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Kaktos Komments

a bimonthly publication of the Houston Cactus and Succulent Society
to promote the study of cacti and other succulents



Espostoopsis dybowskii
by Karla Halpaap-Wood



Houston Cactus and Succulent Society
Founded in 1963
Affiliated with the Cactus & Succulent Society of America

From the editor

Karla Halpaap-Wood

I want to thank the contributors to this edition, especially Chaden Yafi and Liliana Cracraft for their articles. Every member can have an input on the club and it's publication, by submitting articles, pictures or thoughts.

Membership

Kathy Fewox

Still unable to hold in-person meetings due to COVID-19, HCSS held Zoom meetings in September and October. While Zoom meetings are better than no meetings at all, I feel safe in saying that we all wish we were able to get together in person.

Ten people attended the Zoom meeting held on September 23rd. Among those were Leighton Webb, a delightful young guest who has a knowledge of cacti beyond his years, and his father, Andrew Webb.

Our October 28th Zoom meeting was attended by sixteen people. Leighton Webb once again graced us with his presence, as did another visitor, Carmela Tajonera. It was an enjoyable and informative meeting.

Let's all stay safe by wearing our masks and observing social distancing. It's not pleasant, but it's what we must do to get through this.

Please email any news of HCSS members and their families to July Olson at saint.juniper@gmail.com or Kathy Fewox at kathyfewox@gmail.com.

Calendar:

November 11, 2020 7:30 pm Board Meeting via Zoom

November 18, 2020 7:30 pm Membership Meeting via Zoom
 Program: "Agave Plants and the Spirits Obtained From Them"
 by Liliana Cracraft

January 1, 2021 Deadline for submitting articles for the KK.



November Cactus of the Month

Sarai Ramirez

Opuntia Erinacea Ursine

Name: *Opuntia Erinacea Ursine*

Common Name: Snow Prickly Pear, Woolly jacket Prickly Pear, Blue Jacket, Hairy Roger

Genus: *Opuntia*

Family: Cactaceae

Description: *Opuntia* are commonly referred to as 'Prickly Pear' plants and are native to the Americas. Prickly pears typically grow with flat, rounded pads (cladodes). This *Opuntia* is covered in long fuzzy white hairs rather than the pointy spines that one typically associates with other *opuntias*. Many prickly pears begin life covered in hair but grow out of that stage in a few weeks. This plant appears to be stuck in that juvenile stage; always furry and never blooming. I was not able to find any information about this plant in bloom. I did learn that there are over 180 species of *Opuntia*. It is a very large genus of cacti, varying in size from 2 inches tall (5 cm) miniature plants to 100 feet tall (30 m) trees.



Cultivation/Growth:

Opuntia species are the most cold-tolerant of the lowland cacti. They love the sun and dislike water. I water my plant maybe once a month and I do not use fertilizers. I use well-draining soil with a lot of perlite. I have this *opuntia* outside in a sunny location next to my other cacti, I have slowly learned to group my plants by genus, so that I do not overwater them. Over time you will see new pads sprout from the plant, and if one ever breaks from an accident, allow for the cut to heal and plant the pieces in the same type of soil. Make sure to protect them from heavy rains and standing water to prevent rot.

My Experience: I purchased this plant last year at a big garden center. The main reason it caught my eye was its long flowy hair. It is relaxing to sit and watch the hairs move as the breeze blows on a lazy Sunday morning. One theory about the *opuntia's* shabby look is that its long, soft, and white hair protect it from both excessive heat and cold, which helps it to retain moisture for a relatively long period. My hairy *opuntia* sits in a covered patio where it gets afternoon sun, it has been in the same spot for a year and I think it has grown about 3 inches. It is a show stopper when my friends and family come over to visit. I hope to grow more in the coming years.

