavirus-pandemic-fuelling-plant-poaching-philippines>
16. Approaches to the problem. <https://www.bgci.org/news-events/plant-poaching-is-on-the-rise-what-can-we-do/cape-succulents-20211022>
17. South Africa Plant Redlist. <http://redlist.sanbi.org/>
18. Arrest of Italian collector. <https://phys.org/news/2021-06-rare-poached-cacti-italy-home.html>
19. Return of poached Copiapoa to Chile. <https://www.iucn.org/news/species-survival-commission/202104/over-a-thousand-illegally-poached-copiapoa-estimated-market-value-one-million-euro-return-their-native-chile>
20. News video of Copiapoa returned to Chile. <https://www.youtube.com/watch?v=aoZNW1AUna4>

21. Dudleya poaching. <https://cdfgnews.wordpress.com/2018/04/06/cdfw-wildlife-officers-arrest-three-for-poaching-succulents-in-humboldt-county/>
22. Threats to Dudleya. <https://fws.gov/story/2021-06/hanging-thread-california-liveforevers-face-new-threat-poachers-engaged-lucrative>
23. Dudleya pachyphytum poaching. <https://www.ensenada.net/noticias/nota.php?id=59051>
24. Discovery of Dudleya poaching. <https://www.npr.org/2018/05/20/611570479/the-case-of-the-stolen-succulents>
26. Legislation to protect Dudleya. <https://www.cnps.org/news-releases/passage-of-dudleya-bill-24992>
27. Dudleya poacher sentenced. <https://www.courthousenews.com/south-korean-man-sentenced-to-two-years-for-poaching-wild-succulents/>
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30. Conviction of cactus poacher. <https://www.fox10phoenix.com/news/arizona-man-admits-to-stealing-and-trading-protected-cacti-for-drugs-sentenced-to-fines-and-probation>
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32. FloraGuard internet monitoring project. <https://www.kew.org/sites/default/files/2020-10/FloraGuard%20Tackling%20the%20illegal%20trade%20in%20endangered%20plants.pdf>
33. Propagation as protection. <https://cnps.slo.org/2018/10/defeat-dudleya-poaching-through-propagation/>



Conophytum bachelorum S.A.Hammer	VU	CR	Genuine increase in threat status
Conophytum blandum L.Bolus	NT	VU	Genuine increase in threat status
Conophytum bruynsii S.A.Hammer	VU	CR	Genuine increase in threat status
Conophytum buysianum A.R.Mitch. & S.A.Hammer subsp. politum A.J.Young & Rodgeron	VU	EN	Genuine increase in threat status
Conophytum calculus (A.Berger) N.E.Br. subsp. calculus	LC	VU	Genuine increase in threat status
Conophytum calculus (A.Berger) N.E.Br. subsp. vanzylii (Lavis) S.A.Hammer	LC	VU	Genuine increase in threat status
Conophytum chrisocruzum S.A.Hammer	VU	CR	Genuine increase in threat status
Conophytum chrisolum S.A.Hammer	VU	CR	Genuine increase in threat status
Conophytum comptonii N.E.Br.	LC	NT	Genuine increase in threat status
Conophytum concavum L.Bolus	Rare	VU	Genuine increase in threat status
Conophytum danielii Pavelka	VU	CR	Genuine increase in threat status
Conophytum depressum Lavis subsp. perdurans S.A.Hammer	LC	NT	Genuine increase in threat status
Conophytum ectypum N.E.Br. subsp. cruciatum S.A.Hammer	NT	CR	Genuine increase in threat status
Conophytum ernstii S.A.Hammer subsp. ernstii	VU	CR	Genuine increase in threat status
Conophytum globosum (N.E.Br.) N.E.Br.	Rare	VU	Genuine increase in threat status
Conophytum hammeri G.Will. & H.C.Kenn.	Rare	VU	Genuine increase in threat status
Conophytum hanae Pavelka	Rare	VU	Genuine increase in threat status
Conophytum Irmae S.A.Hammer & Barnhill	Rare	EN	Genuine increase in threat status
Conophytum jucundum (N.E.Br.) N.E.Br. subsp. fragile (Tischer) S.A.Hammer	LC	NT	Genuine increase in threat status
Conophytum khamiesbergense (L.Bolus) Schwantes	VU	EN	Genuine increase in threat status
Conophytum marginatum Lavis subsp. littlewoodii (L.Bolus) S.A.Hammer	Rare	VU	Genuine increase in threat status
Conophytum maughanii N.E.Br. subsp. latum (Tischer) S.A.Hammer	LC	VU	Genuine increase in threat status
Conophytum minusculum (N.E.Br.) N.E.Br. subsp. leipoldtii (N.E.Br.) S.A.Hammer	Rare	EN	Genuine increase in threat status
Conophytum mirabile A.R.Mitch. & S.A.Hammer	Critically Rare	VU	Genuine increase in threat status
Conophytum publicalyx Lavis	Rare	VU	Genuine increase in threat status
Conophytum roodiae N.E.Br. subsp. corrugatum T.Smale	Rare	VU	Genuine increase in threat status
Conophytum roodiae N.E.Br. subsp. cylindratum (Schwantes) T.Smale	Rare	VU	Genuine increase in threat status

Figs. 2 & 3. The sheer scale of plant poaching in South Africa is staggering. These *Conophytum praesectum* (Fig. 2) and *C. acutum* (Fig. 3) are the result of a single confiscation and add to the hundreds of thousands already seized. Photos: Adam Harrower.

