

Xerophilia

the passion for cacti and other succulents

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**to all
the victims
of these last
terrifying months**

Xerophilia

the passion for cacti and other succulents

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Front cover

Carnegiea gigantea.

Photo by
Heike & Robert Bader



Back cover

The magnificent and rare
Encholirium pedicellatum.

Photo by
Luiz Menini Neto

Xerophilia

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no 22 october 2017

The task of writing the editorials is brought to me in moments of sadness which we would have preferred not to have. On the one hand, Eduart, the Editor of Xerophilia, has to withdraw for an indefinite period, delegating to me his tasks. On the other hand, a friend has passed away. And because things are not simple, beyond the death of the late Juan Manuel Sotomayor, over the last three months, the world around us seems to go into chaos.

- The world is shuddered.
- The world is collapsing.
- The world is turned over by winds.
- The world is swallowed up by the waters.
- People die.
- People become homeless.
- People go, aimless and hopeless.
- People suffer, wherever we turn our eyes!

Apocalyptic floods in Bangladesh; devastating quakes; the last one in Mexico; cyclones, hurricanes and thunderstorms that swept the Caribbean and the surrounding states; even in Romania, a monster storm, like never seen before, killed people, destroyed houses and immersed cities in the dark!

Our team constantly advocates for the protection and biosecurity of this planet, against the callousness, greed and insensible feeling of some, just a few, against all the countless people.

People – good or bad - are also part of this planet, and our team cannot remain insensitive to the horrors faced by our peers.

So, we are worshiping a pious thought for all the lives lost in tragedy – their souls should rest in peace.

We affirm our feelings of solidarity to those in need.

We pay tribute to the rescuers and heroes, because in such cases, they always appear, from the crowd, to show the real face of humanity in us.

People from anywhere, our team at Xerophilia is standing next to you!



editorial 22

d. franco

Stephen Robert Irwin, nicknamed "The Crocodile Hunter", was an Australian zookeeper, conservationist and television personality. Irwin achieved worldwide fame from the television series *The Crocodile Hunter* (1996–2007), an internationally broadcast wildlife documentary series which he co-hosted with his wife Terri. Together, the couple also owned and operated Australia Zoo, founded by Irwin's parents in Beerwah, Queensland, Australia

Irwin died on 4 September 2006 after being pierced in the chest by a stingray barb while filming an underwater documentary film titled *Ocean's Deadliest*.

(Wikipedia)



Xerophilia 22's Favorite Quote

**The message is simple:
love and conserve
our wildlife!**

Steve Irwin
The Crocodile Hunter



Aeonium cuneatum Webb & Berthelot

the succulent which comes from the clouds



Marco Cristitini

Aeonium 'Emerald Carpet' at Roraima Nursery.

Aeoniums are common and widespread plants, which almost all succulentophiles have met almost once. They are deservedly famous for their geometrical shape, for their wonderful flowers and for their drought-resistance. Surfing the net it is easy to find photos of them in their main habitat, the Canary Islands, growing in arid hills and on sunny outcrops or thriving in windy valleys.

Aeoniums are quite widespread also in Southern Europe, in California, in Australia and in New Zealand, where they are cultivated in gardens and greenhouses next to cacti and other desert plants, so it is easy to think that all these succulents come from dry regions and have to

be grown accordingly, but in every genus of plants there are exceptions and this article is about one of them, *Aeonium cuneatum*.

The first time I saw *Aeonium cuneatum* I was not particularly impressed. I was visiting the Botanical Garden of Rome and I spotted the plant in a greenhouse, together with many other aeoniums. I duly photographed it, but I was more attracted by other species, such as the big *Aeonium urbicum*, the bushy *Aeonium arboreum* or the intriguing *Aeonium castello-paivae*, which was in blossom. After a year I met again *A. cuneatum*, this time at Jardin Exotique de Monaco. The plants grew together with other aeoniums and they looked much better than those I saw in Rome, but I did not linger long before them, since they seemed to me quite normal, ordinary succulents

Photo credit: Noélene Tomlinson



summary →



Aeonium cuneatum growing in Melbourne.

I quite forgot them until I bought Rudolf Schulz's *Aeonium in habitat and cultivation*, the book which introduced me to the wonderful world of aeoniums. When reading the pages about *Aeonium cuneatum*, I discovered a fascinating story. This plant, which looks so ordinary in cultivation, comes from the most humid part of Tenerife, the Anaga region, and grows in the evergreen laurel forest (laurisilva) under tall trees. Unlike other aeoniums, it likes shady and wet spots, where it reaches 40 cm in diameter. I think that this is the reason, why *A. cuneatum*

does not thrive when grown together with other aeoniums. In fact it needs a richer soil and a wetter environment in order to retain its distinctive features.

During the following months and years I kept looking for information about this big and strange succulent, but I did not manage to find much more. Then I had the opportunity, in August 2016, to spend my holidays on Tenerife and I planned a trip to Anaga to look for *A. cuneatum* and other plants.

I was not disappointed.



Tenerife, Taborno, *Aeonium cuneatum* among ferns in a very shady spot.



Tenerife, Taborno, the habitat of *Aeonium cuneatum*.

My first meeting with this wonderful species took place on 15th August. In the morning I went to Chinamada (Anaga), where I saw and photographed many *A. lindleyi* in full blossom. In spite of the weather, which was rainy and cloudy, the sight of hundreds of aeonium bushes yellow with flowers was unforgettable. On the way back I noticed a few strange plants beside the road, near Taborno, so I stopped to observe them more carefully.

Upon coming closer I was surprised by what I saw. Under the trees, among ferns and moss, there were dozens of *A. cuneatum*, many having 30-40 cm in diameter. They grow in the under-wood, in the middle of a very wet laurisilva fo-

rest. When I was there, the air was full of humidity, water was trickling from the branches and the soil was very moist. "No country for succulents" I would have thought looking at the sky, full of thick and fast clouds, if I had not seen *A. cuneatum* thriving there.

I do not know the average weather of that region of Tenerife, but the other parts of the island were very dry when I went there, whereas I always saw clouds over Anaga. Moreover, the plants grow under the trees and, sometimes, they are also hidden by ferns and bushes, so they do not manage to receive much sunlight. Shadow and humidity, however, seem not to be a problem for them.



Tenerife, Taborno, a group of *Aeonium cuneatum*.

Two days later I traveled east of Taborno and I saw again some *Aeonium cuneatum* near Roque Suarez (see map 2). There the plants were, if possible, bigger than those I saw before. It is not easy to appreciate their size from the photos, so I once put my arm near a big specimen and I noticed that one leaf was almost as large as my hand. Also the plants near Roque Suarez grow under the *laurisilva*⁽¹⁾ forest foliage, on a wet terrain, which is covered by moss and

ferns. I also observed smaller specimens, probably seedlings. It is easy to take photos of these plants, because they are very abundant near the TF-12 road. I did not dare to venture into the woods, since they seemed quite dark and impenetrable and I had plenty of photogenic subjects waiting for me a few steps from the asphalt, but more adventurous travellers can surely find plenty of *A. cuneatum* in the depth of the laurisilva forest



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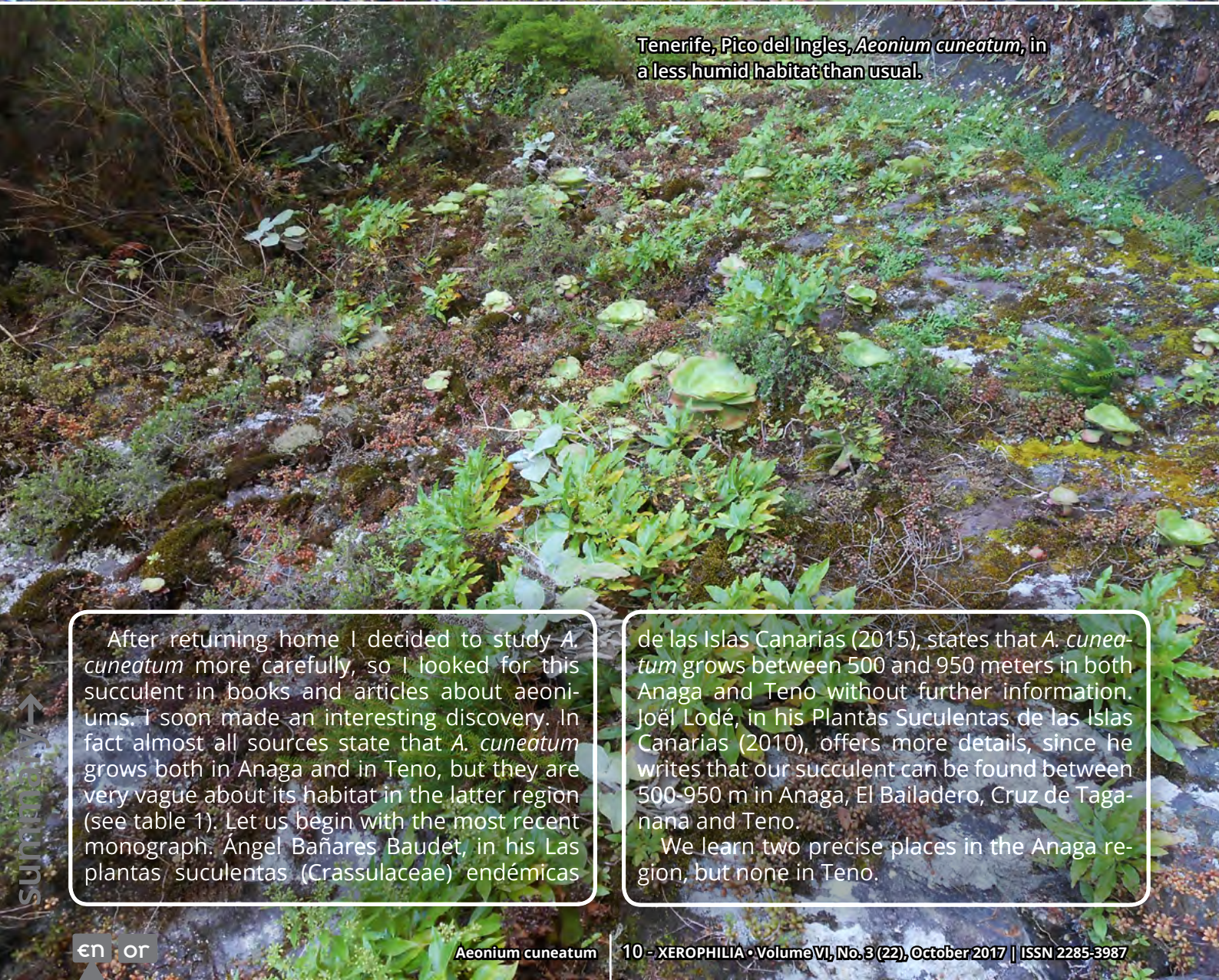
Tenerife, Pico del Ingles, *Aeonium cuneatum*,
(close-up).

On 19th August I was again in Anaga and I spotted many *A. cuneatum* around Pico del Ingles, which is not far from Taborno. They grow together with *Monanthes anagensis*, always on

mossy terrain. The plants, however, looked smaller and with more rounded leaves than the ones I saw previously, maybe because there was more light.



Tenerife, Pico del Ingles, small *Aeonium cuneatum*.



Tenerife, Pico del Ingles, *Aeonium cuneatum*, in a less humid habitat than usual.

After returning home I decided to study *A. cuneatum* more carefully, so I looked for this succulent in books and articles about aeoniums. I soon made an interesting discovery. In fact almost all sources state that *A. cuneatum* grows both in Anaga and in Teno, but they are very vague about its habitat in the latter region (see table 1). Let us begin with the most recent monograph. Ángel Bañares Baudet, in his *Las plantas suculentas (Crassulaceae) endémicas*

de las Islas Canarias (2015), states that *A. cuneatum* grows between 500 and 950 meters in both Anaga and Teno without further information. Joél Lodé, in his *Plantas Suculentas de las Islas Canarias* (2010), offers more details, since he writes that our succulent can be found between 500-950 m in Anaga, El Bailadero, Cruz de Taganana and Teno.

We learn two precise places in the Anaga region, but none in Teno.



Tenerife, Pico del Ingles, three nice *Aeonium cuneatum*.

The situation is similar in Eduardo Carbonell's book, Cuadernos de succulencia (2007), where he locates the species in Anaga, El Bailadero, El Teno and Taganana. Rudolf Schulz, in his Aeonium in habitat and cultivation (2007), mentions only "Tenerife's wet and windy northeast peninsula", whereas Reto Nyffler, in Urs Eggli's Illustrated Handbook of Succulent Plants: Crassulaceae (2003), writes that *A. cuneatum* grows between 500-900 m in East and West Tenerife, echoing Ho-Yih Liu's Systematics of Aeonium (Crassulaceae) (1989), where the succulent is said to live between "500-950 m, in the laurel forest regions of the eastern and western ends of Tenerife". Liu, on the other hand, was quoting Robert Lloyd Praeger's An account of the Sempervivum Group (1932), where we find out that our succulent grows "at the eastern and

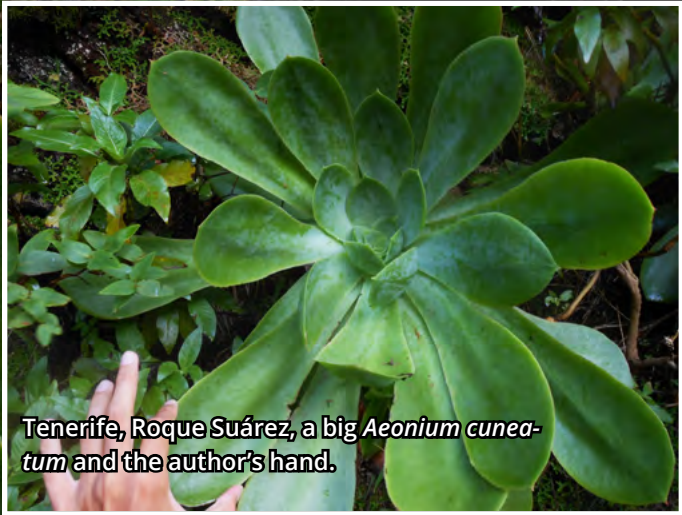
western ends of the island" of Tenerife "about 1500 to 3500 feet", that is between 457,2 and 914,4 meters (1 ft = 0,3048 m) or, if we want to round up these numbers, between 500 and 900/950 meters. A slightly different information is to be found in David and Zoë Bramwell's Flores Silvestres de las Islas Canarias (1974), where they again write that *A. cuneatum* grows at the eastern and western ends of Tenerife, but between 600-800 meters. This little experiment of Quellenforschung (a German word which means "looking for the sources") tells us that all authors who wrote about *A. cuneatum*'s distribution (with the possible exception of Schulz) more or less quoted Praeger, whereas the Bramwells probably derived the altitudinal vegetation zone of this species from their experience.



Tenerife, Roque Suárez, medium-sized *Aeonium cuneatum*, seedlings.

Now the obvious question is: where did Praeger's information about *A. cuneatum* in Teno come from? The answer is very easy: from himself. In an article published in 1929 Praeger writes that he saw *A. cuneatum* "in abundance in several places in the great wooded valley behind Los Silos, 750-1050 meters". He found it there because Oscar Burchard (1863-1949) told him that "he had found this plant near the western end of the island" (Praeger 1929). In fact Burchard published in the same year his *Beiträge zur Ökologie und Biologie*

der Kanarenpflanzen, where he writes that he found *A. cuneatum* both in Anaga, between 500 and 1000 m, and in Teno, under the Fuente de Calera (750 m), which I was unfortunately unable to locate on the map. Since it is said to be on Monte de Los Silos (750 m) in an area rich of water, I think that it could be east of El Palmar (see maps 3 and 4). Burchard provides the readers also with a good black and white photo, which is the only image of an *Aeonium cuneatum* plant growing in Teno I was able to find in botanical literature.



Tenerife, Roque Suárez, a big *Aeonium cuneatum* and the author's hand.

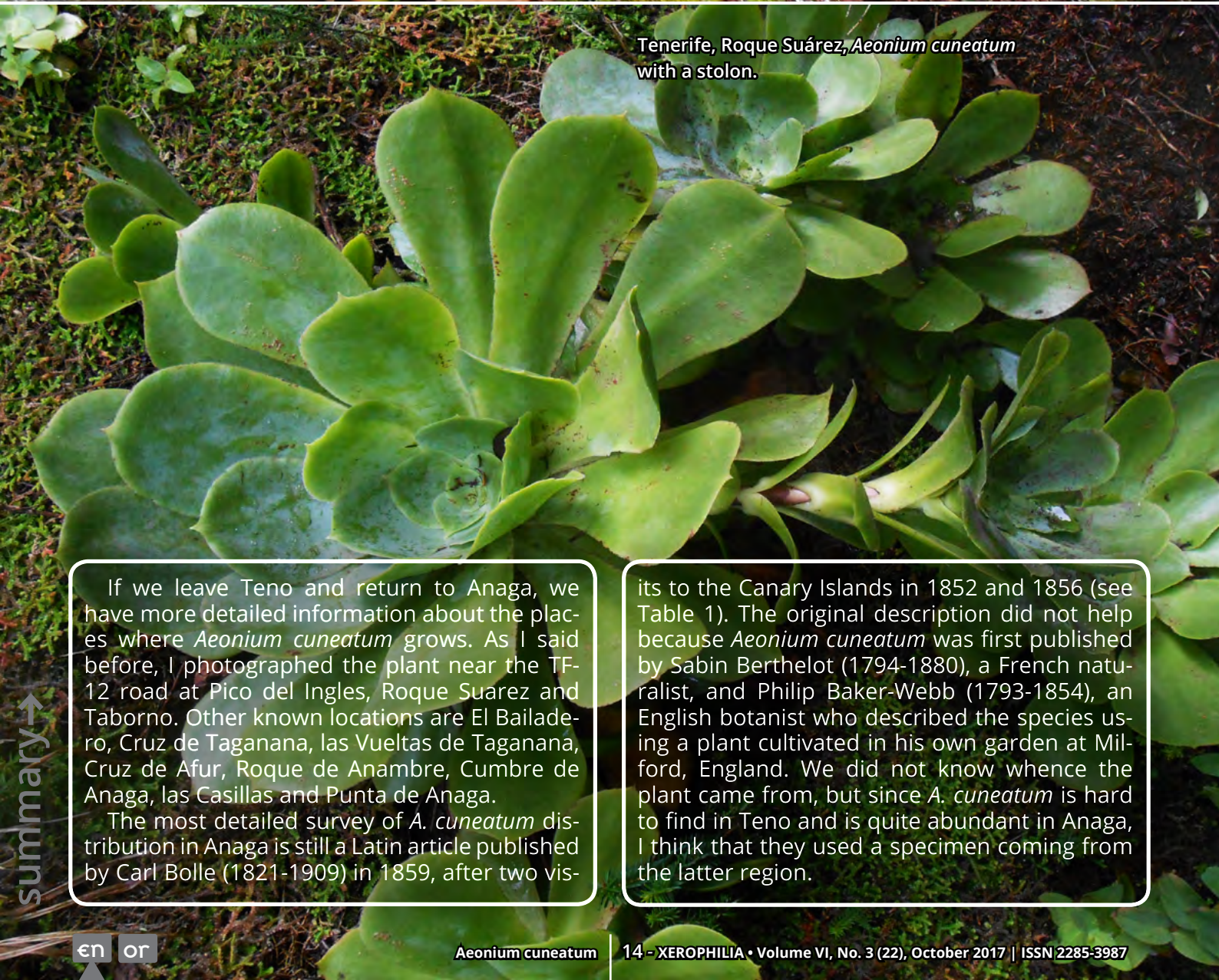
Tenerife, Roque Suárez, a big *Aeonium cuneatum*.

When I went to Tenerife, I stopped at Los Silos and I walked for a few hours on a path leading towards the hills, but then I unfortunately had not yet found out the exact location of *A. cuneatum* in Teno, so I did not look for it. The landscape I saw, however, was very dry. There was plenty of *A. urbicum*, *A. tabuliforme* and *A. canariense*, but no moss, no ferns and no *A. cuneatum*. Since reading about Praeger's and Burchard's discoveries, I wrote to a few experts of Tenerife's flora in order to find out whether they

have ever seen such a succulent in the Teno area. Ricardo Mesa Coello kindly answered me that he saw the plant in Las Calabaceras and in the upper part of the Barranco de los Cochinos, in the escarpments looking to the north. Then, on 14th June 2017 he went to Monte del Agua, where he photographed a thriving population of *A. cuneatum* with some rosettes bearing inflorescences (located at these coordinates: 28° 20' 14.08" N; 16° 49' 36.92" W or, if we use UTM coordinates, 28 R 320918 3135918).



Tenerife, Roque Suárez, *Aeonium cuneatum* in the laurisilva.



Tenerife, Roque Suárez, *Aeonium cuneatum* with a stolon.

If we leave Teno and return to Anaga, we have more detailed information about the places where *Aeonium cuneatum* grows. As I said before, I photographed the plant near the TF-12 road at Pico del Ingles, Roque Suarez and Taborno. Other known locations are El Bailadero, Cruz de Taganana, las Vueltas de Taganana, Cruz de Afur, Roque de Anambre, Cumbre de Anaga, las Casillas and Punta de Anaga.