Credit:

<https://www.gardentags.com/plant-encyclopedia/opuntia-erinacea-ursine/26221> <https://www.desertmuseum.org/visit/sheets/OpuWoolly.pdf>

November Succulent of the Month**Michael Ramirez****Haworthia Fasciata****Name:** Haworthia fasciata**Common Name:** Zebra Haworthia**Family:** Asphodelaceae**Genus:** Haworthiopsis**Species:** H. fasciata

Description: Named for the distinctive white bumps that line the outside of its leaves. In nature, it grows in the shrublands of South Africa with acidic soil and partial shade or filtered light. The haworthia fasciata plants are generally small, less than 4 inches high.

Cultivation/Growth:

Haworthia fasciata “Zebra Plant” is a common household succulent. It is perfect for beginners, because it grows well indoors when taken care of properly. This plant has typical succulent watering needs. Haworthia fasciata is not cold hardy, so if you live in a zone that gets colder than 30° F it’s best to plant this succulent in a container that can be brought indoors. It does best in partial sun. If you want to plant it, in garden make sure that it gets 4-6 hours of sunlight in the morning. If given more sunlight it will turn a deep red color showing it is stressed. If grown indoors, place in a window that gets plenty of sun. When grown outdoors, Haworthia fasciata flowers in the fall. It has small white or pink flowers that grow on a tall, thin stem. This plant is very easily propagated through offsets, sprouting up around the base of the plant. Simply pull these up and allow the offsets to dry for one to two days before replanting in well-draining soil.

My Experience: I love these! I have one at work and I asked my wife to grow more for me and my coworkers. They look great in almost any planters. I think I like them so much because of the clean, almost symmetrical leaves. I like things to be consistent and uniform. This succulent, in my opinion has those characteristics. Although I have grown fond of many of my wife’s plants, this is currently my favorite.

Credit: <https://www.succulentsandsunshine.com/>



December Cactus of the Month

Cindy Gray

Stenocactus erectocentrus

Accepted Scientific Name: *Stenocactus multicostatus*

Habitat: Mexico (Coahuila, Chihuahua, Durango) This species is native to high, dry, grassy, meadowlands, during times of drought is often hides in the rocky soil.

Synonyms:

- *Stenocactus multicostatus* (Hildm. ex K. Schum) A. Berger
- *Brittonrosea multicostata* (Hildm. ex Schum) Speg.
- *Echinocactus multicostatus* Hildm.
- *Echinofossulocactus multicostatus* (Hildm. ex K. Schum.) Britton & Rose
- *Echinofossulocactus zacatecasensis* var. *moranensis* Bravo
- *Efossus multicostatus* (Hildm. ex Schum.) Orcutt



Common Names: Brain Cactus, Wave Cactus

Description: *Echinofossulocactus erectocentrus* (*Stenocactus*) is a quite variable plant and the dissimilarity among seedlings spines and ribs shape may be considerable. According to Anderson, *E. erectocentrus* was not a valid published name, not a name at all although it keeps cropping up on labels, and he refers plants with his name under the *Stenocactus multicostatus* group complex. However, the two are easy to tell apart. *Stenocactus multicostatus* have short no more than 3 cm or very thin and flimsy spines and the plants have few areoles and many ribs as many as 120 where *Echinofossulocactus erectocentrus* are long, flexible spines to 13 cm come up and close the top of the plant.

Stems: Solitary, globose, vivid green with flat tops 8-15 cm wide and up to 7-12 cm tall. Typically, with less than 43, very tight, thin, wavy ribs.

Areoles: There are only 2 or 3 areoles in each rib, which are covered with white felt in young plants.

Spines: 6 to 9 radial spines, the upper ones are longer with a stout, flat, erected central spine sometime up to 13 cm long, while the lower ones are shorter and point downwards.

Flowers: Flower buds are set in late fall and held in the dense wool of the stem's apex, often with just the tips visible until mid-winter, when some sunny days come along and both the buds and plant start to grow. The plant will throw quite a few buds in early spring and open several 3 cm flowers at a time over the course of a month. If the conditions are right it can bloom again later in the year. Once flowering is complete the spines closeup over the stem tip again. The blooms are white with a purple midvein.

