

Xerophilia

the passion for cacti and other succulents

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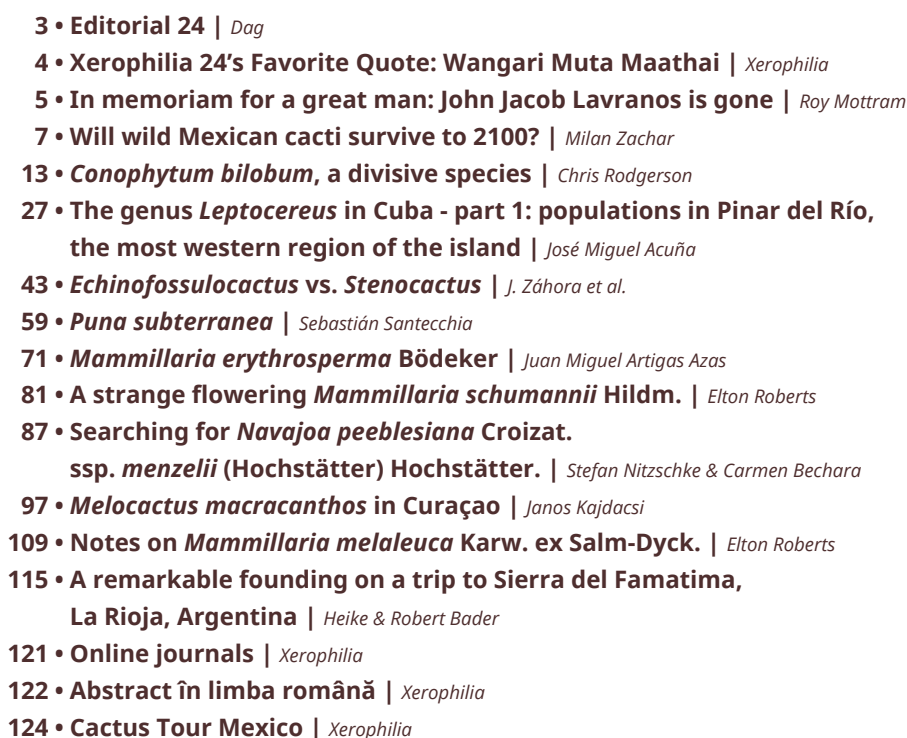


24

December
2018

the passion for cacti and other succulents

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Xerophilia

the passion for cacti and other succulents

no 24 december 2018

When I wrote a first Editorial in March 2018, when, despite any pragmatic judgment, I thought we still have a chance to get this issue, if not at the right date, at least one month late.

They were, and still are, not one, but nine! Nine months of delay!!

That initial editorial, which we published on Facebook, on our fan group page, is now no longer relevant, although the basic problem remains the same: if the lack of support from all who can contribute with articles will persist, as it did not happen until the end of last year, then - more surely - **Xerophilia** will have to fade away, with all the efforts of a few devoted and with all our availability and willingness.

Now, at the end of the year, I prefer to be optimistic. Therefore, for a few days, we will forget about the vicissitudes surrounding the publication of this issue, to enjoy just the unspeakable help that has come in the last 45 days!

So, on behalf of our team:

On the one hand, I wish to thank all those who, authors, friends or collaborators, have put the last required effort to allow us to publish this issue;

And on the other hand, I want to thank all those who have been waiting for so many months to have their articles finally published.

To the latter, on behalf of the whole team, we present our most sincere apologies!

Have a Happy New Year!

Happy Holidays, Dear Readers !!



editorial 24

Happy New
Year!!

2019

d. panco

Photo by Ricardo Ramirez Chaparro.
Mammillaria senilis

December 27 2018

summary→

Wangari Muta Maathai (1 April 1940 – 25 September 2011) was an internationally renowned Kenyan environmental political activist and Nobel laureate. She was educated in the United States at Mount St. Scholastica and the University of Pittsburgh, as well as the University of Nairobi in Kenya. Wangari Maathai earned a Ph.D in veterinary anatomy.

In 1977, Maathai founded the Green Belt Movement, an environmental non-governmental organization focused on the planting of trees, environmental conservation, and women's rights.



Xerophilia 24's Favorite Quote

We need to promote
development
that does not destroy
our environment.

Wangari Muta Maathai





Farewell to a distinguished botanical explorer

by Roy Mottram

John Jacob Lavranos is gone

Corfu, Greece, 29 Mar 1926
Loulé, Portugal, Feb 2018

Following a debilitating stroke, John Lavranos survived only a few days longer to utter his farewells in five different languages before he finally died on 1 February 2018 at the age of 91.

John Jacob Lavranos (1926-2018) was born on the Lavranos family estate at the town of Chlomos, which his ancestors had founded, on the Greek island of Corfu. His early education was classical for a well-to-do family, involving learning languages and playing music. John himself could play the violin and piano quite competently. However, this idyllic lifestyle, as was well described by Lawrence Durrell, was soon to be over after the years of depression and WW2 destroyed the assets that supported that way of life.

His cousin's family on the island of Cephalonia had their estate bombed and they became refugees, fleeing via mainland Greece to Egypt, then on to South Africa, finally settling in 1950 in Johannesburg. John's own family home was not touched by the bombing, but his education was interrupted. He attended the University of Athens, where he acquired degrees in law and economics, followed by a couple of years in the Greek navy.

A lifelong interest in natural history prompted him to travel, at first in Greece. Then he decided to join his relatives in Johannesburg in 1952,

where his interest in nature soon blossomed into a new career of botanical exploration. He gained employment in the insurance brokerage industry, working mainly for a partnership, but also at one stage in his own business. It allowed him time to travel and to indulge his passion for nature, espe-

cially botany, and in 1954 he began to record his activities in his famous field notebooks. It was about this time that he also met his third and final partner for life, Mireille. She had a dog grooming business, for which John prepared her accounts. She died in 2014 of leukaemia, causing John very great distress.

John travelled in Yemen, thanks to having British contacts in Aden, and he made several expeditions in southern Yemen. He then had a wonderful opportunity to explore the island of Socotra, organised by the military base at Aden, just before the British were obliged to withdraw from Aden in 1967.

He studied natural science in his spare time at Witwatersrand University, obtaining BSc qualifications in Botany and Geography in 1967. He

contemplated doing a PhD course in botany, but his decision to remain freelance rather than be employed by an institution meant that further qualifications were not necessary to achieve his objectives. Staying independent allowed him to undertake any research he wanted to do, rather than be bogged down with bureaucracy and instructions to undertake uninteresting projects by employers in the institutional world.

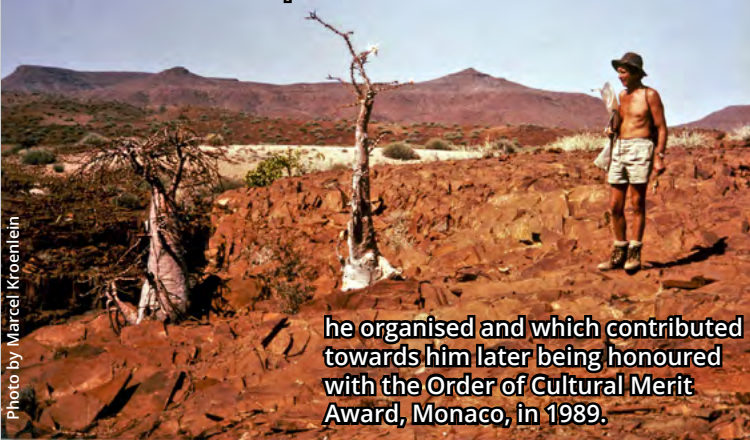
At that time the Anti-Apartheid movement meant that South African botanists were unwelcome in certain neighbouring countries, but having a Greek passport, this enabled John to travel where other South African botanists were banned. This included Somalia, arguably the most interesting flora of the Arabian peninsula, and he became a regular visitor, organising several expeditions sponsored by the Missouri Botanic Gardens, St. Louis, and the Royal Botanic Gardens, Kew.

In the tradition of botanical explorers of the past, he financed his explorations mainly by sponsorship, supplying subscribers with plants, seeds, or exsiccata. He also collected mineral speci-

mens, insects and mollusca for other sponsors. His interests in natural history were very broad, but he gained most satisfaction from gathering new succulent plants, especially stapeliads and aloes. Institutions and hobbyists alike gained hugely from his discoveries.

In total, during 60 years of exploration, he made over

John Lavranos with one of his favourite plants, *Adenium obesum*, on the 1978 Monaco Namib Expedition that



he organised and which contributed towards him later being honoured with the Order of Cultural Merit Award, Monaco, in 1989.

30,000 plant gatherings, many new to science. He was honoured in the names of 19 taxa, and himself described, solely or jointly, 194 new taxa of which 74 were asclepiads and 96 aloes. He was awarded many honours, of which those that he was most proud of were becoming a Corresponding Member of the Museum d'Histoire Naturelle, Paris (1968), and receiving the Allen Dyer Gold Medal Award (1992).

The world has lost an incredible talent, with a reputation to envy, and a personality that made him the darling of lecture tour organisers. It could easily be said that he is the last of a distinguished line of botanical explorers, the like of which we are unlikely ever to see again.

Will wild Mexican cacti survive to 2100?



Milan Zachar

Text and photos by the author

summary→

It was a long time ago, in 1983, when Professor Kurt Schreier published an article in *Kakteen und andere Sukkulente* magazine with the title “Are the days of the Mexican cacti counted?” It was the time when communism ruled with an iron fist in Eastern Europe and we wouldn’t even have dreamt about travelling to the homeland of cacti. We simply had to acknowledge the stated facts and trust them. In his highly reasonable article, Professor Schreier considered the population boom, the burning of pine forests and the pressure exerted

by cactus collectors to be the greatest problem for cacti. He also considered the numerous authorized propagating stations in the regions as well as Mexican nationalism and pride (about the fact that they considered themselves “the most amazing cactus country”) to be a chance for the survival of cacti. After thirty years we may conclude that some of his statements appear to have been visionary and some unrealistic. It seems that nobody could have thought that society would become enslaved by economic growth and the population boom would help it on the way to hell.

After “the wall came down” the gate to the world and “normal life” opened also for us. I travelled to Mexico for the first time in February 1990 – for three months, only with my backpack. I had the words of Professor Schreier in my head. It had been published seven years back and I compared his description of the situation with the current status quo at the beginning of the nineties. It was the time when the industrial revolution was silently picking up. Mexico seemed to be a bit asleep. We had vibrant discussions about it in the glow of campfires. As early as in the nineties, we noticed a growing civilization pressure on native plant communities of the Mexican flat lands. We used to say that only the plants inhabiting hills will survive. The first signs were seen to the South of

Saltillo, towards the direction of Matehualu. The beautiful *Yucca filifera* vegetation had to concede to the first farms. With the majestic Yuccas, also *Echinocereus pulchellus* ssp. *sharpii* disappeared. Not even its inclusion in CITES I (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) helped the situation. This jewel of nature has not been eliminated by collectors but rather by the necessity to produce food for the growing population. Who knows, maybe it would have been enough to leave small “islands” of native *Echinocereus pulchellus* ssp. *sharpii* vegetation in fields. Here I see a role for Mexican conservationists. The population boom was only about to come and therefore it might not have been economic to use ground water for irrigation yet.



El Pilar, Coahuila

1990 - Original vegetation with *Larrea tridentata*, including *Ariocarpus kotschoubeyanus*.

2017 - Nothing! Everything destroyed.



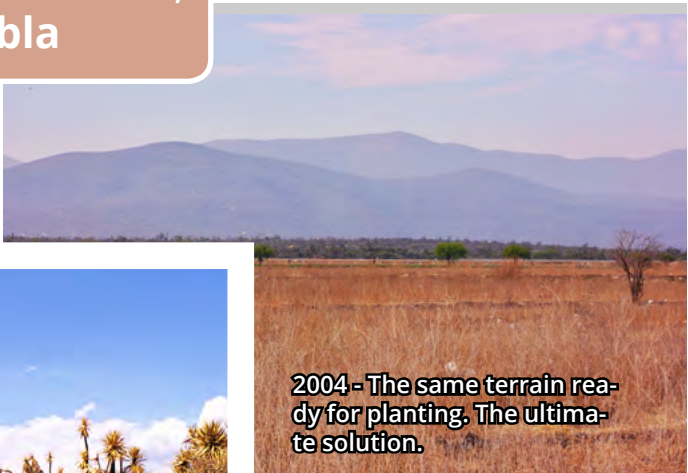
At the beginning of the nineties, a cactus collector in Mexico was considered to be a madman. The locals enjoyed talking about cacti, one could show them pictures and ask questions about these plants. Even police officers thought we were just weirdos and were really friendly. At the turn of the centuries, the situation radically changed. The pressure that cactus collectors exerted on nature grew significantly due to fantastic discoveries of *Geohintonia mexicana*, *Aztekium hintonii*, *Mammillaria sanchez – meyoradae*

or *Mammillaria luethyi*. The hunt for Czech and/or German cactus collectors started. Sometimes the hunt for the mentioned groups of cactus collectors was successful, sometimes not so much. I had an impression that Japanese and Asians in general were not taking part in the hunt even though sights into Japanese greenhouses were prompting one to guess that they were just better traffickers than Europeans. Legendary Charlie Glass used to say that cactus collectors had not picked any of the sites clean. Unlike bulldozers.

I personally thought this furious hunt was kind of revenge. The locals believed that they were the only ones to profit from the Mexican plants, not the foreigners. They had all the tools and conditions in place. Until now, however, there is lack of will, knowledge and skills. *Geohintonia mexicana* is a good example. From its discovery until the moment when the site was visited by “uninvited guests” on 10 January 1995 three or four years had passed. During this time the local growers did not manage to cultivate a single culture seedling. They had enough extra time. A better example is *Mammillaria luethyi*. It was a stunner and interest in the plants was enormous. I tried to help my Mexican friends with propagating. A principal problem is that successful and fast propagating

requires precise cultivating procedures. And this was where we faced an unmanageable problem. It was impossible to prepare the plants for propagating. It ended up in enormously overpaying for two clones and getting the material to Europe. In Europe, it took only two years to propagate the material and achieve sufficient volumes. In that way, *Mammillaria luethyi* was accessible to each collector and the pressure on the habitat almost completely stopped. This is the way to save top taxa on their natural sites. In order to implement it, we needed the Mexican nature conservationists to get in the game and in the case of civilization pressure to prevent the destruction of the habitat under any pretext. This, however, is an illusion. Just like certified propagating stations in Mexico.

Mesa San Lorenzo,
Puebla



A good example of how cactus conservation in their natural habitat may work in Mexico is *Mammillaria sanchez-mejoradae*. It was discovered sometimes in the mid-eighties by Rodrigo Gonzales at his ranch. Later, he sold the land. Nowadays, a big agricultural co-op farms the land. The whole area is fenced with an electrical charge. There are two little hills in the area of the farm where the mentioned *Mammillaria* grows. Many tried to find it in the bigger range of the farm. As far as I am concerned, nobody was successful. So, if you

wish to see *Mammillaria sanchez-mejoradae* in its habitat you need a bit of luck and meet the farm owner. Then you need to convince him to let you see the little hills. No bribes are possible. What would be the price of such a bribe? Ridiculous. We visited the farm in 1998. Many visitors must have knocked on his door during those 20 years and by now he must be allergic to newcomers. But as I mentioned above, this farm is a copybook example of efficient conservation of an endangered taxon in its habitat.



2015 - The limestone factories "gobble" all the hills, including hundreds of thousands of cacti and other plants, creating the silhouette of the city of Monterrey.

During our most recent cacti trips to Mexico in 2014-2015, we were looking for new taxa in intact places. Nevertheless, we saw extensive and irreversible devastation of native plant communities. In addition to that it seemed that numerous populations of the *Astrophytum* genus became significantly smaller. During our autumn 2017 trip, we visited some of the notoriously-known old sites. The status of these sites is alarming! Indigenous, rich and largely covered habitats are completely devastated today. Only "the last of the Mohicans" survive. One of those being the first hills at the foot of Sierra de la Paila or the habitat of *Astrophytum capricorne* ssp. *niveum* "nudum" in the vicinity of Cuatrociénegas. This once upon a time Garden of Eden today is a total disaster. I personally believe the hunting expeditions of cactus collectors in the nineties might be the reason for it. There is no other reasonable explanation.

And what is the state of play today, after 27 years of me looking for cacti in Mexico? Will the endangered cacti survive the 21st Century in their habitats? H. Sanchez-Mejorada wrote as early as in 1966 that "all the natural treasures of Mexico will be destroyed". In 1983, Professor Schreier to his own question "Can we save the cacti flora in their habitat?" provided the following answer: "No". What answers can we give to those sad questions today, in 2018? According to the internet, Mexico's population one hundred years ago, in 1921, was approximately 14.3 million. In 1990, it was around 85 million. In 2000, more than 100 million. According to the International Bank for Reconstruction and Development, the number of inhabitants of Mexico in 2016 was 127.4 million. The ratio of rural and urban population was 30:70. That much for bare numbers. It is important to recall that Mexico has rich oil deposits. It means that the country is more successful at eliminating

poverty than other Latin American countries. Electrification of Mexico is very good, which means that each shack or cabin, even at the end of the world, has its own satellite installed. What the poor see in telenovelas is a wonderful life in the cities. There is hardly any chance for a good life in the mountains or semi-deserts of Mexico. These people, the young ones, have moved to live in cities.

The rural areas are being depopulated quite fast. What one can see alongside roadways are offers for sale of ranches. Only the old stay. To spend the rest of their days. Once this



Monterrey,
Nuevo León

generation dies out the countryside will become completely empty. And the masses in the cities need to be fed. The extreme population growth means that the old methods will not suffice. It has been known for a long time that there are reserves of groundwater in the North. It has been also known that this groundwater from a big depth is rich in minerals. That is, it can make the soil salty quite quickly, and in that way devalue it. First, however, the bulldozers come and raze everything to the ground. "Everything" means all the native vegetation, including CITES I plants. Vast flat lands of native vegetation have been changed at a quick pace to greenhouses to grow tomatoes, chili peppers and beans. After the ground water is used up or the soil devalued, greenhouses stay abandoned and the whole process gets launched someplace else. Just as it happened with the beautiful Maya civilization. After several years, the greenhouses cease to exist and the plots under them will be recovered with a new vegetation.

However, the native plant communities will not stand a chance. How could we preserve them? One way could be to leave behind stretches of native plant communities when the land is cleaned up. This, again, should be an exclusive task of nature conservationists. But they rather organize campaigns against foreign cactus collectors. This gets us back to the very beginning, to the times of the hunt for cactus collectors. There is lack of educated and wise people here. A good example of that is a presenter for a regional Mexican TV from Monterrey who made a trip to the *Aztekium valdezi* habitat and is now trying to sell to the audience that the depleted *Aztekia* plants were dug out from under the eroding slope by profit-seeking foreign cactus collectors. On the top of it, she mentions such enormous prices

for *Aztekia* plants that it must prompt negative emotions, if not directly hatred, with the deprived ranch owners. Listening to her report, I had a feeling that just anyone can become a journalist.

At the same time, large covers of CITES I plants are being destroyed (especially *Ariocarpus kotschoubeyanus* to be at least a little specific) and no one cares. These lines clearly lead to the conclusion that the Mexican conservationist scene is strongly politicized. If CITES was dealt with a little more substantially in Mexico, this country could become, under certain circumstances, the leader on the global horticulture market without



having to endanger its own nature beyond the limits of today's development. No possibility to export, in a reasonable volume, plants that had to give way to the interest of civilization makes the Mexicans accomplices in the destruction of their own biodiversity. The proceeds from the sale of thousands of otherwise destroyed plants could maybe help local communities in reaching sustainable growth. Who knows?



1991 - The first habitat of *Ariocarpus scapharostris* discovered by A. Lux in the second half of the eighties.

1994 - *Ariocarpus scapharostris*.

Rayones
Nuevo Leon

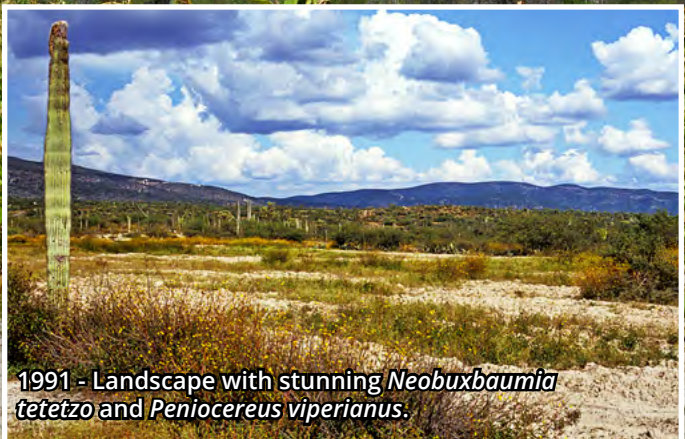


2014 - Only the gate remained.



Zapotitlan de Salinas,
Puebla

Hence, what is the answer to the question in the title? In Mexico, civilization processes have been taking place extraordinarily fast. There is an extreme utilization of non-renewable resources of the country. It means growth that is not sustainable. At some point there will be a massive lack of groundwater and greenhouses will collapse due to it and a humanitarian disaster of inconceivable dimension will be triggered. In any case, we are afraid that the catastrophic prognosis of Sanchez-Mejorada of 1966 will be fulfilled within a hundred years. Those who will be here, please recall these words.



1991 - Landscape with stunning *Neobuxbaumia tetetzo* and *Peniocereus viperianus*.

2014 - The same country twenty-three years later. Today, only maize fields are there. And the ultimate solution for cacti.

To conclude, a question emerges whether these grim prognoses aren't a hidden reason for the building of the wall on the Mexican-American border. Once the humanitarian disaster hits the country, tens of millions of thus affected people will try to make a move towards better living conditions. And nobody will remember the politicians of yesterday and today who had caused it all.

Conophytum bilobum, a divisive species



With *Conophytum hanae*

Chris Rodgerson

Photos by the author unless otherwise stated



Conophytum bilobum subsp. *bilobum*,
on Black Face Mountain.

Sadly, *Conophytum bilobum* is often at best tolerated and at worst despised in cultivation, often described by growers as ordinary and boring. But as with any widespread species, much variation in size, shape and flowering is seen throughout the range so it's actually an ideal subject to grow and study. There is certainly no reason not to have a good representation within any *Conophytum* collection. It is one of my favourite *Conophytums* and this article will show the current seven taxa* (as published in Steven Hammer, "Dumpling and His Wife", 2002) and other distinct forms in habitat and will attempt to change the perceptions of many.



Originally described by Marloth during the early 1900s as *Mesembryanthemum bilobum*, there are no less than one hundred synonyms with many forms being described as species over the years. During the 1920s and 1930s there were quite a few people botanising Namaqualand and beyond and sending the material back to Tischer, Lavis, Brown et al and, with *Conophytum bilobum* especially, to Louisa Bolus in Cape Town.

She was quite happy to name them all, as possibly only being supplied with single clones she could have had little idea of the natural variation as we now understand it. Many of these original plants are still in cultivation to this day, so there are definitely enough local variants to seek out.



Conophytum bilobum subsp. *bilobum*, on Black Face Mountain, with *Adromischus alstonii*.

Hammer in his wisdom used his 1993 "Conograph" to simplify the species considerably by reducing *C. bilobum* to just seven taxa and placed the majority of old names into synonymy. But these historical names are not lost, one merely needs to label them with quotation marks, e.g. *C. bilobum* "compressum" to keep history intact and a handle on them for growers.

C. bilobum enjoys a very wide distribution of more than 300 km north to south. With subsp. *gracilistylum* on a couple of hills to the north west of Bitterfontein at its most southern point, it reaches as far north as just south of the Orange River at Pokkiespramberg and Swartpoort. Other species cross the watery divide, but *C. bilobum* although common throughout the Richtersveld has yet to be discovered in Namibia. There is but one report in southern Bushmanland, where further north the small "bilobes" *C. blandum* and *C. marginatum* reign supreme. Most *C. bilobum* forms seem to prefer quartzite but they can also favour gneiss and occasionally schist in some



cases. They tend to like open aspects rarely being seen on shadier south or west facing places where *C. meyeri* often lurks.

Conophytum bilobum
subsp. *bilobum*
Eenriet, north of Steinkopf



What many would consider to be a fairly standard example of *C. bilobum*, in flower during April at Eenriet, a group of mountains to the north of Steinkopf. This large and robust form was originally described as *C. pole-evansii* although it also spent some time as *C. meyeræ*

fma. *pole-evansii*... the difference being merely the length of lobes! But that does suggest that the old taxonomists did begin to get an idea of variation within the species. *C. meyeræ*, another form of *C. bilobum* not to be confused with *C. meyeri*, a related but different species.

Conophytum bilobum
subsp. *bilobum*
North of Eksteenfontein



C. bilobum to the north of Eksteenfontein showing how colourful and attractive the plants can be in good light.



Conophytum bilobum subsp. *bilobum* var. *muscosipapillatum*, showing extreme variation in body size.



Conophytum bilobum
subsp. ***bilobum***
var. ***muscosipapillatum***
Brandberg (Sandberge)
South west of Komaggas

C. bilobum subsp. *bilobum* var. *muscosipapillatum*. A large and spreading hill to the south west of Komaggas is known by two names, Brandberg on older maps and the better suited Sandberge on more modern versions. The form of *C. bilobum* here goes back to a collection by Hans Herre in 1929 and Hammer considers it distinct enough to warrant varietal status. It

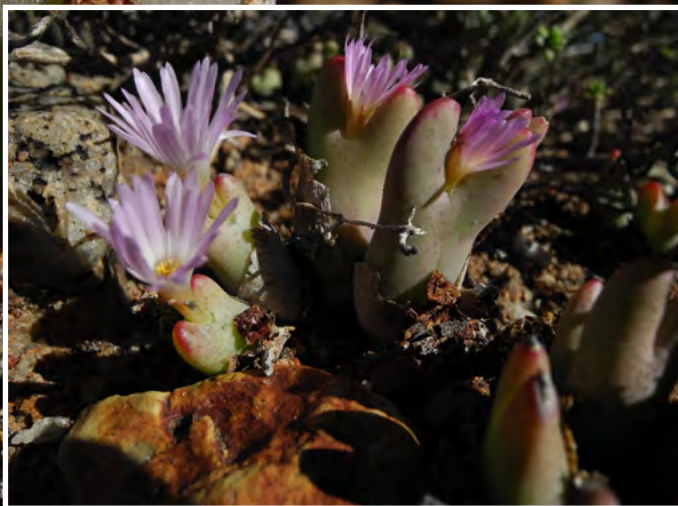
is an attractive form, having thick bodies with red keels and epidermal fine grey trichomes. This has been re-collected and reintroduced into cultivation in recent years by Lavranos and Brack. Sandberge itself is not particularly sandy at higher levels but as the name suggests it is surrounded by very deep, soft and fine sand which makes approaching it extremely difficult.