(Chart, above). The “Summary of recent changes” tab of the South African National Biodiversity Institute makes for painful reading. This is only a part of the section on *Conophytum*, but illustrates the impact poaching is having on the future of these plants in habitat, with many species moving into the endangered (EN) or critically endangered (CR) categories, meaning they are in danger of extinction.

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Funky Thistle

Cirsium funkiae is the first formally described living organism of the year in the Rocky Mountain Region.

Courtesy of the Denver Botanic Gardens

Jennifer Ackerfield, Ph.D., head curator of natural History collections at Denver Botanic Gardens, led an expedition to Mount Sherman, near Leadville, Colorado with Gardens colleagues, representatives of the U.S. Forest Service and a Colorado State University Master's student. The goal was to collect what is called a "type" or reference specimen for a new plant species that Ackerfield discovered as part of her Ph.D. research.

The species, *Cirsium funkiae* – named by Ackerfield in honor of her mentor Dr. Vicki Funk – is native to Colorado and is an important component of the alpine landscape. This describing is significant because effective conservation of a species relies on accurate taxonomy. We can't protect what we don't know is out there. We acknowledge that Indigenous communities of Lake County, Colorado, may have discovered this plant many years ago, but Ackerfield's work gives this species a formal scientific name using a combination of physical, geographic and genetic data.

"When we think about describing new species, we often picture exotic places like the crater of an extinct volcano, or the Amazon rainforest, not a mountain top visited by hundreds if not thousands of people each year" says Ackerfield. Yet, according to her, this is exactly where many species findings are made, in part because of advances in DNA sequencing technology. The Rocky Mountains harbor potentially many plant species, just waiting to be formally described by scientists as they unravel their genetic "code."

The thistle rose tall with yellow flowers against a landscape of tiny alpine plants. According to Ackerfield, "while other alpine plants have adapted to this extreme environment with their low stature to withstand the cold winds, the thistle has taken a different approach. Instead, these thistles adapted by producing dense, woolly hairs surrounding their flowers. These hairs help protect these flowers from the harsh, cold conditions of the alpine tundra." She also mentions that the hairs do more than just protect the plant's flowers, they also provide food for insect pollinators and pikas.



Cirsium funkiae

To ensure the plant was the first published new Rocky Mountain species in 2022, Ackerfield completed a scholar web search and checked new species journals.

The scientific study of biodiversity is the foundation of botanic gardens, allowing the Gardens' scientists to conserve diversity at home and around the world through greater documentation and understanding. The Gardens' research and conservation team investigates and explains biodiversity patterns and processes in pursuit of a vision of a biodiverse world.

About Denver Botanic Gardens: Green inside and out, Denver Botanic Gardens was founded in 1951 and is considered one of the top botanical gardens in the United States and a pioneer in water conservation. Accredited by the American Alliance of Museums, the Gardens has a robust living plant collection, natural history collection and art collection along with temporary art exhibitions. The Gardens is a dynamic, 24-acre urban oasis in the heart of the city, offering unforgettable opportunities to flourish with unique garden experiences for the whole family – as well as world-class exhibitions, education, and plant conservation research programs. Additional sites extend this experience throughout the Front Range: Denver Botanic Gardens Chatfield Farms is a 700-acre native plant refuge with an active farm in Jefferson County; Mount Goliath is a high-altitude trail and interpretive site on the Mount Evans Scenic Byway. The Gardens also manages programming at Plains Conservation Center in Aurora.

For more information, visit us online at www.botanicgardens.org



Ant in *Sclerocactus glaucus* flower, near Grand Junction
Photo: Courtesy of Denver Botanic Gardens

How to estimate a total population size of a rare plant and why it matters

Michelle DePrenger-Levin,
Denver Botanic Gardens
April 11, 2022

Conservation of rare species involves knowing where they are found and how many individuals are in a population. If a species can only survive in certain habitats, then any changes to that habitat can drive a species to extinction. Similarly, as the population size decreases, chance events can have an increasing impact.

A rare cactus found only in western Colorado has recently been recommended for delisting from the Endangered Species Act because we know more about its natural history now than we did at the time of listing. We have a clearer understanding of how much genetic diversity is present within and among populations (enough to propose naming a new species). We know more about how survival, growth and reproductive rates drive population

size (pretty stable). Lastly, and maybe most importantly to this decision, we have better estimates of the number of individuals in each population (many more than previously documented). Estimates of the minimum cactus abundance provide a snapshot of the current status and show that population sizes are large enough to persist through random fluctuations in germination and reproduction.