References:

"The Cactus Family" by Edward F. Anderson

Echinofossulocactus erectocentrus Cactus and Succulent Journal, Volume 80 (1-6): 258, 2008

Llifle – Encyclopedias of Living Forms www.llifle.com/Encyclopedia/CACTI/Family/Cactaceae/1737/Echinofossulocactus_erectocentrus

December Succulent of the Month

Cindy Gray

Euphorbia schoenlandii

Habitat/Origin: Port Elizabeth, South Africa (fairly close to the South African west coast mainly on the Sand Veld area right along the coast). Plant grows in open fields often on beach sand far enough from the present shoreline to support plant growth. The climate is characterized by winter rain, fog, and summer drought.

Synonyms:

- *Euphorbia schoenlandii* Pax
- *Euphorbia fasciculata* N.E.Br. non Thunb.

Description: *Euphorbia schoenlandii* is a small pickle shaped succulent with prominent spiny tubercles, sometimes resembling a green pineapple, usually stemmed but may branch with age.

Stem: Up to 20 cm thick and 100 – 130 cm tall, upright growing and club-shaped with large conical tubercles up to 12mm long.

Spines: 2.5 – cm long, the “spines” are only the stout, woody, withered remains of fertile peduncles which endure.

Flowers: Cyathia (8mm) solitary or in simple cymes, arising above the spines, peduncles up to 2.5 cm long with a few 2-3 cm long scattered and deciduous bracts. Nectar glans oblong, margin with 3 to 8 entire or bifid linear, separated, processes up to 1.5 mm long.

Fruits: Globose to sub-globose up to 6mm wide, sub-sessile, with oblong seeds up to 4mm wide.

Cultivation: Likes a sunny position. It does best in a mineral soil, good drainage is essential, Water sparingly during the summer months and keep dry in the winter. Is a slow growing long lived plant and once established, it will be content in its position and its soil for years. Can tolerate moderate shade, and a plant growing in shade should be slowly hardened off before placing it in full sun as the plant will be severely scorched if moved too suddenly from shade into sun.

Propagation: The plant is propagated from seed sown during spring or summer. Germination occurs within 3 weeks, but it can be reproduced by cuttings as well. Flowering can be achieved within 5 – 8 years.

References:

Planet Desert – www.planetdesert.com/products/euphorbia-fasciculata-schoenlandii-cactus-cati-succulent-real-live-plant

Succulent Gardening – www.succulents.us/euphorbiaschoen.html

Llifle – Encyclopedia of SUCCULENTS – www.llifle.com/Encyclopedia/SUCCULENTS/Family/Euphorbiaceae/17508/Euphorbia_schoenlandii



Are Cacti intelligent?

Chaden Yafi

Intelligent? You would ask! They do not have a brain or a nervous system, how can they be intelligent?

We know that plants don't have a stomach, but they eat; they don't have lungs but they breathe. Why can't we accept that they can think and process information even without having a brain or a nervous system?

Recent studies have shown that while plants do not have a brain, they do possess a highly elaborate signaling system as well as many of the chemicals and hormones that exist in the brains of mammals.

Let's start by defining intelligence. Etymologically speaking, the word intelligence comes from the Latin verb "*intelligere*" (*inter*: between, *legere*: choose" meaning to compare or choose between things or situations.) (1) Perhaps the most common definition of intelligence is: the ability of problem solving. This ability manifests itself in being flexible and capable of adapting to new situations by making correct choices.

This article will examine some of the problems and issues that cacti encounter, and examine the ways they behave to solve them. In the end, I will give a few glimpses of new studies on plants' intelligences in general.

Drought

Living in an arid environment is a harsh reality shared by most cacti. However, they learned to adapt and thrive in it. Throughout their evolution they had invented a way to alter the photosynthesis process and carry it at night instead of the day and thus minimize water loss. Nevertheless, water is still an important element for the life of all living creatures, even cacti. How can a cactus live for weeks, months, or years without water?

Examining the Copiapoa cactus might give some answers.