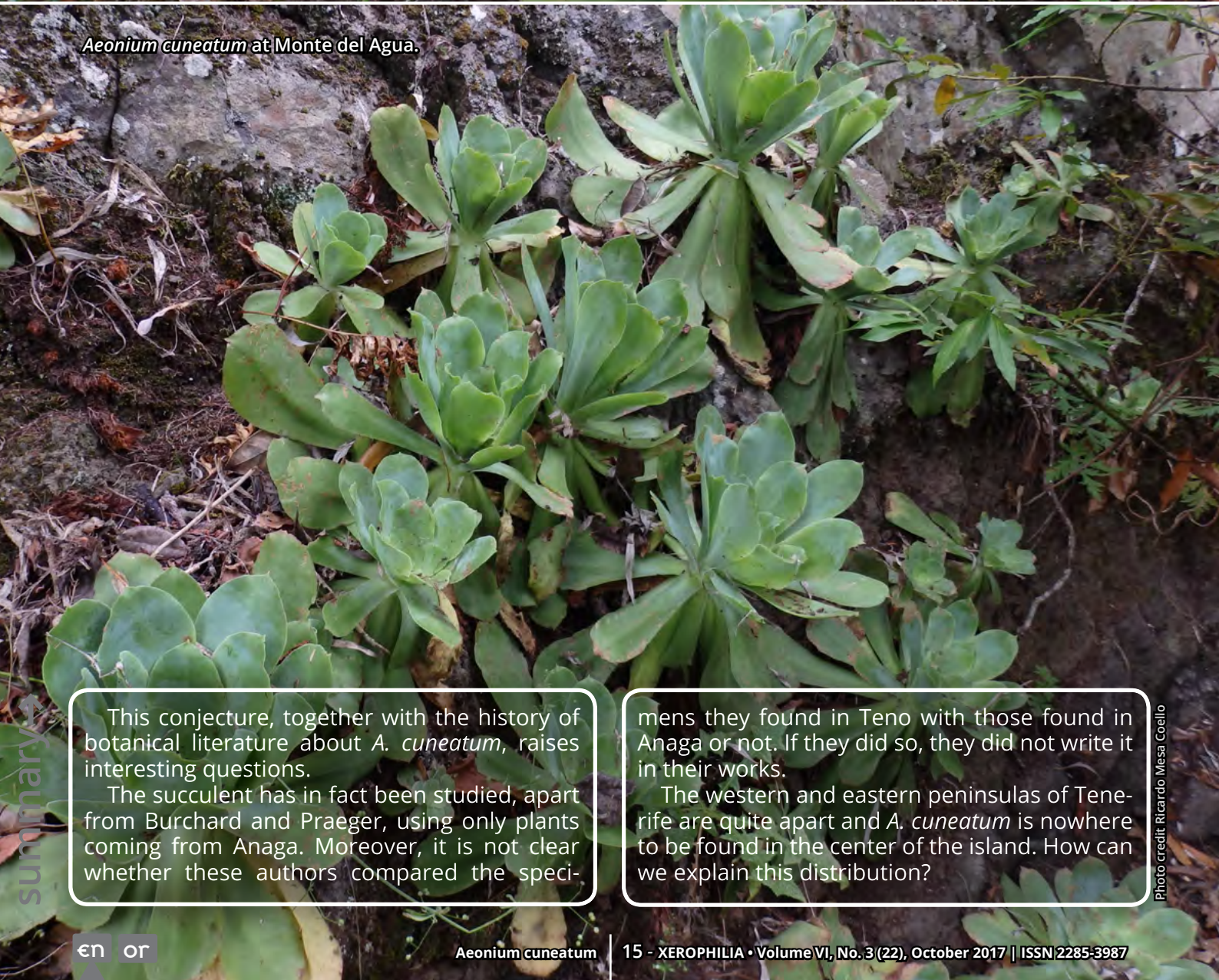
The most detailed survey of *A. cuneatum* distribution in Anaga is still a Latin article published by Carl Bolle (1821-1909) in 1859, after two vis-

its to the Canary Islands in 1852 and 1856 (see Table 1). The original description did not help because *Aeonium cuneatum* was first published by Sabin Berthelot (1794-1880), a French naturalist, and Philip Baker-Webb (1793-1854), an English botanist who described the species using a plant cultivated in his own garden at Milford, England. We did not know whence the plant came from, but since *A. cuneatum* is hard to find in Teno and is quite abundant in Anaga, I think that they used a specimen coming from the latter region.



A big *Aeonium cuneatum* at Monte del Agua.

Photo credit: Ricardo Mesa Coello



Aeonium cuneatum at Monte del Agua.

Photo credit: Ricardo Mesa Coello

This conjecture, together with the history of botanical literature about *A. cuneatum*, raises interesting questions.

The succulent has in fact been studied, apart from Burchard and Praeger, using only plants coming from Anaga. Moreover, it is not clear whether these authors compared the speci-

mens they found in Teno with those found in Anaga or not. If they did so, they did not write it in their works.

The western and eastern peninsulas of Tenerife are quite apart and *A. cuneatum* is nowhere to be found in the center of the island. How can we explain this distribution?



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An inflorescence of *Aeonium cuneatum* in its habitat at Monte del Agua.

Possibly, once *A. cuneatum* grew throughout Tenerife, and then an eruption of El Teide or a climate change divided the two populations. It is very difficult to guess when this happened, but I think that a careful analysis of the eastern population of *A. cuneatum* could offer some clues. It would also be interesting to investigate whether these plants are really identical to those living in Teno or they belong to two different subspecies

(a sort of *Aeonium cuneatum* ssp. *tenense* and *A. cuneatum* ssp. *anagense*), as it often happens when two populations of the same taxon have been growing apart from each other for a long time. For all these reasons it would be a very praiseworthy enterprise if a botanist decided to explore the Teno area in search of *A. cuneatum* and then to compare it with the plants growing in Anaga.

Photo credit: Ricardo Mesa Coello



Close-up of inflorescence of *Aeonium cuneatum* in its habitat at Monte del Agua.

After this long discussion about *A. cuneatum* distribution, however, it is time to provide the readers with a short description of it. *A. cuneatum* is a perennial succulent, sometimes epiphytic, whose rosettes, up to 40 cm (or more) in diameter, are often solitary, but they sometimes develop stolons up to 25 cm long (Praeger 1932), which appear, according to Burchard,

around flowering rosettes. The stem is stout, very short and smooth.

The green-bluish leaves are rigid, quite fleshy, obovate to obovate-oblongate, mucronate, finely ciliate, usually 10-30 cm long and 5-8 cm wide, but there are also bigger plants, with leaves up to 40 cm long. The inner leaves sometimes form a cup

Photo credit: Ricardo Mesa Coello



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Bracts of *Aeonium cuneatum* nel suo habitat a Monte del Agua.

A. cuneatum flowers from April to June according to literature. In fact the inflorescences photographed by Ricardo Mesa Coello on 14th June 2017 in Teno were spent, but still green. The flowering stem is 1 m tall and very leafy, with

many yellow flowers with 8-10 triangular sepals 3-4 mm long; 8-10 oblanceolate, glabrous and acuminate petals 6-7 mm long; yellow stamens 6 mm long and pale green carpels 6 mm long. Cytology is said to be $n = 18$ by Liu.

Photo credit: Ricardo Mesa Coello

An *Aeonium cuneatum* hybrid.

Praeger (1929) writes that this aeonium hybridizes with *A. canariense* var. *canariense* and *A. urbicum*. He gives a Latin description of the former hybrid, which, translated, says “rosettes many, cup-shaped. Leaves spatulate, intermediate between the parents, fresh green, glabrous or lightly pubescent, ciliate with pectinate or pubescent cilia, or without cilia. Inflorescence densely glandular-pubescent. Flowers pale yellow, petals 7 mm long” (Praeger’s translation, published in 1932). Praeger found two hybrids, one nearer to *A. cuneatum* and another nearer to *A. canariense*, at the head of Barranco Tajodio (or Tahodio), above a 30-foot waterfall at 700 meters. During the late Twenties, when Praeger

saw the plant, the Embalse de Tahodio, an artificial lake, was created for irrigation purposes and maybe the 30-foot waterfall Praeger spoke of is to be connected with the dam which seals the lake. This hybrid is called *Aeonium x tahodense* by Bañares (2007), who partially translates Praeger’s description in Spanish in his book (2015) and writes (in both article, 2007, and book, 2015) that the lectotypus is the only extant illustration of the plant, published on plate IX (figure 4) of Praeger’s article (1929), which, however, is of very little help, since it is only a quick sketch of the leaves. The plant was previously called *Aeonium x bramwellii* by Gordon Rowley (Jacobsen & Rowley 1973).



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Aeonium 'Emerald Carpet' in Perth.

As far as the hybrid with *A. urbicum* is concerned, Praeger (1929) is more uncertain, he writes about some strange plants he found in the Anaga woods having yellowish flowers and lightly glandular-pubescent inflorescence-branches, bracts and calices. He thinks that

they could be a cross between *A. cuneatum* and *A. urbicum*, but he writes that the plants are very similar to *A. urbicum*. Unfortunately, he is not very precise about the place where he found this alleged hybrid, so it is impossible to locate it on the map.

Photo Credit: Treacy Lockie



Aeonium 'Emerald Carpet' in Perth.

A. cuneatum hybridizes also in cultivation and it is thought to be a parent of *Aeonium* 'Emerald Carpet'. Noelene Tomlinson wrote me that she saw three hybrids of *A. cuneatum* in Melbourne and that both *A. cuneatum* and *A.* 'Emerald Carpet' are quite common there. The latter is to be found at Melbourne's Royal Botanic Gardens Victoria and, as Treacy Lockie wrote me, grows also in Perth, where it has been cultivated for quite a few years, since her parents obtained a cutting of it between the late 70's and the early 80's. *A.* 'Emerald Carpet' grows very well in poor soil and develops offshoots, one of the main features of *A. cuneatum*. Treacy wrote

me also that it took ten years before the plant flowered. The climate of Perth can be very hot, dry and windy in summer, so it is similar to that of Tenerife and this is almost surely the main reason, why *A.* 'Emerald Carpet' grows so well there. Since *A. cuneatum* likes shady and wet spots, the other parent of this hybrid should be a very drought-tolerant aeonium, maybe *A. urbicum*. This guess is corroborated by Praeger, who wrote about such an hybrid, and by Attila Kapitany, who reports that *A. cuneatum* crossed with *A. davidbramwellii* and *A. urbicum* in his garden, giving birth to plants with pale yellow-cream flowers.

Photo credit: Treacy Lockie



Aeonium 'Emerald Carpet' at Perth.

Photo credit: Treacy Lockie



Aeonium cuneatum in cultivation.

Aeonium cuneatum is not widespread in cultivation. What Praeger wrote in 1932 is still true today: "It is rare in cultivation and deserves to be more widely grown". Rudolf Schulz (2007) says that it can be found in California and that it "should do well in wetter environments such as the Pacific north coast of the USA and New Zealand", where it could be used as a ground cover. He also warns that this species does not grow well in pot. He then wrote me that he "found that it grew quickly and easily as a seedling, but it did not do well outdoors near Melbourne, in Australia, as it did not seem to like the extreme summer heat". Also Joël Lodé kindly shared with me his cultivation experience, stating that the plant can be grown in the shade of a greenhouse with humus and pozzolana, but some humidity is advised. Noelene Tomlinson confirms these cultivation requirements stating that this aeonium "prefers afternoon shade and wet conditions, but good drainage".



Aeonium 'Emerald Carpet' at Royal Botanic Gardens Victoria, Melbourne.



Roma, Orto Botanico, *Aeonium cuneatum*.

Roma, Orto Botanico, *Aeonium cuneatum* leaf.

Bañares (2015) too stresses the importance of humidity and writes that *A. cuneatum* needs an environment similar to its habitat. When I am writing this article (May 2017), I have been growing this plant for ten months and I agree that it can be a

difficult species, since its growth is slow and it is easily attacked by mealy-bugs if kept indoors during winter. However, if one lives in a frost-free and not too arid area, I would recommend this succulent, because it is really a wonderful plant.



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Jardin Exotique de Monaco, *Aeonium cuneatum*.

To conclude, this brief paper has shown that *Aeonium cuneatum* deserves more attention from both botanists and succulentophiles. The distribution of this beautiful species has not been adequately investigated and the most detailed studies about it are almost a century old. The population of *A. cuneatum* growing in Teno could offer valuable clues to understand better this species' history, taxonomy and distribution, so a careful investigation would be a praiseworthy task.

Moreover, this succulent has, in my opinion, a great cultivation potential, because it can be grow in wet climates, where other succulents would rot quickly. For this reason it could become popular among all succulentophiles living in wet and temperate regions. In fact, where other plants suffer because of frequent rains and constant shadow, *Aeonium cuneatum* feels at home and thrives, as it thrives in its remote habitat, among the woods and the clouds of Anaga.



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Addendum

***Aeonium cuneatum* on Monte de los Pasos (Teno)**

After I finished my article about *Aeonium cuneatum*, I had an unexpected opportunity to spend a day on Tenerife on 11th August 2017 and I went to Teno in order to look for this elusive succulent. Thanks to Ricardo Mesa Coello, who kindly informed me about the coordinates of the plants observed by him, I was able to pin down on my map the location of *A. cuneatum* and to plan my trip accordingly. So I went by car to Las Portelas

A group of *A. cuneatum* belonging to the first population.

and then I took the Carretera Monte del Agua, a road which is suitable for vehicles, but I advise to walk, if one has not a jeep. Along the path there are lots of wonderful *Aeonium haworthii* bushes and quite a few well developed *A. urbicum*. The road is sunny and hot at the beginning, but it enters soon in the laurisilva, where the air is more damp and the temperature much more endurable. There I spotted many dry inflorescences of *Aichryson laxum*, a few tiny plants of this species and one solitary *Monanthes laxiflora*.



A plant of *Aeonium cuneatum* on Monte de los Pasos.

- The first population of *A. cuneatum* on Monte de los Pasos.

At a crossroad with signs for Erjos (6.3 km far), Las Portelas (4.4 km far) and Las Moradas I took the path for the latter destination and after 100-150 meters I spotted a group of *A. cuneatum* partially concealed by bushes, growing on a steep mossy cliff, on the Western slope of Monte de los Pasos. The GPS coordinates provided by my smartphone were 28° 20' 13.94" N, 16° 49' 36.95" W (more or less 850 m above sea level). The succulents were not in a very good shape, because many of their leaves had been damaged

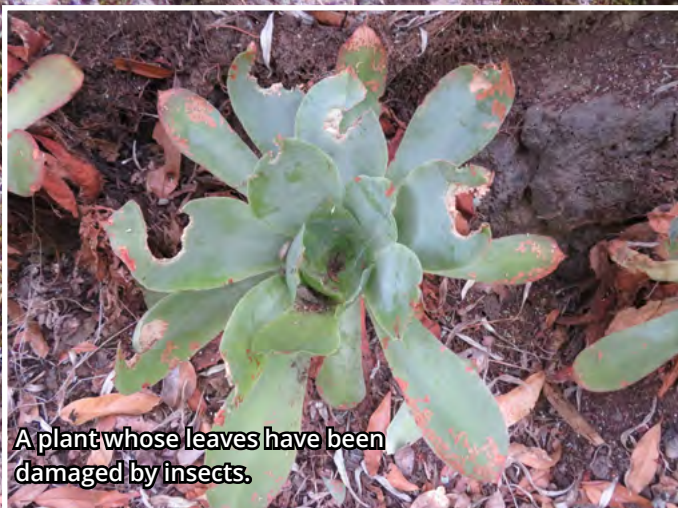
by insects, but they were quite similar to those I saw in Anaga, albeit a bit smaller. The environment, however, was drier than the laurisilva of Anaga, at least during my visit. In this first group of plants there were a few grown specimens, but I saw no traces of inflorescences. After a few meters there was a second population of *A. cuneatum*, again growing on a steep cliff, where I spotted two dried inflorescences. These plants looked healthier than those I observed before, but were fewer in number.



Aeonium cuneatum on Monte de los Pasos.

The second population of *A. cuneatum* on Monte de los Pasos.

I walked on this path towards Las Moradas for quite a while and then I carried on along the main road towards Erjos until another crossroad (4.5 km from Erjos). I spotted again *A. haworthii* and *A. urbicum*, several good-looking *Aichryson laxum*, some very dried members of section *Greenovia* (maybe *A. diplocyclum*) and a single *A. canariense* var. *canariense*, but no *Aeonium cuneatum*.



A plant whose leaves have been damaged by insects.

Two *Aeonium cuneatum* on Monte de los Pasos.



I was impressed by how few *A. cuneatum* I saw. Moreover, they grow only on two cliffs and many plants were badly damaged by insects. I fear that a landslide or a massive attack by parasites could entirely destroy these little popu-

lations. The mountain behind the plant, however, is quite steep and it is not easy to explore the neighbouring forest, so I hope that there are other groups of *Aeonium cuneatum* hidden in the laurisilva of Teno.

**Table 1: *Aeonium cuneatum*
distribution according to literature**

Banares Baudet 2015	Elemento termomediterráneo relegado a los ambientes más húmedos del monte verde en Tenerife (Anaga y Teno) donde crece en sectores escarpados y sotobosque así como epifítico de árboles de esta formación forestal, desde los 500 a 900 m s.m.
Lodé 2010	Tenerife (Anaga, El Bailadero, Cruz de Taganana, Teno) [...] <i>Aeonium cuneatum</i> grows between 500-950 m in alt., in the laurel forest, on cliffs or soil banks, sometimes on trees, in relatively wet habitats.
Carbonell 2007	Medium-high wooded areas of Tenerife: Anaga, El Bailadero, El Teno and Taganana.
Schulz 2007	In clearings in the dense evergreen laurel forest on Tenerife's wet and windy northeast peninsula.
Nyffler 2003	Canary Islands (E and W Tenerife); 500 - 950 m, laurel forest region in fairly humid habitats.
Liu 1989	Common on rocks, soil banks, and among bushes, occasionally on trees, in fairly moist habitats; 500-950 m; in the laurel forest regions of the eastern and western ends of Tenerife, Canary Islands.
Bramwell 1974	Limitada a los viejos bloques montañosos en cada extremo de la Isla, Anaga y Teno, riscos de bosques y terraplenes, común localmente por la cumbre de Anaga, Cumbres de Taganana, El Bailadero, 600-800 m.
Praeger 1932	Canary Islands: Tenerife, locally abundant at the eastern and western ends of the island, on rocks, banks and among bushes, about 1500 to 3500 feet.
Praeger 1929	Dr. Burchard told me that he had found this plant near the western end of the island (it had been known previously only from the Anaga area, in the extreme east), so I was not surprised when I saw it in abundance in several places in the great wooded valley behind Los Silos, 750-1050 meters. Both here and at Anaga it may be found growing in woods in deep shade, among luxuriant ferns and <i>Selaginella</i> , as well as in exposed situations.
Burchard 1929	Ist es sehr auffallend, daß sich mehrere nur und ausschließlich im Anaga-Gebirge bekannte Sondertypen von Crassulaceen jetzt auch im Tenogebirge haben nachweisen lassen, welche sonst absolut nirgends vorkommen, <i>Aeonium cuneatum</i> und die bisher als große Seltenheit bekannte <i>Greenovia gracilis</i> . (p. 43) [...] Im Tenowalde findet sie [<i>Prunus lusitanica</i>] sich etwas unterhalb der fuente de Calera, einer anderen Quelle in 750 m Höhe, auch ist weiter oben an Felsen der cumbre <i>Aeonium cuneatum</i> in großen Mengen. (p. 45) [...] Die Art war bisher nur aus dem Anagagebirge bekannt, wo dieselbe auf den Felsen der Cumbre, etwa vom Cruz de Afur beginnend, nach Osten zu immer häufiger wird und in der Umgebung des Ostabsturzes der Insel beim Roque de Anambre. Massenvegetation bildet, hier auch vielerorts auf den Humusboden der Wälder übergeht, 700-1000 m. Schon vor vielen Jahren entdeckte ich dies <i>Sempervivum</i> an den feuchtesten Stellen der Teno-kette im Westen, wo ich das Bild (Taf. 40) bei der Fuente de Calera (750 m) aufnahm. Die Art dringt hier kaum tiefer in die obere Küstenzone hinab. Sie fehlt völlig im zentralen Teile der Insel. (p. 128)
Pitard-Proust 1908	Vueltas de Taganana (Bourg.); Punta de Anaga (Christ).
Bornmueller 1904	Teneriffa: in rupibus montium Anagae inter Cruz de Afur et Cruz de Taganana (n. 657), in jugo inter Taganana et San Andres, c. 900 m s. m
Bolle 1859	Habitat in Nivaria quam maxime septentrionali secus viam sylvosam las Vueltas de Taganana; abunde in lauretis et dendro-ericetis supra vallem las Palmas et inde ad Punta de Anaga et las Casillas usque nec non ubi ima vallis S. Andreae jugum Cumbre de Anaga dictum attingit.