Conophytum bilobum
subsp. *gracilistylum*
North west of Bitterfontein

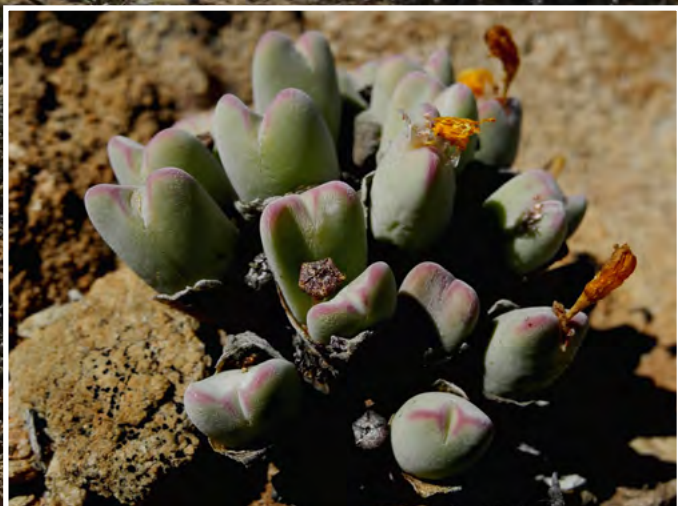


Being the southern-most member of the large *Conophytum bilobum* complex, *C. bilobum* subsp. *gracilistylum* pictured atop a granite hill to the north west of Bitterfontein. A slender and attractive but rather delicate plant whose

thin epidermis can easily scorch under glass. Its flowers vary from light purple (pink) to white which makes it easy to identify. It is worth noting that the nearby *C. chauviniae*, a "mini-bilobe" also has purple flowers.



Conophytum bilobum
subsp. *bilobum*
"dolomiticum"
North west of Uitspanpoort



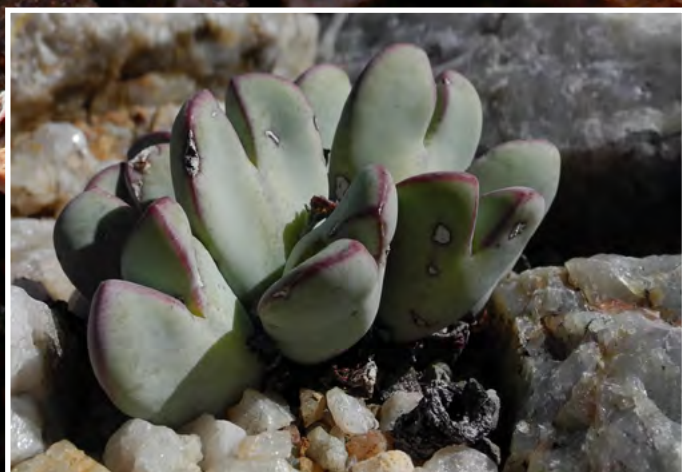
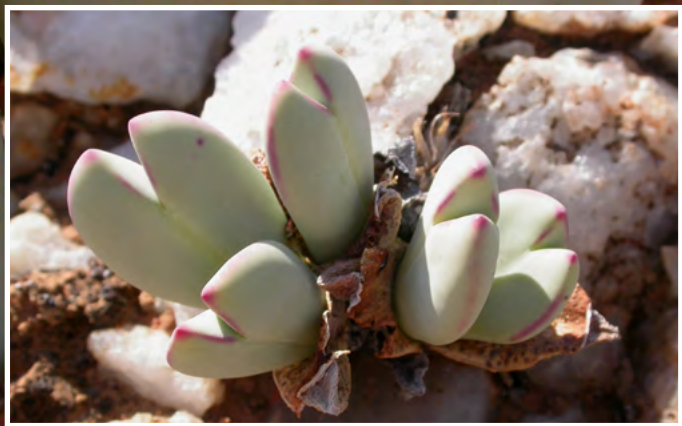
C. bilobum subsp. *bilobum* "dolomiticum", a form originally described from the arid Dolomite peaks which are situated between Khubus (Kuboos) and Uitspanpoort in the Richtersveld. These illustrated grey-white

papillose example from just north west of Uitspanpoort is particularly fine, much nicer than the Hammer & Brack 782 Dolomites form which is illustrated in Hammer's second book, "Dumpling and His Wife".



Conophytum bilobum
subsp. *bilobum*
var. *linearilucidum*
Southern Richtersveld

Here we see one of Hammer's new combinations *C. bilobum* subsp. *bilobum* var. *linearilucidum*, a form he considered worthy of recognition. The epithet describes the narrow "line of light" translucent window which runs vertically from the fissure cleft. It is sporadic but not uncommon in the southern Richtersveld and well worthy of space in any collection although the lovely grey-bluish epidermal colour of habitat is impossible to maintain under glass and European light levels.



summary→

Conophytum bilobum

subsp. *altum*

In the lower Richtersveld
to the south and west of Lekkering



Restricted in the lower Richtersveld to the south and west of Lekkering, *C. bilobum* subsp. *altum* has much smaller bodies with rounded lobes than is usual for *C. bilobum*. It is an easily recognisable shrubby plant with narrow, long tubed flowers on twiggy stems. It could be described as a miniaturised and lax growing version of *C. bilobum*, which with age will eventually grow into a long-branched bonsai-like tree. It makes an attractive subject for a small pot.

From the Steinkopf area are two outstanding white flowered forms of *C. bilobum* subsp. *bilobum*. White to pale yellow flowers are occasionally known as exceptions within standard yellow populations, but at two well documented places there are stands of pure white-flowered plants, where yellows are unusual. *C. bilobum* subsp. *bilobum* "leucanthum" is a tall and thin variation on the theme which grows in the environs of Umdaus. Sharp, red-pointed and flared lobes add to the attraction of the pure white flowers which appear late in the year.

Conophytum bilobum "leucanthum" fully gorged in September after winter rains.



Conophytum bilobum "leucanthum" at Umdaus in flower during April.



Conophytum bilobum
subsp. *bilobum*
"leucanthum"
Umdaus



summary→

summary→


The other white oddity is *C. bilobum* "lacteum", which is known from the Kosies area, just to the west of *C. bilobum* "leucanthum". This is a shorter form – more a standard *C. bilobum* in size and shape, and glabrous, but with the surprise of a pure white flower.

Conophytum bilobum
subsp. ***bilobum***
"lacteum"
Kosies

C. bilobum subsp. *claviferens* is the most recent addition to the *C. bilobum* group and was named as recently as 2001. Known only from the farm Rietkloof to the west of Steinkopf it was named for the club-shaped trichomes (visible under SEM) which give the leaf pairs a pubescent roughness. We looked long and hard for this plant over five or six field trips as Hammer & Marx who discovered it in 1995 have no recollection of exactly where it was.

Conophytum bilobum
subsp. ***claviferens***
Rietkloof
to the west of Steinkopf
(1 of 2)





Conophytum bilobum subsp. *claviferens* alongside *Crassula alstonii*.

I don't think we found the type locality as our plants do not exactly match Hammer's description of growing in shade and having no red keels, but otherwise are certainly subsp. *claviferens* and might be said to be a more attractive form than H&M's.

Conophytum bilobum
subsp. ***claviferens***
Rietkloof
to the west of Steinkopf
(2 of 2)

C. elishae was described by N E Brown way back in 1916. It is a relatively small form and one of the easiest to grow, quick to divide and therefore probably the commonest bilobum form in cultivation. Relatively widespread on the hills all around Springbok, it is best known from the quartzite hill over-looking the town so is easily accessed and has been visited by many people over the years. There it grows sympatrically with *C. violaciflorum* where they occasionally hybridise to produce orange

Photo on this page by Andy Young.

flowered plants. This promiscuous behaviour also happens to the east of Springbok where var. *elishae* grows (and flowers) sympatrically with *C. ectypum* subsp. *brownii* as can be seen in the orange flowered plant in this picture. Hammer considers the most easterly report of *C. bilobum* from Hytkoras near Gamoep to be *C. bilobum* subsp. *bilobum* var. *elishae*, but this is a very small and pale bodied form which is rather out of range and I consider somewhat different.

Conophytum bilobum subsp. *bilobum* var. *elishae*, having orange flowers as consequence of hybridisation with *C. ectypum* subsp. *brownii* (purple flowers).

Conophytum bilobum
subsp. *bilobum*
var. ***elishae***
Around Springbok

(*) - Recently Steven Hammer and Andy Young have published a further treatment of *Conophytum* for Heidi Hartmann's 2017 Springer publication Illustrated Handbook of Succulent Plants: "Aizoaceae A-E"... where *Conophytum bilobum* is recognised as four sub-species: *C. bilobum* ssp. *altum*, *C. bilobum* ssp. *bilobum*, *C. bilobum* ssp. *claviferens* and *C. bilobum* ssp. *gracilistylum*.

We especially thank our friend **Rodica Marinescu**, from Bucharest, Romania, for her persuasive dedication to see this article in *Xerophila* journal.

The genus *Leptocereus* in Cuba

part 1:

populations in Pinar del Río, the most western region of the island



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Photos by José Miguel Acuña and Yohans Magdaleno

Although Cuba does not have large semi-desert areas, nor with the high concentration of genera and species of cacti that are located in North and South America, it does have the greatest diversity of cacti in the Caribbean (Mittermeier et al., 1999). This small regional distinction becomes more important if we consider the endemisms and peculiarities that exist in the Cuban cactus flora. Among them we find the disjunctive *Cylindropuntia hystrix* (Griseb.) Areces 1976 and *Escobaria cubensis* (Britton & Rose) Hunt 1978,

There are Bromeliads with discrete inflorescences, this on the contrary surprises by its size and contrast.

the latter also located in *Neobesseyia*, according to the criteria of several authors. The primitive *Leuvenbergeria zinniiflora* (DC) Lodé 2013 and *Dendrocereus nudiflorus* (Engelm. Ex Sauvalle) Bt & R 1920 are also endemic and with scarce populations. On the island there are also genera of cacti from distant latitudes, such as *Harrisia* and *Melocactus*, with the result of the emergence of rare endemic species such as *Harrisia earlei* Britton & Rose 1920 and *Melocactus matanzanus* León 1934.



Within Cuban cacti we find a little known and cultivated genus, with an exclusive lineage and that is currently being studied intensely, I am referring to *Leptocereus* (Berger) Britton & Rose 1909. Native of the Antilles, it is on the island of Cuba where *Leptocereus* is mostly represented; there are currently 11 recognized species (González-Torres et al., 2016). *Leptocereus* thrives in coastal limestone plains and terraces, also in limestone hills inland. In plant formations that go from the xeromorphic coastal and sub-coastal scrub, the semi-desert forest, the dry forest to the vegetation complex of mogotes; from sea level to just over 300 meters altitude.

With this work an informative series begins to approach this important Caribbean cactus genus and appreciate the natural environment where they grow. We will start at the western end of Cuba, in the province of Pinar del Río. For this region are initially reported *L. assurgens* Britton & Rose 1909, *L. prostratus* Britton & Rose 1920 and *L. ekmanii* (Werderm.) F.M.Knuth 1935. Distributed to the west of the Cordillera de Guaniguanico, in the Sierra de los Órganos.

These species of *Leptocereus* grow as decum-

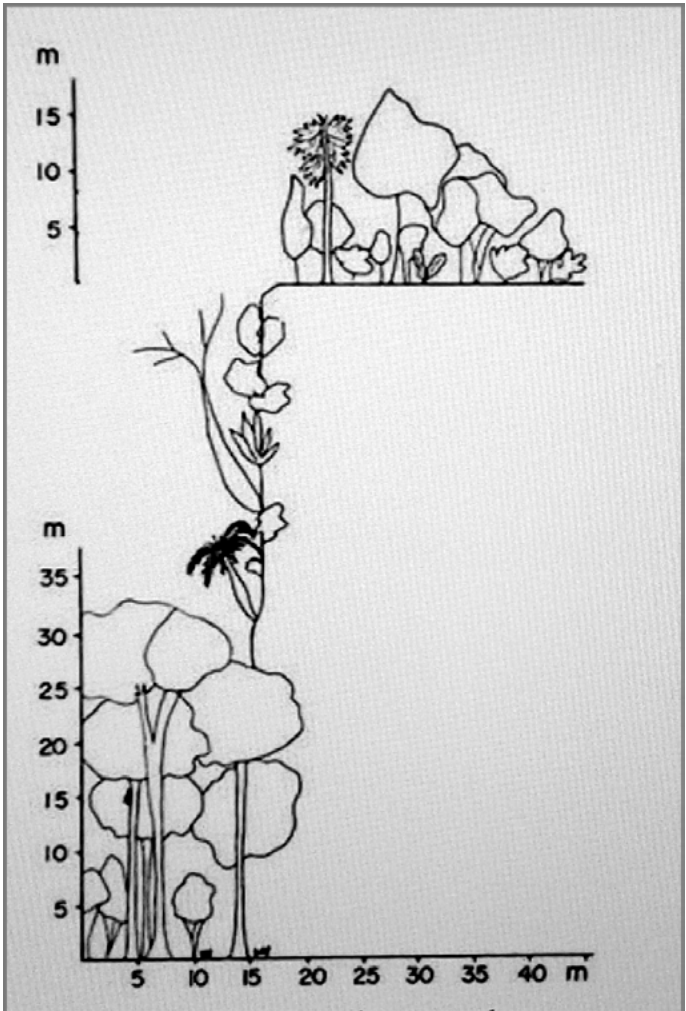
Typical form of a mogote.

bent shrubs, prostrate and crawling, although some can be seen erect, found on the steep slopes and hilltops of the mogotes (isolated steep-sided residual hills composed of either limestone, marble, or dolomite) of these mountains. The mogotes are karstic elevations with conical aspect, with more or less rounded tops and general vertical walls. They are composed of limestone rocks that belong to the Mesozoic era, from the Upper Jurassic to the Upper Cretaceous (161 to 65 million years). The mogotes were formed from erosive processes that include corrosion, landslides and landslides that affect the outer surface of mountainous areas. In the interior of the mogotes, erosion is manifested by the dissolution of limestone rocks and cave collapses. About 6,000 to 10,000 years ago, the valleys separating the mogotes flooded, remaining as islands in an extensive interior lagoon that are currently the bottoms of the valleys and this determined the development of local endemics, both of the flora and the fauna (Borroto, 2005).



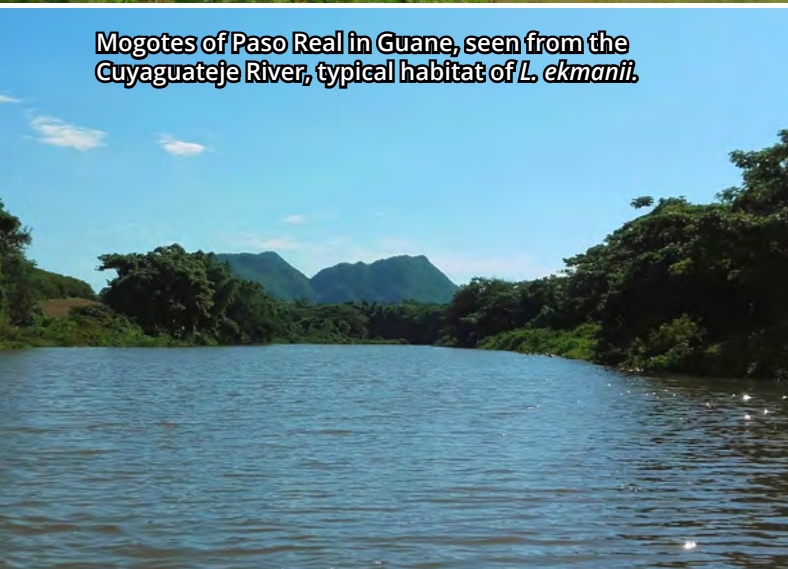
In mogotes specialized vegetation develops in a staggered manner and is composed of three basic strata (Borhidi, 1991). At the bases of these mountains, dense ever-green and/or semi-desert forests alternate. When ascending, the low forests of bushy aspect give way to thorny bushes, palms and agaves that grow dispersed in cracks of slopes and summits, in this last we also find a high presence of succulents and xerophytes bushes, which vary slightly according to the height and form of the mogote. At the top of some mogotes there are depressions due to the collapse of the roof of caverns, where the concentration of moisture makes develop dense forests. This vegetation formation is known as mogote vegetation complex (Capote and Berazaín, 1984). Therefore, to appreciate *Leptocereus* in its habitat, we must cross forests in places with high humidity where we would never expect to find cactus (except for the epiphytes, which is not the case of *Leptocereus*), in addition we have to climb sharp limestone rocks known as dog tooth and cross rivers. It is difficult but not impossible, and the reward of these habitats full of unique botanical rarities and animals is the dream of any nature lover. Within the flora stand out the five inaccessible, (so called because of the radical growth mode on the walls of the mogotes), the Rutaceae (*Spathelia brittonii*), the sierra palm (*Gaussia princeps*), the guano de loma (*Thrinax morrisii*), the ceibón (*Bombacopsis cubensis*) and the maguey (*Agave tubulata*). The fauna is rich in birds and reptiles, but it is the molluscs with regional endemism that caught our attention.

View of the stepped vegetation in a mogote. This vegetation formation is known as mogotes vegetation complex.

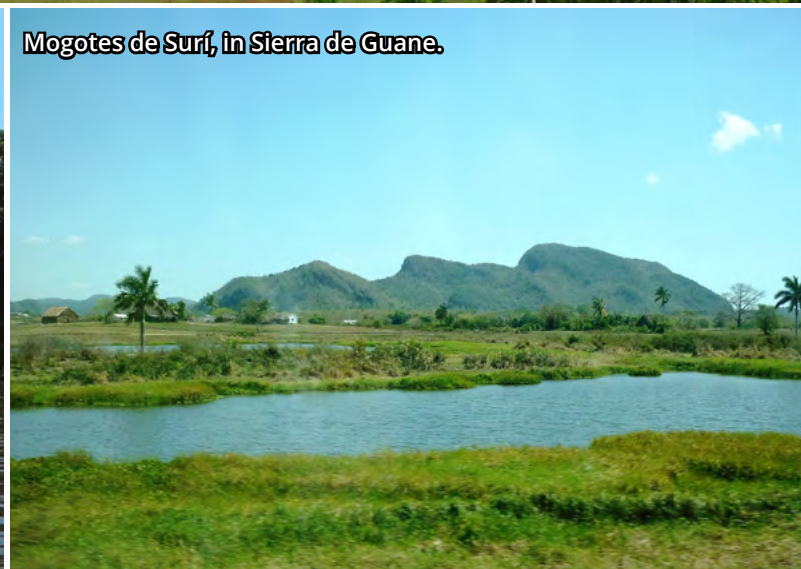




Mogotes del Valle de Viñales, is the most famous landscape of Cuba. Habitat type of *L. assurgens*.



Mogotes of Paso Real in Guane, seen from the Cuyaguaje River, typical habitat of *L. ekmanii*.



Mogotes de Surí, in Sierra de Guane.

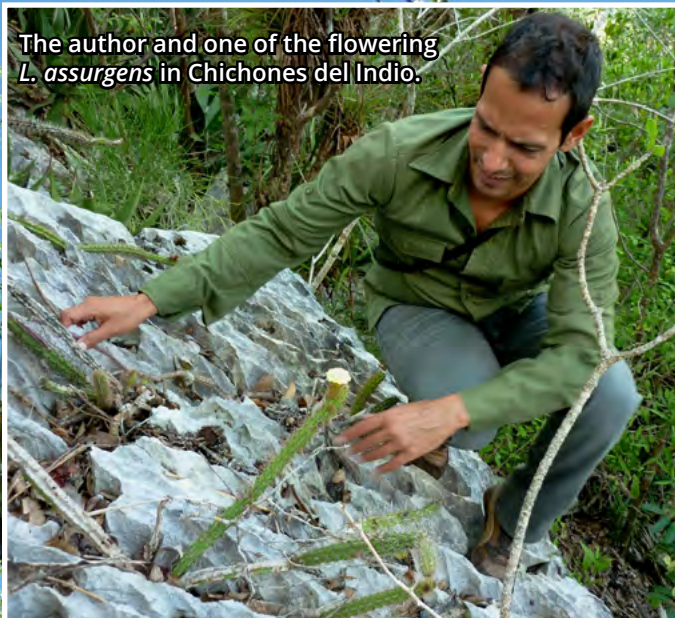
Leptocereus assurgens (Wr. Ex Griseb) Britton & Rose was the first to be described and has the largest distribution area in mogotes of the Viñales municipality. The Valley of Viñales (near the northern slate heights) and the mountains that surround it are recognized as National Park and National Monument, receiving by Unesco the category of Cultural Landscape of Humanity and Natural Heritage of Humanity, it is a site very visited by tourists. Specimens of *L. assurgens* are reported in altitudes between 200 and 360 meters above sea level, in Pan de Azucar, Vigil mogote, Pita mogote and Chichones del Indio mogotes, Barrios & González-Torres (2015). There are also sightings of *L. assurgens* on the slopes of the mogote of the Cueva del Indio in the San Vicente Valley (com per Y. Magdaleno), this is the most north-eastern town reported.

Distribution of the species of *Leptocereus* described for the Sierra de los Organos in Pinar del Río.

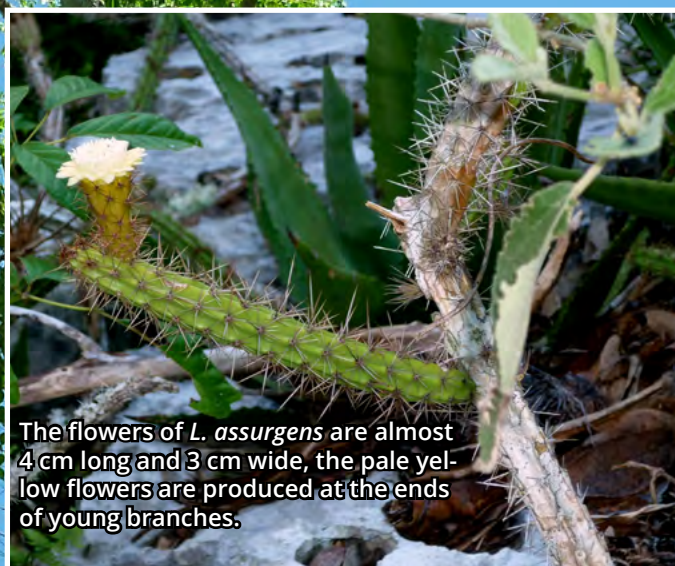
- L. assurgens*.
- L. postratus*.
- L. ekmanii*.



The author and one of the flowering *L. assurgens* in Chichones del Indio.



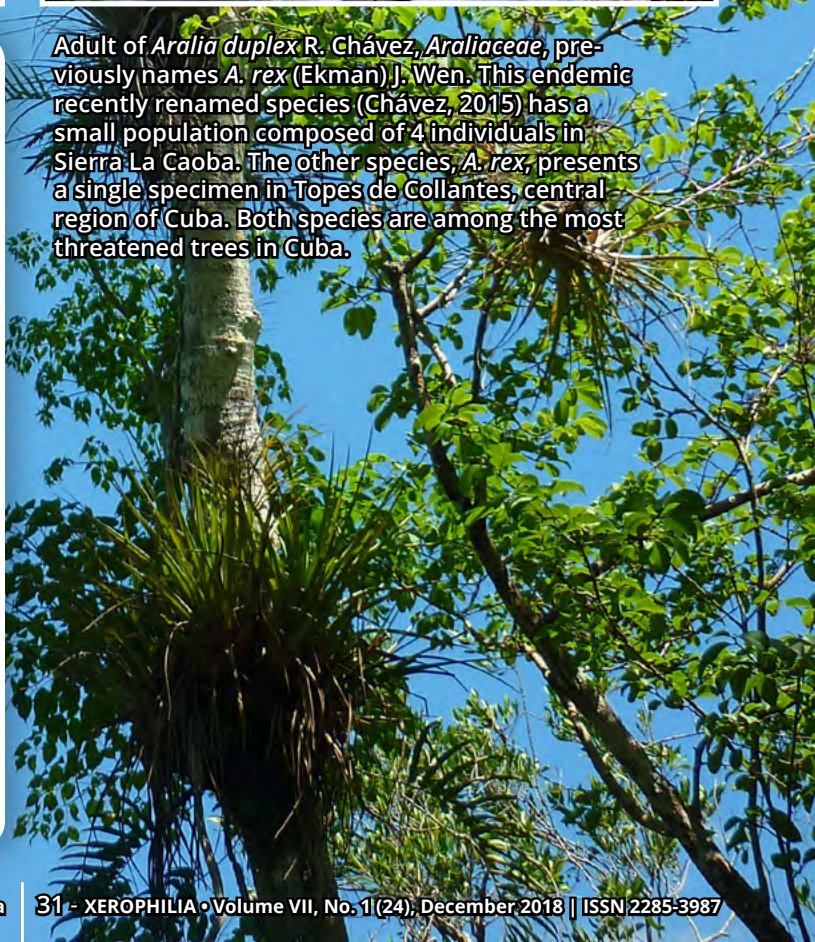
L. assurgens in Chichones del Indio.



The flowers of *L. assurgens* are almost 4 cm long and 3 cm wide, the pale yellow flowers are produced at the ends of young branches.