Most Copiapoa cacti live in the Atacama Desert, which is one of the most arid areas in the world. In the 1980s, this desert experienced straight years of extreme dry climate (even for a desert) with not a drop of rain. All the plants died except the Copiapoa family! (2)

At a certain point of its evolution the Copiapoa developed the ability to produce a wool-like material over its spines. This wool-like material serves as a way to trap a single drop of water in the atmosphere from dew, mist or fog. The Copiapoa cactus also learned to store water not only in its stem (like other cacti) but also in its root, which is very large in size (sometimes larger than the cactus itself.) This ability made the Copiapoa survive the years of extreme drought.

Other cacti use different strategies to conserve water. They produce more roots when it rains to absorb as much water as they can. When the climate gets dry, their roots will shrivel and even break off to conserve the water they have in their stems. If the



Copiapoa humilis subspecies tenuissima blending with their surroundings
Photo credit: Stefan Burger
www.cactusexplorer.com
published with authorization from the photographer

cactus contains more water than the soil where it is growing, it risks losing water to the soil. Thus, the cactus will cut itself from that dry soil. (3) That made some cacti growers advise against restricting watering completely during winter for the fear that a cactus might lose all its roots.

Attracting pollinators, mastering the art of seduction

The case of the *Espostoa frutescens* cactus

E. frutescens is a columnar cactus native of the Andes Mountains. The flower of this cactus blooms at night, thus attracting bats to pollinate. We know that bats use echolocation to target their meals. Many plants attract bats to pollinate their flowers by reflecting their sonar, thus making their flowers more appealing. But, the *E. frutescens* takes the whole game a step further. The main type of bats that pollinate its flower is Geoffroy's tailless bat. The flower of the *E. frutescens* is surrounded by a hairy type of material called the cephalium. In a recent study, scientists examined the possibility that the cephalium plays a role in the pollination of the flower of this cactus. They found that the hairy cephalium absorbs ultrasound around 90 kHz. This number is not random! It turns out that Geoffroy's tailless bat happens to echolocate at frequencies right around that 90 kHz! This is a totally different method of attracting the bat. By absorbing (not reflecting) the ultrasound and dampening the background of the flower, they make the flower itself more conspicuous and appealing. It is as if the plant found a specific "language" to address the bats and invite them over! (4)

Predators

Among the various functions the spines of a cactus have is keeping predators away. Some cacti that don't have strong sharp spines (ex. Copiapoa and Lophophora) protect themselves by using their amazing camouflage ability. They blend with their surroundings and make themselves invisible to herbivores. The Copiapoa family also can pull itself almost completely underground to avoid the heat and predators at the same time.

Heat stroke

When a cactus gets too much sun exposure that results in sunburn, it opts to enter dormancy. It does so by halting the developing of new tissues that will get burned too. It temporarily reduces its growth rate and will sit inactive until the optimal conditions are back. Then the cactus will continue to grow. Thus, cacti growers are advised to be careful with watering if they notice the "summer" dormancy or sunburn on their plants. This can happen even in the summer months which is the growing season for cacti.

Trauma

When a cactus is damaged or feels something threatening its growth, it produces many pups. This way it can guarantee its continuation and survival of its species.

Some commercial growers deliberately damage the center of the cactus to produce pups so that they can sell more plants. However, this is not a good way to deal with cacti and the forced damage might not always result in pups.

Research on plants intelligence

One might consider all that is mentioned so far to be merely a physiological reaction by cacti. And some would not agree to use the word “intelligence” when describing any plant behavior.

Plants’ intelligence is not a new discovery. Perhaps Darwin was the first to mention the possibility of plants having a “brain”. For Darwin, the brain would be the roots as he wrote in the last paragraph of his book, The Power of Movement in Plants. His son, Francis, was famous for declaring that plants are as intelligent as animals.

Nonetheless, speaking about plants’ intelligence has become more valid and acceptable in the last two decades. There is a lot of scientific research examining: plants behavior, memory, ability to store and use information, adaptations capability, plasticity, etc. The new microscopes and time lapse filming helped scientists to gather new facts about plants that they didn’t know before. All of this puts plants again in the center stage and debunks the old inherited ideas that plants don’t think or deliberately make decisions.