Table 2: *Aeonium cuneatum*
in literature - page 1

	BAÑARES BAUDET 2015	LODÉ 2010	CARBONELL 2007	NYFFLER 2003	LIU 1989	BRAMWELL 1974	PRAEGER 1932	BURCHARD 1929	WEBB & BERTHELOT 1841
Name	<i>Aeonium cuneatum</i> Webb & Berthelot, Hist. Nat. Iles Canar. (Phytogr.) 3 (2.1): 197 (1841) (Góngaro de Anaga).	<i>Aeonium cuneatum</i> Webb & Berthelot 1841.	<i>Aeonium cuneatum</i> Webb & Berthelot (Phyt. Canar. 197).	<i>A. cuneatum</i> Webb & Berthelot (Phytogr. Canar. 1: 197, 1841).	<i>Aeonium cuneatum</i> Webb & Berth., Hist. Nat. Iles Canaries 3(2.1): 197. 1841.	<i>A. cuneatum</i> Webb & Berth.	<i>Aeonium cuneatum</i> Webb & Berth.	<i>Sempervivum cuneatum</i> W.B.	<i>Aeonium cuneatum</i> Nob.
Type				Canary Islands (Anonymus s.n. [not located]).	Spain, Canary Islands, detailed locality, collector and date unknown; cultivated in Webb's own garden at Milford, England (type specimen has not been located in the Webb herbarium).				
Synonymes	<i>Sempervivum cuneatum</i> (Webb & Berthelot) Webb & Berthelot ex Christ 1888.			<i>Sempervivum cuneatum</i> (Webb & Berthelot) Webb ex Christ (1888).	<i>Sempervivum cuneatum</i> (Webb & Berth.) Webb & Berth. ex Christ, Bot. Jahrb. Syst. 9:161. 1888.		<i>Aeonium cuneatum</i> Webb & Berth. Phyt. Canar. 1, 197 (1840) <i>Sempervivum cuneatum</i> Webb & Berth. l.c. (1840).	<i>Aeonium cuneatum</i> Webb.	<i>Sempervivum cuneatum</i> Nob. in hort. Milf.
Habit	Cespitoso, de hasta 20 cm de alto, suacaule, a menudo estolonífero.	Herbaceous succulent, sometimes epiphytic.	Ascending, rosetted plant.	Perennials, rosettes solitary or occasionally off-setting.	Perennial terrestrial or epiphytic herbs.	Planta arrossetada.			
Stems		Very short, often stoloniferous stems.	Very short.	Stout, glabrous, smooth.	Very short, often stoloniferous, 0.5-3 cm diam., brown, erect.		Usually very short or decumbent.	Kurz, stark.	Caule fruticoso, crasso.
Stolones					To 25 cm long, decumbent, glabrous, leafy.		Few, strong, horizontal, on leafy stems up to 25 cm long.	Zahlreiche Ausläufer mit Tochterrosetten umgeben die Hauptrosette, welche zuerst zur Blüte gelangt.	
Rosettes	De 20-40 cm de diámetro.	15-20 cm in diam.	Very tight [...] greyish green colour, almost a bluish green.	15 – 50 cm diameter, cup-shaped.	15-50 cm diam.; phyllotaxy 5/13.		Very large, up to 1,5 foot across, <i>canariense</i> -like, the inner leaves forming a cup.		
Leaves	Glaucas, cuneadas y mucronadas, de 12-30(40) x 5-8 cm, glabriúsculas.	Fleshy [...] obovate-oblongate to cuneate, glabrous, stiff, arranged horizontally, those of centre ascending, sometimes waved, bluish-glaucous.	Long and wide [...] oblong-spathulate [...] have a mucronate tip. They are concave, rigid and completely glabrous.	Inner leaves generally tightly appressed to each other; leaves 10-25 x 5-8 cm, 5-9 mm thick, obovate or obovate-spatulate, apically acute, mucronate, basally cuneate, glabrate, [...] occasionally slightly undulate.	Obovate to obovate-oblongate, 10-25 cm long, 5-8 cm wide, narrowly transversely rhombic in cross-section, 5-9 mm thick, glabrate, at base cuneate, at apex mucronate, [...] and sometimes with portions of margin undulate.	Ascendentes sobresaliendo, horizontales. Hojas rígidas, glabras, azulglaucos, más ó menos oblongas, el ápice mucronado.	Rigid, glabrous, glaucous in shelter or when young, elongate-cuneate, broadest near apex, up to 25 cm long, 8 cm broad above, 5 cm broad at base, acute and mucronate at apex.	Mit schmal spatelförmigen, völlig glatten unbehaarten, bläulich-grünen Rosettenblättern. [...] Die jungen Blätter neigen sich eiförmig zusammen.	Foliis rigidis, elongato-cuneatis, laete viridibus, apice mucronatis, ad basim sensim attenuatis 4-gonis.
Cilia	Margen con cilios cilíndricos.	With the margins very finely ciliate.		Margin with conical cilia (≤ 0.4 mm).	At margin ciliate with conical unicellular trichomes c. 0.4 mm long.	Bordes sutilmente ciliados.	Margins finely and evenly ciliate. Cilia patent, crowded, almost cylindrical blunt hyaline.		Margine breviter ciliatis.
Phenology	En abril-mayo.	April-June.	From April to June.		Flowering from April to June.		Aprile-June.	Die Blütezeit ist wenig später als die von <i>Aeonium canariense</i> .	
Flowering stem						Tallo floral frondoso, hasta 1 m de altura.	Terminal, up to 3 or 4 feet long or more, very leafy, with decreasing leaves.		

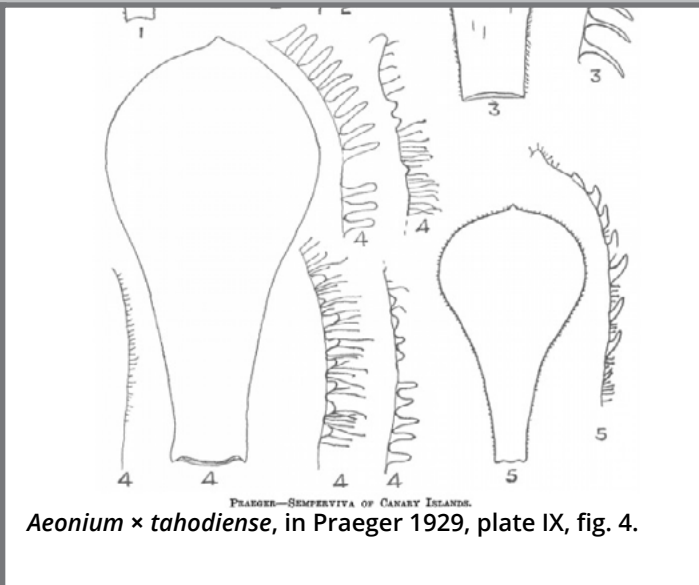
Table 2: *Aeonium cuneatum* in literature - page 2

	BAÑARES BAUDET 2015	LODÉ 2010	CARBONELL 2007	NYFFLER 2003	LIU 1989	BRAMWELL 1974	PRAEGER 1932	BURCHARD 1929	WEBB & BERTHELOT 1841
Inflorescences	Cónica; pedunculados y pedicelos pubescentes.	Conical, with flowers golden yellow in 8-10 parts.	Very tall and luxuriant.	18-60 x 12-30 cm; peduncle 15-50 cm, leafy.	18-60 cm long, 12-30 cm diam.	Cónica.	Occupying the upper third of the stem, 1 to 2 feet long, elongate-conical in outline, with alternate, glandular-hairy branches, sparingly bracteate in lower part, [...] branching above into 6 to 12 simple or dichotomous branchlets.	Der Blütenschaft erreicht Meterlänge.	
Bracts							Ovate acuminate.		
Buds							Ovoid, pointed.		
Flowers	8-9 partidas.		Golden coloured flowers.	8- to 9-merous.		Amarillo dorado, 8- a 10-partidas, planas.	Subsessile [...], 8-to 9-parted, golden, flat.		
Calix	Pubescente; segmentos deltoides, agudos.						Densely glandular-pubescent, cup-shaped, 6 mm long, cut half-way down into ovate-lanceolate or deltoid-lanceolate acute segments.		
Pedicels				1-6 mm, puberulent.	1-6 mm long, puberulent.				
Sepals				Puberulent.	8-9, triangular, 3-4 mm long, 1.2-1.6 mm wide, puberulent, at apex acute.				
Petals	Amarillo-oro, linear-lanceolados, agudos y de margen serrulado.			6.5-7.5 x 1.3-1.6 mm, oblanceolate, acuminate, yellow.	Oblanceolate, 6.5-7.5 mm long, 1.3-1.6 mm wide, yellow, glabrous, at apex acuminate, at margin minutely denticulate.		Non contiguous, linear-lanceolate, finely subserrate, very acute, 7 mm long.		
Stamens	Glabros.				With interpetalous ones 5.5-6 mm long, with antipetalous ones 5-5.5 mm long.		Yellow, 6 mm long.		
Filaments				Glabrous.	Glabrous.				
Carpels	Puberulentos en su cara adaxial.				With ovaries 3-3.5 mm long, c. 1.8 mm diam., sparsely puberulent adaxially.		Slender, pale green, 6 mm. Long.		
Anthers					Yellow.				
Styles					3.5-4 mm long.		Equalling or slightly longer than ovaries.		
Nectaries	Subcuadrados, algo ensanchados en el ápice.				Widely obovate, c. 0.7 mm long, 0.6 mm wide, greenish, at apex rounded and slightly emarginate.	Subcuadradas o redondeadas.	Roundish-subquadrat, broader above, 0.75 mm long and broad, greenish.		
Citology					$n = 18$				





Aeonium cuneatum near Fuente de Calera, Los Silos (Burchard 1929, table 40).



Aeonium x tahodiense, in Praeger 1929, plate IX, fig. 4.

Acknowledgments

I would never have been able to write this article without the encouragement and help of many succulentophiles. I would like to thank Rudolf Schulz, Joël Lodé, Noelene Tomlinson, Treacy Lockie and Attila Kapitany, who allowed me to quote their remarks about *A. cuneatum*. Noelene, Treacy and Attila also allowed me to publish some of their photos and gave me valuable information about *A. cuneatum* hybrids. Ricardo Mesa Coello gave me a fundamental help in establishing the succulent's presence in Teno, provided me with the coordinates of Monte del Agua's population and allowed me to publish his very good images. Eduardo Carbonell, Giuseppe Tavormina and Roberto Mangani helped me with the plant's distribution in Tenerife, whereas Anna Trevisan and Mauro Miglioli kindly shared with me their photos, observations and field notebooks. Thanks are also due to Massimo Afferni, Margrit Bischofberger, Mario Fasolato, Steve Goodman, Darren Irwin, Maria Luigia Pinton and Eduart Zimer.

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Sitography

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Notes

(1) **Laurel forest**, also called **laurisilva** or **laurissilva**, is a type of subtropical forest found in areas with high humidity and relatively stable, mild temperatures. The forest is characterized by broadleaf tree species with evergreen, glossy and elongated leaves, known as "laurophyll" or "lauroid". Plants from the laurel family (Lauraceae) may or may not be present, depending on the location.

Visiting Copiapoaland

La Costa Esmeralda,

Región de Antofagasta, Chile



Heike & Robert Bader

Pan de Azucar, Atacama, Chanaral, Chile.

Cactus, enthusiasts who drive the Carretera Panamericana (here in Chile, called Ruta 5) from Chanaral to the north towards Taltal, should not miss a half-way detour to Costa Esmeralda. During a trip through northern Chile in February 2012 my wife Heike and I visited this coastal area. The region is located just north of the national park Pan de Azucar. The shoreline is about 25 km away from here. There is an untouched cactus paradise with some endemic species and a beautiful coastal landscape.

Costa Esmeralda; looking at the Pacific Ocean, over the rocks.



summary →



Copiapoa longistaminea
RB 2083 273 m

Latitude 25; 54; 26.42595496
Longitude 70; 38; 19,45192668



After turning off from the Rota 5, you cannot believe to see so many cacti. The Atacama Desert appears at first completely without life. But as soon as the descent through the coastal mountains begins, the influence of the coastal mist Camanchaca is shown. The runway is easy to drive with a simple small car. For the trip to the Costa Esmeralda, we took four hours of time and made amazing discoveries in this short time.



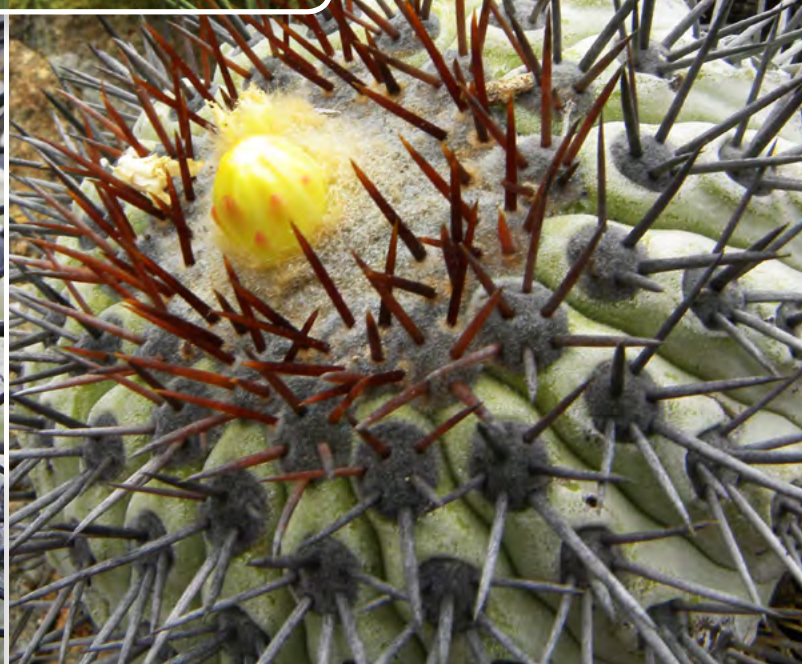
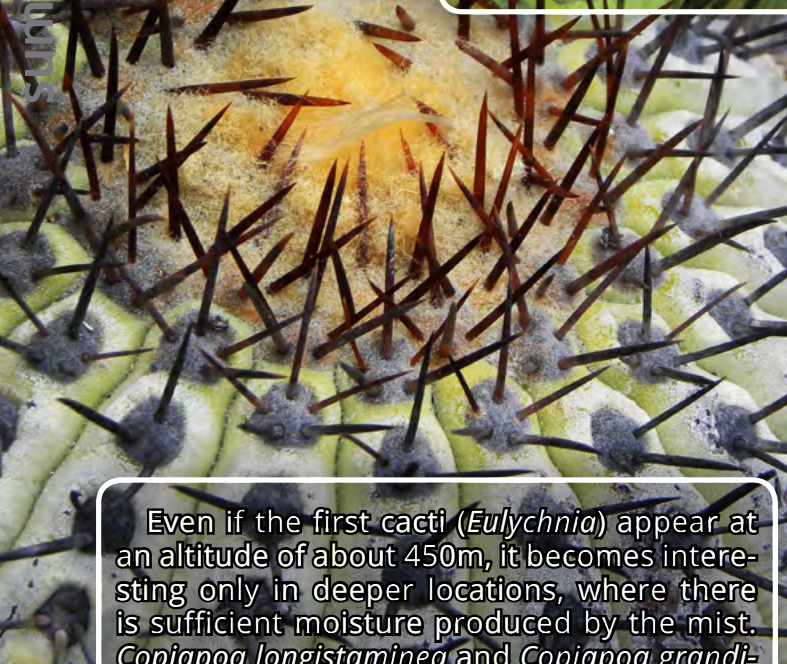
summary

Copiapoa longistaminea

RB 2083 273 m

Latitude 25; 54; 26.42595496

Longitude 70; 38; 19,45192668



Even if the first cacti (*Eulychnia*) appear at an altitude of about 450m, it becomes interesting only in deeper locations, where there is sufficient moisture produced by the mist. *Copiapoa longistaminea* and *Copiapoa grandiflora* are very common here and form many-headed cushions. Young plants are also often found. *Copiapoa longistaminea* was discovered by Friedrich Ritter in 1956 and described in 1963 (FR 531).

Copiapoa longistaminea

RB 2094 92 m

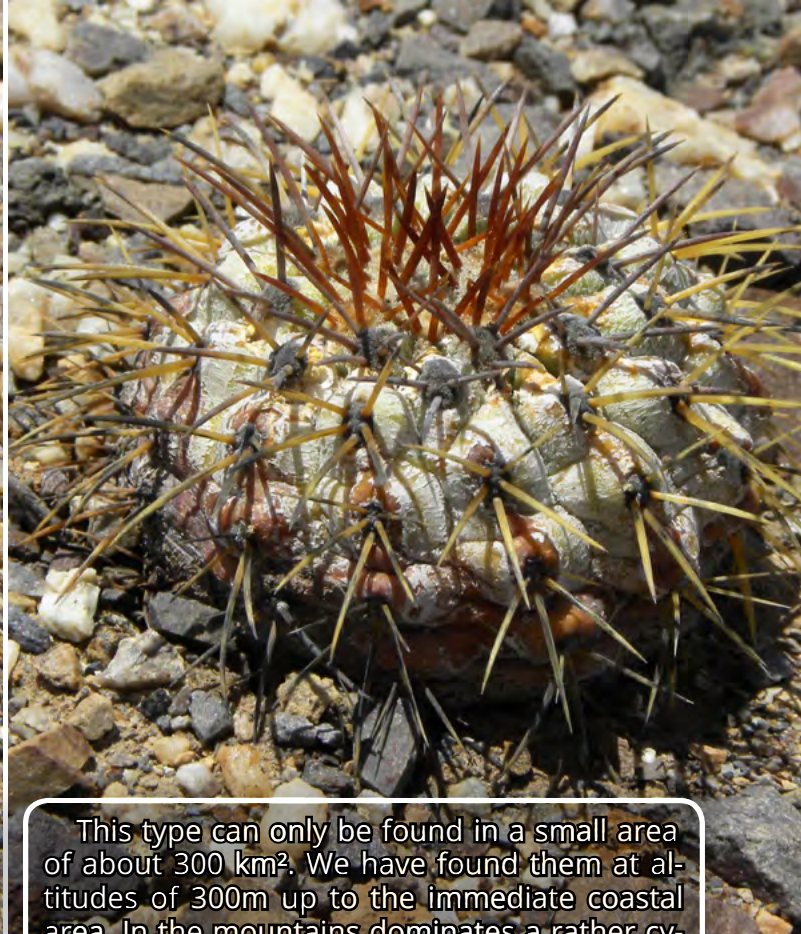
Latitude 25; 53; 58.91073007

Longitude 70; 40; 32,39283587



summary

summary →



Copiapoa longistaminea
RB 2094 92 m

Latitude 25; 53; 58.91073007
Longitude 70; 40; 32.39283587

This type can only be found in a small area of about 300 km². We have found them at altitudes of 300m up to the immediate coastal area. In the mountains dominates a rather cylindrical growth form, while the specimens in the vicinity of the coast are significantly more widespread and low growing.



summary →

Copiapoa longistaminea

RB 2083 273 m

Latitude 25; 54; 26.42595496

Longitude 70; 38; 19,45192668

summary →



Copiapoa longistaminea

RB 2089 217 m

Latitude 25; 53; 35.39814529

Longitude 70; 39; 20,47797172



summary →

Copiapoa longistaminea

RB 2083 273 m

Latitude 25; 54; 26.42595496

Longitude 70; 38; 19,45192668

summary →



Copiapoa longistaminea

RB 2094 92 m

Latitude 25; 53; 58.91073007

Longitude 70; 40; 32,39283587



Copiapoa longistaminea

RB 2089 217 m

Latitude 25; 53; 35.39814529

Longitude 70; 39; 20,47797172

summary →



The three photos on this page are showing the variability that can occur in *C. longistaminea* body and spine colors.

The typical form of *Copiapoa longistaminea* and widespread in the coastal region. This is a special form of *Copiapoa longistaminea* with strikingly cylindrical growth. We found this form only in the mountains where it occurs together with the typical shape. Maybe a natural hybrid?

Copiapoa longistaminea

fma. **RB 2084** 273 m

Latitude 25; 54; 26.42595496

Longitude 70; 38; 19.45192668



Eriosyce taltalensis
var. *pygmaea*
RB 2085 273 m
Latitude 25; 54; 25.16521038
Longitude 70; 38; 19.23172783



There are more succulent species in this valley. The strong-tempered *Eriosyce taltalensis* ssp. *pygmaea* is difficult to discover, as it is well adapted to the surrounding rock.

F. Ritter wrote that the subspecies *pygmaea* differs from the type form by the straight, not bent thorns.

We have found it these plants near the type locality witch is about 20 km north of Chanaral.

Eriosyce taltalensis

var. *pygmaea*

RB 2085 273 m

Latitude 25; 54; 25.16521038

Longitude 70; 38; 19.23172783




Thelocephala esmeraldana
RB 2095 92 m

Latitude 25; 54; 0.26512098

Longitude 70; 38; 33.06610801



However, the real intend of our trip to the Costa Esmeralda was the aspiration to find *Thelocephala (Eriosyce) esmeraldana*. After some searching, we finally found some plants on flat hills near the coast. The plants were deeply wrapped up into the fine-grained sandy substrate. Small depressions in the ground were somehow the guarantee for finding *T. esmeraldana*. The plants were in a miserable condition.



Thelocephala esmeraldana
RB 2095 273 m

Latitude 25; 54; 0.26512098

Longitude 70; 38; 33.06610801

summary →

Dryly shrunk and pulled back into the ground. Most of them showed crest injuries, which probably resulted from strikes made by the Guanaco (*Lama guanicoe*), a native camelid. The species can, however, be successfully regenerated by the formation of new heads.



summary→

summary→

***Eulychnia iquiquensis*
var. *saint-pieana***
RB 2091 217 m

Wonderful are young plants of *Eulychnia iquiquensis saint-pieana*. They have often a colourful expression in younger plants, and have also highly marked areoles. The rosettes of *Deuterocohnia chrysantha* (Bromeliaceae) light up along the road. This species is endemic in Chile.
Flowering *Nolana* spec. (ele-



Cistanthe longiscapa



Nolana elegans
RB 2090 217m

gans?) form wonderful contrasts with their bright green foliage. *Copiapoa esmeraldana* is another endemic species in this area, but was unfortunately not found by us.

Deuterocohnia chrysantha
RB 2093 156m



summary →



Copiapoa grandiflora
 & ***Deuterocohnia chrysantha***
RB 2087 217 m
 Latitude 25; 53; 35.39814529
 Longitude 70; 39; 20,47797172



Copiapoa grandiflora was also discovered by Friedrich Ritter in 1956 and described together with *C. longistaminea* in 1963 (FR 523). The species should only populate a small area of 200m². Nevertheless, *Copiapoa longistaminea* and *Copiapoa grandiflora* form stable popula-

Copiapoa grandiflora
RB 2088 217 m
 Latitude 25; 53; 35.39814529
 Longitude 70; 39; 20,47797172



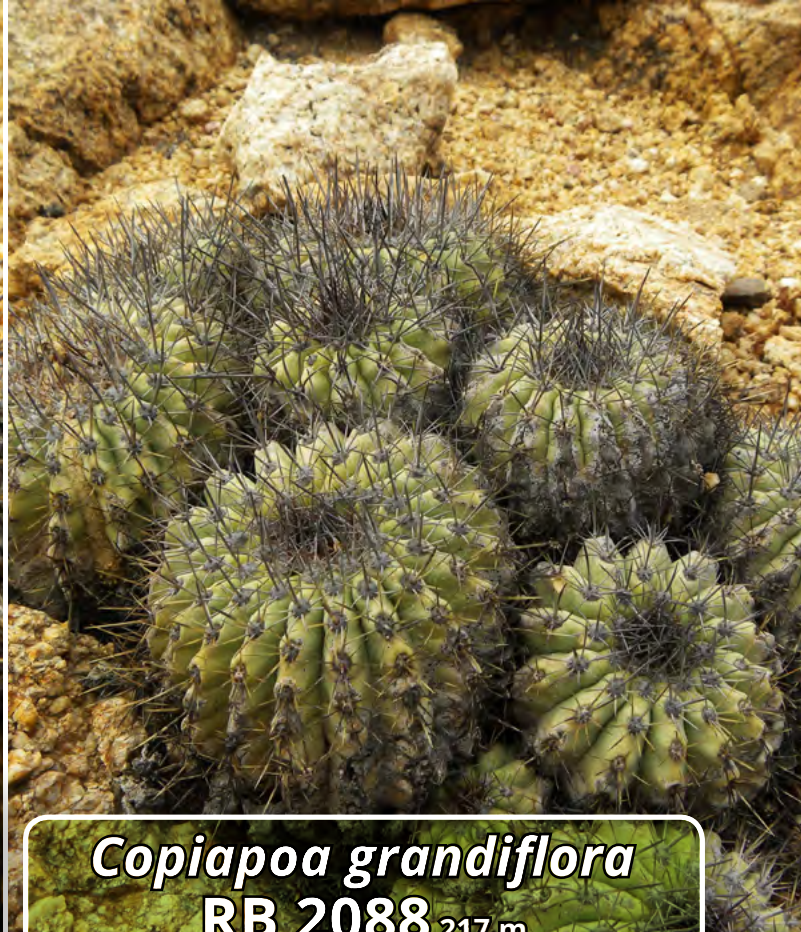
summary →



summary →

tions in their area and are currently not seriously endangered.