The most important visit to these habitats was in the mogotes of Chichones del Indio and Sierra La Caoba. Together with Ramiro Chávez, who had located this new population of *L. assurgens* when he was doing prospecting work on *Microcycas calocoma* and *Aralia duplex* (Chávez, 2015), both endemics and botanical jewels of the region. The new location gave us the pleasure of finding some *L. assurgens* in full bloom. The mounds Chichones del Indio are located in the Sierra de Pons, outside the protected area of Viñales Park, however the state of conservation of the flora is magnificent. For several days in the company of Duniel Barrios we made a strenuous ascent to several mogotes in search of more plants of *L. assurgens* but without much success. When measuring the height with the GPS in the scaled mogotes, we realized that when passing the height of 380 meters the vegetation that usually accompanies *L. assurgens* in lower altitudes is not present, and we never find *Leptocereus* above that level.

Adult of *Aralia duplex* R. Chávez, *Araliaceae*, previously names *A. rex* (Ekman) J. Wen. This endemic recently renamed species (Chávez, 2015) has a small population composed of 4 individuals in Sierra La Caoba. The other species, *A. rex*, presents a single specimen in Topes de Collantes, central region of Cuba. Both species are among the most threatened trees in Cuba.





The old and necrotic stems can be viable and emit new branches with very long yellow spines, different from *L. ekmanii*.



Daniel Barrios (left) and Ramiro Chavez (right) with *L. assurgens* after a long search.



Flower detail of *L. assurgens*.



New locality for *L. assurgens*, Mogotes de la Cueva del Indio in Valle de San Vicente.

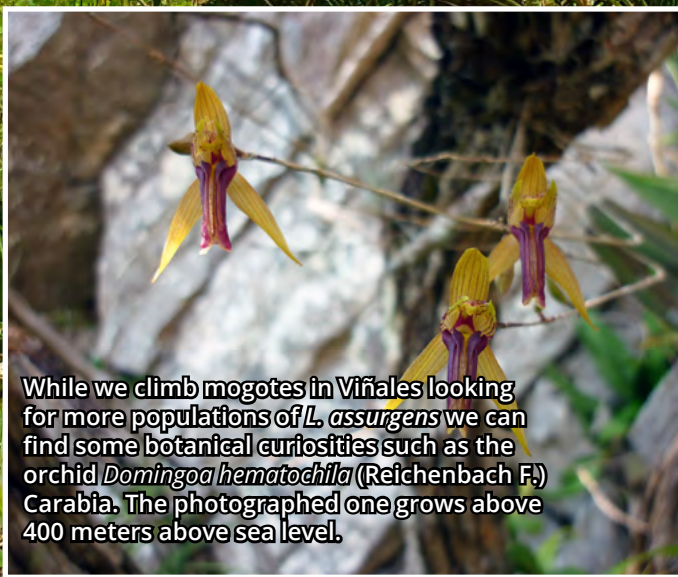
These very fragmented populations have very few juveniles and some of these can be derived from broken cuttings. There are localities where flowers and fruits were not observed, even though they were in reproductive season. In Barrios 2015 it is indicated that *L. assurgens* has a high probability of extinction. Although its habi-

tat is preserved and there is no human pressure, it is likely that the reduction of its individuals is favored by natural factors occurring in its original habitat, such as the change from arid to wetter conditions, competition with fast-growing species that tend to form dense colonies that currently occupy their ecological niche as *Selenicereus grandiflorus* (L.) Britton & Rose and also because their self-incompatible reproductive system hinders the formation of sexual offspring as population numbers decrease, which causes a genetic aging of the populations.



Tillandsia

Microcycas calocoma



While we climb mogotes in Viñales looking for more populations of *L. assurgens* we can find some botanical curiosities such as the orchid *Domingoa hematochila* (Reichenbach F.) Carabia. The photographed one grows above 400 meters above sea level.

The living fossil *Microcycas calocoma* (Zamiaceae) has a good population in Los Chichones del Indio, together with *Agave tubulata* subsp. *brevitiba* A. Álvarez, *Tillandsia* and *L. assurgens*.


L. assurgens.

Agave tubulata subsp. *brevitiba*

Agave tubulata subsp. *brevitiba*

summary→

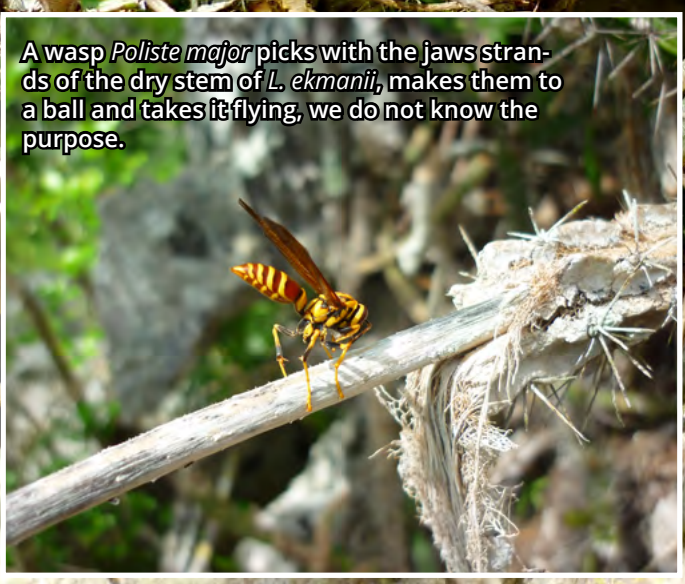
The second most represented species is *L. ekmanii* (Werderm.) F.M.Knuth. Their specimens are distributed at altitudes of 30 - 60 meters above sea level, facing south in the last mogotes west of the Sierra de los Órganos, specifically in the mogotes of Paso Real and mogotes de Surí. These elevations called Sierra de Guane are very close to the slate heights of the south, structurally separated from the mogotes of Viñales and surrounded by an important cut-off point, however the difference in vegetation between dry and rainy periods is remarkable.



The new shoots of *L. ekmanii* are different in number of ribs, areolas shapes, size and color of the spines (Barrios, 2015).

First photo of *L. ekmanii*, in 2011 in Los Portales, the location of this population had an impact on clarifying the taxonomic position in respect to *L. assurgens*.

summary→



A wasp *Poliste major* picks with the jaws strands of the dry stem of *L. ekmanii*, makes them to a ball and takes it flying, we do not know the purpose.



Detail of the flower of *L. ekmanii*.

The tiny bright yellow flowers of just over 2 centimeters remain open after 2:00 pm.

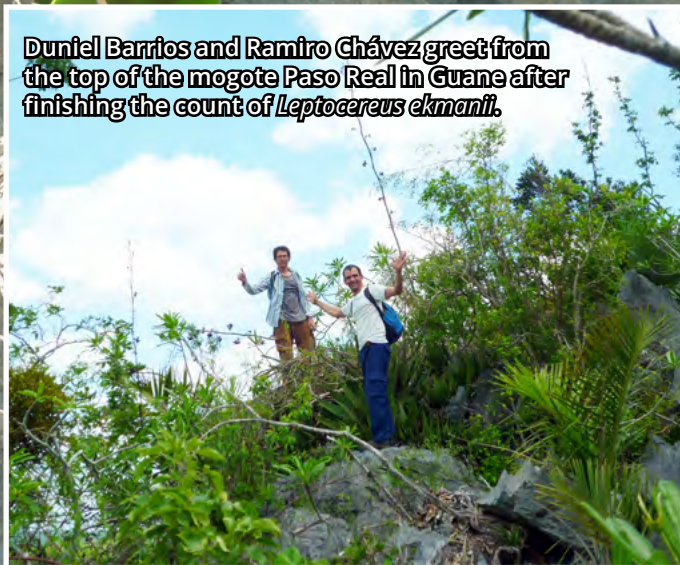
It is very possible that the town of Paso Real is the type locality reported in the year 1924 by Ekman (Werdermann, 1931), given the case that *L. ekmanii* grows more exposed to the Sun than *L. assurgens*. Getting to this place is very easy and it is done from the campsite Salto de los Portales, although locating *L. ekmanii* took 3 days of searching during my first visit in 2011. The place is very picturesque; the flora is abundant in orchids, bromeliads and palms. In 2015 I guided Duniel Barrios to this site in order to take samples, being surprising the large number of flowers and fruits on the *Leptocereus*.



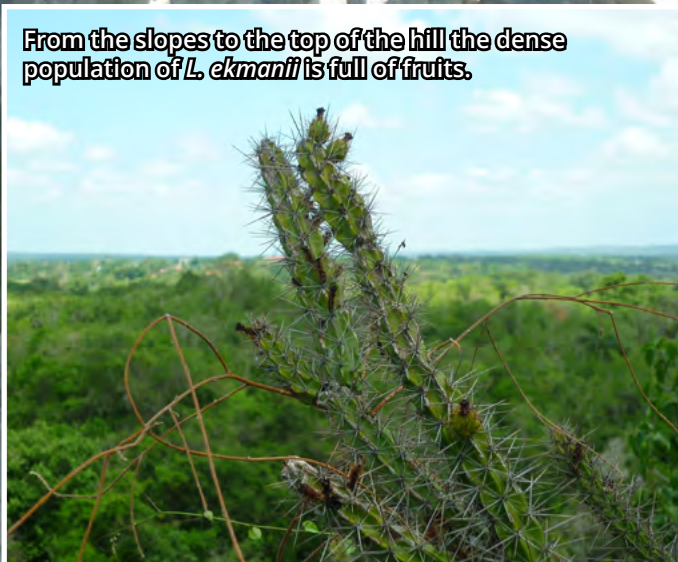
L. ekmanii in the sharp limestones of mogotes of Surí next to a trunk of *Gaussia princeps* and juveniles of *Agave tubulata* subsp. *brevitiba*.

My last visit was made in June of 2017 to visit the mogotes of Surí, this new locality for *L. ekmanii* was notified by Yohans Magdaleno. To access the mogotes of Surí it is necessary to cross the Cuyaguateje River in a boat, the ascent is very contrasting from a gallery forest to a xerophytic scrub. Almost at the top the specimens of *L. ekmanii* grow scattered in patches of dozens of individuals. Its small yellow flowers and fruits make it very recognizable. Although juveniles are not common in this species, populations of *L. ekmanii* are denser than *L. assurgens*. Perhaps its partially diurnal flowers (remain open until after noon) make the visit of other pollinators influence the success of greater fruit production. The threat to this species comes from the fire that the campers make near the mogotes in Los Portales.

Daniel Barrios and Ramiro Chávez greet from the top of the mogote Paso Real in Guane after finishing the count of *Leptocereus ekmanii*.



From the slopes to the top of the hill the dense population of *L. ekmanii* is full of fruits.



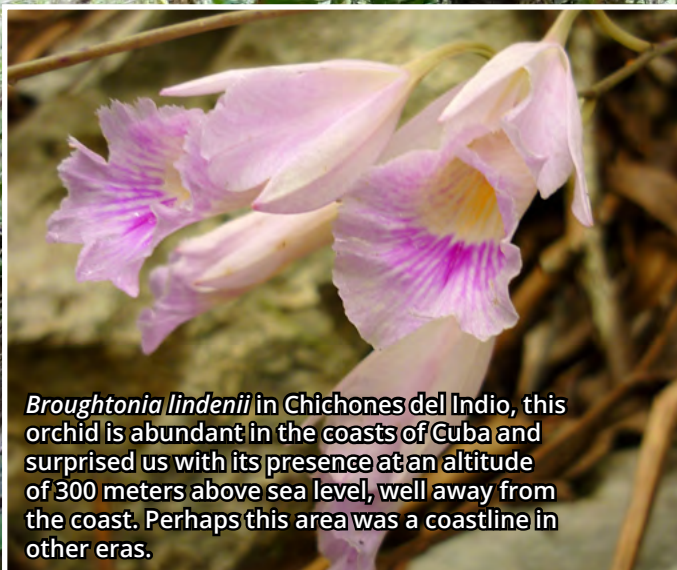
The new population of *L. ekmanii* in mogotes of Surí.



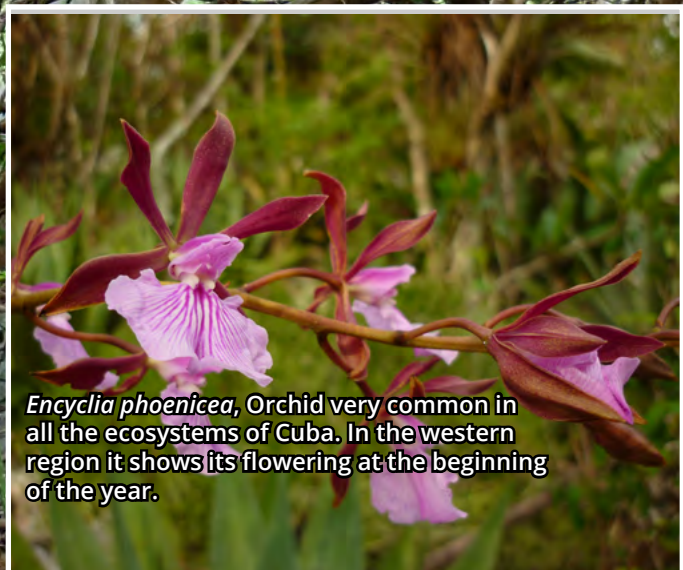
Leucothrinax morrisii (H. Wendl.) C. Lewis is another palm of the mogotes and evergreen forests, micronophiles, it is very abundant and its distribution includes the United States, the British Virgin Islands, Puerto Rico and the Dominican Republic.



Gaussia princeps, Arecaceae, grows on the rocky walls is an endemic to the mogotes.



Broughtonia lindenii in Chichones del Indio, this orchid is abundant in the coasts of Cuba and surprised us with its presence at an altitude of 300 meters above sea level, well away from the coast. Perhaps this area was a coastline in other eras.



Encyclia phoenicea, Orchid very common in all the ecosystems of Cuba. In the western region it shows its flowering at the beginning of the year.



There is another *Leptocereus* described for this area of western Cuba, it is *L. postratus*, this grows on humus in cracks of limestones, at altitudes between 200 and 250 meters above sea level, in the mogotes of Sumidero of the municipality Minas de Matahambre. It was also the last reported by Britton and Rose in 1920. *L. postratus* grows 14 kilometers in a straight line from the nearest population of *L. assurgens* in Pons and 31 kilometers from *L. ekmanii* in Los Portles. A single population is known, but there are several mogotes in the surroundings that are still unexplored. These mounds of Sumidero are separated by valleys of the limestone formations of the northeast and the southwest, from them the Cuyaguaje River arises.

The supposed *L. postratus* dominates from the heights of a mogote the town of Sumidero.



The young stems of *L. postratus* are similar to those of *L. assurgens*.

My friend Johans climbed and managed to photograph the *Leptocereus* that grow there, but in the absence of flowers and fruits we have not been able to determine if it belongs to any of its neighboring species, since *L. postratus* grows between both populations or is a properly distinct species. Observing the features of the young stems, these are similar to those of *L. assurgens*.

The proximity of three species of *Leptocereus* in the Sierra de los Órganos), with similar vegetative characteristics added to the lack of studies on these, made them recognized as *L. assurgens* in (Hunt et al 2006). In addition, there are no previous works that record the vegetative traits, including the original descriptions that also do not provide many details in this regard. Only Areces (2003) mentions that the flowers of *L. ekmanii* are smaller without providing further details.

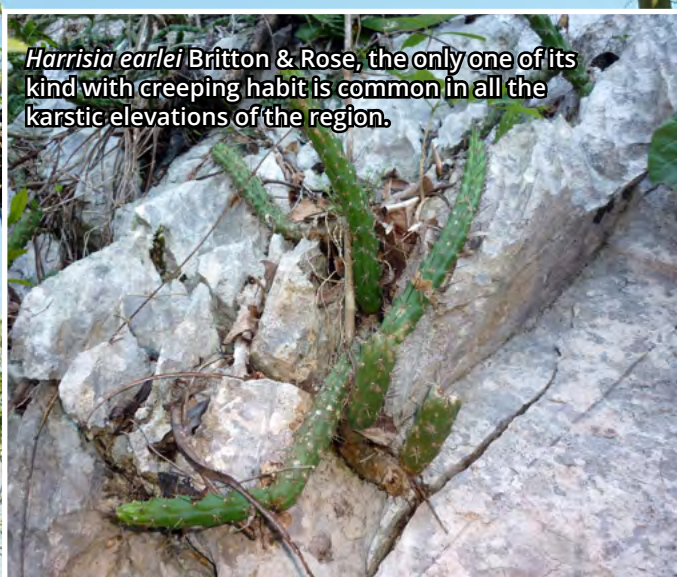


From the mogotes of Sumidero we can observe the Sierra de Pons, which is habitat of the nearby *L. assurgens*.

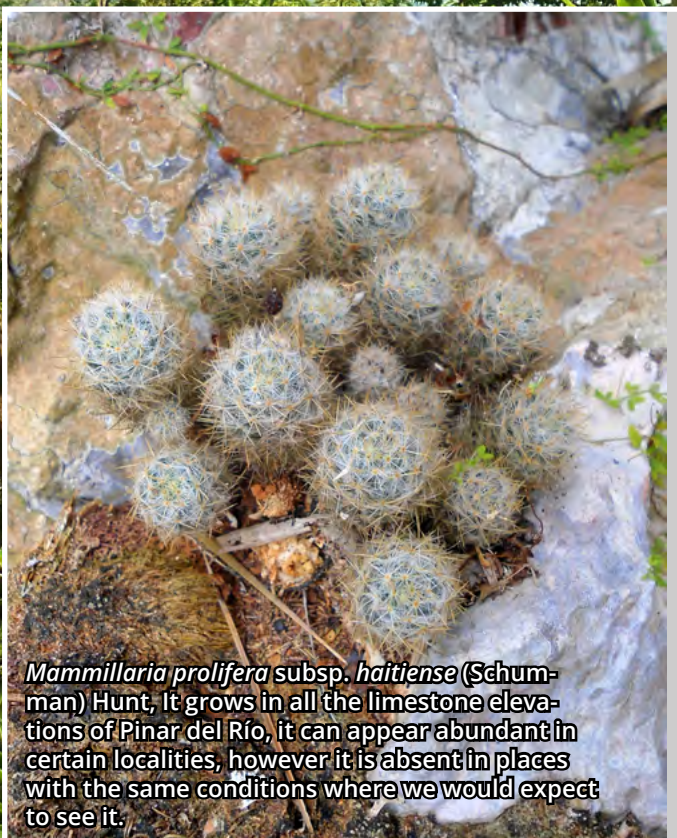
However, after these explorations and the analysis of the samples, they resulted in the study that managed to separate *L. assurgens* from *L. ekmanii* (Barrios, 2015). For the first time flowers and fruits of both species and certain different morphological aspects in the forms of the areolas, stems and number of ribs that some collectors had already noticed are detailed for the first time. There are still missing those details about *L. postratus* to make final considerations, so we have to make new visits to Sumidero. And of course the genetic confirmation, still in process, that could give the definite specific location of these taxa.



Bromeliads grow in large clumps in the wooded hills of vine yards.



Harrisia earlei Britton & Rose, the only one of its kind with creeping habit is common in all the karstic elevations of the region.



Mammillaria prolifera subsp. *haitiense* (Schumman) Hunt, It grows in all the limestone elevations of Pinar del Río, it can appear abundant in certain localities, however it is absent in places with the same conditions where we would expect to see it.



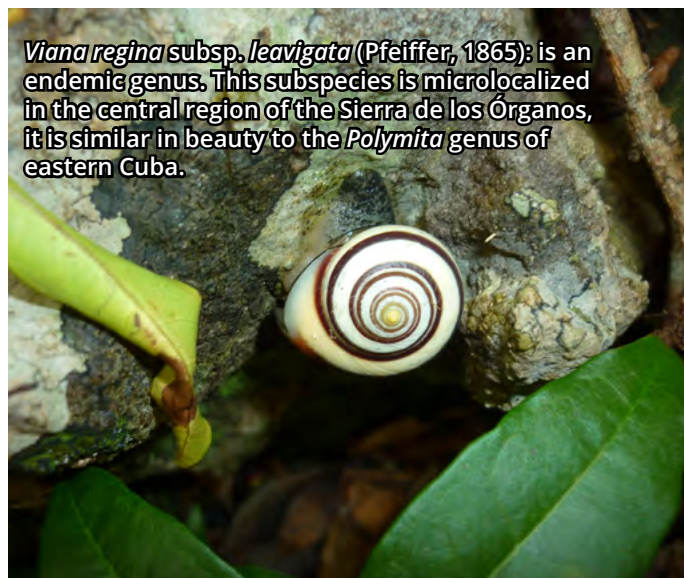
Bombacopsis cubensis = *Pachyra cubensis* (A.Robyns) Fern.Alonso *Bombacaceae* with thick green pieces and leaves at the ends of the branches makes its way through the hard rock both on the slopes and on the top of the mogotes.



Chondrothyrella pudica (D'Orbigny, 1842) micro-localized on the north side of Pan de Guajaibón, Pinar del Río. It is recognized by the edge of the yellowish cream peristoma.



Tomelasmus irroratus (Gundlach, 1856) has a wide distribution in mogotes, lives in limestone walls in the dry season or associated with cacti and small bushes.



Viana regina subsp. *leavigata* (Pfeiffer, 1865): is an endemic genus. This subspecies is microlocalized in the central region of the Sierra de los Órganos, it is similar in beauty to the *Polymita* genus of eastern Cuba.

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We especially thank our friend **Juan Daguerre**, from Cuba, for his help and dedication in obtaining this article for *Xerophilla*.



Emoda sagraiana (D'Orbigny, 1842), the only representative of that genus in the western region of Cuba.

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Zachrysia guanensis subsp. *castanea*: this giant lives in the leaf litter at the foot of the mogotes, is possibly the largest of its kind with about 6 centimeters in diameter in its shell, its meat is edible. Of course, we let him go his way!

Echinofossulocactus or *Stenocactus*



J. Záhora
P. Najera Quezada
J. L. Flores Flores
J. Morales

Photos by J. Záhora & P. Najera Quezada



Fig. 1 *Echinofossulocactus multcostatus* (Nuevo León) - a typical characteristic of plants from this genus is a presence of numerous narrow and wavy ribs and nice flowers.

This article is dedicated to the chronological description of important records or events that have occurred in the past with regards to the generic names *Echinofossulocactus* and *Stenocactus*. A typical characteristic of plants from this genus with these competing names is the presence of numerous (up to 141 in the case of *E. multi-*

costatus) narrow and wavy ribs and attractive flowers (Fig. 1), often with darker central strips. Spines are essentially of two types: the upper ones robust, longer, and the lower or radial, smaller and often a little transparent.

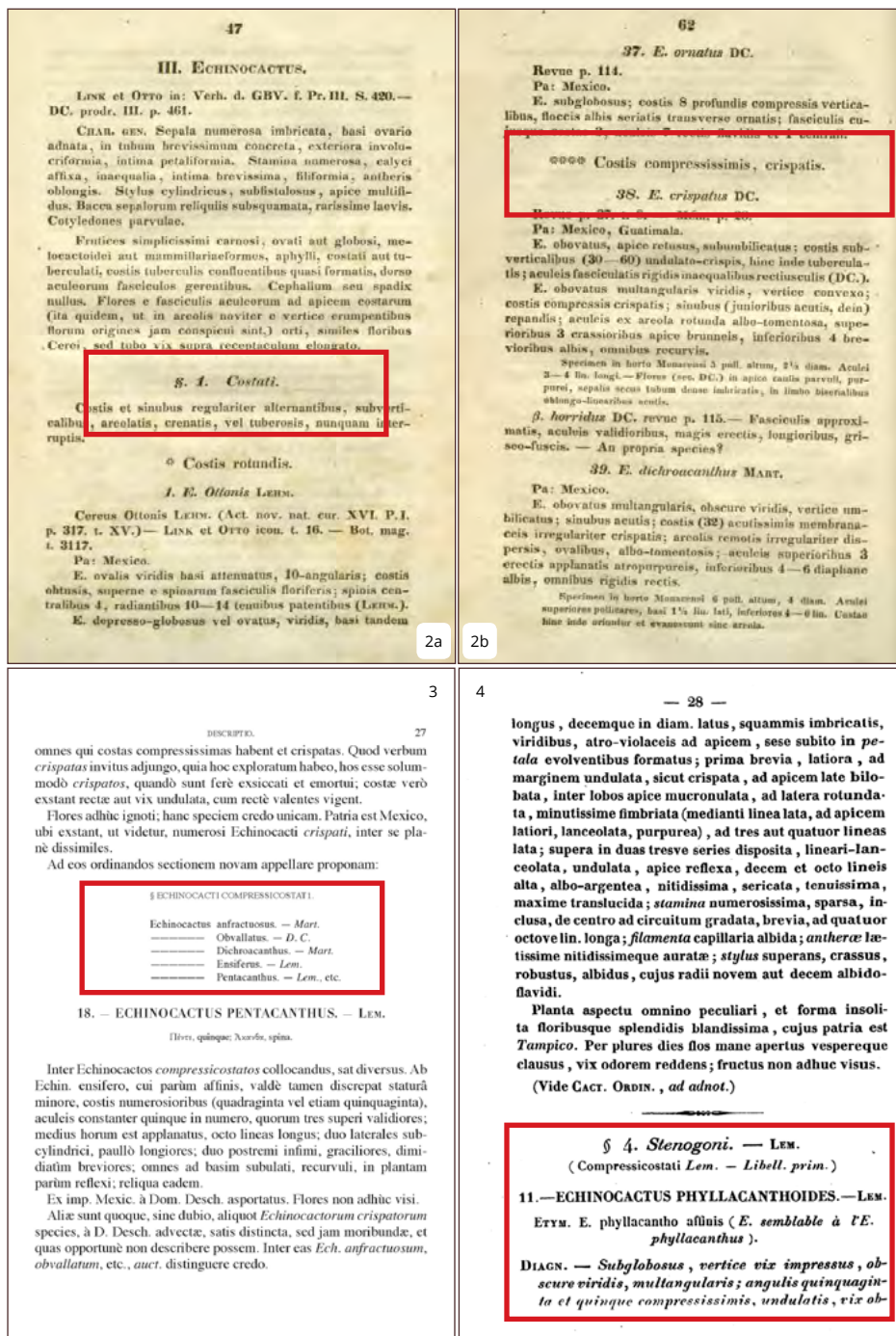


Fig. 2a - Clippings from Pfeiffer´s publication "Enumeratio diagnostica cactearum hucusque cognitarum" (Pfeiffer, 1837, page 47); „§.1. Costati”;

Fig 2b - Clippings from Pfeiffer´s publication "Enumeratio diagnostica cactearum hucusque cognitarum" (Pfeiffer, 1837, page 62): „**** Costis compressissimis, crispatis”.