Studies have shown that the ability of plants to transport signals from one part of it to another is very similar to that of neurons in mammals. Cacti have chemical substances that share the same structure of that in the nervous system of animals.

The two leading figures in this realm of study are the British scientist, Anthony Trewavas, and the Italian scientist, Stephano Mancuso, who is also one of the pioneers of so-called “Plants Neurobiology”.

It is also important to mention an experiment that the Italian-Australian scientist Monica Gagliano (associate professor of biology at the University of Western Australia) repeated the Pavlov Dog conditioning experiment while using a plant!

In Ivan Pavlov’s famous experiment, a dog was offered food every time a bell rang. The bell didn’t mean much to the dog before the experiment. The dog would salivate when he gets the food, but in the end, when they rang the bell without offering the dog any food, the dog still salivated! The dog was able to link the bell sound with the concept of food. Therefore, the dog was able to “imagine” or “conceptualize” the food upon hearing the bell alone!

Dr. Gagliano used the same principle but with a plant. She chose the climbing pea plant and instead of the bell, she used a fan. Instead of food, she used blue light that plants love as an essential element for their growth. The pea plant grew toward the blue light wherever it was placed with the fan. Eventually, the pea plant was growing toward the fan, even with the absence of the blue light! (5)

Another notable experiment Gagliano carried was testing plants “memory”. She used the *Mimosa pudica* to achieve this. (This experiment echoed a previous experiment that the French botanist René-Louiche Desfontaines carried back in the 18th century on the same plant species.)

The *Mimosa pudica* closes its leaves when feeling any danger or strange situation. Gagliano invented a plant dropping device, and attached many potted *mimosa pudica* plants to them. The machine would drop the plant several times. Each time the plant was dropped, the plant would close its leaves. Eventually, when the plant “learned” that there is no danger in this, it ceased to close its leaves. Several weeks after the initial experiment, the plant did not close its leaves when it was subjugated to the drop. It remembered. The plant was able to remember information for more than 15 days! (6)

All of the recent research confirmed that plants are more intelligent than previously thought. Their behavior and adaptive capability are not found to be merely an automated physiological reaction. A plant’s response to different occurrences varies, and can be, at times, individualistic. A cacti grower does not need to be cognizant

of scientific discoveries and experiments. Any cacti grower can notice that two cacti seldom behave in the exact same way or grow identically! Each one has its own “personality” and peculiarities.

Perhaps all of these findings will inspire us to treat plants with more care and respect; to view them not from a utilitarian or medicinal way, but as living creatures that have so much to teach us about existing in this world and wisely using its resources. Maybe also this will make us relinquish our tendency of putting plants on the bottom of the hierarchy, below humans and animals.

The plants that seem abundant today might be endangered tomorrow.

The new findings about plants intelligence and behavior will make us step out of our deepened anthropocentrism and open new “green” horizons in our hearts and souls.

1. (<https://www.etymonline.com/word/intelligence>)
2. Nobel, Park S. *Desert Wisdom Agave and Cacti: Co2, Water, Climate Change*. New York: iUniverse, 2010
3. <https://www.livescience.com/4188-cacti-survive-surprising-strategies-quench-thirst.html>
4. <https://www.the-scientist.com/news-opinion/ecuadorian-cactus-absorbs-ultrasound--enticing-bats-to-flowers-66981?fbclid=IwAR0yjkll5WzrFTAjjRjELojxg2IVRjFtf0BqZP0nxJ3bLDsu3aM2sSKDjTk>
5. <https://www.abc.net.au/news/2019-01-15/researcher-teaching-plants-dog-tricks/10709530#:~:text=Dr%20Gagliano%20said%20her%20most,time%20a%20bell%20was%20rung.&text=%22The%20fact%20many%20plants%20grow,light%20is%20very%20well%20accepted.%22>
6. <https://www.nationalgeographic.com/science/phenomena/2015/12/15/can-a-plant-remember-this-one-seems-to-heres-the-evidence/#close>

Other references:

Mancuso, Stefano. *Brilliant Green, The Surprising History and Science of Plant Intelligence*. Washington: ISLANDPRESS, 2015.