The species grows preferably on granite rocks along the Quebrada de Guanillos, through which the access road leads to the coast. As the name suggests, it has strikingly large yellow flowers, which we unfortunately could not see during our stay.



Copiapoa grandiflora

RB 2088 217 m

Latitude 25; 53; 35.39814529

Longitude 70; 39; 20.47797172



summary →

summary →
The RB 286 population is growing on masiv granitic rocks substrate.



***Copiapoa cinerea*
var. *columna-alba***
RB 2086 273 m

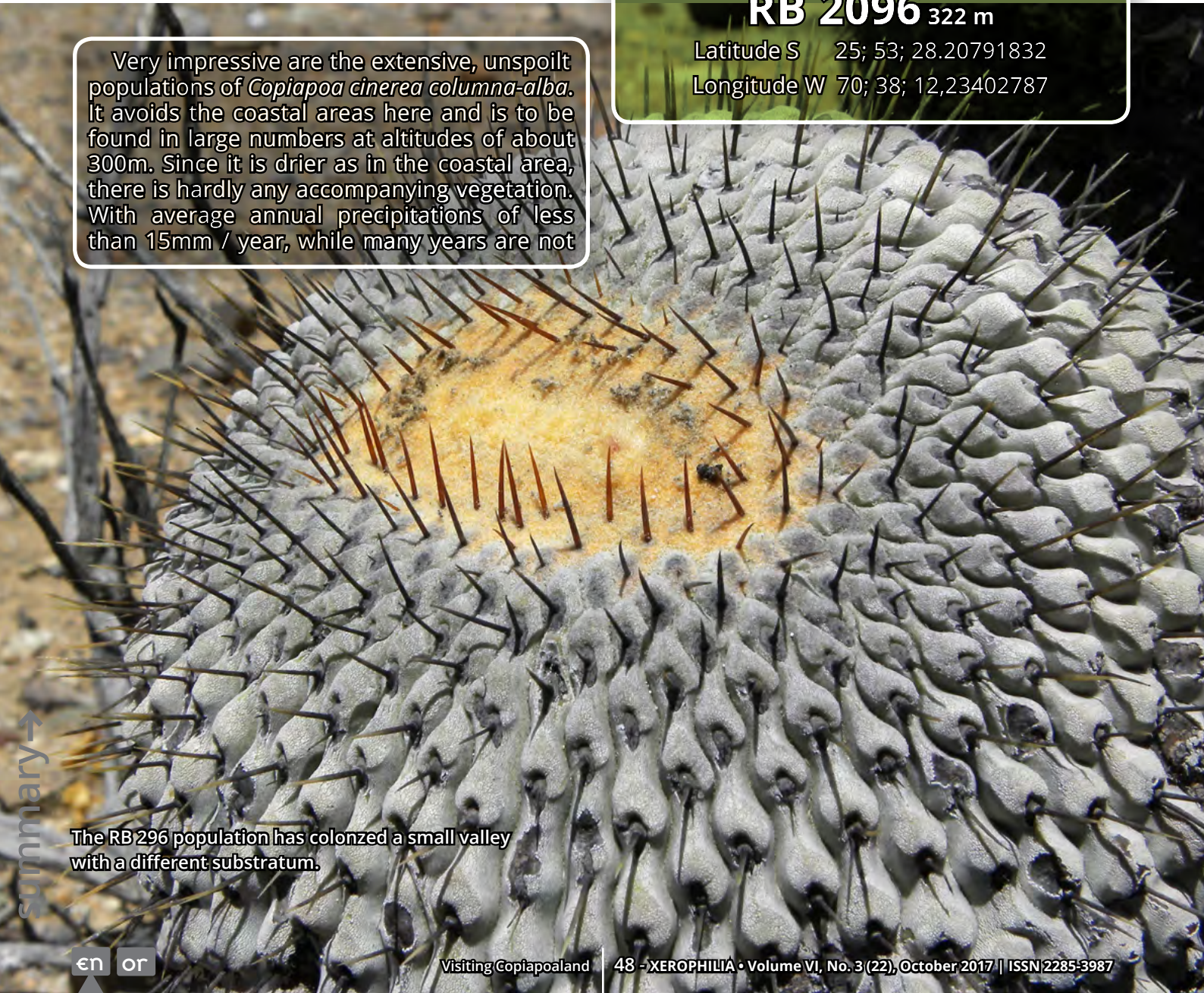
Latitude S 25; 53; 25.16521038
Longitude W 70; 38; 19.23172783



***Copiapoa cinerea*
var. *columna-alba***
RB 2096 322 m

Latitude S 25; 53; 28.20791832
Longitude W 70; 38; 12.23402787

Very impressive are the extensive, unspoilt populations of *Copiapoa cinerea columna-alba*. It avoids the coastal areas here and is to be found in large numbers at altitudes of about 300m. Since it is drier as in the coastal area, there is hardly any accompanying vegetation. With average annual precipitations of less than 15mm / year, while many years are not



summary →
The RB 296 population has colonized a small valley with a different substratum.



uncommon without rain. *C. cinerea columna-alba* is the southernmost species of the Cinera Group. It grows very little either individually or sprouts if compared to the northern relatives. Their stems are usually strongly oriented north, towards the sun (in the southern hemisphere of the earth).



***Copiapoa cinerea*
var. *columna-alba***

RB 2096 322 m

Latitude S 25; 53; 28.20791832

Longitude W 70; 38; 12,23402787



One of the co-authors (Heike) beside a group of plants to show their size.



summary→



Ectinogonia darwinii is a small colourful beetle from the family of the magnificent beetles (Buprestidae). It is considered to be the most important pollinator of *Copiapoa cinerea columna-alba*, as it feeds on the pollen of the plants and thus ensures the pollination of these cacti on its way from plant to plant.



summary→



The RB 298 population grows in a dry riverbed with fine granitic gravel.

Copiapoa cinerea
var. *columna-alba*

RB 2098 290 m

Latitude S 25; 54; 39.33210987

Longitude W 70; 37; 34,37131648



Copiapoa cinerea
var. columna-alba
RB 2098 290 m

Latitude S 25; 54; 39.33210987

Longitude W 70; 37; 34.37131648

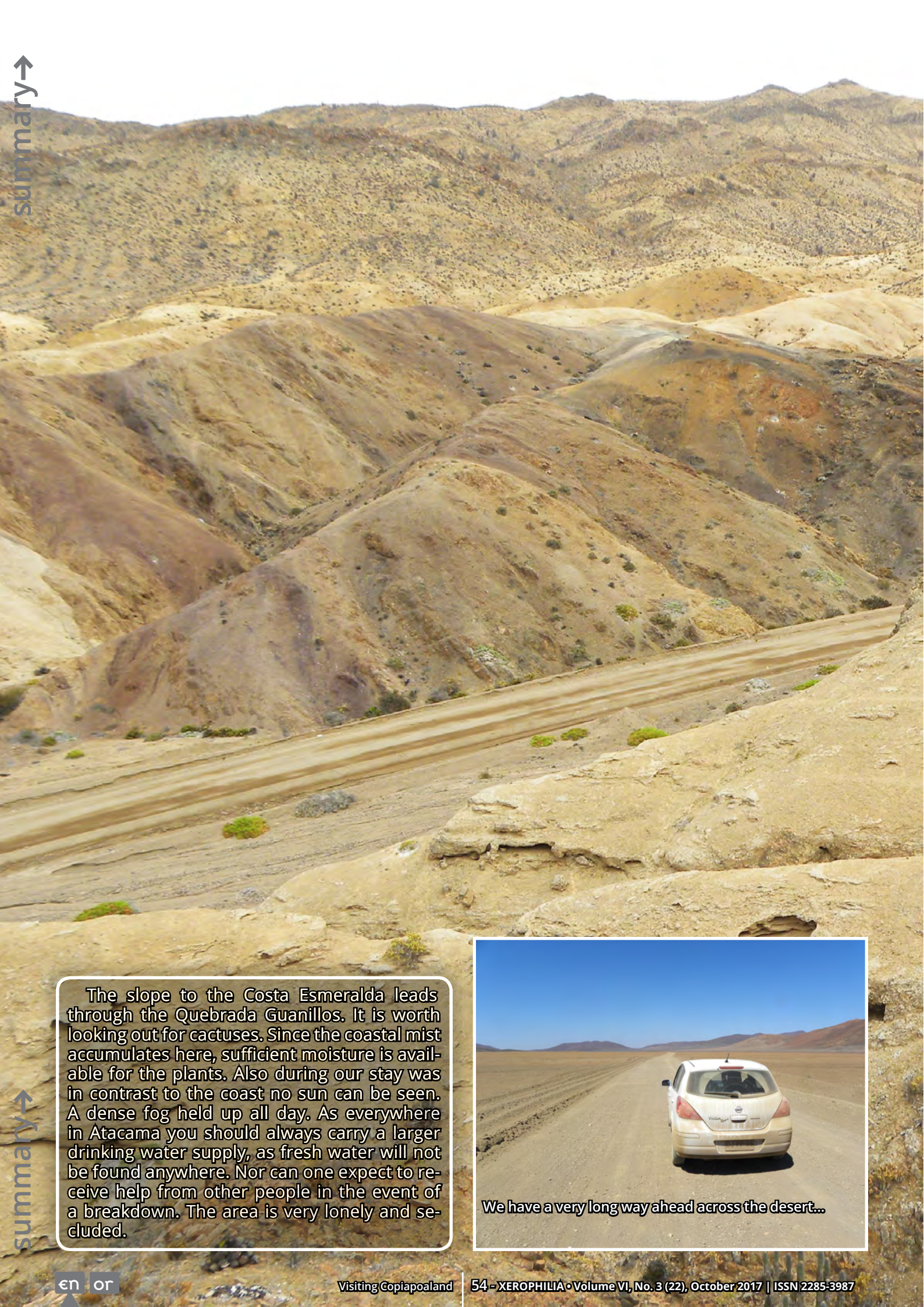




One of the authors (Heike) taking a picture.

Copiapoa cinerea
var. columna-alba
RB 2098 290 m
Latitude S 25; 54; 39.33210987
Longitude W 70; 37; 34.37131648





The slope to the Costa Esmeralda leads through the Quebrada Guanillos. It is worth looking out for cactuses. Since the coastal mist accumulates here, sufficient moisture is available for the plants. Also during our stay was in contrast to the coast no sun can be seen. A dense fog held up all day. As everywhere in Atacama you should always carry a larger drinking water supply, as fresh water will not be found anywhere. Nor can one expect to receive help from other people in the event of a breakdown. The area is very lonely and secluded.



We have a very long way ahead across the desert...

Encholirium: the rare bromeliads of Cadeia do Espinhaço



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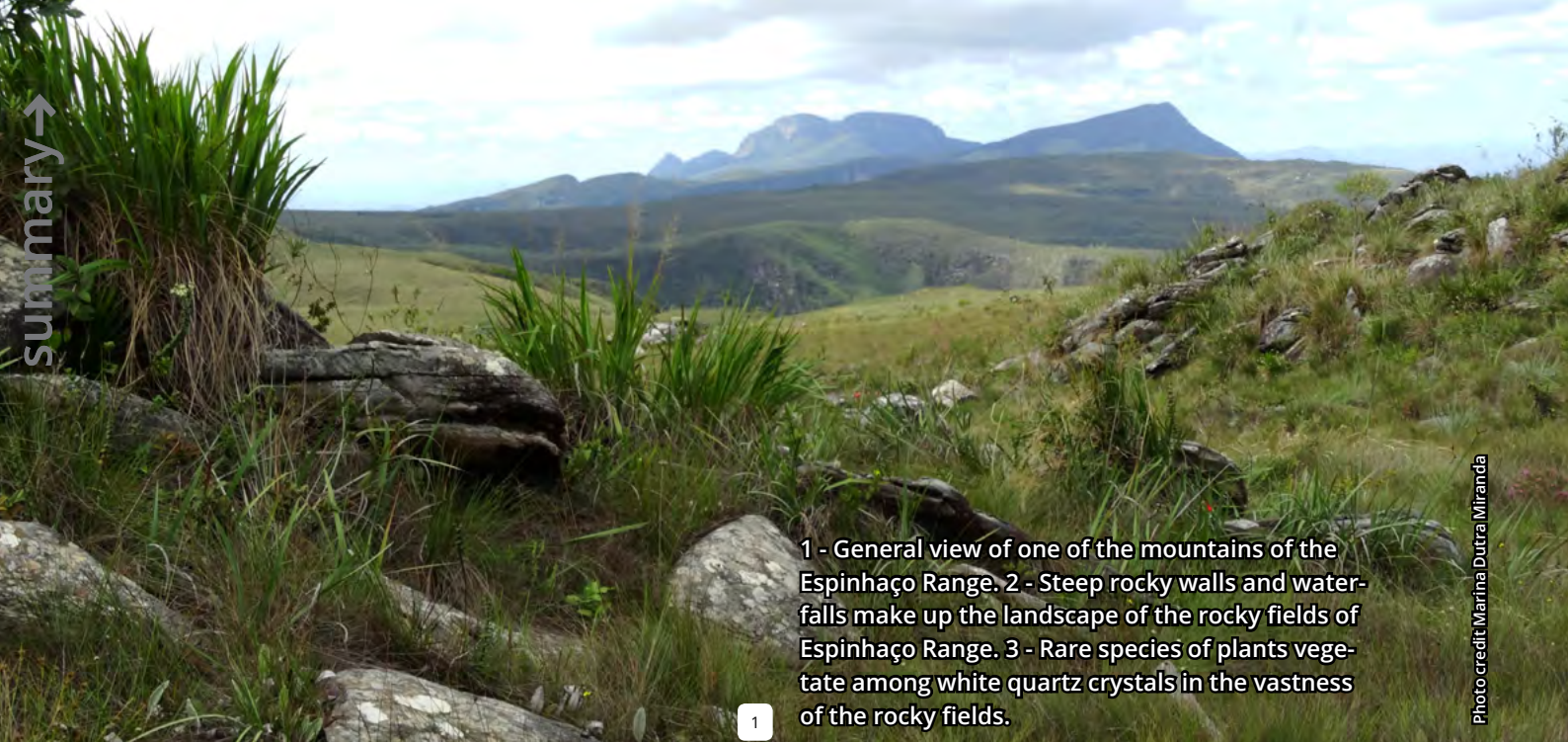
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Even there, in the rocky fields of the Espinhaço Range, it is hard to find them. Some species are so rare that only one population is known by Science. Here we report an expedition in search of these plants, and part of the results of a research on the genetic diversity of their populations. The field work highlighted the extinction risk of these species, while genetic studies gave surprising results and allowed the definition of conservation strategies.

Photo credit ???



summary →



1

1 - General view of one of the mountains of the Espinhaço Range. 2 - Steep rocky walls and waterfalls make up the landscape of the rocky fields of Espinhaço Range. 3 - Rare species of plants vegetate among white quartz crystals in the vastness of the rocky fields.

Photo credit: Mariana Dutra Miranda



2

Photo credit: Mariana Neves Moura



3

Photo credit: Mariana Neves Moura

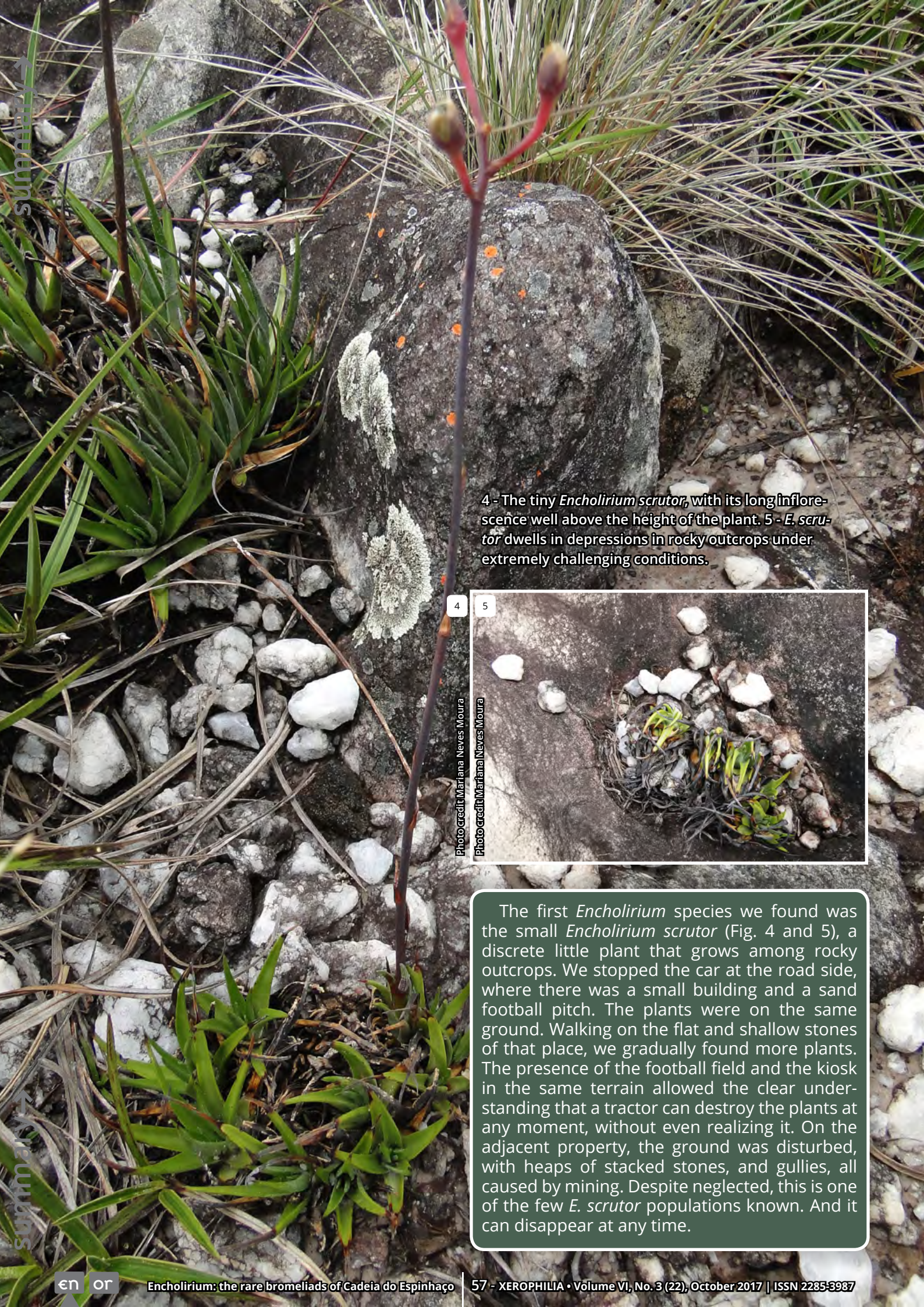
Encholirium is a genus of bromeliads which comprises 29 species, all endemic to Brazil. Of those, 13 are threatened (seven are classified as critically endangered - CR - and six as endangered - EN). Moreover, few species are protected in Conservation Units. They are habitat-demanding plants, preferring sand-stony soils or growing directly on rocky outcrops. Most species of *Encholirium* present very restricted distribution, for example, in a certain mountain range where there is a certain type of rock. Because they are so dependent on a specific environment, which is usually in process of accelerated degradation, these plants are in serious danger of extinction.

Fourteen *Encholirium* species occur in the Espinhaço Range (Cadeia do Espinhaço) (Fig. 1), a mountain chain formed in the Proterozoic (1), which extends over the states of Minas Gerais and Bahia for approximately 1,000 km and is formed by several mountains, each one with its own characteristics and flora. Although these hills are relatively well conserved, the protected area in Con-

servation Units is small in relation to the total area, and contains only a small part of the enormous biodiversity of this ecosystem.

Our study, supported by the World Wildlife Fund (WWF), aimed at searching for the *Encholirium* species the rocky fields of the Espinhaço Range and verifying the state of conservation of its populations, through field inspection and genetic studies. Three species were chosen for the genetic studies, generating very interesting and important results for the conservation of these plants.

We spent a short three days in this extraordinary place. The species richness is amazing. Sited on a rock by the side of the road, we could see dozens of species of Orchidaceae, Veloziaceae, Xiridaceae, and, of course, Bromeliaceae. Each mountain has its own plant community. The landscape changes from hill to hill, passing from steep outcrops (Fig. 2) to flat terrains covered with white pebbles and crystals (Fig. 3). In the rocky fields, which at first sight may seem like a common pasture, care must be taken not to step on plants that only exist in that place.



4 - The tiny *Encholirium scruator*, with its long inflorescence well above the height of the plant. 5 - *E. scruator* dwells in depressions in rocky outcrops under extremely challenging conditions.

4

5

Photo Credit: Mariana Neves Moura

Photo Credit: Mariana Neves Moura



The first *Encholirium* species we found was the small *Encholirium scruator* (Fig. 4 and 5), a discrete little plant that grows among rocky outcrops. We stopped the car at the road side, where there was a small building and a sand football pitch. The plants were on the same ground. Walking on the flat and shallow stones of that place, we gradually found more plants. The presence of the football field and the kiosk in the same terrain allowed the clear understanding that a tractor can destroy the plants at any moment, without even realizing it. On the adjacent property, the ground was disturbed, with heaps of stacked stones, and gullies, all caused by mining. Despite neglected, this is one of the few *E. scruator* populations known. And it can disappear at any time.



Summary

6 - *E. magalhaesii* on rocksteps in the Espinhaço Range. 7 - One of the many species of Velozaceae of the Espinhaço Range.



6 7

Photo credit Mariana Neves Moura
Photo credit Mariana Neves Moura

At the end of the day we find *E. scrutor* again, along with *E. magalhaesii* (Fig. 6), a much larger species. The locality was fantastic: wide rocky steps covered by sandy soil and white stones. The vegetation was fascinating, especially the Velozaceae (Fig. 7). The light was already fading when we finished our activities.