Source: BHL/Biodiversity Heritage Library/.

Fig. 3 - Clipping from Lemaire´s publication "Cactearum aliquot novarum ac insuetarum in horto Monvilliano cultarum accurata description", (Lemaire, Paris, 1838, page 27), showing: "§ ECHINOCACTI COMPRESSICOSTATI”.

Fig 4 - Clipping from Lemaire´s publication "Cactearum genera nova speciesque novae et omnium in horto Monvilliano cultarum ex. affinitibus naturalibus ordinatio nova indexque methodicus", (Lemaire, Paris, 1839, page 28), showing: "§ 4. Stenogoni Lem.”

Source: BHL/Biodiversity Heritage Library/.

Prior to 1841, the plants belonging at the present time to the genus *Echinofossulocactus* Lawr. have been included in the genus *Echinocactus*. The physician Ludovico Pfeiffer was in 1837 perhaps the best oriented in this group of plants, which has he proven it in the publication dealing in details with diagnosis of the then known species of *Echinocactus* (*Enumeratio diagnostica cactearum hucusque cognitarum*). Within the genus *Echinocactus* constituted the group with ribs, "§.1. Costati" (Fig. 2), and within this group the fourth subgroup indicated by four stars, whose ribs should be more compressed and wavier against the others (**** Costis compressissimis, crispatis) (Fig.2a and 2b) with the sense for morphological features included he in this subgroup following species: *Echinocactus crispatus*, *E. dichroacanthus*, *E. anfractuosus*, *E. obvallatus* and

E. phyllacanthus.

However, L. Pfeiffer did not have to deal with the classification of *E. coptonogonus*, since it was described by C. Lemaire a year later, together with two other species, *Echinocactus ensiferus* and *E. pentacanthus* (Lemaire, 1838). Although C. Lemaire was a botanist, he included *E.coptonogonus* Lem. as other species of the genus *Echinocactus* (according to his own remark without the observation of floral characteristics), not together with *E. ensiferus* Lem. and *E. pentacanthus* Lem. into a group that according to Pfeiffer, he described as: "ECHINOCACTI COMPRESSICOSTATI" (Fig. 3). In 1839 C. Lemaire changed the designation of this group to „§ 4 Stenogoni. - Lem. (Compressicostati - Lem. Libell. Prim.)" (Fig. 4) and described three other new species: *Echinocactus phyllacanthoides* Lem., *E. grandicornis* Lem. and *E. tetracentrus* Lem..

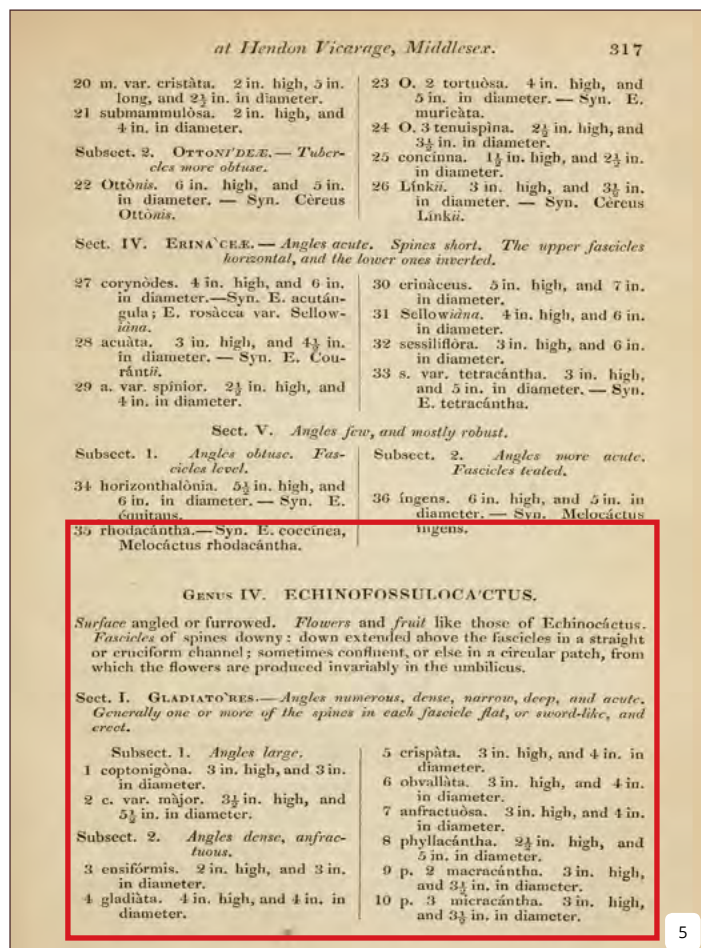


Fig. 5 - Characteristics and organization of the section I. Gladiatores en el género *Echinofossulocactus*, published by George Lawrence in "Loudon's Horticultural Magazine" from 1841, page 317.

Source: BHL / Biodiversity Heritage Library.

Shortly thereafter, in 1841, English gardener George Lawrence published in Loudon's Gardeners' Magazine the Catalogue of the cacti from the collection of his employer, the Reverend Theodore Williams of Vicarage Hendon, Middlesex (Lawrence, 1841). There we can find the generic name *Echinofossulocactus* (Fig.5) (Lawrence, 1841). Later uncertainties concerning the validity of the generic name which are appearing from time to time come mainly from the too broad original concept of the genus. Specifically, G. Lawrence has divided the genus into three sections, of which only the first section labelled "Gladiatores" corresponds to the genus *Echinofossulocactus* in today's concept, including also *E. coptonogonus* Lem. [unlike as it was presented in the concept of C. Lemaire, (1839)]. Plants from the second section correspond to today's concept of *Ferocactus* (Fig. 6).

The remaining third section includes species with very different characteristics, and its representatives are currently included into five genera; *Echinocactus*, *Ferocactus*, *Thelocactus*, *Astrophytum* and *Strombocactus* (Heath, 1989).

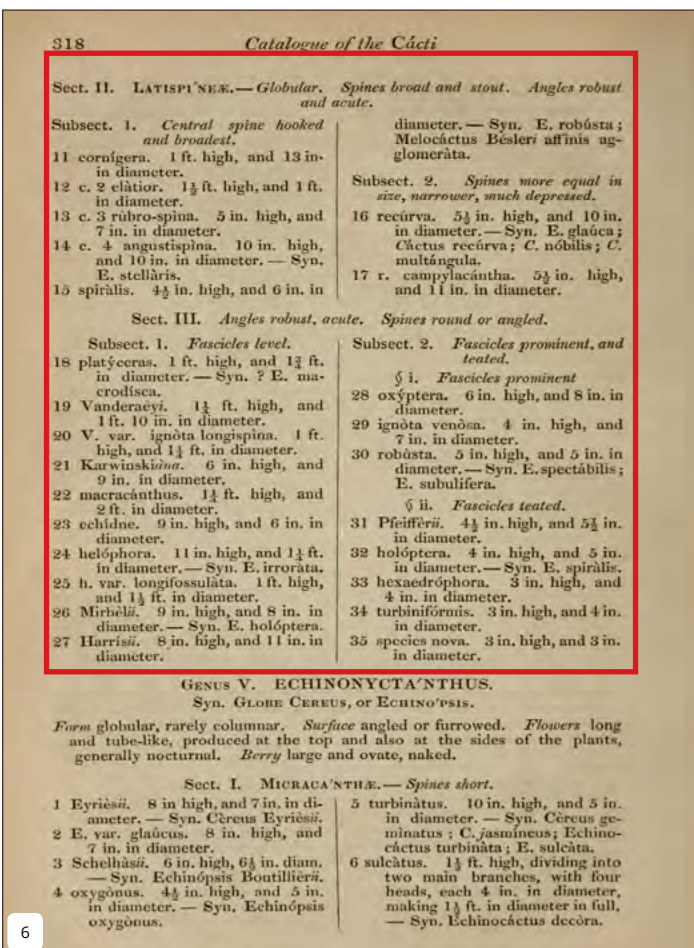


Fig. 6 - Characteristics and organization of the section II. Latispineae and of the sección III. in the genus *Echinofossulocactus*, published by George Lawrence in "Loudon's Horticultural Magazine", 1841 page 318.

Source: BHL / Biodiversity Heritage Library.

The origin of the botanical name *Echinofossulocactus* from George Lawrence (1841) derives from the Latin "fossula", which reflects a little furrow or channel above the areoles from which flowers and fruits are growing (Fig. 7-15). And this is again a complication, because this sign has common presence in plants of several genera, so it can be only hardly used to reliably identify the plants corresponding to the genus *Echinofossulocactus* in today's concept. Next complication is that G. Lawrence did not designate a type species.

Karl Moritz Schumann, one of the greatest cactus-authorities of the late 19th century, did not know or perhaps did not want to know the genus *Echinofossulocactus* described by G. Lawrence. For this group of plants he established the subgenus *Stenocactus* in the genus *Echinocactus* (Schumann, 1898). K. Schumann referred at that to an earlier Lemaire's label for the subgenus "Stenogoni Lem.". Botanical name *Stenocactus* was derived from the Greek adjective "stenos" (narrow), which is a reference to thin, narrow and numerous ribs.



Fig. 7 - "Fossula", a little furrow above the areola, from which the areolous wool flower and fruit are growing, here on the example of *Echinofossulocactus coptonogonus* (San Luis Potosí).



Fig. 8 - "Fossula" on *Echinofossulocactus dichroacanthus* (Querétaro).

In 1922, the American botanists Nathaniel Lord Britton and Joseph Nelson Rose created a separate genus from the first Lawrence's section of "Gladiatores", which they named *Echinofossulocactus* with respect to the priority of the description (Britton and Rose, 1922). As a type plant they chosen the first species listed by Lawrence, *E. coptonogonus*, which is not typical for most members of the newly delimited genus. N. L. Britton and J. N. Rose followed the American Code of Botanical Nomenclature, of which N. L. Britton was the leading proponent.

Such typification was at that time permitted by the Code.

Carlos Spegazzini suggested in 1923 that, the itinerant name *Echinofossulocactus* should be kept in oblivion due to an hybrid origin and extremely length pronunciation, exactly lawless, therefore to be rejected (*hybridum et sesquipedale, prorsus exlex, ideo rejiciendum*), and replaced it with the name *Brittonrosea* Speg. "in honor of valiant monographs" (Spegazzini, 1923). Later, in 1926, C. Orcutt, apparently unaware of Spegazzini's publication, proposed the abbreviation *Efossus*, and specifying *E. cop-tonogonus* as the type in accordance with Britton and Rose's choice of lectotype (Orcutt, 1926).

Although K. Schumann ignored the earlier existence of the generic name *Echinofossulocactus*, and his name *Stenocactus* has been established for sub-generic level, it has been spreading due to its easy pronouncement and adherent designation. The first use of the *Stenocactus* name at the generic level is usually attributed to A. Berger (Berger, 1929). But in his work he did not strictly differentiate between the levels of the genus and subgenus. So the first authors, who used the name *Stenocactus* unambiguously for the genus denomination, were C. Backeberg and F. M. Knuth (Backeberg et Knuth, 1935). They were followed in 1937 by Helia Bravo and J. Borg, and in the manual for amateur collectors "Cactaceae" in 1941 jointly by W. Marshall T. and T. M. Bock. However, increasing respect to the International Code of Botanical Nomenclature has led to changes in the view of the correct use of the *Stenocactus* name. This has led in 1961 to acceptance of generic name *Echinofossulocactus* sensu Britton & Rose by such authors as Backeberg (Backeberg, 1961) and in the following year by F. Buxbaum. To the name *Echinofossulocactus* Helia Bravo returned in 1969, J. Meyran in 1972 and, in 1979, also N. Taylor, in



Fig. 9 - Despite the unsolved taxonomic questions are *Echinofossulocactus* populations sometimes very rich due to the enormous adaptability to the conditions of bare soil. Illustrative photo from the locality of the sprouting form of *E. dichroacanthus* (near Ixtlahuaca, Querétaro).

the taxonomic work that strongly reduces the number of species („A Commentary on the genus *Echinofossulocactus* Lawr."; Taylor, 1979).

In 1980, David Richard Hunt tried to revive the ancestral name *Stenocactus* in the somewhat biased article "Decent re-burial for *Echinofossulocactus* Lawr." (Hunt, 1980), in the fourth issue of the Cactus and Succulent Journal of Great Britain, which he edited together with Nigel Taylor. The essence of his article is the establishment of a new lectotype from the complex of the plants that G. Lawrence ranked in the genus *Echinofossulocactus*.

Echinofossulocactus phyllacanthus.

According to D. Hunt corresponds to the Lawrence's brief description of the genus, namely the presence of "fossula" principally *E. helophorus* (LEM). Lawr., thereby he has replaced the original lectotype of *E. coptonogonus* (LEM). Lawr. selected by N. J. Britton & Rose. *E. helophorus* is the taxonomic synonym for *Echinocactus platyacanthus* Link & Otto in a broader sense and also a lectotype species for the genus *Echinocactus* Link & Otto. D. Hunt continues with a description of the historical development of the taxonomic concept by individual authors and at the end of the article, on the basis of newly established lectotype and the invalidation of the name *Echinofossulocactus* Lawr., he is considering about suitable replacement of a name for the genus. He states that the oldest appropriate designation corresponding to the genus level of the genus *Echinofossulocactus* according to the concept in the N. Britton & J. Rose is *Brittonrosea* Spegazzini (1923). But this name was not accepted, and so D. Hunt recommends in the conclusion of his article to submit a proposal in order to legitimize the name *Stenocactus*, if this group would to remain at the generic level. For illustration, it may be useful to quote the English botanist D. Hunt as commenting on the activities of American colleagues in this article: „Britton & Rose duly exhumed *Echinofossulocactus*, ..." or „Recognition and surgery by the American mon-

ographers did not immediately revive their dismembered dinosaur." In the same journal and in the same issue, and even in the following article titled "*Ferocactus* and *Stenocactus* united", his author Nigel Taylor appreciated that D. Hunt has invalidated the generic name *Echinofossulocactus* Lawr, thereby "unlocking" this group of plants for further systematic modifications, enabling him to classify *Stenocactus* to the level of the subgenus of the genus *Ferocactus* (Taylor, 1980). At first sight the articles from D. Hunt and N. Taylor act as a bad joke, as a concentrated effort to deal with the undulated ribs once and for all. But by reading more closely, we can find that N. Taylor only continues in his earlier effort to systematically organize the genus *Ferocactus* in a broader sense (Taylor, 1979a), outgoing from the concept of the *Echinocactus* genus presented by K. Schumann (1898) which he modifies and thus defines against the concept of the genus *Echinocactus* according to N. Britton & J. Rose (1922) and K. Backeberg (1961). For the supporter of the generic concept of *Echinofossulocactus*, he points underlining the invalidity of the *Stenocactus* name for the genus and prefers the valid but little-known generic name of *Brittonrosea* Spegazzini (1923). He advocates the unification of *Echinofossulocactus* with *Ferocactus* by a striking similarity of *E. coptonogonus* with *ferocacti* (Taylor, 1980).



Echinofossulocactus dichroacanthus.



Fig. 10 - Invisible "fossula" due to very broad upper spines in the case of the *Echinofossulocactus phyllacanthus* (San Luis Potosí).

To what extent was N. Taylor dealing with the genus *Echinofossulocactus*, we can sense from the rapid changes in the author's opinion about the further subdivision of *Echinofossulocactus* into individual species. In 1979, N. Taylor reduced the number of species in the genus *Echinofossulocactus* to six: *E. coptonogonus*, *E. crispatus*, *E. multicostatus*, *E. phyllacanthus*, *E. sulphureus*, *E. vaupelianus*. According to the author's own expression he made it "with ruthless attitude" (Taylor, 1979b). Already in the following year N. Taylor admits the existence of only four species by classifying *E. multicostatus* and *E. sulphureus* into the all-embracing species of *E. crispatus* (Taylor, 1980). The author's remark that "the systematic position of the Stenocacti is more easily settled than the question of how many species this group should comprise" (Taylor, 1980), can also be illustrative to the reader.

One year later, David Hunt (1981) concedes his mistake formulated at the conclusion of his previous article (Hunt, 1980). Namely, that the oldest available name for *Echinofossulocactus* sensu Britton & Rose is *Brittonrosea* Spegazzini (1923), and therefore he has at that time recommended to submit the proposal to legitimize the name *Stenocactus* if that group will be maintained as a genus. Appointed mistake with the proposal justified he by overlooking the Article 63.1 of the International Code for Botanical Nomenclature (1978 edition) which he interpreted in such a way, that *Brittonrosea* Speg. (1923) was in fact already illegitimate when published because it was nomenclaturally superfluous and remains so in spite of the relectotypification of *Echinofossulocactus*. The invalidation of the name *Brittonrosea* Speg. (1923) leads D. Hunt to conclusion that the name *Stenocactus* K. Schum. is a legitimate name at both generic or sub-generic level, and that there is no need to make any proposal for legitimization it. In the last sentence of this short article (only three paragraphs) D. Hunt reminds that "the lectotype species as designated by Taylor (in CSJGB 42(4): 107, 1980), is *Echinocactus crispatus* DC".

Echinofossulocactus phyllacanthus



Fig. 11 - Well developed "fossula" on another *Echinofossulocactus phyllacanthus* (San Luis Potosí).

D. Hunt's conclusion, that there is no need to submit any proposal to legitimize the name *Stenocactus* K. Schum., was not respected. In 1982, W. L. Tjaden submitted a proposal to the Committee for Spermatophyta in order to conserve the name *Stenocactus* (K. Schum.) Berger (1929) over *Echinofossulocactus* Britton & Rose (1922) and other generic names (Tjaden, 1982). W. J. Tjaden has gathered arguments that in his opinion demonstrate, on the basis of an "incidental mention", under Articles 34.1 and 34.3 of the Botanical Code, the invalidity of Lawrence's name for the genus *Echinofossulocactus*. As arguments he used Lawrence's too broad concept of the genus, sub-generic division into sections and even sub-sections, some inexactness like misspellings etc. Supposed invalidity of the Lawrence's name and the convenience of the Schumann's sub-generic name *Stenocactus* to the actual users are, according to Tjaden's

opinion, good reasons to submit the proposal to legitimize the name *Stenocactus* (Tjaden, 1982).



Echinofossulocactus multicostatus with 144 ribs, La Muralla, Coah.



Fig. 12- "Fossula" on the typ species *E. crispatus* (Oaxaca) from cultivation.



Echinofossulocactus ochoterenanus.



Echinofossulocactus coptonogonus.

Echinofossulocactus multicostatus, La Muralla, Coah.



The reaction to Tjaden's suggestion (Tjaden, 1982) did come soon. One year later, N. Tylor (1983) commented: "Stenocactus (Schumann) Berger (1929), based on *Echinocactus* sub-genus, *Stenocactus* Schumann (1898), is the only legitimate generic name for *Echinofossulocactus* sensu Britton & Rose (1922). The competing generic names *Brittonrosea* Speg. (1923) and *Efossus* Orcutt (1926) were both illegitimate when published and remain so. Valid publication of *Echinofossulocactus* should be credited therefore to Lawrence (1841). This name no longer competes with *Stenocactus* following its re-lectotypification by Hunt (1980), who rejected the earlier lectotypification by Britton and Rose as mechanical and hence arbitrary under the terms of Art. 8.1. Conservation of *Stenocactus* "is not required, nor is its retention at generic rank justified on taxonomic grounds".



Echinofossulocactus ochoterenanus.

The subsequent reaction by W. Tjaden in the next year (1984) was not a surprise. He referred to his earlier submission of the proposal to legitimize *Stenocactus* K. Schum. (Tjaden, 1982) and disproves Taylor and Hunt's interpretation (Taylor, 1983; Hunt, 1981). W. Tjaden correctly explained Art. 63.1 of the International Code (ICBN Art. 63.1; 1978), in which it is stated that for the automatic application of the words "nomenclaturally superfluous" (see. Hunt, 1981), the International Code requires the prior existence of a valid name. If the name *Echinofossulocactus* is held to be illegitimate, then Brittonrosea as the next valid name must be considered. Apparently disgruntled Tjaden criticized that: "Nomenclature does not seek to dictate taxonomic views".

Echinofossulocactus multicostatus, Laguna de Sánchez, N.L..

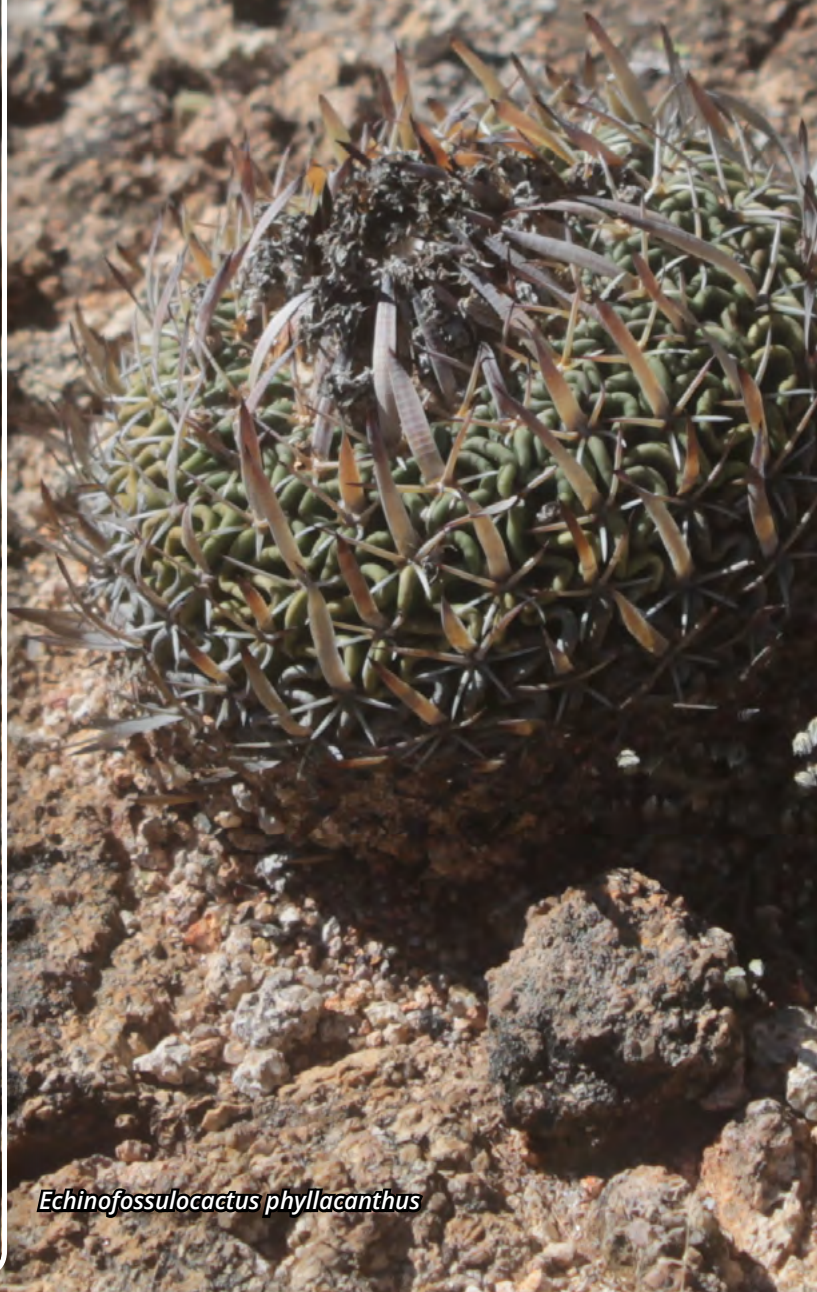


In this light, it sounds visionary even after 34 years, the short historical overview of the development of the generic name written by Jan Pechánek in up until the present only one monograph of this genus (Pechánek, J. 1984: Rod *Echinofossulocactus* Lawrence, Klub kaktusů *Astrophytum* Brno, pp. 95, ISBN: 3071-84): „Considering the impossibly long name of the genus (*Echinofossulocactus*), several attempts were made to rename it in its history. K. Schumann in Gesamtbeschreibung der Kakteen, 359, (1898), used for the subgenus VIII. of the genus *Echinocactus* the name *Stenocactus*. Spegazzini (A. Soc. Cient. Argent., 96, 89, (1923) used the name *Brittonrosea* and finally Berger (Kakteen, 244, (1929)) used Schumann's name for the subgenus to designate the genus. While the name *Brittonrosea* has completely failed, *Stenocactus* can still be found at Borg, in older works at H. Bravo and in common speech of cactus hobbyists. In his not quite accurate interpretation Hunt (Decent reburial for *Echinofossulocactus* Lawr., C. and S. J. of Great Britain, 42, (4), 105 - 107, (1980)) tried to de facto legally defend the validity of the name *Stenocactus*. His attempt, however, was not accepted in the world. Similarly, Taylor's unification in a single genus *Ferocactus* (*Ferocactus* subgenus *Stenocactus* (K. Sch.) NP Taylor comb. nov.; in: "Ferocactus and Stenocactus united", C. and S. J. of Great Britain, 42 (4), 108, (1980) was not accepted and the whole world continues to use the old designation *Echinofossulocactus* Lawr.". Tjaden's proposal to maintain *Stenocactus* (K. Sch.) Berger (1929) over *Echinofossulocactus* Britton & Rose (1922) and other generic names (Cactaceae) was in 1987 discussed by the Committee for Spermatophyta. The Committee has disagreed with the proposer in interpretation of some essential facts (e.g. that *Echinofossulocactus* was both invalid and illegitimate when published by Lawrence in 1841), and therefore with nomenclatural conclusions derived from them. A minimum of eight votes in favour is required for recommendation by this Committee that the proposal be accepted. The result of the final vote 2-9 against the proposal, may be largely based on member's opinions that conservation is not necessary (Brummit, 1987).