Mancuso, Stefano. *The Revolutionary Genius of Plants*. New York: Atria Books, 2018.

HUEHUETLATOLLI

Liliana Cracraft

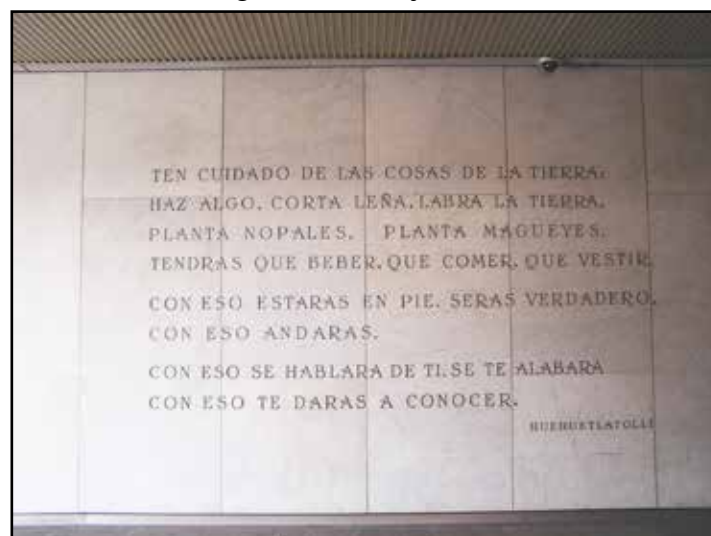
When we visited the National Museum of Anthropology in Mexico City a few years ago, I was overwhelmed by the display of the rich history of the country where I was born. So much culture, so much knowledge, and so much art.



Undoubtedly, the Spaniards must have been shocked when they first encountered the Aztec civilization in 1519. The Aztecs were extraordinary astronomers who had developed a yearly calendar accurate to within 11 minutes. They charted the movements of the stars using only their eyes. They were mathematicians, skilled craftsman, spectacular architects, and engineers. There were also artists -musicians, painters, sculptors, and dancers. They were meticulously clean in their person, bathed daily, and were offended by body odors, and used herbs as deodorants and for a fresh breath.

The Aztecs had a deep knowledge about plants and their medicinal properties. It is also well known that emperor Moctezuma had an immense botanical garden that may have been the first botanical garden in the Americas. If their civilization had not been destroyed during the conquest, the Aztecs, like the Chinese, might have given a great contribution to the world through their vast knowledge of medicine.

Of the hundreds of photos that we took during our visit, my favorite is the ancient inscription located at the entrance of the museum.



It reads:

“TAKE CARE OF THE THINGS OF THE EARTH.

DO SOMETHING, CUT FIREWOOD, FARM THE LAND,

PLANT PRICKLY PEARS, PLANT AGAVES.

YOU WILL HAVE SOMETHING TO DRINK, SOMETHING TO EAT, AND SOMETHING TO WEAR.”

WITH THAT YOU WILL STAND ON YOUR FEET; YOU WILL BE TRUTHFUL,

WITH THAT YOU WILL WALK,

WITH THAT YOU WILL BE TALKED ABOUT, YOU WILL BE PRAISED,

WITH THAT YOU WILL BE KNOWN.”

The inscription comes from Huehuetlatolli, which in the Nahuatl language of the Aztecs means “the sayings of the elders,” though it can also be translated as “ancient word.”

Huehuetlatolli consisted of many manuscripts that in the form of a tale, described their norms for conduct, moral vision, celebrations and beliefs. After the conquest all those manuscripts were compiled by two Spanish friars, and currently are kept in the National Library of México.

We all should follow the advice of the Aztecs; Take care of the things of the earth, plant prickly pears, and plant agaves.



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