However, future conservation decisions are also based on trends. Ideally, we would know how many individuals there are, a census of an entire population and how the total population size changes over time so we can determine if or when this species' listing status might need to be revisited and if conservation actions are needed. We can and will infer population trends from the growth, survival and reproductive rates sampled from plots within populations. Our data

about population trends come from representative plots scattered throughout the species' range. Because of the purposeful placement of plots, we are limited in our ability to project plant density outside of plots.

Unlike animals, most plants can be found in the same location from year to year, and we are able to count all the individuals we see. Counting every individual is nearly impossible due to our inability to comb over all suitable and known habitat. Even if we could, we would likely miss many seedlings or vegetative individuals, so our counts are always estimates of the true population size. To get population counts that are comparable from year to year, we can use a plotless sampling design to

estimate the total population size within defined habitats and a model for how many individuals we miss as we survey.

Last summer, supported by our summer internship program with two students from Colorado Mesa University, we tested a distance sampling method commonly used for animal species. With help from a spectacular graduate student from Regis University, we are using this preliminary data to determine an efficient sampling design to estimate the total population size across the entire range of the species. This summer we'll test our design. If successful, we could use this method to get more accurate population counts to estimate abundance and population trends for more of our rare and threatened species.

<https://www.botanicgardens.org/blog/how-estimate-total-population-size-rare-plant-and-why-it-matters>



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Last of the Peyoteros

Mauro Morales: In Memoriam

Kevin Feeney, Ellensburg, Washington

I first met Mauro Morales in 2012 during my initial visit to South Texas. I was a graduate student in cultural anthropology at the time and was trying to determine whether a study on the federally licensed trade in peyote (*Lophophora williamsii*) would be a viable topic for my doctoral research. I didn't know anyone in South Texas, didn't know my way around, and my Spanish was marginal, but with a phone call, Mauro came to meet me downtown and guided me back to his place. I was welcomed warmly by both Mauro and his wife Dora, who invited me into their home and treated me like an old friend.

I learned a lot from Mauro during the months that I spent with him and his family. Mauro was a wealth of knowledge and loved to tell stories, including stories of local folklore, of his relationships and experiences with his Native American customers over the years, as well as discussing his lifelong involvement with the peyote trade.

Mauro first started picking peyote when he was around eleven or twelve years old. He recounted that he could get about two cents a button (cactus top) from the local peyote dealers so long as the peyote was half-dollar sized or larger (now they are typically quarter-sized). He also collected arrowheads which he could sell in town to schoolteachers and others for a few cents each. Like others in his community Mauro worked the peyote seasonally. Due to few local economic opportunities many families worked as migrant workers, traveling to different parts of the country during the spring and summer to work on farms or in factories. Peyote was one of the few local sources of income, but for pickers it was not sufficient to support a family, though it provided important income in the off-season.

After years of traveling to Maryland, Delaware, and other locales, Mauro took a job at a local feed yard in the early 1980s that allowed his family to stay in South Texas year-round. Eventually an injury stopped him from working and he began to get involved in peyote again, where he found he could make more money than working at the feed yard. Mauro decided to leave his job and filed his paperwork to become a federally licensed peyote distributor in 1992. With the help of his family, Mauro soon became one of the largest licensed distributors in South Texas. He developed relationships with Native Americans from around the country, some who would stay with his family for days or weeks at a time, and hosted peyote ceremonies on his family ranch. In the late 2000s Mauro became seriously ill and his weight dropped to a mere 97 pounds. A Lakota Roadman, hearing of his illness, came to visit him and held a healing ceremony. Mauro eventually recovered but he slowed down physically and so did his business. When I met Mauro, he was only one of three remaining peyote distributors and he continued to work with his family in the peyote business until his passing.

While the peyote trade continues in South Texas, it has lost one of its warmest, kindest, and gentlest souls. Rest in Peace Mauro Morales (March 5, 1943–January 16, 2022).



Top: Mauro Morales (left), Kevin Feeney and son, Keller, in Rio Grande City, Texas (2017).

Center: Peyote bins at Mauro Morales's place of business in 2013. The orange staining on the peyotes indicates the buttons were picked while wet or during a rain. Buttons are typically sold by the thousand.

Bottom: Mauro Morales's peyote garden, including specimens of peyote (*Lophophora williamsii*) and star cactus (*Astrophytum asterias*). While many peyote distributors keep peyote gardens at home, these are typically provided for Native American Church members to conduct prayers rather than for harvesting and sale.



A closer look:

**Pachypodium
Succulentum
Seed**

Information & photos: Gary Hunt, [BirdCam on Cheltenham](#)

An open seed pod on *Pachypodium succulentum* (Fig 1). To take a closer look, I took one of the seeds- before the wind blew it away- and put it under my digital microscope* (Fig 2).

For further observations, I separated the hairs from the seed. On the left in Figure 3, is a black human hair for a comparison to the thin silky, white hairs from the *Pachypodium* seed on the right.

Here's the hairless seed under the microscope (Fig 4).

*The Digital Microscope sensor is 3 mega pixels and is capable of 10X-230X magnification. Eight LEDs are the light source and the focus was manual. It was connected to a computer via a USB cable.



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Mission Statement

The Cactus and Succulent Society of America is an international community dedicated to advancing the appreciation, knowledge, research, and conservation of cacti and succulents.