On the other hand this proposal has raised some nomenclatural questions, particularly in regard to Hunt's re-lectotypification of *Echinofossulocactus*. There is a disagreement among those concerned in nomenclature as to whether such a change of type is retroactive or dates only from the time the change is made.



Fig. 13 - Flower buds growing from "fossula" in the case of *Echinofossulocactus lamellosus* SB 111 (Hidalgo).



Echinofossulocactus phyllacanthus

Only if one accepts retroactivity, then the type of *Echinofossulocactus* has been *E. helophorus* since the name was published in 1841, and when Britton and Rose excluded this species and chose *E. coptonogonus* in 1922 in fact they published an illegitimate new name, *Echinofossulocactus* Britton & Rose. This would mean that if *Brittonrosea* Spegazzini, 1923 had been published as substitute for Britton and Rose's name while *E. helophorus* was excluded (which it was not) it would be legitimate. At this occasion the Committee members were invited to indicate what they considered to be the correct name for the genus at present. Seven members considered that *Stenocactus* is at present correct; one thought *Brittonrosea* is correct, and three thought *Echinofossulocactus* is correct. On the basis of this crazy opinion of the

members, the Committee Secretary Brummitt concluded that the majority view of the Committee is that, even if *Echinofossulocactus* were at present correct, it is a taxonomic synonym of *Echinocactus* currently typified by *E. helophorus*, and so the name *Stenocactus* should be used for the genus currently known by this name (Brummitt, 1987).

In 1989, P. V. Heath in exaggeration asked in his comprehensive article "The question of *Echinofossulocactus* (Cactaceae)", whether the Code is in need of radical reform if it cannot provide an answer to such a straightforward question concerning the validity of the generic name *Echinofossulocactus*. Furthermore, he criticized the failure of the Committee to recommend the conservation or rejection of any of the competing names guarantees that the uncertainty will continue (Heath, 1989).

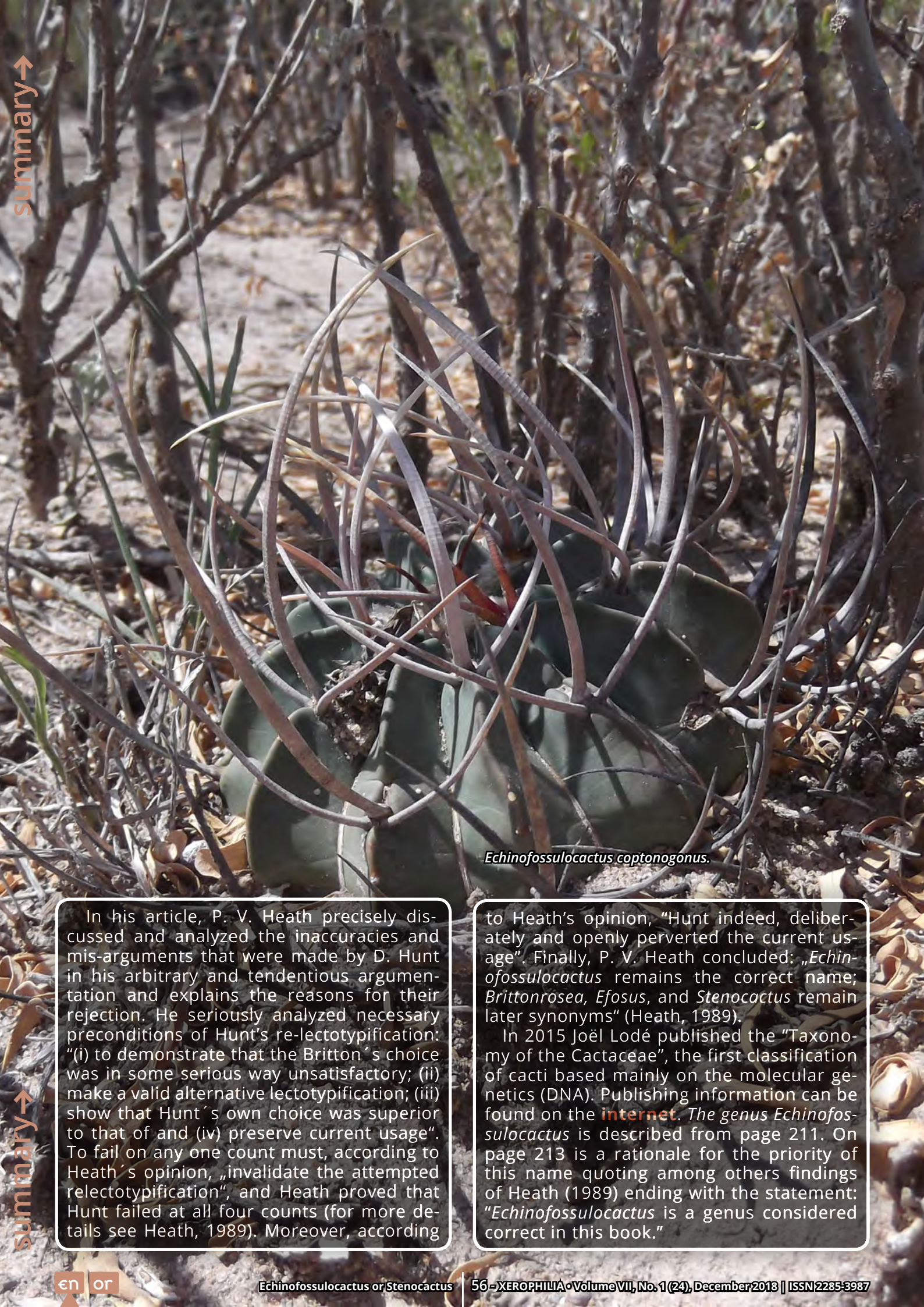
Echinofossulocactus lloydii.





In another place P.V. Heath quoted the American botanists C. Glass and R. Forster (1981) also reminding that "The aim of the International Code of Botanical Nomenclature is 'the provision of a stable naming of taxonomic groups ...' (Preamble 1)" and that "the code should not be reduced to a legalistic game that can be manipulated and controlled by anyone shrewd enough to manoeuvre through loopholes". Heath further continued by him: "It would appear that Glass and Foster's misgivings are shared by at least some members of the Committee for Spermatophyta. Brummitt reported that of the 12 committee members, seven thought that Hunt's procedure was "acceptable", and five did not".

Fig. 14 - Some species are very attractive in collections like this *Echinofossulocactus heteracanthus* (from Pachuca, Hidalgo) showing quantity of the areolous wool.



Echinofossulocactus coptonogonus.

In his article, P. V. Heath precisely discussed and analyzed the inaccuracies and mis-arguments that were made by D. Hunt in his arbitrary and tendentious argumentation and explains the reasons for their rejection. He seriously analyzed necessary preconditions of Hunt's re-lectotypification: "(i) to demonstrate that the Britton's choice was in some serious way unsatisfactory; (ii) make a valid alternative lectotypification; (iii) show that Hunt's own choice was superior to that of and (iv) preserve current usage". To fail on any one count must, according to Heath's opinion, "invalidate the attempted relectotypification", and Heath proved that Hunt failed at all four counts (for more details see Heath, 1989). Moreover, according

to Heath's opinion, "Hunt indeed, deliberately and openly perverted the current usage". Finally, P. V. Heath concluded: „*Echinofossulocactus* remains the correct name; *Brittonrosea*, *Efosus*, and *Stenocactus* remain later synonyms" (Heath, 1989).

In 2015 Joël Lodé published the "Taxonomy of the Cactaceae", the first classification of cacti based mainly on the molecular genetics (DNA). Publishing information can be found on the [internet](#). The genus *Echinofossulocactus* is described from page 211. On page 213 is a rationale for the priority of this name quoting among others findings of Heath (1989) ending with the statement: "*Echinofossulocactus* is a genus considered correct in this book."



Conclusion

The article describes the chronological development of the key opinions and statements on the generic names *Echinofossulocactus* and *Stenocactus* and concludes that *Echinofossulocactus* remains the valid name.

We can only regret, that C. Lemaire and G. Lawrence have not more respected L. Pfeiffer's historical priority in his recognition of the uniqueness of these plants and their separation in the group "Costis compressissimis, crispatis" within the genus *Echinocactus*. Both mentioned authors did not have to invent anything new in creating the appropriate generic name (C. Lemaire - the group "§ 4. Stenogoni", and G. Lawrence the genus "*Echinofossulocac-*

Fig. 15 - Well visible "fossula" on the very rare *Echinofossulocactus sulphureus* (Querétaro).

tus", section I. Gladiatores), in contrary they should simply respect more Pfeiffer's main characteristic of the genus, namely narrow and wavy ribs. In such theoretical circumstances we could nowadays devote more energy to discussing the huge richness and adaptation possibilities of species within the fictional genus "*Crispicactus* Anonymous" with the fictional type "*Crispicactus crispatus*". Instead of it we are in roles of passive spectators observing increasingly less understandable disputations about the validity of names.



Echinofossulocactus ochoterrenus.

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Puna *subterranea* (R. E. Fries) R. Kiesling



Sebastián Santeccchia

Text and photos by the author

Fig. 1 - *Puna subterranea* with fruits.

P*una subterranea* (R. E. Fries) R. Kiesling 1982, subfamily *Opuntioideae*, is established in the high Andean grasslands and scrublands, at altitudes of 3000 to 4000 meters above sea level; its populations are found between Cerro el Moreno (province of Jujuy, Argentina) to the surroundings of Culpina (Chuquisaca department, Bolivia). Color variations in flower and stem depend highly on the site where the plants grow; being geophytes in habit (with reduction of stem size during dry and cold seasons) they display some of the characteristics that determine the genus

proposed by R. Kiesling in 1982. Described for first time in 1905 by R. E. Fries under the name of *Opuntia subterranea*, it has been reclassified since then and included in other opuntoid genera. In 1982 Kiesling proposed the genus *Puna* including *O. subterranea* Fries 1905 and *O. clavarioides* Pfeiffer 1837. Its actual taxonomical situation is undefined; Anderson (1999) includes it in genus *Maihueniopsis* (Spegazzini 1925), while Stuppy (2001) postulates the subgenus *Puna* adopted later by Hunt (2002); and at the present time is considered to be related with *Cumulopuntia* (F. Ritter 1980) based on molecular markers (Griffith & Portery 2009).



Genus *Puna* Kiesling 1982: History of systematical classification and particular morphological characters

In 1943 Castellanos included two species (*O. subterranea* and *O. clavarioides*) into a "serie" among *Opuntia* genera named - **Punae** - (Gen. *Opuntia*, subgen. *Tephrocactus*, serie *Punae*) as a first intent to segregate this species based on morphological characters which R. Kiesling did not considered of relevance in his description of the genera. Earlier, Britton & Rose (1919) hve placed this species into a different subgenus: *O. subterranea*, subgenus *Tephrocactus*, serie *Pentlandianae*, among other species that now are included in *Maihueniopsis* and *Cumulopuntia*; this classification is distinguished by the scarce presence of aerolar glochides (unicellular trichome with small apically retraced barbs typical of *Opuntieae*) and by the great development of the root system; and *O. clavarioides* into subgenus *Cylindropuntia*, an evident mistake due to lack of habitat information and from describing the specie from a cultivated and grafted organism that developed an abnormal cylindrical and elongated shape.

Fig. 2 - *Puna subterranea*, pectinated spines.

In 1982 Robert Kiesling proposed the genus ***Puna***, including in it two species (*O. subterranea* and *O. clavarioides*), based on similar morphological characteristics that makes them different to the other opuntioide species:

- pericarpelar scales – rudimentary reduced to a few persistent bristles sprouting from the axils of the bracts (the abscission of this bristles takes place while the fruit dries off);
- the structure of the third tegument (aril) of the seeds;
- total or partial absence of areolar glochides;
- dry and indehiscent fruits;
- geophytic or semi-geophytic habitus;
- pectinated disposal of spines on the sides of the areola (a characteristic only known for subfamily *Cactaceae* (R. Kiesling 1982).

In 1997 along with Ferguson, Kiesling described a new species into the genera – *Puna bonnieae* (D.J. Ferguson and R. Kiesling 1997).

In the descriptive notes of the genus, Kiesling (1982) makes reference to similar characters shared with three species of the genus *Tephrocactus* [*T. aoracanthus* (Lemaire) Lemaire, *T. alexanderi* (Britton and Rose) Backeberg and *T. bruchii* (Spegazzini) Spegazzini], today there is a synonymy of the first mentioned species: a similar structure on spine surface and a third tegument of the seed with spongy consistence. Respecting to vegetative and phenologic appearance finds similarities with some species of the genus *Pterocactus* on which remarks the absence of glochids in some of these plants by citing Leunberger's article, "Pollenmorphologie der Cactaceae" 1976, in which he refers to the similar pollen grain of cylindrical Opuntioids (*Austrocylindropuntia*, *Cylindropuntia*, *Tephrocactus* and *Pterocactus*). Then, he concludes that *Puna* has affinity to *Tephrocactus*.

It is concluded then that the genus *Puna* is described based on morphological characters. At present, by means of molecular analysis, a new classification in the family is given, of which I propose a summary here: the genus *Puna* is contained into *Maihueniopsis*, with uncertainty, based on DNA sequence analysis by Dickie and Wallace (2002) and the seed morphology studies of Stuppy (2001) (some taxonomists don't give evidence of differentiation among *Puna* and *Maihueniopsis*). Notwithstanding *Maihueniopsis* seeds as well as its teguments that surrounds the seed are lenticular, with juicy fruits, abundant areolar glochids and unpectinated spines but mostly flattened and does not present geophytic habitus, although there is the case of some thickened roots (functioning as a reserve); in *Maihueniopsis* *minuta* (Backeberg) R. Kiesling, formerly called *M. mandragora* considered these roots as an adaptation to severe weather condition, characteristically present in other genera of Cacti (*Pterocactus* K. Shumann and *Lobivia bonnieae* Halda, Hogan & Janeba). In 2002 Stuppy publishes "Seed characters

and generic classification of *Opuntioideae*", by studying the seminal aril indicates that *P. subterranea* and *P. clavarioides* have the same cell disposition as *Maihueniopsis*, meanwhile *P. bonnieae* same as *Tephrocactus*. In The New Cactus Lexicon (NCL) Hunt relocates *Puna bonnieae* D. J. Ferguson & R. Kiesling into *Tephrocactus*. In the NCL Hunt includes subgenera *Puna* (Stuppy 2001) into *Maihueniopsis* genera noting the absence of glochidia in *P. clavarioides* and the dry fruit in *P. subterranea* and *P. clavarioides*.

Phylogenetic studies of *Opuntia* link the three species of *Puna* into three different genera of *Opuntioideae*: *P. clavarioides* into *Maihueniopsis*; *P. bonnieae* into *Tephrocactus*; and *P. subterranea* into *Cummulopuntia*; and all of these genera into clade *Maihueniopsis* (arguing morphological similarities due to evolutionary convergence) - that would give origin to the *Opuntioideae* - being polyphyletic (species with different origins) unlike the other three clades that are monophyletic (species with single origin).

By 2010 Nyffeler, R. & Eggil, U. proposed a subdivision of *Opuntioideae* into two tribes *Opuntieae* and *Cylindropuntieae* in an article named "A farewell to dated ideas and concepts; molecular phylogenetics and a revised subgeneric classification of the family Cactaceae", including only *P. bonnieae* into subclade *Tephrocactus* (monophyletic clade), and the two other *Puna* species were stated as "orphan" but without leaving them to link to the genera *Maihueniopsis* and *Cummulopuntia*(*)).

In brief, *Puna* differ from the rest of *Opuntioideae* because: lack (in *P. clavarioides* and *P. bonnieae*) or notable absence of glochids (in *P. subterranea*); a dry non-dehiscent fruit (Fig. 1 and 9); seeds with a cover that seems hair covered, in *P. subterranea* seemingly naked at simple sight; soft texture, pectinated spines (Fig. 2); pericarp with simplified and reduced scale-shaped areola, with apical and elliptic or linear stalk areola, and full or partial geophyte habitus.

(*) Classification based on molecular analysis trend to make monophyletic clades, hence a paraphyletic clade seems in an inconclusive stage, and there is where "orphan" species are nursed, such as *Puna* Kiesling 1982. (Nyffeler, R; Eggil, U. 2010).

Fig. 3 - *Puna subterranea*, with its semi-geophytic, habitus, rarely under the shelter of shrubs - "Tola" *Baccharis* (Asteraceae).

Puna subterranea (R. E. Fries) R. Kiesling
Puna subterranea is described for first time in 1905 by R. E. Fries under the name of *Opuntia subterranea* since then to the present time it has been reclassified in other genera of *Opuntioideae*; in 1935 as *Tephrocactus subterraneus* by Backeberg and *Pseudotephrocactus subterraneus* by Kreuz, *Cumuloopuntia subterranea* in 1980 by Ritter, in 1982 Kiesling decides to create the genera *Puna* including this species, (the naming is inspired in the works made by Castellanos, the creator of the series "Punae") in the article mention as main characteristic its tuberculated short sub-cylindrical stems, with turnip-shaped root united directly to the stalk (Fig. 4 and 5), and the presence of glochid only in basal areola (Fig. 6), although in cultivation the species tend to develop glochid in every areola, in 1999 as *Maihueniopsis subterranean* by Anderson in

"The Cactus Family" describing it as small and almost buried plant, with few glochids, pectinated spines and absence or pericarpel areola but presence of hairy scales; by 2002 into subgenera *Puna* (Stuppy 2001) of genus *Maihueniopsis* by Hunt in The New Cactus Lexicon where he makes reference to deciduous glochids. Finally, in 2012, Ritz et. al. by molecular analysis postulates the finding of major relation between *Cumuloopuntia* than the other genera of *Opuntioideae* as proposed by Ritter in 1980.



Fig. 4 - *Puna subterranea*, body and fruit.

Fig. 5 - *Puna subterranea*, adult plant.



Maihueniopsis subterranea
 La Quiaca, Jujuy
 3452 msnm

4

6 Fig. 6 - *Puna subterranea*, great development of glochidies in the basal areoles.





Fig. 7 - Flower of *Puna subterranea*, La Quiaca, Jujuy.

Due to variability of *P. subterranea* in its distribution, in time several proposals for new species appeared, among the most noticeable being *Tephrocactus variflorus* described in 1962 by Backeberg, growing in the Bolivian Puna region, and more recent in 2000, *Tephrocactus pulcherrimus* by Halda & Horáček in the town of Camargo (Dep. of Chuquisaca, Bolivia).

The flower color varies from brownish to a strong pink in El Moreno (type locality) and the brownish stem; in La Quiaca and Puma-huasi (farther north) the green stem and the pink salmon flower (Fig. 7); the population near Culpina - *Tephrocactus variiflorus*; and in Camargo - *Tephrocactus pulcherrimus*; both locations very close, the color of the flower is a bright violet.

Contributions to the knowledge of the ecology of *Puna subterranea*.

It grows in the southeastern Bolivian Puna region between 3900- 4000 meters above sea level (masl), with *Adesmia occulta* (R.E. Fr.) Burkart and *Azorella compacta* Phil (Navarro, G. and Ferreyra, W. 2004); "In the Preliminary Catalog of Bolivian Cactaceae" the habitat is described and it also gives some names of the representative plant community species with which it coexists(**).

In La Quiaca, Jujuy - 3400 masl - and Pumahuasi, Jujuy - 3600 masl -, rainfall reaches 340 mm per year concentrated mostly from December to April. It usually grows on the bare ground and rarely under the shelter of shrubs [Fig. 3: "Tola" *Baccharis* (Asteraceae)]; the plant community is mostly made up of dwarf shrubs, grasses and

cacti.

Of semi-geophytic habitus (the stems are dehydrated, some die and others persist almost completely buried); fact that is perceived during the winter when the precipitations are scarce or null (10 mm), the high insolation and the temperature descend until - 8°C with maximum of 14°C.

(**) Bolivian *Puna* (Sector Potosino-Tarijensis). Sub-tropical semiarid dry (Altitude = 3400 -3500 masl; Temperature = max. 9.5 - min -10.5°C; Precipitations = 300 mm). Plateaus and rolling highland slopes, with potential vegetation areas of *Prosopis ferox*, among degraded thickets of *Baccharis boliviensis*, *Chuquiraga acanthophylla*, *Junellia bisulcata*, *Nardophyllum armatum* (Navarro, G. 1996).

Fig. 8 - *Puna subterranea*, mature fruit.

When the rains come with the spring, the plant ends with its resting state beginning to hydrate (in some cases damaged stems can be observed due to rapid hydration). Flowering begins at the end of December - Hymenoptera are insects that act as pollinating agents, possibly Coleoptera and Diptera help with this task, they are all together in the pollination this small cactus is due to success (taking into account that its flowers are not autogamous - autogamy is generally related to small flowers and smaller amounts of pollen (Osborn et al., 1988). The fruit of reddish green color on the outside possesses between 4-8 seeds of 2,5 mm +/- in appearance naked, it is produced in the lower areoles of the stem (Fig. 1 and 9) being protected by the soil, once mature (March - April) it begins to dry losing volume and weight, after the days the

wind drags it through the field dispersing its seeds through the field where the ants can also act; finishing there to mature - the seeds of several *Opuntia* species present latency associated with the impermeability of the tegument and funicular hardening (Flores, 1973, Stuppy, 2002). The nursing success in the *Cactaceae* is also linked to the availability of nurses, especially for those that only reproduce sexually, as is the case of *P. subterranea*, case examples were found in the revamp of shrub plants such as "Tola" *Baccharis* L (Fig. 4), related to small rocks and it seems that some seeds do not disperse, germinating in the same place in the shelter of the adult specimen as seen in Fig. 9, but generally growing in open field next to grasses (*Poaceae* Barnhart, such as *Festuca* L.; and *Asteraceae* Bercht. & J.Presl) (fig 10, next page).

Fig. 9- *Puna subterranea*, offsprings, results of sexual reproduction, around the adult plant.



In the summer months, where most of the rainfall is concentrated, the specimens produce stems (in which small deciduous leaves are observed - Fig. 11) roots and fruits; an adult specimen presents more than 20 stems of 1.5 cm in diameter and height; however, it is noteworthy that no specimens that produce more than 2 fruits were observed. When autumn arrives, the recess begins again.

Fig. 10- *Puna subterranea*, related to gramineas of the region.

10

Fig. 11- *Puna subterranea*, adult specimen showing new stems with the presence of deciduous leaves.

11



Current situation

In the habitat of *Puna subterranea* agricultural practice is carried out in small plots that do not threaten the species, livestock can be a threat especially for introduced animals, in some cases are seen specimens foraged probably by goats who resort to them when no availability of pasture (Photo 12); in 1996 Navarro, G. refers to local populations of the puna potosina (Bolivia) threatened by habitat destruction and / or overgrazing.

Currently in the IUCN Red List it is placed in the category of Least Concern (LC) justifying this fact, although it has a restricted

area of distribution, it is relatively abundant in several parts of its distribution area and there are no great threats (Kiesling, R. 2013); by personal observations in the populations visited, the mining activity that removes large areas of land turns out to be a threat, also on a much smaller scale, the urban expansion (La Quiaca for example). It is necessary to take into account the clarifications made by different authors regarding the recruitment capacity of those species that owe much of the success to sexual reproduction, references that I at-

Fig. 12 - *Puna subterranea*, grazed adult specimens.

tach below. The seedling status is very vulnerable (Baskin and Baskin, 1977, Vargas and González', 1992) and processes such as pollination and seed dispersion, which depend on animal interactions (García, 1984, Janzen, 1986, Mandujano et al., 1997) require more time. An individual who devel-

oped from a seed has a low probability of reaching reproductive age (Mandujano et al., 2001).

As it is for a large part of the species of cacti in Argentina, the trade of *Puna subterranea* is neither protected nor controlled as advised by Cites (Appendix II).

It should be noted that most likely because of the particularity of the soil in which *P. subterranea* grows, the Cactaceae family is poorly represented, compared to nearby places, as the only species with which it coexists are: *Tephrocactus nigrispinus* (K. Schumann) Backeberg [Maihueniopsis nigrispina (K. Schumann) R. Kiesling] Fig. 13 and 14; *Cumulopuntia boliviana* (Salm-Dyck) F. Ritter Fig 15 and 16, they have large flowers and a similar phenology (the three species meet fruits at the beginning of autumn); *Maihueniopsis glomerata* (Haw.) R. Kiesling Fig. 17); and *Lobivia pugnacantha* (Rose & Boed.) Backeb. Fig. 18.

Fig. 13- *Tephrocactus nigrispinus* (K. Schum.) Backeb.

Fig. 14 - *Tephrocactus nigrispinus* (K. Schum.) Backeb.



Fig. 16 - *Cumulopuntia boliviiana* (Salm-Dyck) F. Ritter, with fruits.

15



Fig. 17 - *Maihueniopsis glomerata* (Haw.) R. Kiesling.

17

Fig. 16 - *Cumulopuntia boliviiana* (Salm-Dyck) F. Ritter, with fruits.

16

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Fig. 16 - *Lobivia pugionacantha* (Rose & Boed.) Backeb.

Mammillaria erythrosperma Bödeker,



Juan Miguel Artigas Azas

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Text and photos by the author

Introduction

Some of the most attractive of the *Mammillaria* species are those belonging to the *Stylothele* series, their long hooked central spines, dense spination, small size and beautiful flowers confer a special attractiveness to all of the species in this group. One of the most popular of the species in cultivation, yet with a rather restricted range is the subject of this article, *Mammillaria erythrosperma*.

A partially open flower and a bud of *Mammillaria erythrosperma* Bödek., growing in the wild.



Mamillaria erythrosperma Böd. spec. nov.

Von Fr. Bödeker, Cöln.

(Mit Abbildung.)