The next day we left Diamantina (2), a municipality considered as World Cultural Heritage with its baroque houses (Fig. 8). Through a dirt road, after some time of travel, in a rocky outcrop not too far from the road, we found our first population of *E. pedicellatum* (Fig. 9) It is one of the few populations of this outstanding species known. Since its discovery and description, in this same place, in 1896, only recently a second population was found. A brief tour in the site revealed several clusters of plants distributed among the rocks. There, where everything seemed quite similar, we expected to find many plants, but no: after an invisible limit, for no apparent reason, no individual can be found, in any direction. On the other side of the road, where the relief descended to find a stream, we could not find any *Encholirium*, only a few bromeliads of the genus *Dyckia*.



Photo credit Marina Dutra Miranda



8- Baroque mansions in the city of Diamantina, Cultural Heritage of Humanity. 9- The magnificent and rare *Encholirium pedicellatum*.

Photo credit Luiz Manini Neto



10 - A clump of *Encholirium biflorum*, in the only population of this species known by Science.

10

We continue along the same dirt road in search the *E. biflorum* population. We stopped at the sight of a flat field with no outcrops, and we went in search of these tiny bromeliads, smaller still than *E. scutor*. The vegetation was sparse, composed of many grasses and *Veloziaceae*, and white stones. We found the small population of *E. biflorum* (Fig. 10), after a good walk through the field. This population is limi-

ted to a few square meters and that is all that is known about this species since its discovery in 1894.

The most striking is the small size of the population, when compared to the huge and homogeneous field where it is located. It is very curious to look for and find not a single plant in such a vast place, which is apparently favorable for that species.

Photo credit: Mariana Neves Moura

11 - *Orthophytum*, another genus of Bromeliaceae that occurs in the rocky fields, 12 - *Encholirium subsecundum* (right): one of the largest and most robust species of the genus, 13 - *Encholirium diamantinum*, a species of rare beauty.



Photo credit: Mariana Neves Moura

11



Photo credit: Mariana Neves Moura

Photo credit: Mariana Neves Moura

12

13

Back to Diamantina, from where we took another road. This time we were on a winding dirt road. Throughout the 45 km we covered, we could observe several types of landscape. Rocky outcrops at the roadside were adorned with cacti, incredible bromeliads of the genus *Orthophytum* (Fig. 11), and some groups of *E. subsecundum* (Fig. 12), large plants with high inflorescences that appeared and disappeared again as we walked the path. We also find *E. diamantinum*, a grayish plant of rare beauty (Fig. 13). This is one of the only populations of *E. diamantinum* known. The population is near a ri-

ver, where there was a water pump, possibly abandoned, but that left a crater in the population.

By the end of the day we found another population of the robust *E. subsecundum*. We were impressed by its size: there were large clumps of dozens of individuals. We calculated that there should be thousands of rosettes in about 150 clumps. This species is the most common *Encholirium* species in Espinhaço Range, and can be found in several localities, unlike the other species of the genus, which present few populations, hidden among rocky outcrops.

The next day we took the sealed road MG-010 to the Serra do Cipó National Park (Fig. 14). There we found the fourth population of *E. subsecundum*, next to a place known as "Hat of the Sun", where there is a snack bar, eucalyptus and lots of garbage. The road that cuts the Serra do Cipó was recently paved. To this, the course of the road was slightly altered, suppressing some populations of *Encholirium* and *Dyckia*, besides other dozens of endemic plant species. In addition to the disturbance caused by the construction, this "improvement" will bring "progress" to the region: the first residential condominiums, built above one of the highest bio-diverse sites of the planet, are already beginning to appear. It was clear from this expedition that the species visited are at serious risk, simply because they are on private lands and can be buried at any time.



Photo credit Mariana Neves Moura

14

Photo credit Mariana Neves Moura

15



Photo credit Mariana Neves Moura

16

14 - Landscape in the Serra do Cipó National Park, Minas Gerais State. 15 - *Encholirium vogelli*, in the Serra do Cipó National Park. 16 - *Encholirium heloisae*, a tiny plant that vegetates hidden in the Serra do Cipó.

In the region we also visited two species "protected" by the Serra do Cipó National Park: *Encholirium vogelli* (Fig. 15), large spiny plants, and *E. heloisae* (Fig. 16), small sized bromeliads. The landscape where we find *E. heloisae* is a grassy hill. That "pasture" has a unique richness of species, and, in spite of the cattle (that should not be there), the "pasture" is natural. In a bit after, it was evening. The next day, we were in the traffic of Belo Horizonte, the capital of Minas Gerais State.

We returned with samples (only pieces of leaves) of *E. biflorum*, *E. pedicellatum* and *E. subsecundum*. These species were chosen to represent the genus in genetic studies. Currently, knowledge of the distribution of genetic variability in natural populations is considered a starting point for conservation programs. So we started the second part of the project, the analysis of the genetic structure of these populations. Long were the months of laboratory activity. But the work was rewarded by interesting results, some surprising. Here we report only part of the results found for *E. biflorum*, but the same type of study was done with the other two species.



A clump of *Encholirium biflorum*, in one of the few populations of this species known by Science.

17

Photo credit Mariana Neves Moura

As already mentioned, the population of *E. biflorum* was very small. Imagine a soccer field: the population would occupy only the goal area, ignoring the vastness at the side. Now imagine that most of the plants had many shoots, and the clumps were very close together. That was the initial picture of the research, and the main question was: are these plants all genetically identical, since they almost never produce seeds, and since that they have many lateral shoots? So one of the hypotheses raised was that there would be little genetic variability, since all plants would be clones, originating from lateral shoots. During the collection of samples (pieces of leaves), we commented that probably all would be genetically identical, and that we were wasting our time. Even so, we patiently removed the samples, taking care not to pick up two leaves from the same clump. In addition, we commented that if we were to create a germplasm bank for this species (a collection of plants in a botanical garden, for example, where all the genetic diversity of the species should be represented), then we would need only one or two individuals (since they all seemed to be genetically identical).

The results could not be more surprising: of 31 samples collected, only two were genetically identi-

cal. Therefore, each plant (each clump) there originated from a seed, contrary to our expectations.

As the population is very small, and since each individual is genetically different from the others, then each individual carries a large percentage of the total genetic variability of this species. And genetic variability is essential for the survival of a species in the long term. In other words, the most important conclusion was that removing a single individual of *E. biflorum* from this population implies loss of much of the genetic variability of the species. Not even for studies, even for conservationist research, it would be appropriate to collect a plant there, as this would contribute to the genetic erosion of the species. This result is very important, since it altered the strategies that were being defined for the conservation of this species.

Now we know that, in order to compose a germplasm bank of *E. biflorum*, it is not sufficient to collect an individual, but rather that we would need several samples. But we also know that we cannot collect plants there, as this would significantly diminish the chances of survival of this species in nature. One solution, for example, would be to cut a shoot from each clump, leaving the mother-plant in the field.

Through the study of population's genetic structure of these species it was possible to understand how the genetic diversity is distributed (among its individuals, their groups and their populations). This is the fundamental knowledge, the initial step for the definition of conservation strategies.

Our research team has continued to visit the region for more than a decade, noting that the populations of *E. biflorum* and *E. scrutor* are diminishing in size and becoming difficult to find. The conservation status of the Conservation Units is also worrying, since many of the areas are visited constantly by tourists without the necessary care. Tourists stepping and pouching in these region are serious threats.

Mining also causes disturbances to the environment, putting the small populations of these plants at risk (Fig. 17 - previous page).

Recently, we finished a phylogenetic study with most species of the genus *Encholirium* and some of the genus *Dyckia*, but much more studies are needed, mainly focusing on the genetic structure

of populations, since these genera have emerged and diversified very recently in the Brazilian territory and, despite presenting morphological differences, do not present molecular differences that separate them, and in some cases may be called cryptic species.

In addition, the existence of a large number of *Dyckia* and *Encholirium* species occurring side by side in the rocky fields of the Espinhaço Range reveal that much of the plant's diversity of this region is derived from in situ radiation, resulting in a high concentration of micro-endemics species closely related.

In short, we conclude that it is more important, through scientific research, to alert the authorities and the community to the biodiversity that is being lost. *Encholirium* species are very endangered and deserve attention, as well as the environment where they are. Finally, here we leave the reminder that bringing plants home, even the smallest individual, can have a disastrous effect to the population's long term survival.



18 - Impacts caused by mining in *Encholirium* populations in the Espinhaço Range: serious threat to such rare species.

18

Photo credit: Luiz Manini Neto

Notes

(1) The Proterozoic is a geological eon representing the time just before the proliferation of complex life on Earth. The name Proterozoic comes from Greek and means "earlier life", the Greek root protero-, means "former, earlier" and zoic-, means "animal, living being". The Proterozoic Eon extended from 2500 Ma to 541 Ma (million years ago). (Wikipedia)

(2) Diamantina is a Brazilian municipality in the state of Minas Gerais. As its name suggests, Diamantina was a center of diamond mining in the 18th and 19th centuries. A well-preserved example of Brazilian Baroque architecture, Diamantina is a UNESCO World Heritage Site. (Wikipedia)



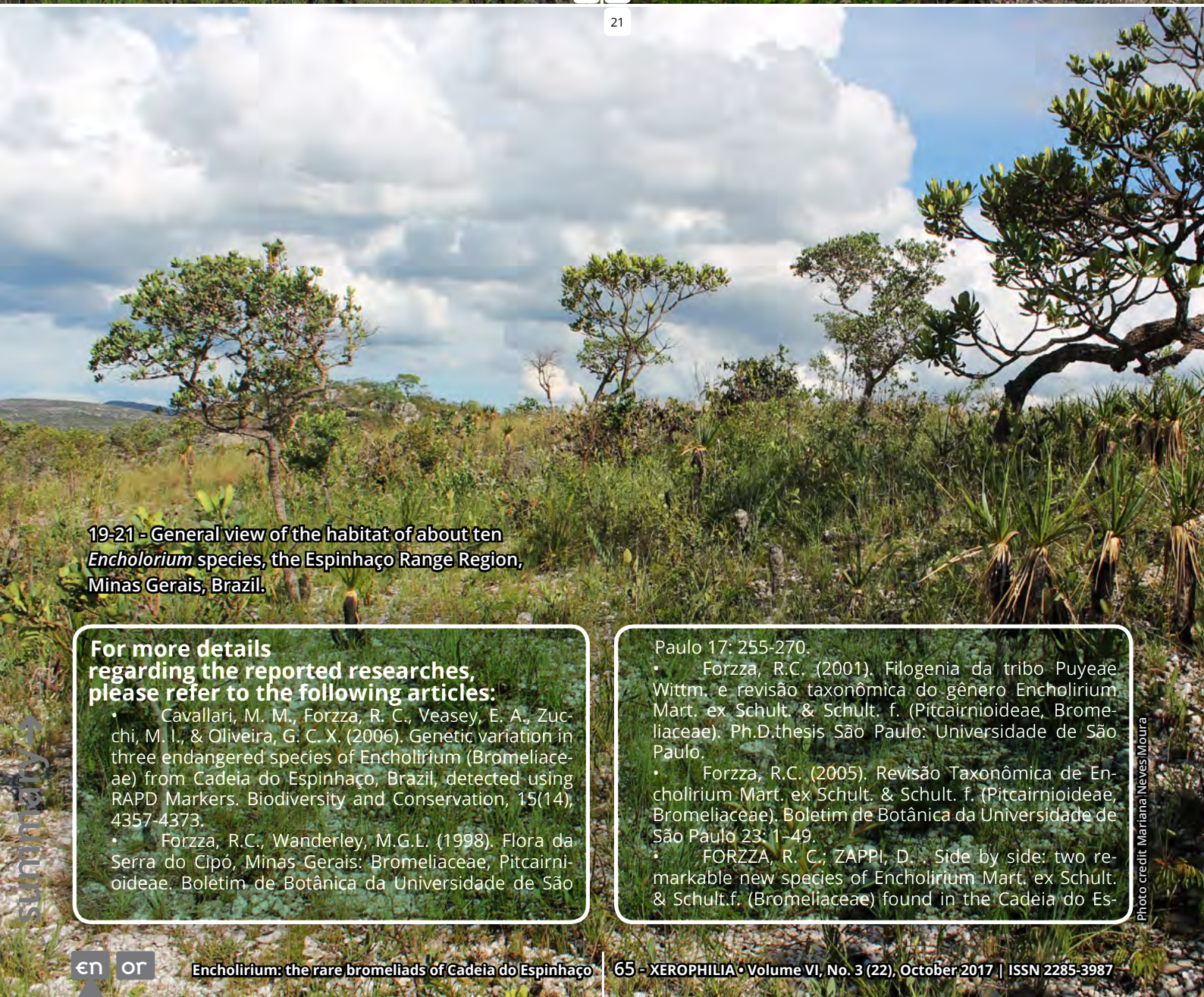
Photo credit: Mariana Neves Moura

19



Photo credit: Mariana Neves Moura

20



21

19-21 - General view of the habitat of about ten *Encholirium* species, the Espinhaço Range Region, Minas Gerais, Brazil.

For more details regarding the reported researches, please refer to the following articles:

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- Forzza, R.C., Wanderley, M.G.L. (1998). Flora da Serra do Cipó, Minas Gerais: Bromeliaceae, Pitcairnioideae. *Boletim de Botânica da Universidade de São Paulo* 17: 255-270.

- Forzza, R.C. (2001). Filogenia da tribo Puyeaë Wittm. e revisão taxonômica do gênero *Encholirium* Mart. ex Schult. & Schult. f. (Pitcairnioideae, Bromeliaceae). Ph.D.thesis São Paulo: Universidade de São Paulo.
- Forzza, R.C. (2005). Revisão Taxonômica de *Encholirium* Mart. ex Schult. & Schult. f. (Pitcairnioideae, Bromeliaceae). *Boletim de Botânica da Universidade de São Paulo* 23: 1-49.
- FORZZA, R. C.; ZAPPI, D. . Side by side: two remarkable new species of *Encholirium* Mart. ex Schult. & Schult.f. (Bromeliaceae) found in the Cadeia do Es-

Photo credit: Mariana Neves Moura



22 - *E. biflorum*; a newly discovered population in the Espinhaço Range.

22

pinhaço, Minas Gerais, Brazil. Kew Bulletin, v. 66, p. 281-287, 2011.

- Forzza, Rafaela Campostrini; COSTA, Andréa ; LEME, Elton M C ; VERSIEUX, L. M. ; WANDERLEY, M. G. L. ; MONTEIRO, R. F. 2013 . Bromeliaceae. In: Gustavo Martinelli; Miguel Avila Moraes. (Org.). Livro Vermelho da Flora do Brasil. 1ed. Rio de Janeiro: Andrea Jakobson & Jardim Botânico do Rio de Janeiro, 2013, v. 1, p. 315-390.
- Forzza, R. C., Leme, E., Ribeiro, O. (2012). *Encholirium pulchrum* and *E. diamantinum* spp. nov. (Bromeliaceae) from the Espinhaço Range, Minas Gerais, Brazil. Nordic Journal of Botany 30: 153-158.
- Forzza, R.C. (2017). *Encholirium* in Flora do Bra-

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- Gomes-da-Silva, J., Amorim, A.M., Forzza, R.C. (2017). Distribution of the xeric clade species of Pitcairnioideae (Bromeliaceae) in South America: a perspective based on areas of endemism. Journal of Biogeography online.
- Moura, M.N., Santos-Silva, F., Gomes-da-Silva, J., de Almeida, J.P.P., Yotoko, K. and Forzza, R.C. (2017 in press). Between spines and molecules: a total evidence phylogeny of the Brazilian endemic genus *Encholirium* (Pitcairnioideae, Bromeliaceae). Systematic Botany.

Echinocactus platyacanthus Link & Otto, biznaga de dulce



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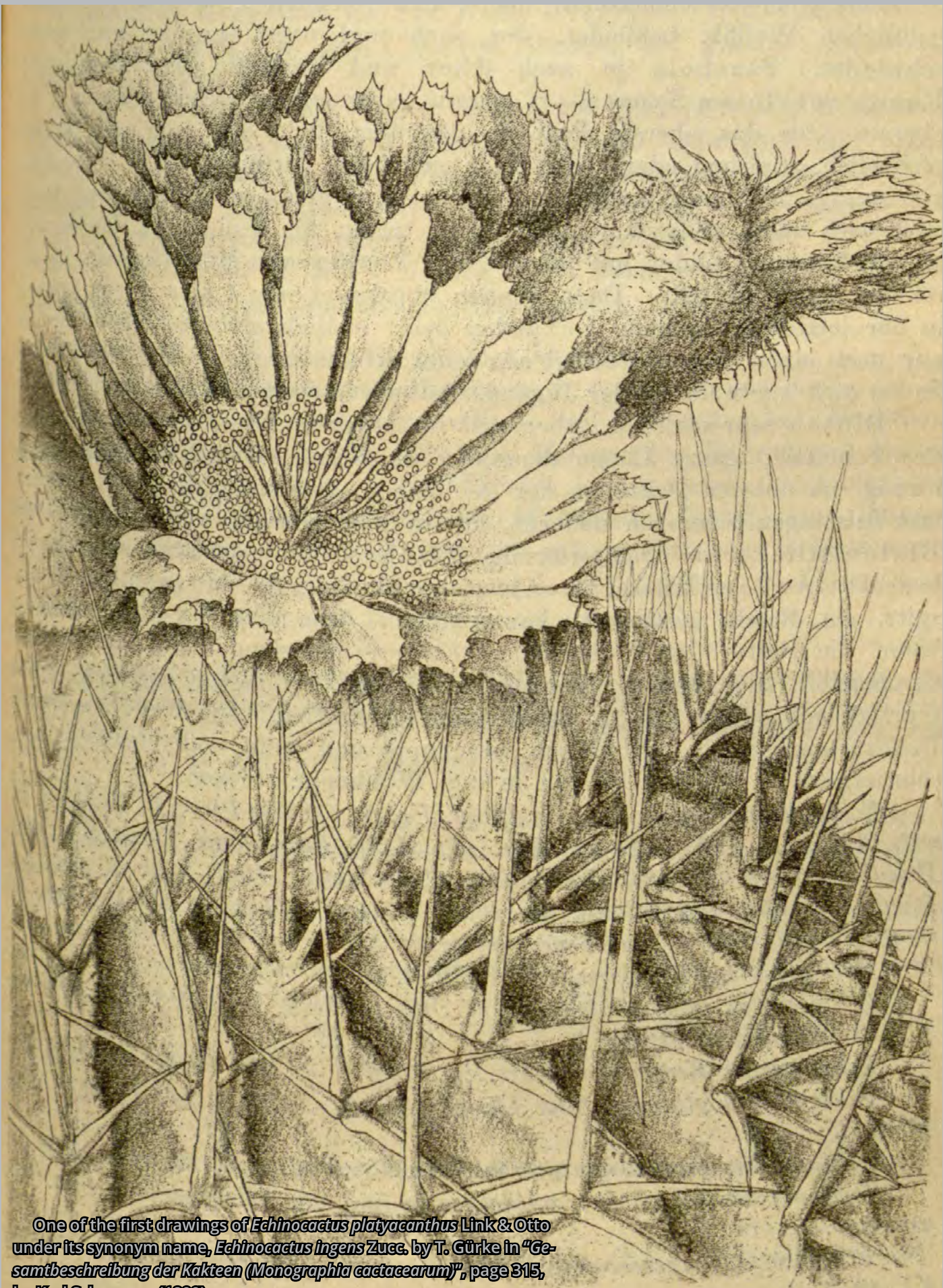
Echinocactus platyacanthus, in Villa Juarez.

Stems nearly globular, 5 dm. high, 6 dm. broad, light green, very woolly at apex; ribs 21 to 30, acute spines brownish at first, grayish in age; radial spines 4, spreading, 12 to 16 mm. long; central spines 3 or 4, spreading, 3 cm. long; flowers 3 cm. long, long-woolly; outer perianth-segments lanceolate, mucronate; inner perianth-segments obtuse, yellow; stigma-lobes 10 - wrote Nathaniel Lord Britton (1859-1934) and Joseph Nelson Rose (1862-1928) on page 171 of the first edition of their "The Cactaceae" volume published in 1922. The paragraph is a transla-

tion of Heinrich Friedrich Link and Christoph Friedrich Otto's 1827 even less enticing Latin description of *Echinocactus platyacanthus*, nevertheless one of the most famous and emblematic of the plants in the cactus family and certainly one of the most beautiful.



summary→



One of the first drawings of *Echinocactus platyacanthus* Link & Otto under its synonym name, *Echinocactus ingens* Zucc. by T. Gürke in "*Gesamtbeschreibung der Kakteen (Monographia cactacearum)*", page 315, by Karl Schumann (1899).

Fig. 54.
Echinocactus ingens Zucc. Stück einer Pflanze mit Scheitel.
 Original von T. Gürke.

summary→



The well known Swiss *Turbiniacarpus* specialist Anton Hofer taking a photo of a flowering *Echinocactus platyacanthus*, in Charco Blanco.

Heinrich Link (1738-1783), a prominent German naturalist and then curator of the herbarium and director of the botanic garden of Berlin, and his co-author, gave the Latin specific name *platyacanthus* to this plant to denote the

presence of large spines [plant to denote the presence of thick spines (platos, platys = broad (Greek) + akantha = thorn, spine (Greek)] and right away placed it in the urchin cactus genus *Echinocactus*, where it has remained to our days.



Echinocactus platyacanthus, in Sandia.

Echinocactus platyacanthus, in Sandia.





Echinocactus platyacanthus, in Charco Blanco.

With a wide distribution in the high altitude plateau lands of northern and eastern Mexico, extending from southern Coahuila to Puebla (Anderson, 2001), including populations in Coahuila, Guanajuato, Hidalgo, Nuevo León, Oaxaca, Puebla, Querétaro, San Luis Potosí, Tamaulipas and Zacatecas, it is not surprising the large number of synonyms (even for Cactaceae) that this plant has collected over years, Anderson (2001)

lists six but other authors list as many as twenty six. Common names for this cactus are equally numerous, known as biznaga de dulce, biznaga gigante, giant barrel cactus, large barrel cactus, among other names. The Huitchol Indians of the Mexican plateau, call this plant Aikutsi and it is said it has been used in their ceremonies as a hallucinogen (together with the peyote) due to the presence of alkaloids in its tissue.



Echinocactus platyacanthus and *Astrophytum myriostigma*, in Villar.



Echinocactus platyacanthus and *Ferocactus hama-tacanthus*, in El Huizache.