Während meines letzten Besuches bei Herrn DE LAET in Contich im Jahre 1914 fand ich dort unter den neuen Einführungen auch u. a. eine wunderschön rotblühende, reichlich sprossende Mamillaria



Page of the monthly journal of the German Cactus Society (Monatsschrift der Deutschen Kakteen-Gesellschaft) in 1930 (2:258-259)

Mamillaria erythrosperma Böd.

Auf den Seiten der Typ, in der Mitte die Varietät *similis*.

Von Herrn De Laet photographisch aufgenommen.

Taxonomy

The scientific description of *Mammillaria erythrosperma* appeared published in the monthly journal of the German Cactus Society (Monatsschrift der Deutschen Kakteen-Gesellschaft) in 1930 (2:258-259), it was authored by Friedrich Bödeker (1867 - 1937), a German botanist who specialized in cactus and described several genera and numerous species. He was honored with the taxon *Mammillaria boedekeriana* Quehl 1910.

The name erythrosperma derives from the Greek words erythros, which means red; and sperma, seed (the seeds are reddish black).

The species *Mammillaria multiformis* Britton & Rose 1923 is considered a junior synonym of *M. erythrosperma*.

Description

Mammillaria erythrosperma is a globose to shortly cylindrical, solitary to extensively clustering plant, with stems to 5 cm diameter and 8 cm high. Tubercles are ovoid and spirally arranged, 3 mm diameter to 7 mm high. Axils have variable bristles, initially with hair. Areoles are up to 1.5 mm in diameter with little wool, soon naked. It has up to 15 radial spines, up to 10 mm long, white and spirally arranged. Central spines are brown and up to 3 per areole, up to 10 mm long, the lowest is hooked. The flowers are deep pink to carmine red in color; up to 15 mm long from circumferential axils, and with the same diameter. Fruits are ovoid, red, up to 2 cm long. Seeds are reddish black, curved, ovoid, to 1.2 mm long, with lateral hilum, testa with a pit.



Mammillaria erythrosperma growing in a crack in the mountains of the Sierra de Alvarez in San Luis Potosi, Mexico.

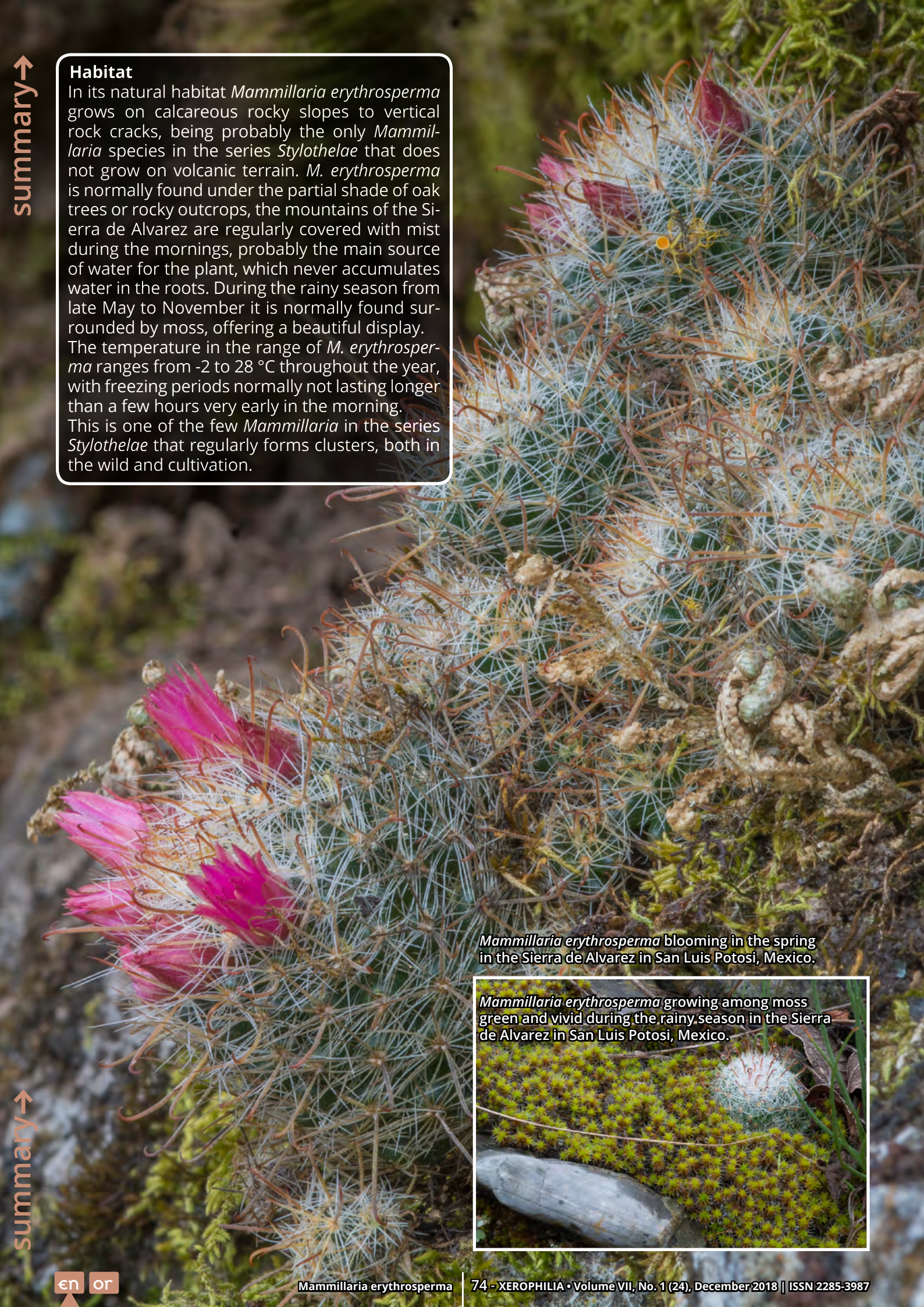
Sierra de Alvarez in San Luis Potosi, Mexico.

Distribution

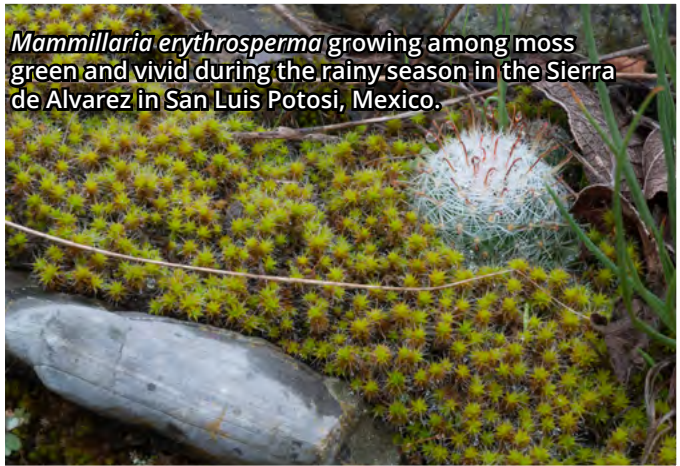
Although the original description establish the type locality as "from Mexico probably from moist-warm, not too sunny places (translated from German)", the type locality of *Mammillaria erythrosperma* is in fact at Alvarez in the peak of the Sierra Alvarez, in San Luis Potosi, Mexico (Fitz-Maurice, personal communication), state to which it is endemic. *M. erythrosperma* is distributed in the Sierra de Alvarez in the state of San Luis Potosi, in what is part of the Mountains of the Sierra Madre Oriental in north eastern Mexico. It is found in many subpopulations on a southwest – northeast stretch of about 40 km of the rocky limestone oak covered mountains at an altitude range of 1,900 to 2,300 m asl.

Habitat

In its natural habitat *Mammillaria erythrosperma* grows on calcareous rocky slopes to vertical rock cracks, being probably the only *Mammillaria* species in the series *Stylotaelae* that does not grow on volcanic terrain. *M. erythrosperma* is normally found under the partial shade of oak trees or rocky outcrops, the mountains of the Sierra de Alvarez are regularly covered with mist during the mornings, probably the main source of water for the plant, which never accumulates water in the roots. During the rainy season from late May to November it is normally found surrounded by moss, offering a beautiful display. The temperature in the range of *M. erythrosperma* ranges from -2 to 28 °C throughout the year, with freezing periods normally not lasting longer than a few hours very early in the morning. This is one of the few *Mammillaria* in the series *Stylotaelae* that regularly forms clusters, both in the wild and cultivation.



Mammillaria erythrosperma blooming in the spring in the Sierra de Alvarez in San Luis Potosi, Mexico.



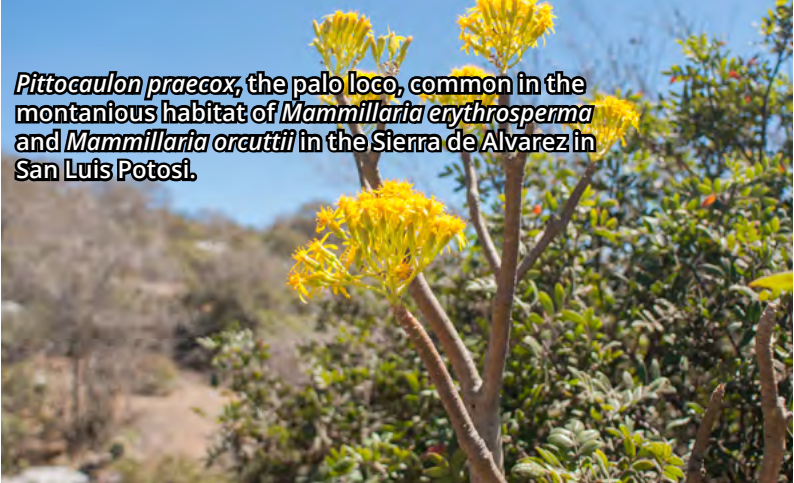
Mammillaria erythrosperma growing among moss green and vivid during the rainy season in the Sierra de Alvarez in San Luis Potosi, Mexico.

summary→

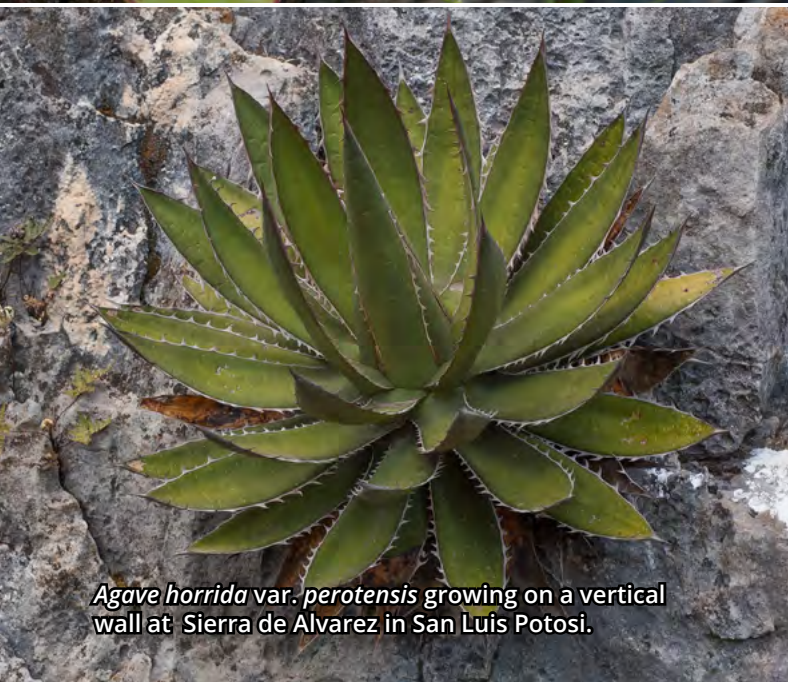
Echeveria subrigida growing at Sierra de Alvarez, San Luis Potosi, commonly found with *Mammillaria erythrosperma*.



Pittocaulon praecox, the palo loco, common in the montanious habitat of *Mammillaria erythrosperma* and *Mammillaria orcuttii* in the Sierra de Alvarez in San Luis Potosi.



Agave horrida var. *perotensis* growing on a vertical wall at Sierra de Alvarez in San Luis Potosi.



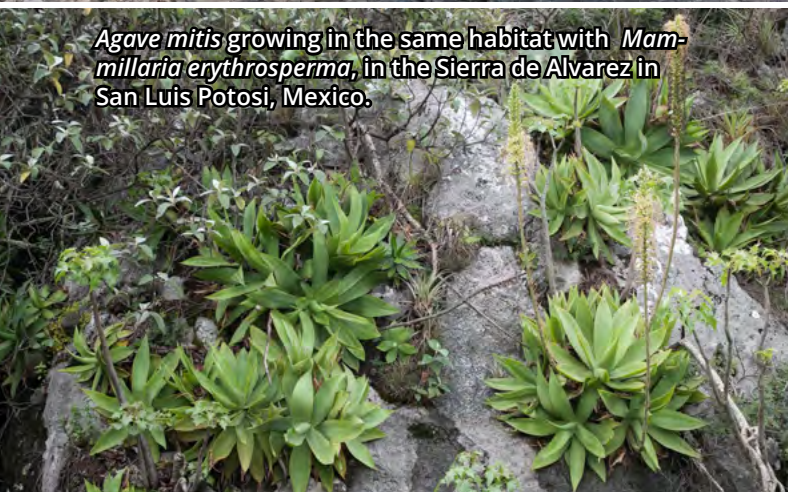
Tecoma stans in the Sierra de Alvarez in San Luis Potosi, Mexico.



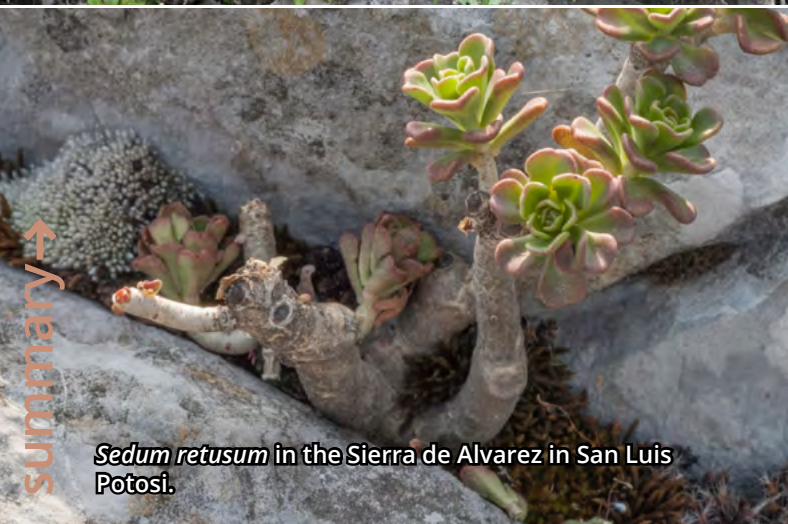
Stenocactus cf. *crispatus*, growing on a vertical rock at Sierra de Alvarez in San Luis Potosi.



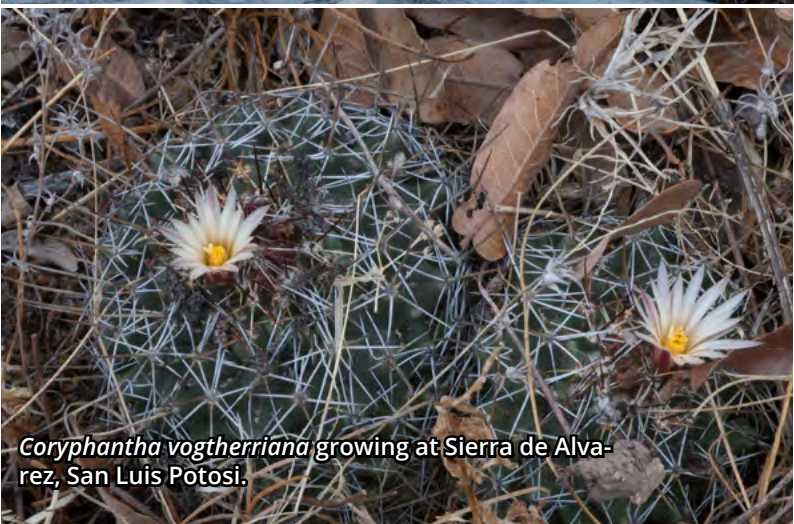
Agave mitis growing in the same habitat with *Mammillaria erythrosperma*, in the Sierra de Alvarez in San Luis Potosi, Mexico.



Sedum retusum in the Sierra de Alvarez in San Luis Potosi.



Coryphantha vogtherriana growing at Sierra de Alvarez, San Luis Potosi.



summary→

Mammillaria erythrosperma, fully open flowers and spine details, in habitat.



Mammillaria erythrosperma, blooming in habitat.



Mammillaria erythrosperma forming a cluster on a calcareous rock in the Sierra de Alvarez in San Luis Potosí.



Mammillaria erythrosperma, cluster in full bloom, in the mountains of the Sierra de Alvarez in San Luis Potosí.





Tillandsia parryi, growing on a vertical rock at Sierra de Alvarez, San Luis Potosí.



Conservation

Mammillaria erythrosperma is classified as of "Least Concern" in the Red List by the International Union for the Conservation of Nature, assessed in 2009 (Fitz-Maurice, 2017). More cautiously, the Mexican government in the National List of Species in Risk of Extinction (NOM-059-SEMARNAT-2010) classifies the plant as "threatened". It is estimated that illegal collecting, both commercial and amateur for use as an ornamental plant, represents a small threat to this species. Most of the range of *M. erythrosperma* is found inside a protected forestry zone. Fitz-Maurice (2013) estimates a total population that consists of more than 5,000 individuals extended in an approximated 2,500 km² area.

Mammillaria erythrosperma, blooming in the spring in the Sierra de Alvarez in San Luis Potosi. Note the dry moss around it, since blooming takes place during the dry season.

In captivity

Mammillaria erythrosperma is a popular plant in cultivation, due to its beautiful flowers and clustering habits. In regards to keeping and reproducing it in culture, *Mammillaria erythrosperma* as other members of the series *Stylothele* is best to keep in very bright light and preferably just filtered sunlight. Although some plants in habitat are found in full sun, most grow in the protection of partial shade. A shallow layer of coarse, porous substrate with some soil or peat to retain some humidity suffices for this species.

I suggest fertilizing the plants once or twice a year, and fumigating with insecticide twice, in the spring and summer, as well as applying fungicide at the beginning of the rainy season.

Mammillaria erythrosperma growing in a crack in the mountains of the Sierra de Alvarez in San Luis Potosí, Mexico.



summary→

summary→

Wild horses, galloping in the fog, at Cerro de los Caballos, Sierra de Alvarez, San Luis Potosi.

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Strange flowering on *Mammillaria schumannii* Hildm.

var.

globosa R.Wolf.



Elton Roberts

Text and photos by the author unless otherwise stated.

Mammillaria schumannii ssp. *globosa*.

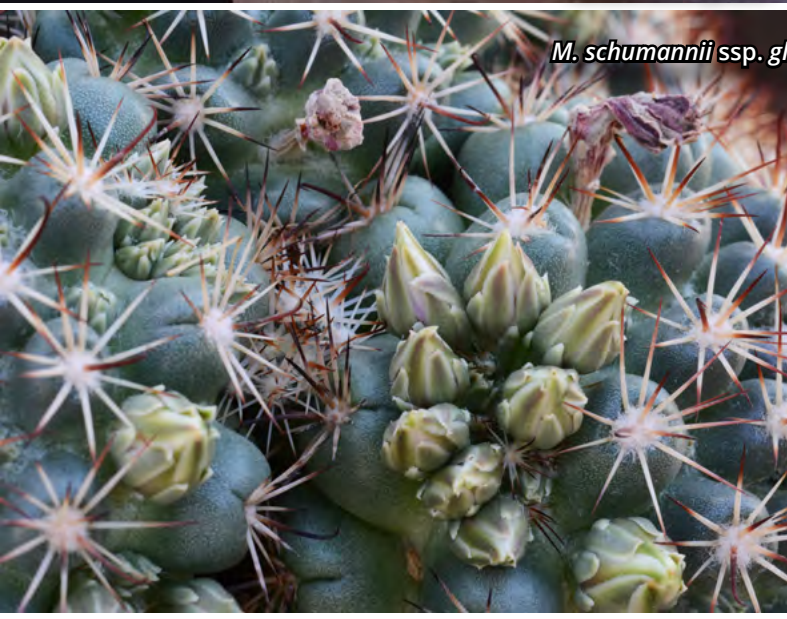
Four years ago (in 2014) I wrote an article on *Mammillaria schumannii* v. *globosa*; there I stated that there is no description of the plant that I can find. The plant is just considered by Anderson (The Cactus Family, 2001) and the NCL (The New Cactus Lexicon, 2006) as *Mammillaria schuman-*

nii. I do not want to get into describing the plant again this writing. I have been monitoring some seedlings growing under the parent plant and after a while I noticed that the plant is getting ready to bloom the fifth time this year. As the buds grew I noticed something strange and that was that some of the axils had more than one flower bud in it.





M. schumannii ssp. *globosa*, a huge almost monstrous plant.



M. schumannii ssp. *globosa*, clusters of buds.



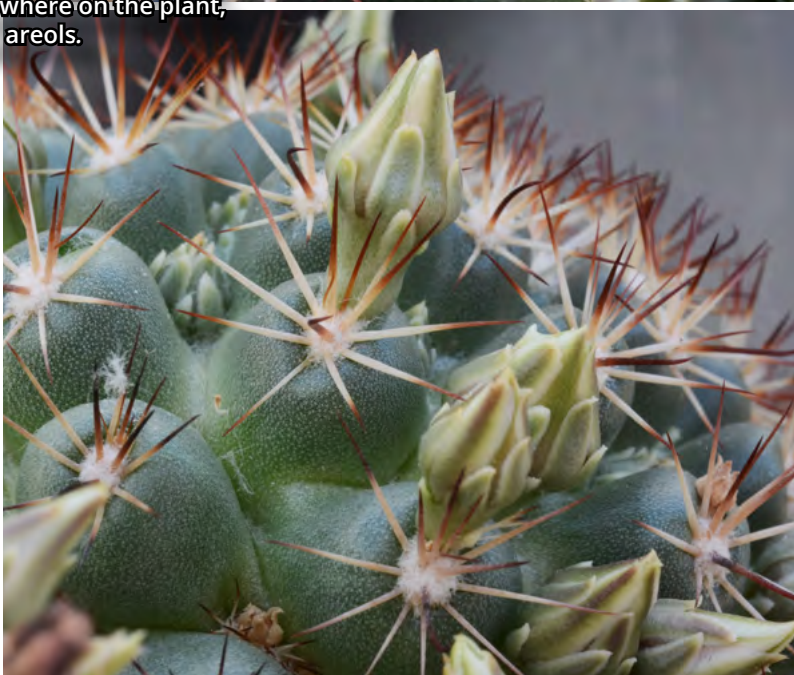
These photos of the plant were taken on the first of September last year. There is showing some clusters of buds between the tubercles. Besides the multiple buds there is something else strange going on also but I will get to that later. One of the other pictures shows an axil that looks like it was trying to make an offset and buds at the same time. I have counted several times and I get nine buds growing in that one axil. Around that axil are axils that have the regular single bud growing. Moving on to another stem is another clump of buds and

I have counted twelve of them at this stage of growth. The plant has clumps of buds here and there; an additional picture shows another cluster of buds. In that cluster it looks like there are eight buds that are going to make it. There are at least three buds that have not kept up with the larger ones in growing. I think this maybe the way it will be in each cluster.

Once the large buds bloom and die the smaller ones may grow and also bloom. At the time it is just hard to say for sure.



M. schumannii ssp. *globosa*, clusters of buds growing everywhere on the plant, from both axils and areols.



However, in a different picture there is something else that for me is strange. On the stem in the back is a small cluster of buds but the strange thing is on the stem in the fore ground at the bottom right. Looking, you can see normal growing single buds and no clusters showing up. But look again; notice that there are two buds growing from areoles. There is also one dead flower remains that also bloomed from an areole. In all my 60+ years of growing cactus plants I do not remember seeing *Mammillaria* plants blooming from an areole. I am not an expert on *Mammillaria* but I do not think that they are supposed to bloom from an areole; it has always been from the axil. There are several pictures showing a bud growing from an areole; there is no question about it that is growing from an areole! I counted on this plant about ten buds that have grown from the areoles. I have two multiheaded plants and the other plant growing within 30 cm is a bit smaller and it is growing normal, with buds only from the axil. That is no clusters of buds from the axils and no buds from the areoles.

One picture shows one bud really well and one to its right that is not as easy to see. They are at the tip of the tubercle growing out of the areole pad. At the base of the bud is wool from the areole; it is against the bud showing that it is growing from the areole. For any one that knows *Mammillaria* they know that flowers from an areole is not something that a *Mammillaria* does. I sent the photos to a friend that had grown *Mammillarias* for most of his cactus growing life and he said he had never seen anything like that before. I figured if anyone would know he would for he studies his plants very carefully and knows all of them like the back of his hand.

I went on the Web and all the photos I found of the plant there was not a single one that had buds or flowers growing out of the areole. I do not think my plant is monstrose but it sure is doing something that is, for me, strange.

Clusters of buds in the place of one and buds from the areoles on *Mammillaria* plants are just something I had never seen before. I have not seen anything written about any *Mammillaria* that grows flowers from the areole.



summary→

summary→

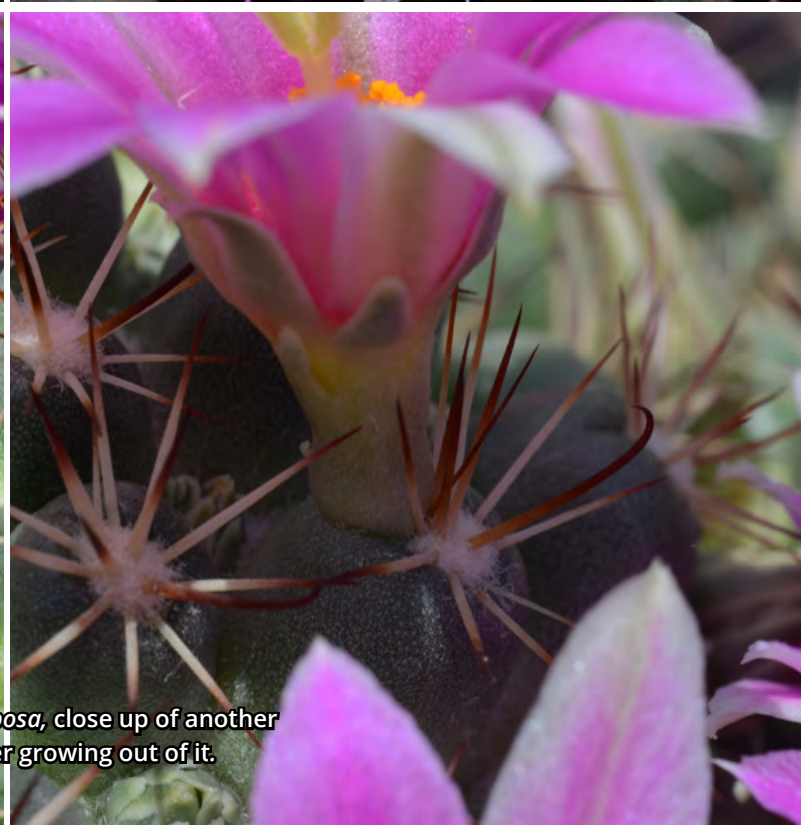
In this pictures you can see two buds growing tight against spine clusters. To me it looks like they are almost growing from under the spine cluster. I even photographed three buds growing from areoles. Each is a different size, the one at the bottom right is just showing above the areole.



M. schumannii ssp. *globosa*, clusters of flowers.



M. schumannii ssp. *globosa*, close up of another areole that has a flower growing out of it.

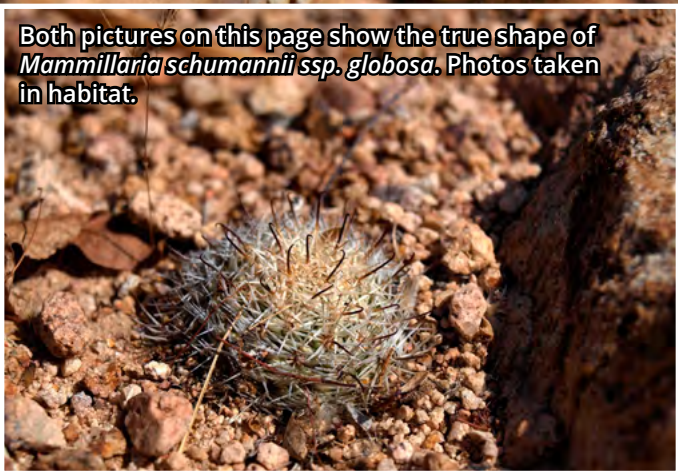


Finally, the plant flowered, actually several clusters of flowers are open. Not all the buds in a cluster open at one time. If they did that would really make the clusters dense. It seems there are of two different clusters of flowers. It can be a round cluster or a long cluster, both of them presented here in pictures. Keep in mind that all the flowers in a cluster are from one axil. Each of the clusters has eight flowers open from the one axil.

Now we come to another set of two pictures; these show flowers that are opened that have grown out of the areole and not the axil. I could have shown at least ten photos of flowers that are open from buds

that grew out of the areole but I think these two photos will be enough. The last two photos show an entire shot of the flower from the side and it is very easy to see that it is from the tip of the tubercle. Notice that the flower has even pushed several spines out of its way. There is no question at all that the bud grew from out of the areole. The last photo is a close up of another areole that has a flower growing out of it. It also has pushed spines out of the way as it grew. To the left of that areole down in the axil is a cluster of four buds forming. At least those buds are growing where they are supposed to grow and that is in the axil.

Both pictures on this page show the true shape of *Mammillaria schumannii* ssp. *globosa*. Photos taken in habitat.



Photos on this page by Grzegorz Matuszewski

As all *Mammillaria* that I know of produce the flower buds from the axil, I thought it would be of some interest to the people that are really into growing *Mammillaria* and know the right way the plants are supposed to grow and flower. The friend mentioned above sent me a map showing that the habitat of *Mammillaria schumannii* v. *globosa* is now all built up with houses and the habitat has apparently been destroyed. With Anderson and the NCL totally ignoring the plant it will slowly fade off into the sunset. At the present time there are a few people that are trying to keep it going.

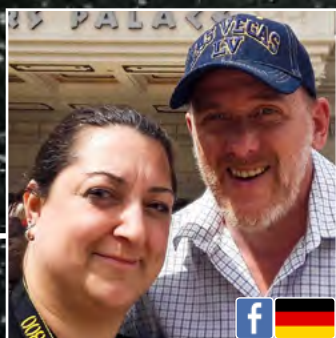
Note

See also the article "Over-fertilization, a determining factor in the dynamics of aberrant growth and flowering in Cactaceae", from *Xerophilia* 23, February 2018.

We thank Grzegorz Matuszewski for his permanent and unconditional help, whenever we needed photos from the habitat.



Searching for *Navajoa* *peeblesiana* Croizat *ssp. menzelii* (Hochstätter) Hochstätter



Stefan Nitzschke

Carmen Bechara

In my last contribution on our USA trip, I preferred to report on the visit of *Navajoa peeblesiana* *ssp. peeblesiana*, now I would like to account on the other cactus experiences encountered during this beautiful journey.

We landed in Los Angeles, and after taking over our hired vehicle we went to the usual tourist hot spots such as the Walk of Fame with the Stars of the actors and personalities from movies and radio, the Chinese Theatre with the hand and foot prints of The Stars, the Dolby Theatre known for the annual Oscar awards. Fortunately, we were on site almost half an hour before the tourist buses ar-

rived and could enjoy the sights in peace and photograph extensively. That changed slightly when we visited "the original farmers market" for lunch. Here we had a great luck to get a seat, but because of lack of decisiveness considering the abundant offer in the end we had to enjoy a very tasty, large salad. After a short rest at the hotel, we set off at dusk and felt that over 10,000 locals and tourists were on their way to the Griffith Observatory around Los Angeles at night. Unfortunately, because of the haze, there was only little success, even in a second attempt the next morning, we could not enjoy the view of the Hollywood Sign, as we were denied to have an unclouded look.



summary→

summary→

In the Mohave desert the Joshua Trees (*Yucca brevifolia*) are a continue presence.



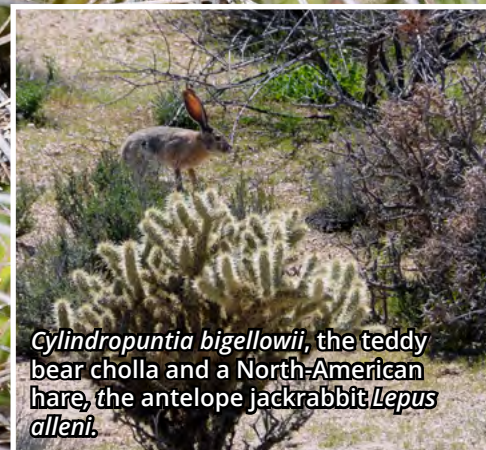
en or



Echinocereus triglochidiatus var. *mojavensis* (Engelm. & J.M. Bigelow) L.D. Benson.



Echinocereus engelmannii.



Cylindropuntia bigelowii, the teddy bear cholla and a North-American hare, the antelope jackrabbit *Lepus alleni*.



Echinocereus engelmannii.

Now we made our way towards Las Vegas, not on the fastest route but through the Mojave Desert with a subsequent overnight stay in Primm. In the Mojave, still south of Kelso, we had then our first stop, just to enjoy the desert landscape. Here we saw beautiful views adorned with *Yucca*, different *Echinocereus* bearing buds and countless desert hares.



summary→

summary→

Navajoa peblesiana ssp. *menzelii* is living in an argillic soil with some organic matter.



The Hoover Dam and the traces of the severe drought on the shores.



Yucca brevifolia is projecting unreal forms on the sky.

After leaving Primm and Las Vegas, we continued in the coming days with the Hoover Dam and taking Route 66 in the direction of Williams. Having narrowed down the visit to the Grand Canyon Skywalk, I was able to prefer a first important cactus stop that was originally scheduled for the following day, as we drove past Williams and north towards the Grand Canyon. Thanks to good preparation in the run-up to the holiday, we also quickly found the planned turn-off on our first truthful dirt road of the journey which should lead to the *Navajoa peeblesiana* ssp. *menzelii*.



Navajoa peeblesiana ssp. *menzelii* has a typical areola, characterized by its reversed cross shape.



Even in the desert it can rains...

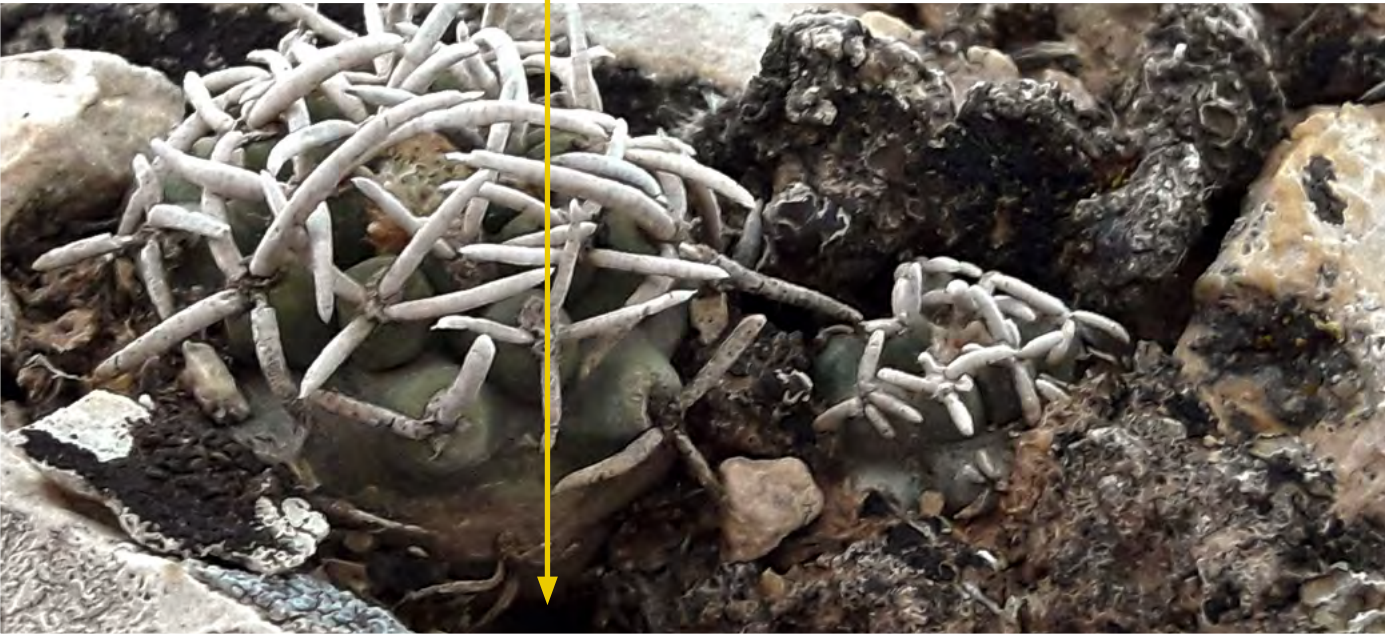


A dirty road crossing a railroad...

As the sun went down from the main road, the sky got slowly covered with clouds and it began to rain and squall, accompanied by occasional breezes we had to drive a few miles on this dirt road. In the barren and lonely landscape, we could observe a pack of mule deer, which quickly retreated behind a hill as soon as we noticed them. Once arrived, I made in vain at storm and thunderstorm in various places in search of the Navajoa and was getting restless. Finally, it was already clear that we could not make the way back during daylight and the road was not safe enough, through the rain it did not get any better. From a hill on which I searched in vain for Navajoa, I had picked a last point that I wanted to investigate before returning.



Bothe plants on the images of this page are showing how dehydrate they are. Look at the place around them, their body will occupy after the rain.





Another close view of corky spines on *Navajoa peblesiana* ssp. *menzelii*.

On the way there was a farmer with his pick-up truck and he wanted to know what I was doing during this unkindly weather searching on his land. After a little talk and looking surprised that I was looking for cacti, he then asked if I'm from East or West Germany and said goodbye. Now, I went to the intended spot of the search and found after a short time my first *Navajoa peblesiana* ssp. *menzelii* together with an *Echinocereus*. The found micro population consisted of about 20 plants. After a few snapshots with the smartphone I made myself happy on

the way to the car. The return during nightfall and the gathering snow storm demanded a few more nerves until we arrived at our hotel in snowy Williams.

The next day I was very happy to have made this trip in search of *Navajoa*, despite the adverse circumstances, because when we drove on the way to the Grand Canyon again at the junction over there were about 10 cm of snow and I would certainly not have managed, as originally planned, to search on that day for *Navajoa peblesiana* ssp. *menzelii*.



.... The Desperados looking in the desert....

By coincidence only a few days later I learned from Jürgen Menzel that I had probably discovered a new location which was unknown to him.

On the history of the plant it is to say that Jürgen Menzel discovered this population on a trip together with Gerhart Frank / Vienna in the 1970s,

and only in 1999 was the plant described by Fritz Hochstätter as fa. *menzelii* and then finally since 2007 renamed as ssp. *menzelii*.

In the third part of this article I would like to report on another interesting site visited in the USA and a short trip to Mexico together with Jürgen Menzel.

Melocactus macracanthos (Salm-Dyck) Link & Otto.

in Curaçao



Ianos Kajdacs

Text and photos by the author; first translation from Hungarian by István Lőrincz.



summary



One of my long time dreams became reality in August 2017, when I finally reached the ABC islands. However, it wasn't really what I wanted, because it was impossible to travel to Aruba. The first island we arrived was Curaçao, respectively the Willemstad airport,

where a rented car was waiting for us. Opposite the airport were some hills the size of Gellert hegy¹ literally covered with a jungle of cacti. Only with a fleeting glance, I searched for *Melocactus* with cephalium, because my goal was to find the specimens growing on this island.

¹ - hills, near Budapest, capital of Hungary, called mountains by the locals.





Melocactus macracanthos, growing on a calcareous cliff.

In some places in the shadow of the columnar cacti, I had the impression of seeing some reddish spines. I was feeling that all my hopes would soon become reality. After about half an hour's drive we arrived at the accommodation. We change clothes, preparing to go out on field, we took two cameras hanging them around the neck and already on the terrace we noticed the surrounding terrain with the help of one of the binoculars. It was clearly visible that the small barrels were hidden, that is, the *Melocactus*. A

gentle and pleasant wind was blowing, which cooled a bit the heat of 40 degrees Celsius. I took my hat, the water bottle, and since the accommodation was just 100 meters, I went down to the endless waters, to pay tribute and to taste a sip from the sea. The palm trees were tied with wind; some people were resting in their shade. Remote fishermen were out on the sea, bright blue sky, shining sun, full of parrots, a song of passers-by, in a word - a wonderful world for me.



M. macracanthos, old plant growing among dry branches and vegetation.

On the uneven and degraded stairs, I managed to overcome the slope. I have already reached the tall *Cereus* that were like trying to reach the sky being 6-8 meters high. On

the other side of the hill a very well-groomed golf course, at its entrance was a mound of rocks on which were planted some *Melocactus macracanthos*.



summary→

summary→

M. macracanthos, young plant and seedlings growing in the alveoli of calcareous rocks.

I finally found them! It's true, not that I expected, but it was a nice feeling to see the plants with their huge spines, and seedlings on their cephaliums. In this area there were only specimens removed from their habitat, people were actually "playing" and occupying their pieces of land with lawns, alleys, small water meshes, eliminating the endemic vegetation. My walk ended in about two hours because of the rain that started falling, but I was happy with what I saw. We scheduled the next searches for the

next morning. After the long evening shower by which I washed all the dust collected from the road, I studied on the map the possibilities of trails on the island. When it was dawn, I came out of my house, I went to the sea to photograph the sunrise.

I went to find the cacti that I had photographed earlier from the balcony. Through the ditches between the bushes half a mile from the road and the hills, I was at the foot of the cliffs, in a thicket of spines.



Caracara cheriway - the northern crested caracara, atop the cliff, looking at us and ready to defend its nest.

Wattle trees (*Acacia*), large *Cereus* and at their base cacti large as the fist, numerous *Melocactus* were sitting in front of me. The spines were like an insurmountable wall. I've been looking for the opportunity to reach the much desired plants. While I was looking down, there was a shadow above me, as I later found out, a Caracara bird flew over with its one-meter-long wings, worried about her puppies.





As it can be seen, *M. macracanthos* grows in pure rocky, sending long powerful roots inside the stone cracks.

Those cacti live on rocks. It seems their roots do not need organic soil; just rocks, even calcareous rocks.

Look at them, finding their way between rock channels and becoming fit with the holes!

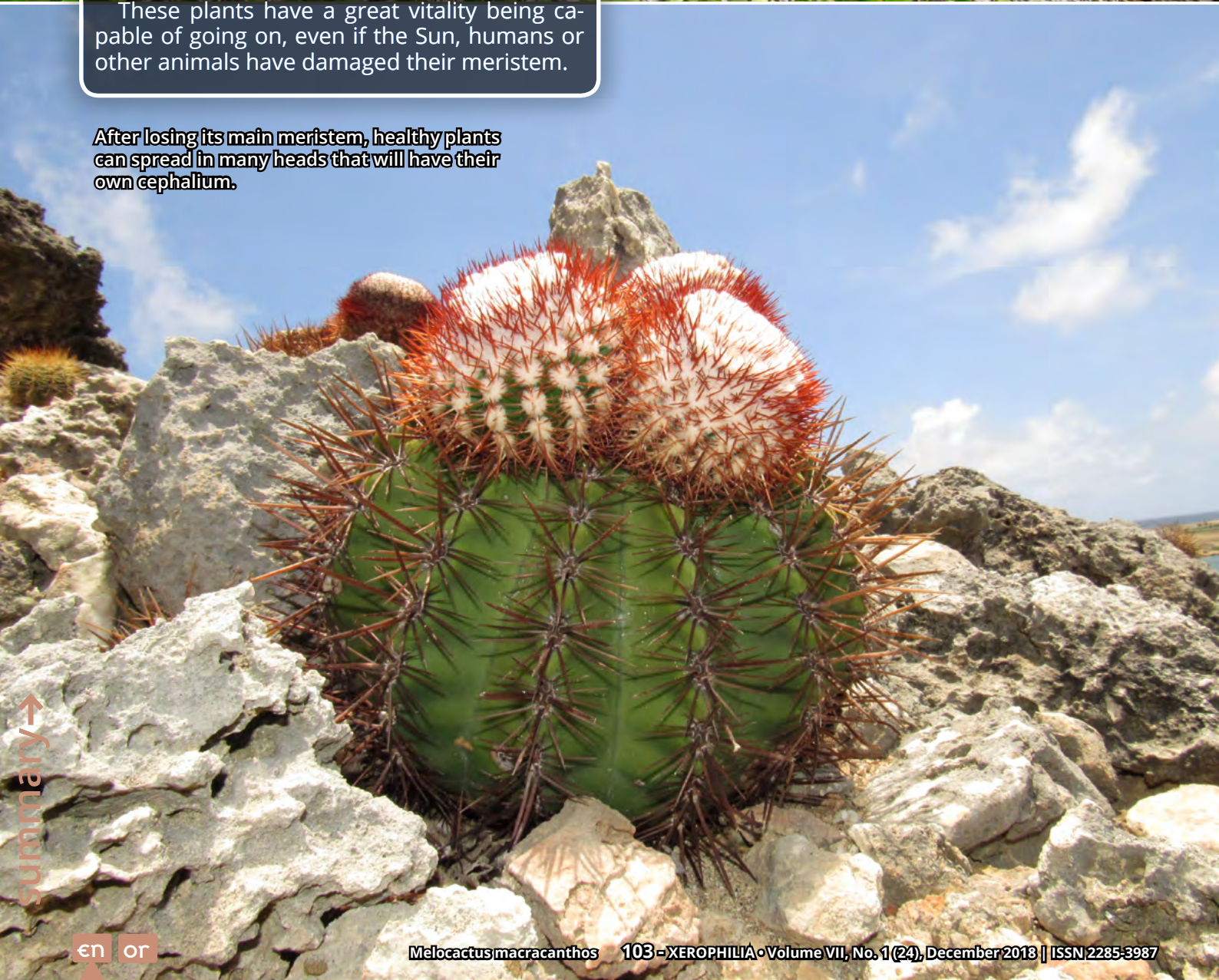




Searching for rocky environments, *Melocactus macracanthos* occupies all the arid cliffs in the island, being often seen atop the sea.

These plants have a great vitality being capable of going on, even if the Sun, humans or other animals have damaged their meristem.

After losing its main meristem, healthy plants can spread in many heads that will have their own cephalium.





M. macracanthos, dichotomous plant.

M. macracanthos, very old plants: the age after adulthood is easily read on the cephalium rings.

As for all melocactus, once the plant has reached its sexual maturity, its body does not grow anymore. All the plant energy is focussed to the specialized flowering zone, the cephalium. This organ grows year after year, taking a columnar shape that can be taller than the plant body.

Sometimes the cephalium can be dichotomous, as you can see in the above photo.

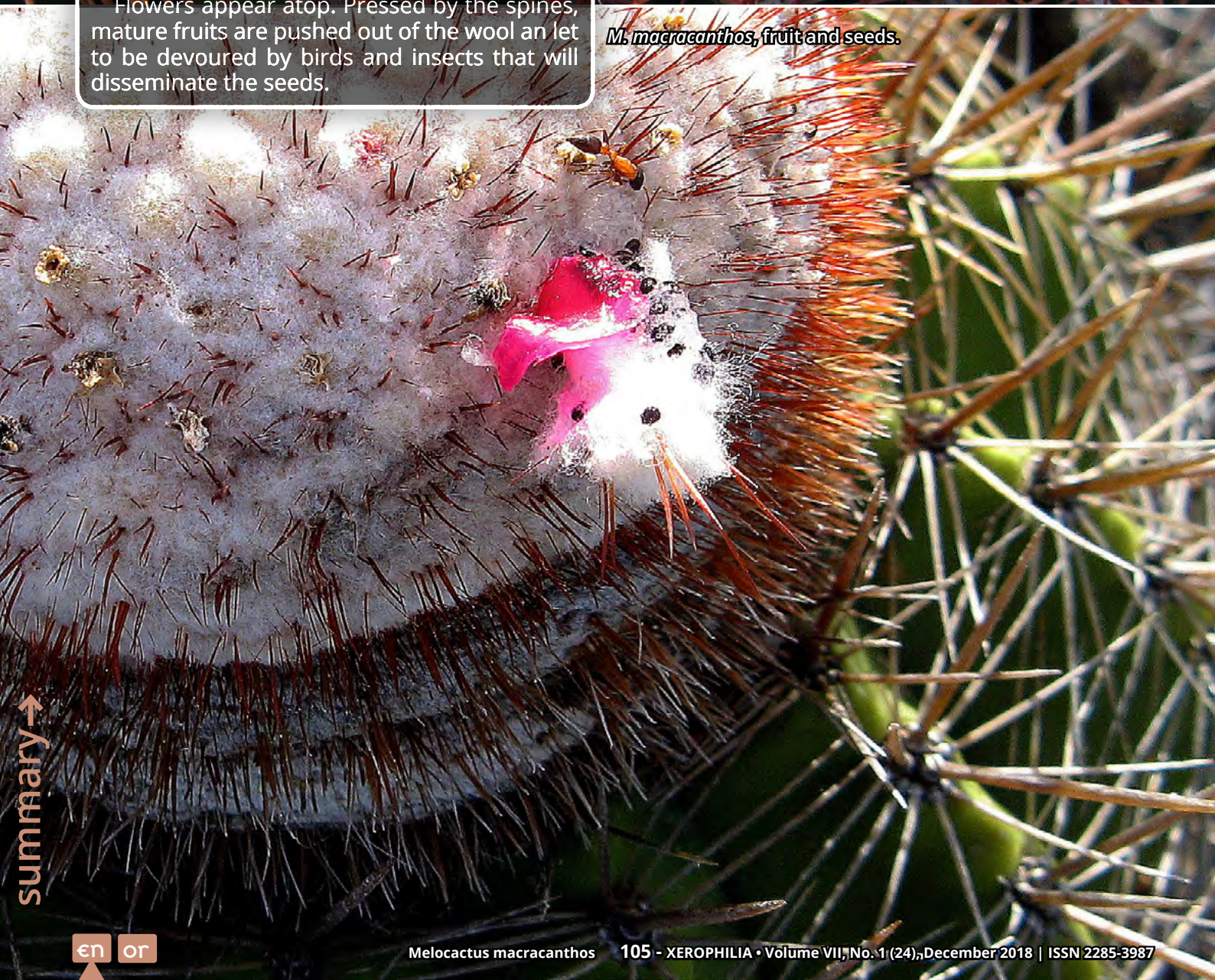




The cephalium is formed by the transformed areols and it always is like a cylindrical brush of thin spines full of wool.

Flowers appear atop. Pressed by the spines, mature fruits are pushed out of the wool and let to be devoured by birds and insects that will disseminate the seeds.