But for the plants disgrace, the tasty tissue has traditionally attracted more than the Huichol priests by its properties, as this plant has been considered a popular candy once crystallized in every Mexican market and supermarket in central Mexico for many centuries, where it is known as “acitrón de biznaga”, with a stronger demand in the Christmas holidays.

Due to this widespread use and the subsequent reduction of the native colonies of this cactus as human populations increase, the Mexican

government has issued a halt to this practice and the cactus has been included in the special protection status NOM-059-SEMARNAT-2010 with a category of special protection, and the sell in market places banned. *Echinocactus platyacanthus* has also been used to feed the livestock and its woolly hair as fiber for filling and wealing (Anderson, 2001). *Echinocactus platyacanthus* is additionally listed as “Near Threatened” by the International Union for Conservation of Nature with update in 2013



Echinocactus platyacanthus, in Nuñez.



Echinocactus platyacanthus, in El Huizache.



Echinocactus platyacanthus, in Charco Blanco.

Echinocactus platyacanthus is without doubt the largest of the Barrel cacti, with some extreme examples of individual plants growing more than two and a half meters tall and a diameter of more than one meter, reaching a weight of almost two tons. Starting its life with five ribs, the plant as it grows can develop more than 60 in adulthood. This species, together with *Ferocactus histrix*, make the most numerous of the barrel cacti in Mexico (Del Castillo and Trujillo 1991).

Goettsch (2007) estimates a population density of 15 plants for hectare in average. Counting's in Hidalgo, the state with the larger populations show up to 1,111 plants per hectare in some areas while in Querétaro, while the smaller colonies up to 435 plants per hectare (Jiménez-Sierra & Eguiarte, 2010). All authors agree on the rapidly diminishing numbers of individuals and colonies of this species and recommend conservation strategies implemented immediately



Echinocactus platyacanthus, in Nuñez.



Echinocactus platyacanthus, in Nuñez.



Echinocactus platyacanthus, in Charco Blanco.

In terms of its beauty, this plant is not easily matched. A sight of Biznaga is equally inspiring when you see them suddenly appearing on a muddy flat in the open valley or when you see a numerous group growing on a rocky mountain side among Xerophilous scrub, regularly over calcareous soils. Few people would not stop a moment to enjoy the beauty of this magnificent cactus. The large, short and beautiful tu-

bular yellow flowers appear at the beginning of the spring emerging from the yellowish flat woolly apex of the cactus, and make an even grander sight. Specimens with twelve simultaneous five to seven centimeters wide flowers are not uncommon, and yet again, a cause of admiration. Fruits follow in late summer and are completely covered in wool, reaching a size of about five centimeters



Echinocactus platyacanthus, in El Huizache.

In horticulture *Echinocactus platyacanthus* is another gift, as it could be inferred by its large distribution range and selection of varied habitats, it is a fairly easy but slow plant to grow, providing pleasure for his keeper

through the many years it will take to reach a large size, however out of the scope of a single life to get to see it in its full glory, as this plant is known to live for more than 100 years.

Echinocactus platyacanthus, in Charco Blanco.

The minimum recommended temperature to keep this cactus would be 10 °C, with small periods where it could stand lower temperatures, as it is the case for part of its distribution. Young plants can be soon accustomed to plain sun light.

As for watering, the common cactus precautions should be exercised in terms of avoid keeping this plant wet, humid and shady, in any of two combinations. In a sunny summer time any water that could be provided to a cactus should not be excessive for this species.

The author admiring a huge *Echinocactus platyacanthus*, in Villa Juarez.

Echinocactus platyacanthus colonies have regrettably shrunk in past decades because of change of soil use to agriculture and the disruption of the sold by livestock in the natural habitat.

Synonyms

Echinocactus grandis, *Echinocactus helophorus*, *Echinocactus ingens*, *Echinocactus karwinskii*, *Echinocactus palmeri*, *Echinocactus visnaga*.

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Notes on

M. egregia Backeb. ex Rogoz. & Appenz

&

M. zephyranthoides Scheidw.



Elton Roberts

Part 1- *Mammillaria egregia* Backeb. ex Rogoz. & Appenz with supplementary photos from habitat kindly given to us, in alphabetical order, by **Stefan Nitzschke**, from Germany, 2 photos   **Heinz Otto**, from Germany, 4 photos  **Ján Rožič**, from Slovakia, 5 photos  



Mammillaria egregia SB 30*

really like or should I say "I love *Mammillaria egregia*"? It is such a beautiful plant even if it is all whitish in color. It may be a whitish ball when golf ball size or it may be a small cylinder shaped plant but it never tries to stick or jab a spine in my fingers. It may have hooked or claw like tips to the spines but it is a lady and does not use them. The spines all lay close to the body and are almost ivory fan

shaped. It is just a really wonderful plant! From a distance it looks like some of the other white spined plants. Like *Mammillaria magallanii*, *Mammillaria lasicantha*, *Mammillaria laui* if it is single stemmed or even *Mammillaria humboldtii* before it offsets. But *Mammillaria egregia*, for me stands out as being really distinguished. In fact, the name means just that!

"Egregius" = distinguished; excellent.






Mammillaria egregia SB 30.

I have four of the plants and am surprised that I have not seen any plants in shows or on the sale tables at any of the shows that I go to. If I were to see any, and it was a true *Mammillaria egregia*, I would buy it for I figure I can never have too many of this wonderful plant. I attend or sell at seven shows a year and after getting my tables set up I wander around to see what other vendors have to offer. At times I still buy plants and if I were to see one or a couple *Mammillaria egregia* I would sure snap them up before someone else gets them. Most people do

not know the plants and all they would see is an off white ball that they would take home and kill. If it had the name of *M. egregia* on it, I would have to look it over really carefully for there are many people that believe the NCL (The New Cactus Lexicon, 2006) and so cross the plants with *Mammillaria lasiacantha* or *M. magallanii* or some other white spined plant of about the same shape. So when you see a plant with a name you have to really be careful and make sure that it is true to the name or that the name is correct for the plant.



Mammillaria egregia SB30, spine pattern.

Looking at the plant you can safely say that is a gorgeous plant. One of the most wonderful plants. There is not a spine out of place and they all lay tight against the plant body. One of my plants is 6 cm in diameter and 8.5 cm tall and I have no idea why the plant has made a nob on the top.

The holes here and there in the spine cluster

areas are where flowers were and then seed pods. I have three other plants; some of them not quite as tall but they have that beautiful look to it also. We can see in some of the photos that something is different from the description and that is the spine color. It is not white like the description says; the spine clusters have a touch of yellow at the base of the spines.



Photo credit: Heinz Otto

Mammillaria egregia west of Jiménez, Chihuahua.

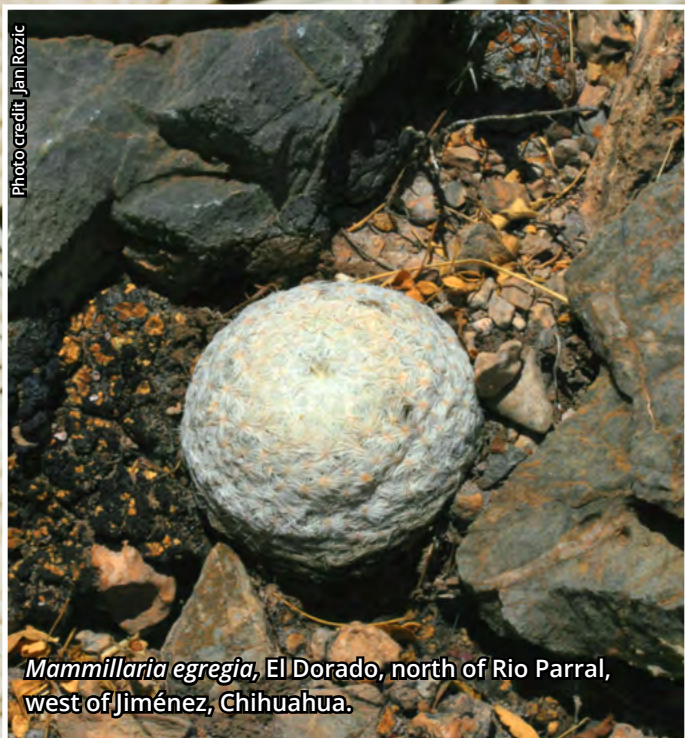


Photo credit: Jan Rozic

Mammillaria egregia, El Dorado, north of Rio Parral, west of Jiménez, Chihuahua.



Photo credit: Jan Rozic

Mammillaria egregia, El Dorado, north of Rio Parral, west of Jiménez, Chihuahua.



Photo credit: Heinz Otto

Mammillaria egregia, west of Jiménez, Chihuahua.

The descriptions of *Mammillaria egregia* that I can find are kind of short and do not really give much information. Before giving the description, Hunt transfers it to *Mammillaria lasiacantha* and gives the page and photo number in the photo book. There the plant that is shown is not *M. egregia*. It is more of a *M. lasiacantha* as the spine clusters do not match the true *M. egregia*. The number of spines does not match

the number of spines on *M. egregia*. Pilbeam in his book *Mammillaria* on page 159 shows what I call, a true *M. egregia*. He also states that he doubts that Backeberg was describing *M. egregia* but some other plant. This would explain why he states the plant has only 'to about 50 spines' and also the pink tips on them. The pink spine tips make it sound like he was describing a *Mammillaria magallanii*.

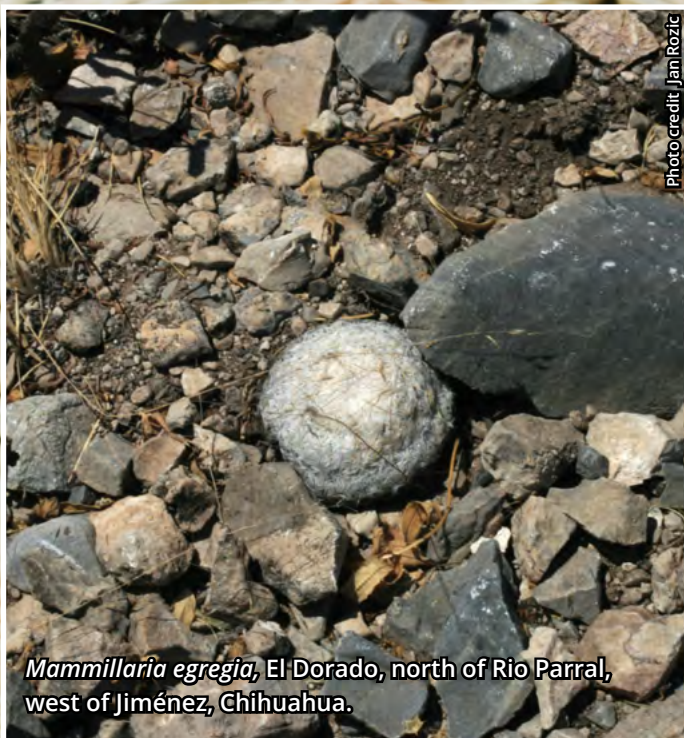


Photo credit: Jan Rozic

Mammillaria egregia, El Dorado, north of Rio Parral, west of Jiménez, Chihuahua.

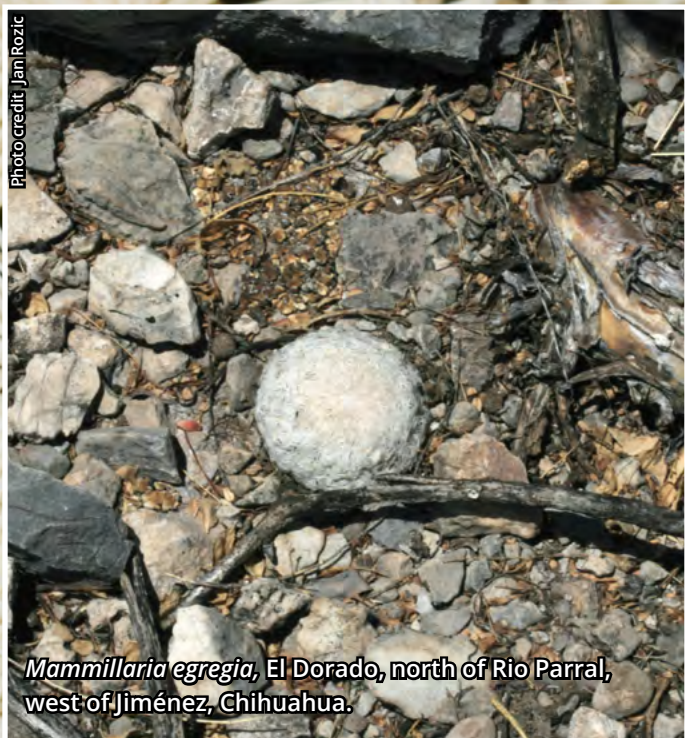


Photo credit: Jan Rozic

Mammillaria egregia, El Dorado, north of Rio Parral, west of Jiménez, Chihuahua.

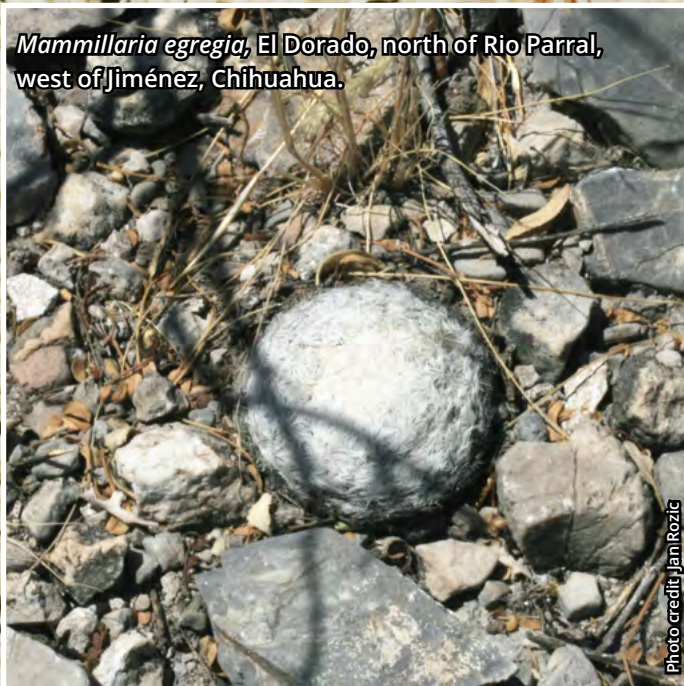


Photo credit: Jan Rozic

Mammillaria egregia, El Dorado, north of Rio Parral, west of Jiménez, Chihuahua.

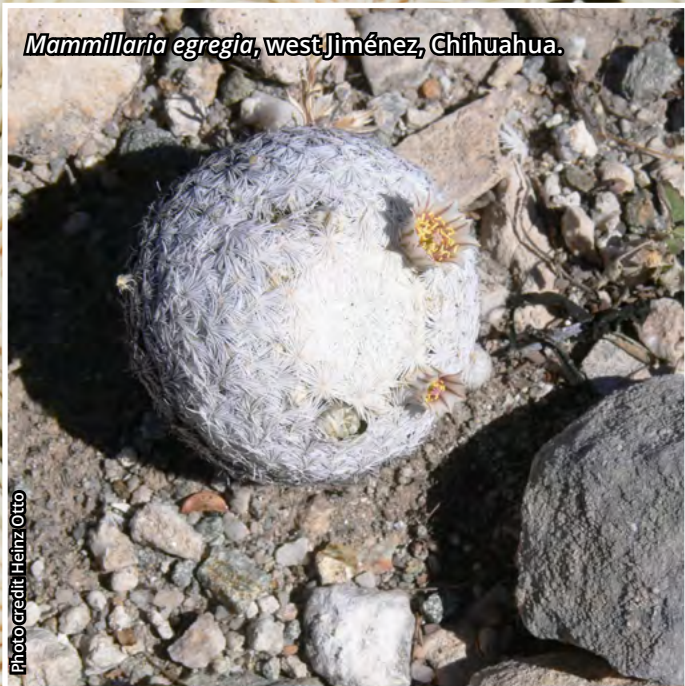


Photo credit: Heinz Otto

Mammillaria egregia, west Jiménez, Chihuahua.

If he had a true *M. egregia* he would have counted close to about 90 spines. Here is the description from the NCL:

"Body simple, under 6 x 4 cm; roots short, fleshy tubercles 6 x 4 mm; axils with scant wool; spines less than 60, 3 - 4 mm, radiating, white; flower 16 x 19 mm; tepals white with pinkish or olive-green midstripe."

If we backup to 1984 we have a little different description by Hunt in his New Review of *Mammillaria* Names (1987):

"Simple, to 5 x 5 cm, central spines 0; radial spines 50 or more, in several series, white tipped somewhat rose at first. Flower 11 x 8-9 cm⁽¹⁾, outer

segments white, striped rose, inner muddy olive greenish white, darker striped. Fruit and seed not described".

Here is the original description taken from Backeberg's *Cactus Lexicon* (1976):

"Body spherical to elongated, to 5 cm high and diameter; Tubercles conical.....Radial spines to c 50, interlacing, white sometimes pink at first, in several series; Central spines 0; flower 11 mm long, to 9 mm in diameter, olive-brownish to whitish; fruit? Mexico."

Note: (1) I am sure that the size is a misprint for it should be in mm and not cm.



Photo credit: Stefan Nitzschke

Mammillaria magallanii, Microonda, Snta Lucia, Coahuila.



Mammillaria egregia, West of Jiménez, Chihuahua.



Photo credit: Stefan Nitzschke

Mammillaria magallanii, Microonda, Snta Lucia, Coahuila.

In 1984 Hunt said that the plant is closely allied to *Mammillaria magallanii*. Hunt in his book, A New Review of Mammillaria Names says that Reppenhausen, in 1976 showed him a plant with the name of *M. egregia* and to him it was 'inseparable from *Mammillaria magallanii*.' Well now if it was 'inseparable from *Mammillaria magallanii*' that tells me one of two things:

- 1 - Reppenhausen did not have *M. egregia*;
- 2 - Hunt just does not know the plants.



Photo credit: Dag Panco

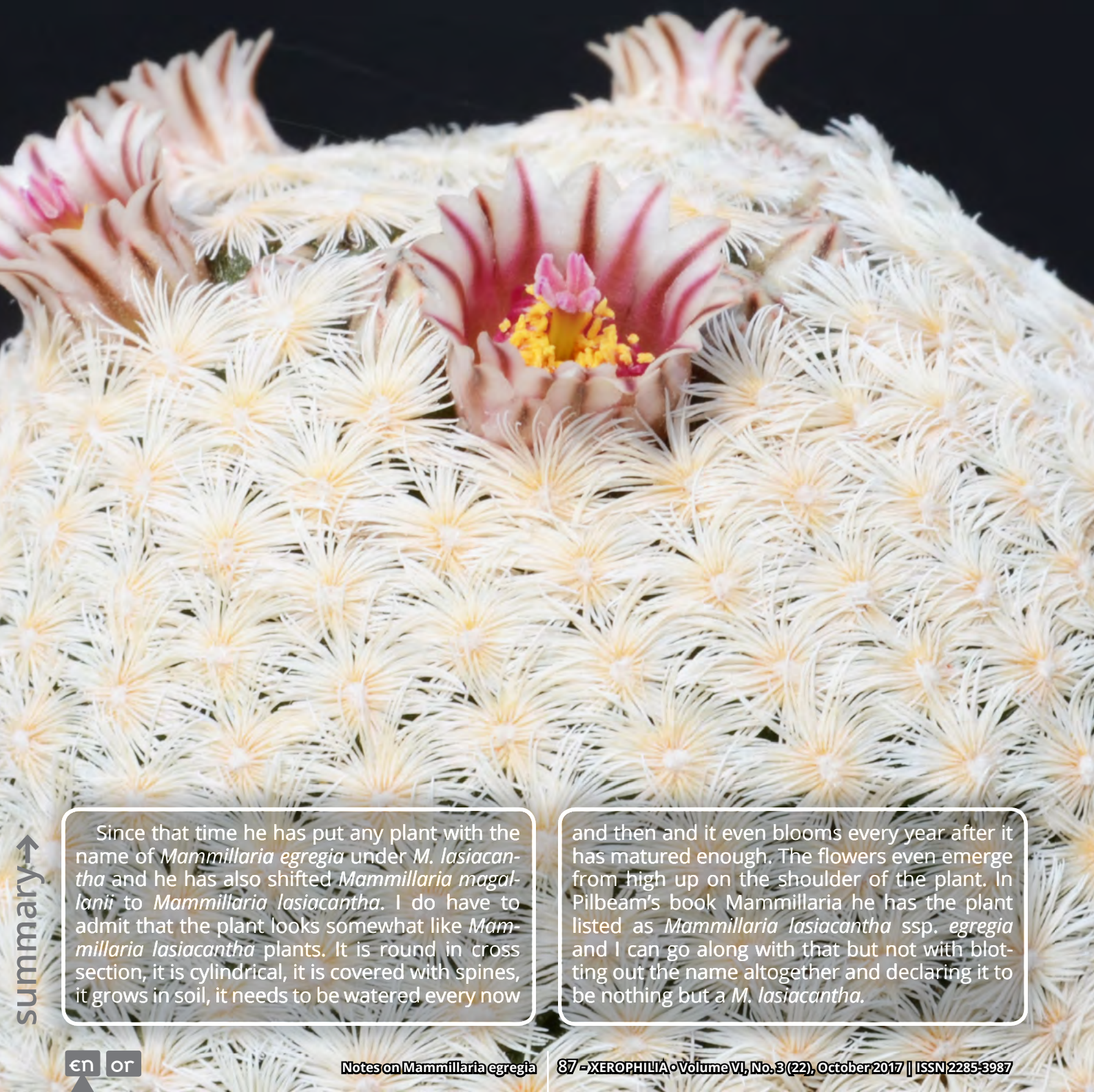
Mammillaria magallanii, flowering in collection plant.



Photo credit: Dag Panco

Mammillaria magallanii, flowering in collection plant.

Mammillaria egregia SB 30, flowering in collection plant.



Since that time he has put any plant with the name of *Mammillaria egregia* under *M. lasiacantha* and he has also shifted *Mammillaria magallanii* to *Mammillaria lasiacantha*. I do have to admit that the plant looks somewhat like *Mammillaria lasiacantha* plants. It is round in cross section, it is cylindrical, it is covered with spines, it grows in soil, it needs to be watered every now

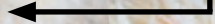
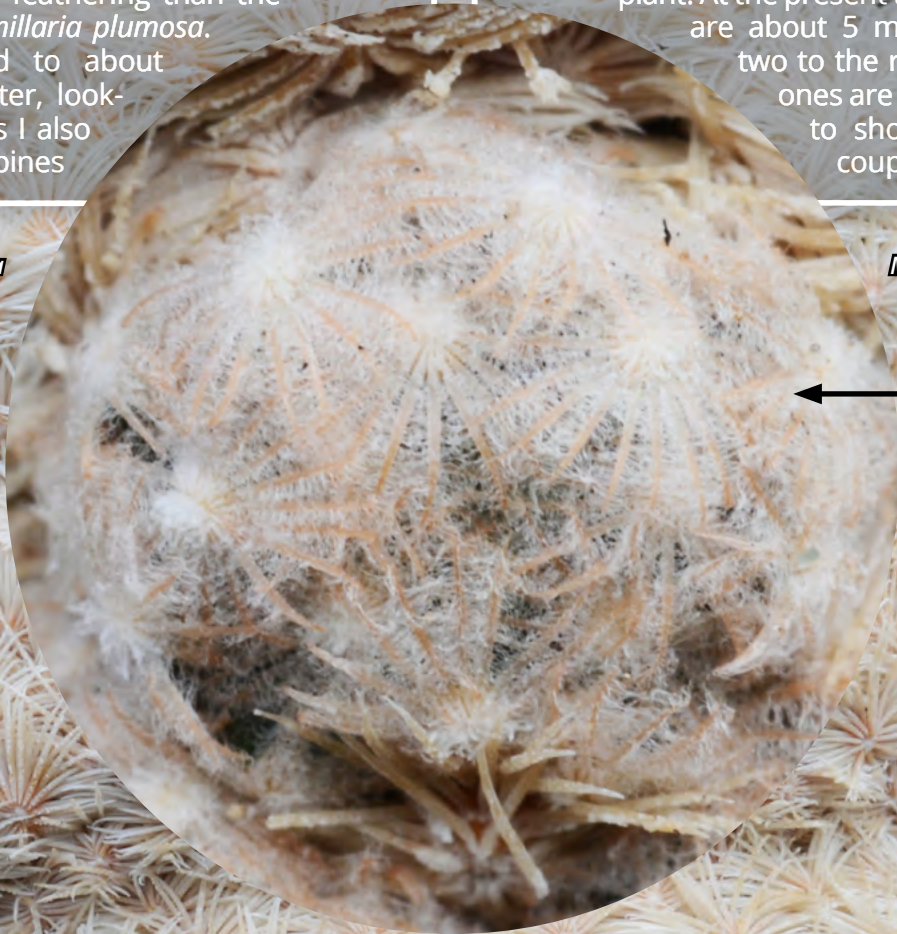
and then and it even blooms every year after it has matured enough. The flowers even emerge from high up on the shoulder of the plant. In Pilbeam's book *Mammillaria* he has the plant listed as *Mammillaria lasiacantha* ssp. *egregia* and I can go along with that but not with blotting out the name altogether and declaring it to be nothing but a *M. lasiacantha*.

In another picture we can see something that the descriptions do not mention. If you look at the bottom center of the plant, there are six offsets. Here is something I did not expect at all, and that is the spines on the offsets are plumose. They have more feathering than the spines on *Mammillaria plumosa*. When magnified to about 15 cm in diameter, looking at the offsets I also notice that the spines

on the main plant still have some feathering on the individual spines. One of the photos is of the offsets, it is easy to see the plumose spines and also if you look close there are minute puffs of wool or pubescens on the spines of the parent plant. At the present time these offsets are about 5 mm diameter, the two to the right of the larger ones are just large enough to show up as only a couple of fuzzy spots.

Mammillaria egregia
SB 30, offsetting
plant.

Mammillaria egregia
SB 30, offset close
up.



Mammillaria egregia SB 30, apex spine pattern.

One of the photos shows the growing point and the new spine clusters growing out of the plant. From the growing point to as far down the plant as is in focus can be seen the yellowish coloring in each of the spine clusters. This coloring starts about half way down the spines and continues to the base of the spines. If the areole is yellowish also I do not know as they are covered in fine wool. The tip of the spines are not a rose or pinkish color but off white or ivory color. Looking at the new spines in the growing point there is not a bit of pink or rose color to the new spine tips either. That yellowish color shows up even deep in the growing point. Inspect also the spine clusters. In this shot on this plant the yellowish coloring does not show up as well as on other plants but it is still there down near the base of the spines and at the areole. In the center of each cluster of spines is a very small puff of wool. The spines lay so neat and orderly and the curves

are so graceful. The lower spines on a tubercle are mostly covered with the spines from the tubercle below, making the upper spines look like fans made of ivory. Many years ago I saw some fans in China Town that looked a lot like these spine clusters, they were quite expensive and I remember they were made of ivory. They were the same color as the spines on these plants. The spines are in layers, I am not sure how many layers I would guess 4 and to even 6 on some areoles. When I magnify the spine clusters to about 30 cm in diameter it looks like there are 5 and may be 6 layers or series of spines. The spines are layered layer upon layer. The spines have a slow taper from the areole to the tip and many have a slow curve to them. At the tip of the spines most have a sudden claw like curve and some actually are hooked. The spines look like they are smooth but they are quite rough. I am not sure if it is hair remains or just super fine pubescens.

Mammillaria egregia SB 30, spine pattern.

Mammillaria magallanii, spine pattern.



Photo credit: Dag Panco

It can be also seen that the coloration of the spines is not at the spine tips but at their base. The puff of whitish translucent wool also is seen on the areole. The description calls for 'to about 50 spines'. I counted a whole lot more than that per areoles and I am sure that I did not get all of them. Without removing several spine clusters it is kind

of impossible to get a true count of the spines. Of the clusters I tried counting I got 92, 96, 78, 80, 94 and 86 spines. That is a lot more than 50 spines and makes me think that they were not looking at spine clusters on *M. egregia* but a different plant. I counted spine clusters on three different plants and there were sure a lot more spines per areole than what the descriptions say.

Mammillaria egregia SB30, bud.

Mammillaria egregia flowers are charming; look at a flower but just starting to open. Here we can see the coloring on the outside of the flower. The spines in front of the flower are what I call chalk or ivory color and not true white; if they were true white then the outer flower petals are not white. I have to say that the color is light pink maybe even a dusty pink. The center

stripe is dense dusty pink and the color fades out from the center stripe to the edge of the petals. The pink of the stigma is just showing out the top of the flower. In the next photo the flowers are open but the stigma has not opened so as to receive any pollen. Here again if the spines are white then the flowers are not white but pinkish with a dark midstripe.



Mammillaria egregia SB 30, flowers.

The areoles show up with the white puff of wool and the yellowish ring of the spine bases around them. The anthers are just starting to open. Finally, we have the anthers open and the stigma is open as well and ready to receive pollen. The styles are dusty pink till just below the stigma and there it is dusty rose pink. The

stigmas lobes are a fuzzy pink that is dark in the center and it fades to light pink at the edges. One of the photos shows flowers that have been open for a while and others that have just opened and one just opening. Those that have been open for a while have the stigma lobes ready for receiving pollen.

Mammillaria egregia SB 30, flowers.

The plant is very elegant and to keep it that way you have to water with care. It doesn't like soil that stays damp very long. Do not give it a thick layer of topdressing for that will hold water and help to rot the plant. I give my plants a very fast draining soil. I keep them powder dry in the winter time. The plants hate alkaline water; give water with a pH of about 5. Do not give any

limestone in the soil or as a topdressing. Give as much light as you can to maintain the lovely spine density and color. If you can, make sure that the plant is where it will benefit from any breezes that blow. The plants can take a frost to -6.5 C (or about 20 F) once in a while but it is best to try to keep them just above freezing in the winter.



✿ - SB 30 - Number and acronym for seed collected in Jimenez, Chihuahua, Mexico, by Steven Brak, the former Mesa Garden owner.

Mammillaria egregia SB 30, apex and flowers.

Acknowledgements

We thank, in alphabetical order, to **Stefan Nitzsche** and **Heinz Otto**, both from Germany, and to **Ján Rožič**, from Slovakia, for their help with photos from habitat.



Only the photos belonging to the author of the article are not labeled.

Part 2 - *Mammillaria zephyranthoides* Scheidw.

with supplementary photos kindly given to us, in alphabetical order, by

Grzegorz Matuszewski, from Poland, 3 photos - webb: www.kaktusymeksyku.pl  

Cristian Perez-Badillo, from Mexico, 4 photos - webb: www.turbincarplus.net  

Valentin Posea, from Romania, 3 photos - webb: cactus.aicon.ro  

Mammillaria zephyranthoides.

Way back in the dark ages of the 1980s and to 1990/91 I had a large *Mammillaria zephyranthoides*; back in those days the plant was known as *Dolichothele zephyranthoides*. Much to my disgust the plant was killed in the big freeze we had back then. The plant was in a 15 cm pot and it filled it quite well. I remember the plant being quite wide and not very tall. When the light hit the plant just right it looked like a pot full of spider webs. I do not remember where I obtained the plant but since it died I have not seen any for sale or seen any articles about the plants. About two years ago a friend said that she had some plants she grew from seed. She gave me one of the seedlings; that plant seemed to like my growing conditions and it soon out grew its 5 cm pot. So I put it in a 9 cm pot and it has grown and filled it and I have just up potted it to a 15 cm pot. The rest of the seedlings that she had slowly got smaller and would not grow so she gave me the last two, one of those died and the other is growing just fine. The first plant is now 10 cm across and the second plant is 7 cm across. The 7 cm plant I have had for just over a year.

Here is the description of the plants first from Anderson's book *The Cactus Family* (2001); the second is more detailed and is from the Craig's book *The Mammillaria Handbook* (1945/1963):

Anderson's description

Plants usually solitary. Stems flattened globose, dark blue-green, to 8 cm high and 10 cm in diameter. Tubercles soft, conical, rounded apically, to 25 mm long, without latex, axils naked.

Central spines one, hooked, white to yellowish to reddish brown, short or to 14 mm long. Radial spines 12 – 18, very slender, white 8 – 10 mm long. Flowers white with pink midveins, to 40 mm in diameter. Fruits ovoid, red. Seeds black. Distribution: Oaxaca, Puebla, Guanajuato, Hidalgo and Queretaro, Mexico.

Craig's description

Body simple, depressed globose to cylindrical, 8 cm high, to 10 cm wide. Tubercles arranged in 5 and 8 spirals, soft in texture, dark bluish green, conic, flattened dorsally and ventrally, with rounded apex, with watery sap, 20 – 25 mm long, 10 – 12 mm wide laterally at base, 7 mm side dorso-ventrally at base. Areoles small round to oval, with white then becoming deep yellow wool, later becoming naked. Axils naked. Central spines 1 occasionally 2, from very minute to 8 – 14 mm long, lower ones longer, acicular and hooked, upper ones (when present) straight, all pubescent, yellowish to red-brown, newly formed ones purplish, porrect or divergent. Radial spines 12 – 18, 8 – 12 mm long, lateral longer, slender hair like, straight pubescent, white, horizontal. Flowers funnellform, near apex, 40 mm long and wide, in August. Outer perianth segments greenish to brown, lanceolate, tip acute, margins serrate. Inner perianth segments white to yellow, carmine-red midstripe, lanceolate, tip acute, margins serrate. Filaments green, base rose above. Anthers golden, style green at base, rose above. Stigma lobes 8 – 10, yellowish green. Fruit red, oval. Seeds black, thick, finely pitted.



Mammillaria zephyranthoides, spines.

Mammillaria zephyranthoides.

Talking about how slow the plants grow and their care, Pilbeam in his *Mammillaria* book says; "A good sunny position and care with watering, using a more than usually gritty compost are recipes for growing this, but the watchword is slow, slow, slow, as in an old fashioned waltz." I would not say that the plant needs three slows or even two, for it is not all that slow that I can see. The person I got the plants from got the seed in 2013 and planted them in the spring time. Two years ago when I got the first plant it was about 2.5 cm across. In the two years I have had it, it has grown from 2.5 cm to 10 cm and it has also bloomed. I would not call that slow much less 'slow, slow, slow.' The 7 cm plant I got a bit over a year ago was at the time about 2 cm across. To grow to 7 cm across in a year and half shows me that the plants are not all that slow growing. For many years I also thought cactus plants were slow growing then I started watering with acidic water and my thinking changed. For my many years as a member of different cactus societies I have heard many times how slow growing *Ariocarpus* are. True when they reach maturity they stop or almost stop growing but when they are young and they receive acidic water they are not all that slow growing. It is the same with all the cactus plants that I have, they grow at a decent rate since they get acidic water.



In the book *Ariocarpus et cetera* (2006) by John Pilbeam and Bill Weightman under soil mixture is stated: "In general many of these plants come from limestone areas in the wild, and our firm belief is that an alkaline soil gives better results, certainly in their adult phase, although this should not be overdone. The addition of fine, limestone chippings and use of rainwater (essential to slowly dissolve them), perhaps in the place of your normal grit or coarse sand, may help to achieve this happy state." Notice the use of rain water to dissolve the limestone chips showing that the rain water is acidic. When people go this route it is no wonder that the plants grow slowly or not at all. Some years ago I found limestone chips that were sized at 3/8 inch (1 cm). That is just what I was looking for, for a topdressing. Long story short, the acidic water started dissolving the limestone and made the soil alkaline and the plants started to die. I repotted many of the plants and eliminated the limestone topdressing. Those plants started to healthy up and grow again. I then thought that repotting all those plants would take half of forever so I started just dumping the limestone topdressing off and watered with acidic water. Those plants also started to grow and get healthy again. It is because of my experiences with limestone and with alkaline water that I preach so much about using acidic water.

Mammillaria zephyranthoides, bud.



Mammillaria zephyranthoides, Buenavista, Queretaro.



Mammillaria zephyranthoides, Buenavista, Queretaro.



Mammillaria zephyranthoides, Buenavista, Queretaro.

All photos on this page - credit Cristian Perez-Badillo

summary →

summary →



Mammillaria zephyranthoides, Miraflores, Guanajuato.

Photo credit: Cristian Perez-Badillo
Photo credit: Grzegorz Matuszewski



Mammillaria zephyranthoides, San José de Magaña, San Luis Potosí.



Mammillaria zephyranthoides, San José de Magaña, San Luis Potosí.

Photo credit: Grzegorz Matuszewski

summary →

summary →



Mammillaria zephyranthoides, flower.

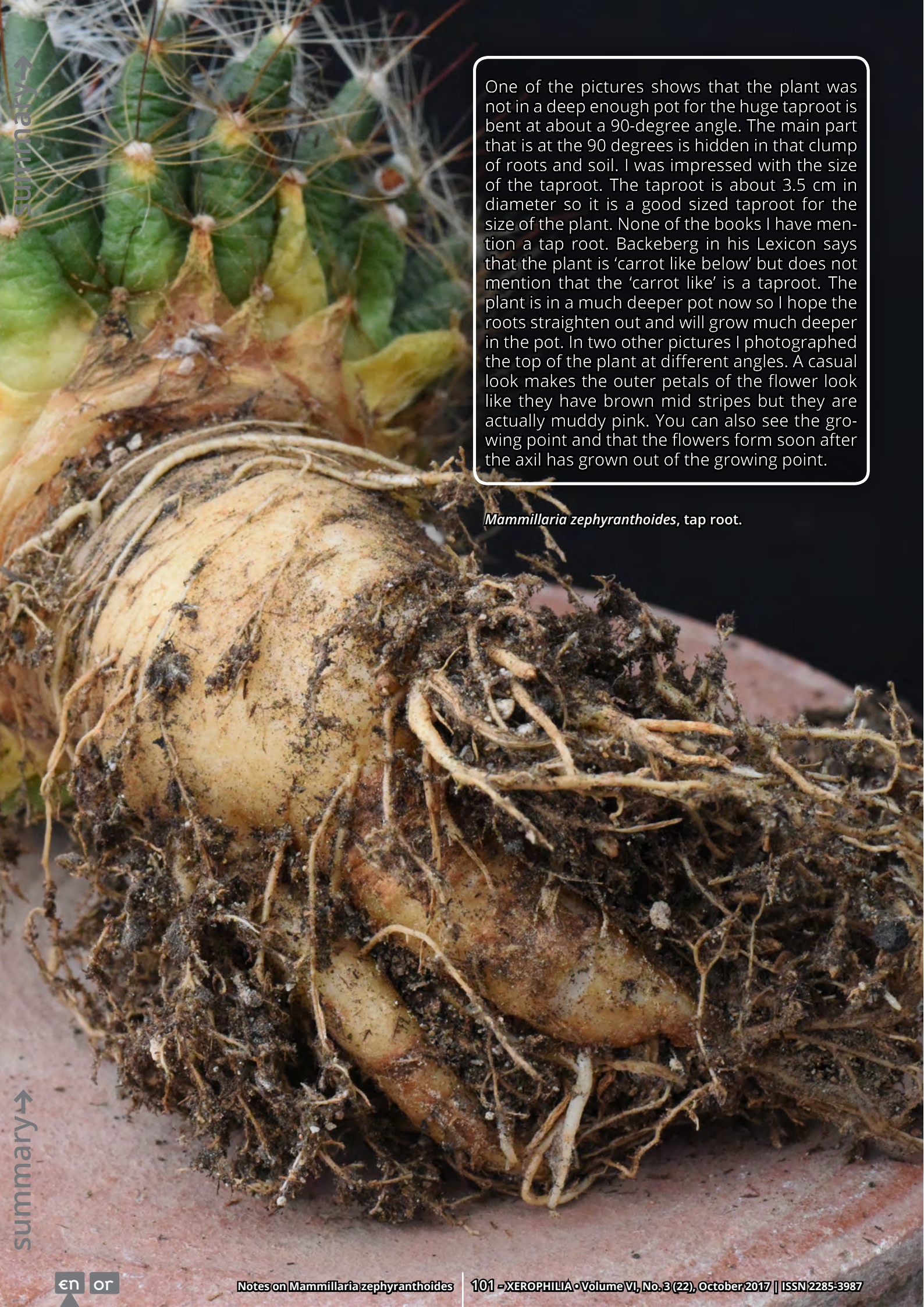


All photos on this page - credit Valentín Posea

My plant has now 10 cm in diameter. It is easy to see in the picture the hooked central spines as they are dark and stand out against the white radials. The pubescence on the spines does not show up in the photo but when I enlarge the photo ten times then it shows up very clearly. All the spines are soft and flexible even the centrals with the hook.

Even if the centrals are soft and flexible the hooks still want to hold on to the fingers. Photo 2 is another view of the plant and there the spines can be seen sticking out in all directions. The tubercles are quite easy to see and the oval to round

wool covered areoles stand out really well. The radial spines look white which they are but they are also semi-translucent. Only the base of the centrals shows up as semi-translucent for there is too much color in the rest of the spine to allow any light to show through. While the first pictures was taken this spring, the second is of the same plant last May. This shows the difference in size of the plant in less than a year; it increased in size by about 2 cm in that time. I would not call that slow, slow, slow. In the photo are seen one flower that has bloomed out and one in bloom and a bud close to opening.



summary →

One of the pictures shows that the plant was not in a deep enough pot for the huge taproot is bent at about a 90-degree angle. The main part that is at the 90 degrees is hidden in that clump of roots and soil. I was impressed with the size of the taproot. The taproot is about 3.5 cm in diameter so it is a good sized taproot for the size of the plant. None of the books I have mention a tap root. Backeberg in his Lexicon says that the plant is 'carrot like below' but does not mention that the 'carrot like' is a taproot. The plant is in a much deeper pot now so I hope the roots straighten out and will grow much deeper in the pot. In two other pictures I photographed the top of the plant at different angles. A casual look makes the outer petals of the flower look like they have brown mid stripes but they are actually muddy pink. You can also see the growing point and that the flowers form soon after the axil has grown out of the growing point.

Mammillaria zephyranthoides, tap root.

summary →



Mammillaria zephyranthoides, flower side.



Mammillaria zephyranthoides, flower of 5 cm diameter.

Mammillaria zephyranthoides, second blooming day, flowers of 6 cm diameter.



Another picture shows the outside of the flower from the side. Here can be seen that the petals that are closer to the inside of the flower its midstripe becomes lighter till it is a narrow pinkish stripe. In another picture taken next day the inner petals show a touch of pink and the midstripe is almost gone but still showing a little bit. The base of the petals is delicate pink and then the tip of the petal is tinged darker pink. The interesting thing is that where the petals lay against the anthers they are stained a very light yellow. The flower may look white but a very close look and the flower is a very light pink. I have also a picture showing two flowers and a visible difference in the flowers. The flower on the left has just opened; the style is quite well above the anthers, and is light greenish in color. A close look at the top of the filaments shows they bend and kind of wrap around the style. The filaments are greenish at the bottom and with only some pink at the tips. The flower on the right opened the day before and what a difference between the two. The filaments are unwound and the

anthers have opened; the filaments are pink all the way from top to bottom and the style is also pink. With the unwinding of the filaments the stigma is now only a few millimeters above the open anthers. This is the first time I have seen a flower change that much on a plant. Photos 10 and 11 are of the same two flowers on that one plant. They are close ups of the flowers and there the differences can easily be seen. If I had to guess, I would think that the flowers are on two different plants but the photo shows clearly that they are on the same plant. On the first day that the flowers opened they were 5 cm in diameter. On the second day and till they died they measured 6 cm in diameter. I did not see the flowers close at night nor open the next day. If they do they open very early and close very late. As the flowers stayed at 6 cm for at least three days I have to believe that they did not close at night. In time I hope to check this out for myself. The two descriptions above say that the flowers are 40 mm or 4 cm in diameter. I am glad to see that they get larger than that.



Mammillaria zephyranthoides, flower filaments.



Mammillaria zephyranthoides, flower filaments.



Mammillaria zephyranthoides, San José de Magaña,
San Luis Potosí.

Photo credit: Grzegorz Matuszewski

Cacti, flowers, landscapes and... elusive snakes



Ricardo Ramirez Chaparro

Chihuahua!
A beautiful and big state with some of the most amazing plants and animals that can be found throughout México. It has many different habitats and a lot of nature diversity, landscapes so big and varied, where one can find truly enjoyable moments, places and life. Here I present a small contribution to show that richness with a few photos of some of these gems.

Opuntia sp., growing on the arid soil of so many landscapes in Chihuahua.



summary →



Here we are in the old Tarahumara territory, the ancestral land of one of the most representative native American people the European invaders found when they came to the New World. These photos were taken in one of their most important festivals.



summary→

summary→

One of the most sacred and most important festivities for the Tarahumara people is the celebration of the Holly Week, which is a mixture of catholic and ancestral beliefs all mixed together to bring to life a very colorful and enriching experience that is very attractive to outsiders.