M. macracanthos, a flowering plant with a two to three years old cephalium.



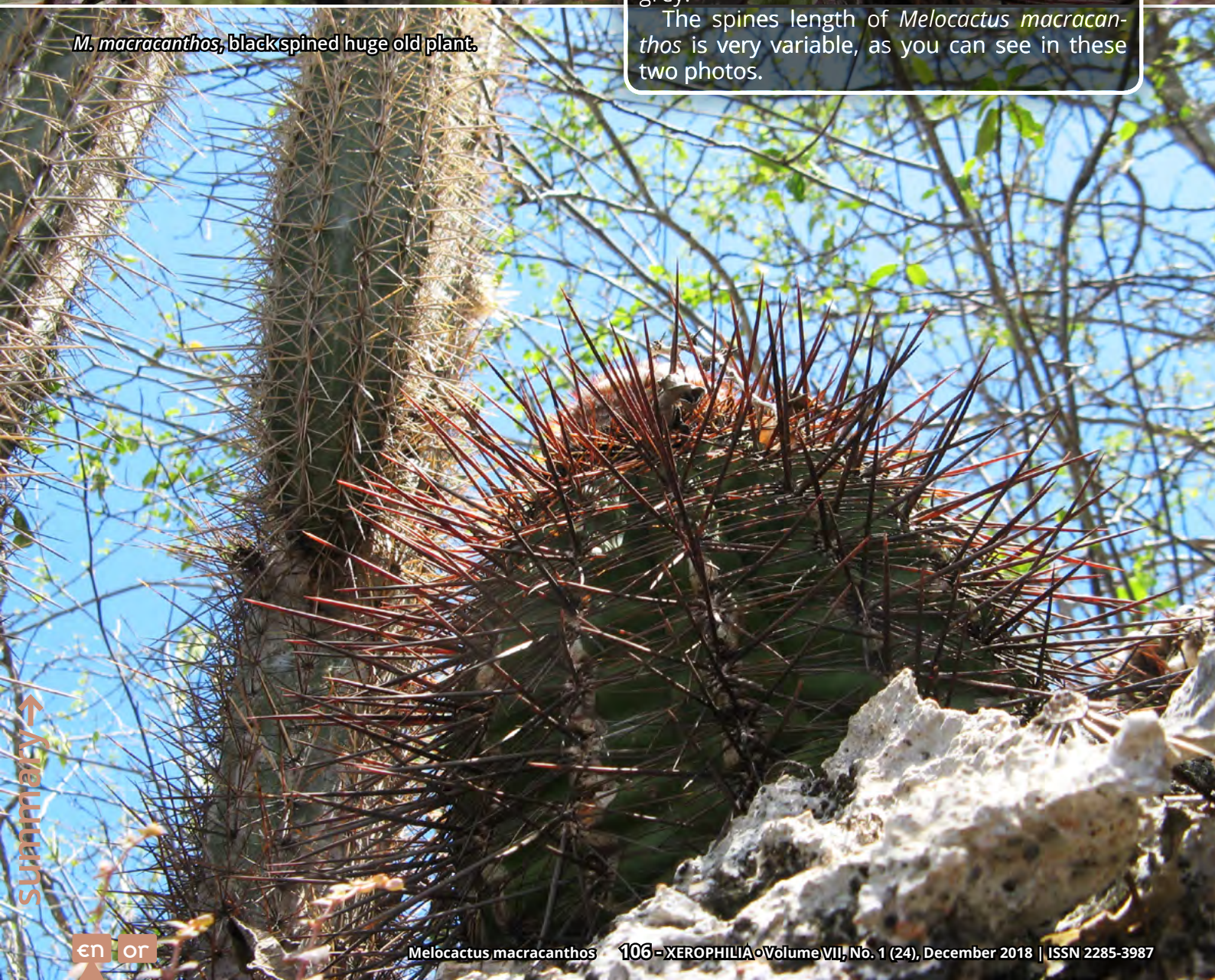
M. macracanthos, fruit and seeds.



M. macracanthos, fire-red spines on new heads growing from a destroyed meristem.

Young spines often have red color. Old ones, like in the photo below, can be almost black or grey.

The spines length of *Melocactus macracanthos* is very variable, as you can see in these two photos.



M. macracanthos, blackspined huge old plant.



As we have shown on the precedent page, the variability of the spine length (photo below) is spectacular.

However the color of the spines can also be very different from an individual to another, even when it comes about two plants growing almost from the same root (photo above).





As we can see, even if it is the most eager stone eater, *Melocactus macracanthos* is not the only inhabitant of the rocky slopes and cliffs in Curaçao. Many other species of cacti and shrubs, even trees, try and succeed to live on this impossible soil.

We especially thank our friend **Marius Dumbrăian**, from Brăila, Romania, for his help in having this article in *Xerophilia*.

Notes on

Mammillaria

melaleuca

Karw. ex Salm-Dyck



Elton Roberts

Text and photos by the author.



Mammillaria melaleuca, flowering specimen.

In the older books you will find *Mammillaria melaleuca* listed under *Dolichothele melaleuca* (Karw. ex Salm-Dyck) Boed. So if you want to look up the name and you have Craig's *Mammillaria Handbook* or Kurt Backeberg's lexicon you will have to look under *Dolichothele* or *Dolicothele*¹ and not *Mammillaria*. Back in my younger days I al-

ways looked under *Dolichothele*. Backeberg lists thirteen species and two varieties. The lumpers have come along and eliminated some names or slid them under another name. Now days if you use the name *Dolichothele* only the old time cactus growers will know what plants are talked about.

¹ - Look at the note on the last page

Photo from habitat by Cezarozmatuszewski.

summary →





M. melaleuca, old clustering specimen.

On pages 353 and 354 of Craig's *Mammillaria Handbook* is the description of *Dolichothele melaleuca*. It is in a section of the book called associated genera as they were not thought of as *Mammillaria*. Here is the description of *Dolichothele melaleuca* from Craig's book:

"Body cespitose. Tubercles semi-flabby in texture, bright green, conic to cylindric, with watery sap, 20 - 25 mm long, 12 - 15 wide at the base, Areoles small oval, naked. Axils naked. Central spines none to 1, present in only about one third of areoles, 10 mm long, straight, acicular, stiff, pubescent, chalky horn color, porrect. Radial spines 6 - 7 (9), 12 - 14 mm long, acicular, straight to slight re-curve, semi-flexuous, chalky horn color, horizontal. Flowers funnelform. Inner perianth-segments yellow, spatulate, tip obtuse and often split. Anthers yellow. Filaments pale yellow. Stigma lobes 5, pale greenish yellow."

Distribution: Oaxaca Mexico².

In his lexicon Backeberg must have copied from Craig's book for he also gives Oaxaca as being where the plants come from.

All the newer books have the correct habitat area. In the book, A new review of *Mammillaria* Names by David Hunt, is a different description and an explanation of the problems with the plant and location as stated by Craig. Here Hunt takes the description straight from the Latin as described by Salm-Dyck:

"Stem globose, axils naked, tubercles stout, robust,

ovate-obtuse, deep glossy green, areoles immersed in the tubercle apex, small, round, white woolly, soon becoming naked, radial spines 8-9 radiating regularly, spreading recurved, the upper 4 a little longer, brown the lower white, central 1, sometimes lacking brown, all slender, rigid."

Here is the explanation given by Hunt as to the problem with the description and location in Craig's book:

"I quote Salm-Dyck's description in translation from the Latin, verbatim, as it clearly shows that Craig (*Mamm. Handb.*, fig. 297) and others did not know the true plant, which is illustrated by Borg (*Cacti*, ed. 2, t.57b. 1951). This was apparently reintroduced sometime before 1933 as Boedeker knew its provenance to be Tamaulipas and not 'Oaxaca'. Glass and Foster again found the plant in Tamaulipas, SW of Jaumave, in 1968 (G & F 666). It is allied to *M. sphaerica* and *M. baumii*, and the spination and coloration, as Salm-Dyck indicated, are highly characteristic. The epithet 'melaleuca' means, literally, black and white. The tubercles are about 10 x 7 mm."

In looking at the plant that Craig shows as *Mammillaria melaleuca* to me it looks more like *Mammillaria sphaerica*.

² - Karwinsky gave the wrong habitat location in his description for the plants saying that they come from Oaxaca Mexico when in fact they come from the state of Tamaulipas Mexico, something like 600 to 800 miles north of the original habitat description.



M. melaleuca, areols and spines.

This photo and the one on the precedent page show the typical *Mammillaria melaleuca* plants, grown in 15 cm pots. As can be seen one of the plants is trying to over grow the side of the pot. The other plant has a little way to grow before needing a larger pot, but I will have to move the larger plant into a 17.5 cm azalea pot. The plants are not really fast growing but when they need a larger pot they need it to stay looking good. I also

think they will need an azalea pot for they do have tap roots (see the photo with the root system). One other photos shows the growing point of one of the stems. It shows the network of spines and the colors of the spines. It also shows something that is not supposed to be and that is some of the areoles have two central spines. The areoles are covered in fluffy wool; that will in time be washed away like the descriptions say.



M. melaleuca, closeup of the areols.

Very interesting are the photos showing the spine clusters. I wanted to see about this thing of some areoles having 2 central spines which the description does not call for. The photos are of two different plants and in both photos it is easy to see that some areoles have two centrals. A few days ago I was moving plants around and discovered that I have five more of the plants than what I thought I had. In inspecting all the plants I have discovered that a couple of the plants have 3 central spines. Not at every areole but enough so that I know I am not making a mistake. Melaleuca means black and white. It is referring to the color of the radial spines. Pilbeam in his book *Mammillaria*, writes in his description of the radial spines, "Radial spines 8 or 9 are slender almost straight, 5 to 12 mm long, the upper the longer, divided into two distinct colours, hence the specific name (melaleuca means black and white), the lower 5 spines being white the others above purplish brown". To try and add confusion, I have plants that have the dark and almost white radial spines as called for; but I also have a couple plants that have all dark radial spines and a couple that have all white radial spines.

Now we come to another problem and this shows up very good in one of the close up photos. Notice that the description calls for the axils to be naked. I have to assume that that bit of informa-

tion is copied from one description to the next. The photo sure shows a lot of wool in the axils and even in other detail photos there is still a hint of wool in the axils. I guess that no one told the plant was not supposed to have any wool in the axils. If you go back to the first two photos you can see that both of the plants have wool in the upper axils.

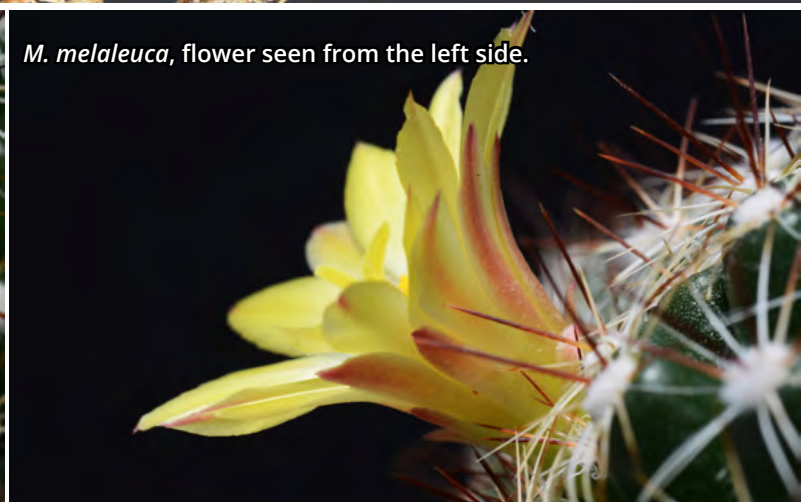
Many times when I see things about plants that do not go along with the description, I think it could be because of my growing conditions. I have seen plants change when moved from a darker area to a bright sunny area. When the temperature outside in the shade is 90 °F (32 °C) it is around 108 to 112 °F (42 to 44.5 °C) in the hothouse. If the temperature is 98 to 100 °F (36.5 to 37.7 °C) in the shade it is 118 to 126 °F (47.7 to 52 °C), if we are suffering with temperatures of up to 110 °F (43 °C) it is anywhere from 130 to 136 °F (54.5 to 57.7 °C) in the hothouses. With temperatures like this it makes plants that do not get any warmer than about 90 °F (32 °C) at the most in habitat, do interesting things, like grow extra spines to help shade the plant body. I have seen plants grow spines two times longer than the spines it had in a more shaded area. I suspect that this is what has happened to my plants for I have found one that spent time in a very bright spot; it has 3 central spines and up to 15 radial spines on a good number of the areoles.



M. melaleuca has huge roots.



M. melaleuca, flower seed from above.



M. melaleuca, flower seen from the left side.

Details of the roots of one of the plants: notice at least 5 taproots³. That is to anchor the plants in their soil where ever they are. I do not see mentioned in any description anything about a tap root. The plants have a tap root or taproots as this plant has. Other *Mammillaria melaleuca* have only one tap root but I have seen that this is for single stemmed or for a plant with two stems. The pictured plant has 5 stems still it looks like the roots are all growing from one area in the plant.

Since it is known that Craig did not describe *Mammillaria melaleuca* we cannot use his description of the flower. In the books I have with the correct description they just give the size and color of the flower. The flowers are 2.5 to 3 cm long and in diameter. That is measuring the flowers on my plants. The outer petals have a dark yellow mid-stripe. In the next photo there is only a slight indication of the dark mid-stripe. The inner petals are yellow with more color in the middle of the petal and

fading to translucent yellow at the edges. The filaments are a goldish yellow with some pink mixed in; the style is yellowish pink, the stigma lobes are a very light green. When the plants bloom many times the plant throws a ring of flowers. If the plant is a many headed plant it is kind of hard to see the individual rings of flowers for each head. (picture of the full flowering plant is courtesy of Keith Flanagan of Overton England) The flowers have a wonderful perfume that can be detected several meters away if the breeze is right. The flowers last for several days and if the weather is cool it can be four or so days. If it is really hot the flowers may only last one day and part of the next day.

³ - Taproot = A taproot is an anchoring root growing downward in a vertical orientation. Taproots are the main root anchoring system that the feeding roots grow from. A taproot is usually a thick root that tapers gradually'. Definition taken off the web, no identification given.

M. melaleuca, meristem.

Notes:

1- I did not know the correct spelling of the name Dolicothele/Dolichothele as I find it both ways in quite up to date books. Many books have it as Dolicothele and some have it as Dolichothele leaving out the h after the c. I went on the web and found both spellings for plants. So I still did not know which is correct. I received an email from Othmar Appenzeller of the German Mammillaria cactus journal saying: «The correct spelling is Dolichothele, from Greek "dolichos" = "long" and "thele" = "tubercle". I have never seen the spelling "Dolicothele"! Can you tell me the books, where you have seen that spelling? If this spelling is to be found in the web, it is a mistake!

(The genus-name Dolicothele is used for some spiders in South America.)»

Othmar wanted to know what books and the first one I took off the shelf was Backeberg's Lexicon and I opened it to the section on Dolicothele. That is found on page 129 and there in bold print is the name Dolicothele. The book was translated by Lois Glass from the original German into English and it was printed by the Blandford Press Ltd. Link House, West Street Poole, Dorset England. The thing we do not know is if Lois Glass spelled the name wrong or if a print setter at Blandford Press accidentally left out the h after the c. I doubt we will know which one it was but it was not caught by proof readers if Blandford Press had

proof readers.

When I type the name *Dolicothele* in Google on the web I get photos of cactus plants and also spiders. On the first two pages there are more articles about cactus plants than of spiders. I believe that the reason for the wrong spelling usage for the last forty years is because Backeberg's Lexicon was the Bible of Cactus plants.

If a disagreement about a plant came up; it was settled by looking at what Backeberg says. Mr. Appenzeller says that as far as he knows no one has ever questioned the use of *Dolicothele* for a genus of cactus till now. I also have never heard or seen any one question that wrong name for a genus of cactus.

Anyone that has the name of *Dolicothele* on one of their plant tags you should change it to *Dolichothele* to have it correct. Otherwise the name is referring to a genus of South American spiders. *Dolichothele* means long tubercles and spiders do not have long tubercles. The strange thing is that when I typed in *Dolichothele* in the Google search it came up with mostly cactus names but also it came up with articles on spiders. I know that many people swear that nothing is wrong on the web!¹

¹ - The genus was erected by Britton and Rose: *Dolichothele* Britton & Rose Cactaceae (Britton & Rose) 4: 61. 1923 [9 Oct 1923].

A remarkable founding on a trip to Sierra del Famatima, La Rioja (Ag)



Heike Bader



Robert Bader

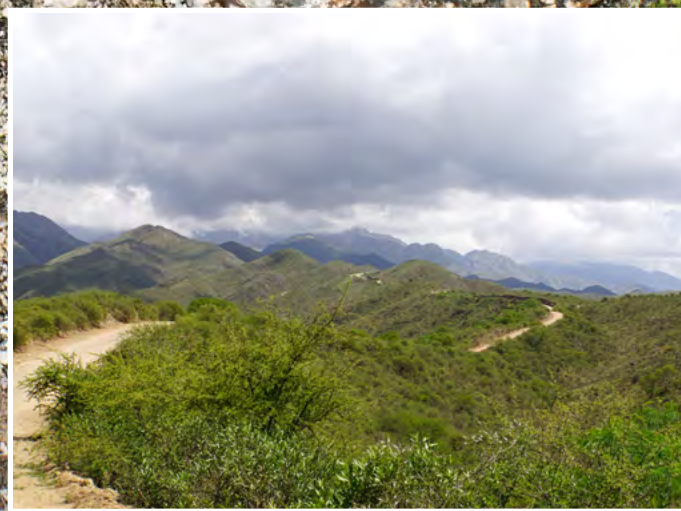


Chilecito in La Rioja, Argentina is a recommended starting point for visiting some interesting cactus sites along the Cuesta Miranda and the mountains of the hard to reach Sierra Famatina. Therefore we planned two days in November 2015 to explore in particular the *Gymnocalycium* plants of the region. At the top of the wish list was the visit several locations of the *Gymnocalycium rit-*

terianum. This species was described by Walter Rausch in 1972 and located in Sierra Famatina. We had few clues as to where to begin the search. Only a vague altitude of 3000-3500m, which turned out later but only as a rough estimate of Rausch, we had noted



We decided to try our luck starting from the south. In the small village of Guanchin, about 15 km west of Chilecito ends the developed road. Numerous walnut plantations line the small hamlet. We found a path that leads us north towards a former gold mine (Mina de Oro) at over 3000m in the Sierra del Famatina. Other mines, such as the Mina La Mejicana, rise up to 4600m. The highest point of this mountain, the Cerro General Manuel Belgrano is visible with its snow-covered summit at 6097m altitude. The track is not paved, but also with our small car (a VW Up!) we managed to cross it without any problem.



summary→



summary→



Meanwhile, occasionally finds of *Gymnocalycium knightianum* from an altitude of about 1800m were reported, among others, by Schweizer and Piltz (P219) who have found such plants. We are curious and actually find the first plants at 1840m. As usually with *G. rhodantherrum*, the plants always remain solitary, even in the case of an apex injury they do not vegetate further. Nevertheless, they differ significantly from *G. rhodantherrum*, which are found frequently at lower altitudes. Although Rausch has always compared his find to *G. rhodantherrum*, we have doubts as to whether these are indeed the plants we are looking for. Maybe I can occasionally report here about these plants.



We decided to continue climbing to higher altitudes, but for the time being we will not find any more cacti. There are fantastic views of the Sierra Famatina. Only at an altitude of 2060m we make a surprising find. These plants are now completely different from *G. rhodantherum*. The flowers are delicately yellowish with a pink throat. Stamens and dust bags are pure yellow. The plants sprouted all without exception and form partly very old hundred-headed mounds. Rausch describes *G. ritterianum* as being single or growing in small groups. Although the extreme sprout formation deviates massively from the first description, these plants fit much better to the characters of the first description as our previous find. In particular, the flat-spherical growth and the high-lying formation of shoots fit. But Rausch cannot put these plants in the group of forms similar to *G. guanchinense* / *rhodantherum*. The differences are striking.





First Description by Rausch KuaS 23 (7)

Body flat-spherical, single or in small groups, the sprouting occurs often high, in the upper half of the body, light green or violet-brown suffused, 3-4 cm high and to 11 cm, with long tap root; ribs 10 to 12, vertical, divided by transverse grooves into 15-20 mm long cusps; areoles deepened in the upper half of the swelling, oval, 5 mm long, white-tipped, under the areole the swellings form a sharp-edged chin; spines 7-9, (3-4 pairs and one downwards) spreading and bent to the body, up to 25 mm long; central spine rarely 1, bent to the apex to the top, to 30 mm long, all spines pink-brown. Flower appearing crest-like, 65 mm long and 75 mm; ovary and the short tube dark green with round pink scales; outer petals spatulate, pink-white with greenish median stripe; inner petals spatulate, very broad, widely spaced, rippled and irregularly bent, white-glossy, throat light purple pink; stamens white; dust bag brownish-pink, style thick, 20 mm long; grains 10, yellowish. Fruit is pear-shaped, 15 mm, tapering upward, bluish with whitish-pink scales. Seed cup-shaped, 1 mm, blackish brown, globular, hilum angled with pronounced, bead-like, whitish edge. Home: Argentina, La Rioja near Famatina at 3,000 to 3,500 m altitude. Type Rausch 126 in the Herbarium W (Vienna).





At 2210 m we find the next population. This does not differ noticeably from the previous one. However, we only find groups up to about 30 heads. The cushions barely protrude out of the ground and we have to be careful that we do not crush them, because the area is covered with hundreds of plants. We always find *G. ritterianum* on flat, rocky and storm-lashed exposed hilltop locations in full sun. Only the reddish colour of the epidermis reveals which environmental conditions these plants are exposed to. The flowers correspond to those from my collection (top right). Happy to see this deviant form of *G. ritterianum* in nature, we begin now the return journey. We definitely want to explore the cactus flora of the nearby located Cuesta Miranda, maybe even today.



Free online magazines

Acc Aztekium Journal (Romanian) - The Romanian Acc Aztekium journal. Latest issue: **No. 47, June 2017.**

Sansevieria Online (German) - The free online journal about the genus Sansevieria. The next issue will be published on 01/11/2017: **No. 6 (2), November 2018.**

Succulentopi@ (French) - free online journal published by the site "Le Cactus Francophone" Latest Issue: **No. 16, May 2017.**

Sukkulenten (German) - Monthly free online journal of the FGaS - Fachgesellschaft andere Sukkulenten (formerly Avonia-News). Latest issue: **Vol. 11, No. 3, November 2018.**

The Cactus Explorer (English) - The first free online C&S journal. Latest issue: **No. 23, December 2018.**

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ABSTRACT - scurtă sumarizare a articolelor

In memoriam: J.J. Lavranos **pagina 5** Roy Mottrama

Un scurt panegiric al regretatului mare om de cultură și mare naturalist, J. J. Lavranos.

Vor supraviețui cactușii mexicani din sălbăticie anului 2100? **pagina 7** Milan Zachar

Mare pasionat, călător, explorator, diplomat, Milan Zachar ne propune o foarte interesantă analiză a situației speciilor de cactuși din Mexic, obligați să facă față dezvoltării imobiliare, agro culturii, mineritului și îmbunătățirilor funciare. Milan crede ca plantele pasiunii noastre vor pierde lupta.

Conophytum bilobum **pagina 13** Chris Rodgerson

Unul dintre cunoscuții specialiști ai genului *Conophytum*, ne prezintă, în acest număr, subspeciile, varietățile și formele speciei *C. bilobum*. Călătoriți prin Africa de Sud, împreună!

Genul *Leptocereus*, în Cuba, prima parte **pagina 27** José Miguel Acuña

Un articol extrem de interesant, despre un gen foarte puțin cunoscut, endemic în Cuba și care, mai ales datorită schimbărilor climatice, se află într-un major pericol de extincție. În acest număr, cele trei specii, cele mai vestice, de pe insulă: *Leptocereus asurgens*, *L. ekmanii* și *L. postratus*.

Ecchinofossulocactus vs. *Stenocactus* **pagina 43** J. Záhora et al.

Un grup pluridisciplinar de naturaliști atacă pe larg și foarte tehnic, vârful iceberg-ului format de haosul care domnește în taxonomia și nomenclatura genului citat în titlu. Știință și fotografii superbe...

Puna subterranea **pagina 59** Sebastián Santicchia

Un argentinian, pasionat de cactuși, își colindă munții neîncetat, studiind și fotografiind incredibila floră xerofită locală. Iată una dintre densele și documentatele sale note asupra unei specii andine, parțial geofită. Bucurați-vă de *Puna subterranea*!

Mammillaria erythrosperma **pagina 71** Juan Miguel Artigas Azas

Ca întotdeauna, un nou articol foarte interesant, tip fișă, despre una dintre mamiliariile foarte frumoase, un articol documentat, cu fotografii pe măsură. Iată o plantă, splendidă atât în natură, cât și în captivitate. Vorbim de o specie decorativă și ușor de cultivat, în colecțiile noastre.

A strange flowering *Mammillaria schumannii* **pagina 81** Elton Roberts

Cunoscutul nostru colaborator prezintă, pe larg, una dintre plantele care au făcut obiectul articolului, privind supra-fertilizarea, din numărul trecut.



ABSTRACT - scurtă sumarizare a articolelor - continuare

Colindând habitatul după *Navajoa peeblesiana* ssp. *menzelii* pagina 87 Stefan Nitzschke

Continuând relatarea călătoriilor sale pe solul nord american, Stefan prezintă, în această a doua parte a jurnalului său de călătorie, găsirea în habitat a acelei subspecii de *Navajoa*, care poartă numele regretatului său prieten, Jorgen Menzel, omul care, pentru prima dată, i-a arătat-o în natură.

Melocactus macracanthos pagina 97 Janos Kajdacs

Un cunoscut colecționar maghiar a ajuns în Marea Caraibelor pentru a vedea și a fotografia un melocactus roșu care trăiește aproape exclusiv pe formațiuni calcaroase, unori lipsite total de sol.

Note despre *Mammillaria melaleuca* pagina 109 Elton Roberts

Deși mai apăsător cu un titlu, în acest număr, ținând seama de diversitatea subiectelor, am făcut o excepție, publicând cele două articole simultan. Elton Roberts ne prezintă o mamilarie splendidă, care, din motive necunoscute, deși are flori mari și frumoase, deși este arătoasă - chiar și când este neînflorită - împreună cu celelalte membre ale fostului gen *Dolichothele*, a cam ieșit din "trend", fiind așadar, destul de rară, în colecții.

O deosebită descoperire pagina 115 Heike & Robert Bader

Explorând Sierra del Famatima, în Argentina, cei doi pasionați exploratori germani au dat peste un grup neobișnuit de plante din specia *Gymnocalycium ritterianum*. Fotografii și explicații interesante.

Mammillaria senilis



in our next issue....

Photo by Ricardo Ramirez Chaparro



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