These people have lived in the mountains of the Sierra Madre Occidental for millennia, and are familiar with the animals and plants that live in their surroundings. Including the

same cacti and snakes presented in the photos of this pictorial. Rarámuri people (as they call themselves, and which means people with light feet) are known for their strength and their abilities for living in these places that at times can present very challenging conditions, like the harsh winter, in which temperatures drop below freezing points. However they have endured and conquer the mountains and remain as the dominant indigenous people in Chihuahua





Echinocereus salm-dyckianus on flower, in the state of Chihuahua, south of the town of Creel, between Ahuareachi, in the west and San Luis de Majimachi, in the est.

I found this beautiful population, in early spring on the forest, while I was looking for rattlesnakes in the area.





Crotalus pricei pricei - the twin spotted rattlesnake. is a member of the rattlesnake family that lives in the same area as these Echinocereus. Small and secretive, these snakes can be the most abundant in some areas. They also possess a venomous bite and should not be bothered if encountered.



Detail of the floral tube and the ovary of the same plant seen on the previous page, with its wonderful flaming tones



These striking *Echinocereus pectinatus* can be found nearby on a different locality, I was surprised to see them blooming on May on a rocky hillside on an afternoon while trying to get a new spot for snakes.

Close up of *E. pectinatus* big warm yellow flower.





Another look at the plant and the flower of the *E. pectinatus* from the previous page. Right: *Crotalus pricei pricei* - twin spotted rattlesnake - venomous, bites can be very painful, and should always be considered as a medical emergency.

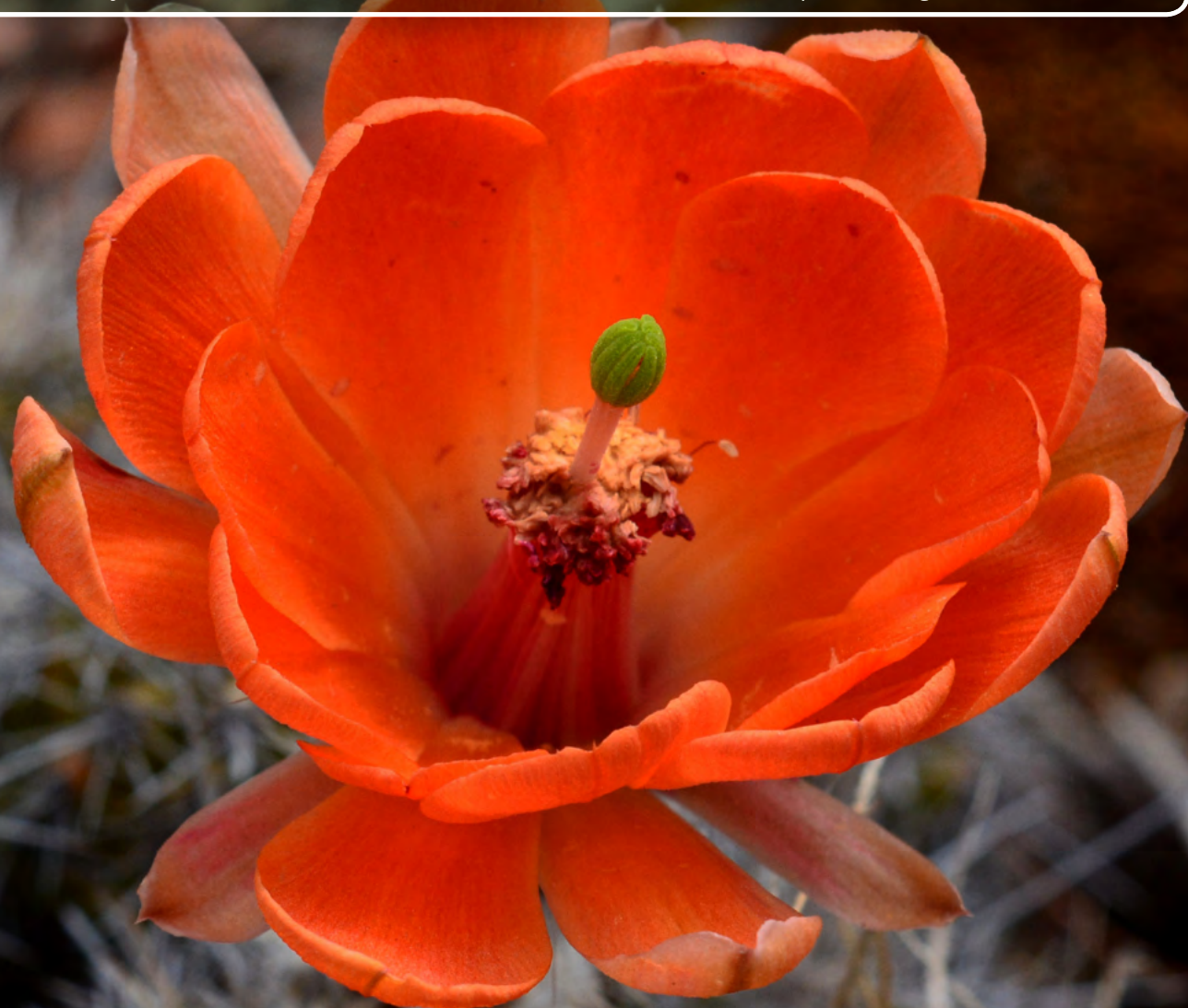
On this hill, there were approximately 10 plants growing on the rocks with very little soil, although it is possible the pin trees around them could provide some organic matter that helps nutrition.





Echinocereus salm-dyckianus, a big clump growing on the rocks, and as can be seen, the moss is dry because of the lack of rains in this time of the year, spring that is when these cacti bloom. These cacti are abundant in the area and as stated previously is a place I use frequently to look for snakes, so these trips work in both themes for me, since I can look at the cacti and snake populations. Cactus will usually grow on groups of rocks or rocky formations along with moss and sometimes under the forest canopy.

Another detail of the flowers, these vivid colors make them contrast with the surrounding colors, flowers are very attractive and some insects as bees that can be seen pollinating them.





The big price! After searching in the mountain I finally got to take a picture of both the things I was looking for: A blooming *Echinocereus* and a Twin spotted rattlesnake (*Crotalus pricei pricei*), both live in the same forests and it's always a treat to find them one next to the other. Rattlesnakes can be difficult to find during this time of the year, because it's the dry season, and they prefer the rainy summer months, but with some effort they can be found too.



Echinocereus pectinatus and its habitat in the mountains of western Chihuahua, you can see the pine trees on the background, usually they are more common in grasslands or drier slopes closer to Chihuahua City, which was why, it was a surprise to me to find this population in the middle of the forest.

Flowers are astounding, with a beautiful yellow tone, as can be seen in this photo, flowers are wider than the plant itself, and it helps locate them while looking for them, if these plants would not have been in bloom probably I would've spotted them.



Crotalus willardi silus - Chihuahuan ridgenosed rattlesnake. A small rattlesnake that lives in woodlands and can be found living alongside *Crotalus pricei pricei* in the mountains of western Chihuahua in the Sierra Madre Occidental, feeds on lizards and mice and is considered dangerous for having a venomous bite. Should be left alone if encountered.



Crotalus willardi silus - Chihuahuan ridgenosed rattlesnake - also venomous, has a very painful bite and should be treated with respect.



Echinocereus pectinatus, a blooming plant with lighter yellow flowers.



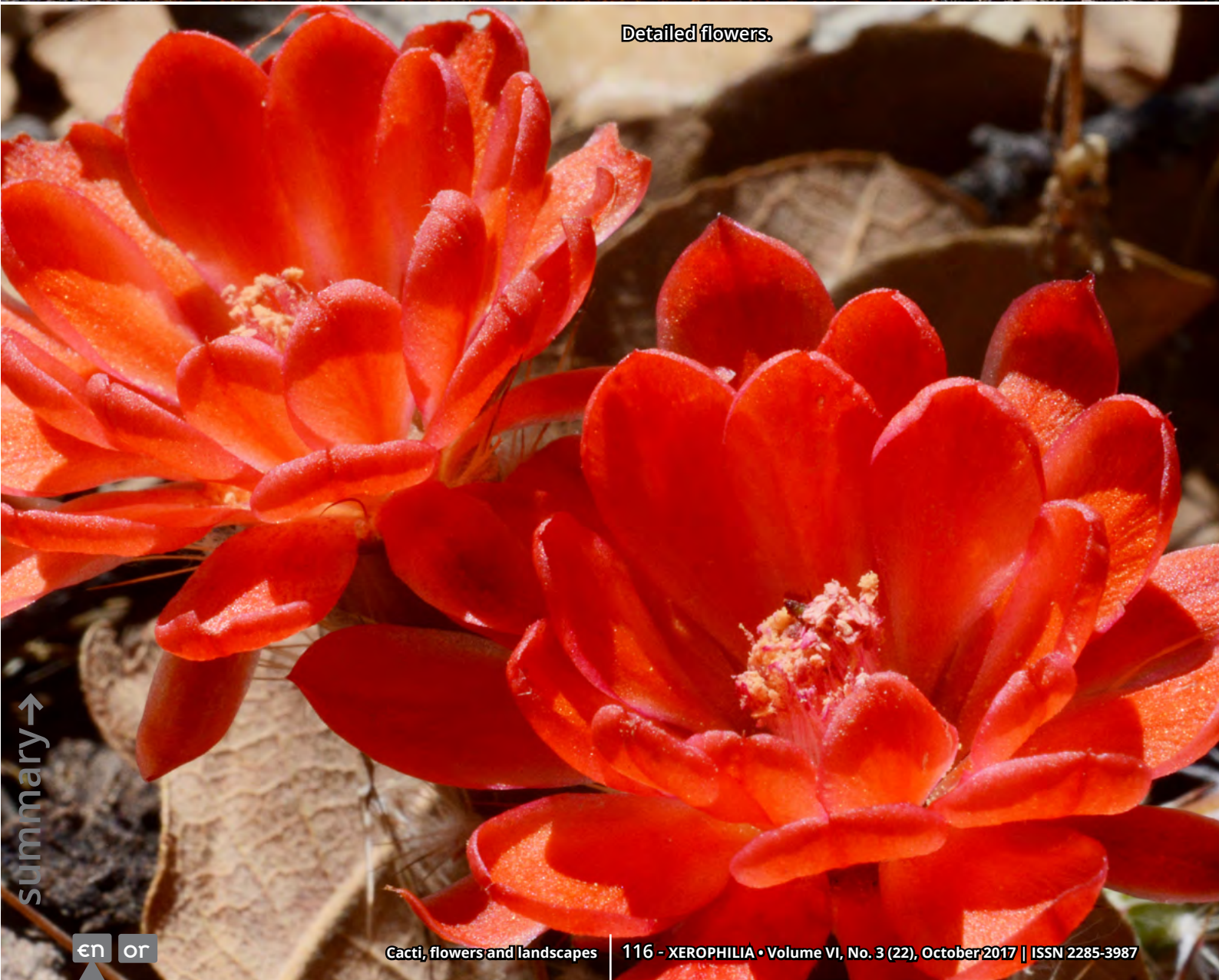
Phrynosoma hernandesi, the biggest short-horned lizard - an ant eater.


Phrynosoma hernandesi - These amazing lizards also live in these forest, their bizarre spiny look helps them avoid potential predators.



Another *Echinocereus salm-dyckianus* growing on the forest floor with pine trees around them.

Detailed flowers.





Multiple flowers can be seen in this species at the time of blooming. Notice how dehydrated the stem on the plant looks, as stated before this is due to the lack of rains in this time of the year.

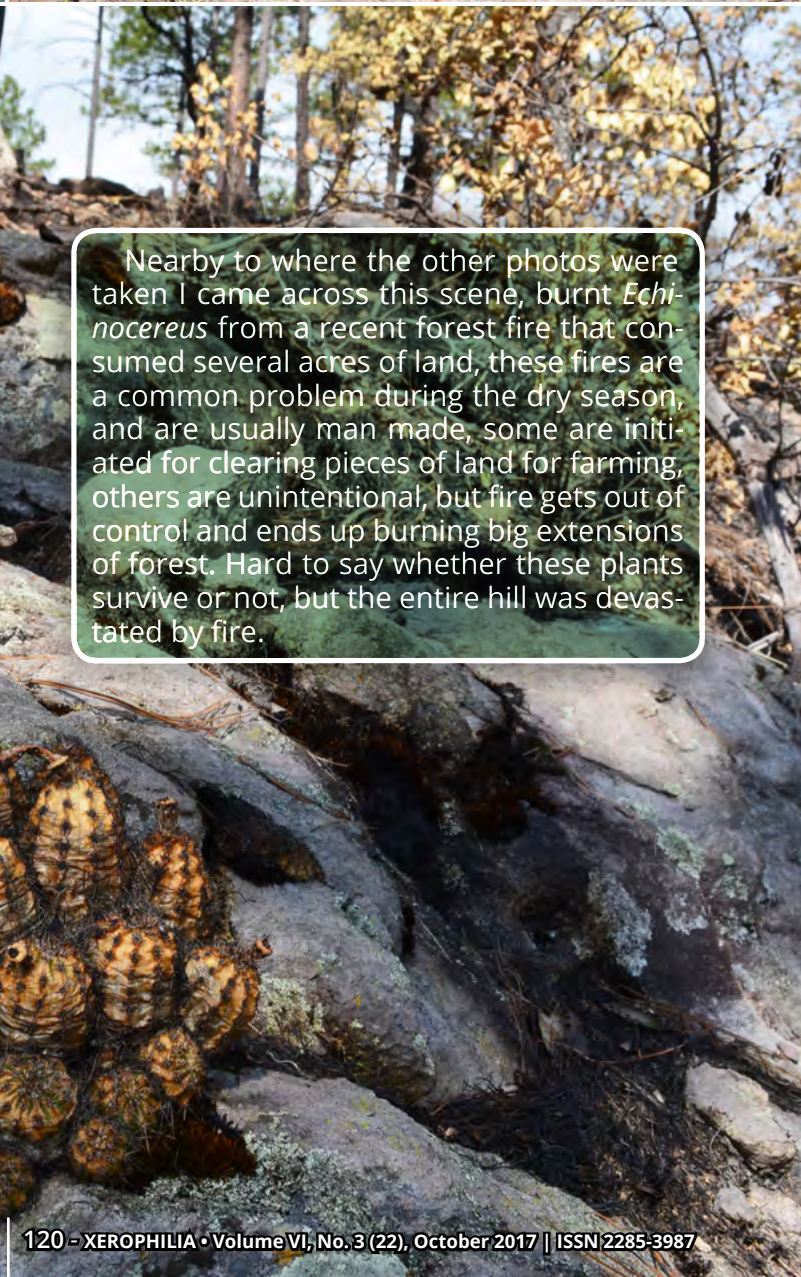


There is variation on the color of the flowers, within this range they all seemed to have different tones of yellow, but few have orange tones. This plant and the one above are growing 15 meters away one from each other.



Another look at the plant and the almost orange flower of the *E. pectinatus* from the previous page.
Right: Close up of *Crotalus pricei pricei* - scales and colors.
Below: Remember! the twin spotted rattlesnake is venomous, always a pleasure to see them, but left alone undisturbed.





Nearby to where the other photos were taken I came across this scene, burnt *Echinocereus* from a recent forest fire that consumed several acres of land, these fires are a common problem during the dry season, and are usually man made, some are initiated for clearing pieces of land for farming, others are unintentional, but fire gets out of control and ends up burning big extensions of forest. Hard to say whether these plants survive or not, but the entire hill was devastated by fire.

Another look at the forest floor and the trees that are all burnt and some are already dead because of fire. Plants are for obvious reasons the more affected by this phenomena, takes years for the forest to recover, but it is also an opportunity for new plants to colonize the area.

Lampropeltis knoblochi - Mountain kingsnake. With very attractive colors, this snake tries to mimic its venomous relative: the coral snakes, so it is very common that people confuse these snakes for venomous ones, when in fact, they are completely harmless. Always it's best anyway, if one is not sure about the identification of any snake to not try to handle or bother them.





Back to life: here a beautiful *Echinocereus* growing on the rocky outcrops at the crest of the hill, with all the forest behind it as its realm. Photo below shows the amount of organic material gathered around the plants, mostly pine needles, and occasionally some small tree branches.





summary →

The king of the hill! *Echinocereus salm-dyckianus* dominates the top of the canyon.

summary →



Opuntia sp. with its magnificent flower, that will soon become a fruit.

In memoriam for a friend

by Grzegorz Matuszewski



CACTÁCEAS

en categoría de riesgo
del Estado de San Luis Potosí

Alberto Arredondo G.
J. Manuel Sotomayor

**Juan Manuel
Sotomayor
is gone!**



On the 3rd of September 2017, aged 78 years, the well-known expert of the flora and cacti of the Mexican state San Luis Potosí – the medical Doctor Jose Manuel Sotomayor Martin del Campo, has passed away.

Manuel was born on the 20th of December 1938. In 1958 he finished his studies at the Colegio Cervantes (Cervantes High School), and in 1965 graduated the Universidad de Guadalajara in the state of Aguascalientes.

Grupo San Luis

The genus

TURBINICARPUS

in San Luis Potosí

Becoming a passionate and active cactophile since 1980, Dr. Manuel Sotomayor has carried out in situ cactus research beginning with 1998. Starting with 2000 he published many articles in several international journals (all about the cacti of San Luis Potosí), co-authoring also a wonderful CD, and a pocket book. Together with other enthusi-

asts, in 1980 he founded NAKARI - Sociedad Jalisciense para el estudio de las Cactaceas y otras suculentas (The Jalisco Society for the study of Cactaceae and other succulents), being the society's first Secretary and, later on, the second President. In October 1995 was established the Sociedad Potosina de Cactologia - The Potosina Society of Cactology (now Sociedad Potosina de Cactaceas y Suculentas A.C. - The Potosina Society of Cacti and Succulents A.C.) with Dr. Manuel Sotomayor becoming its first President and soon organizing the San Luis working group. His organizing qualities were soon worldwide recognized and he also became member of important international organizations - IOS (The International Organization for Succulent Plant Study) and IUCN (International Union for Conservation of Nature).

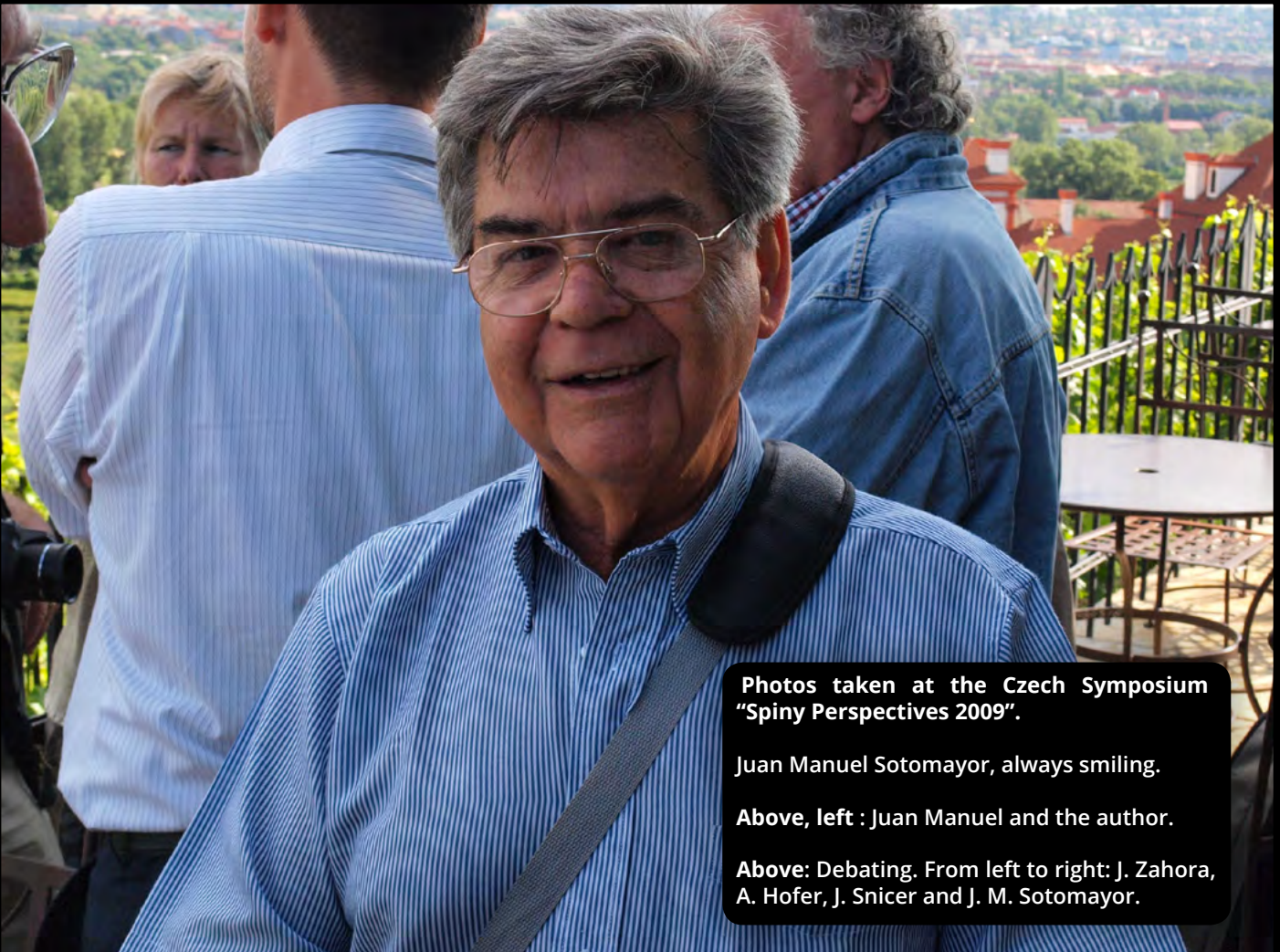
However, the most important accomplishment of Dr. Manuel Sotomayor is the publication by the San Luis working group of the book "The genus *Turbinicarpus* in San Luis Potosí", edited by Cactus & Co. libri in 2004. This book is presenting the results of the in site study and ex site research carried out for the species of the genus *Turbinicarpus* growing in the State of San Luis Potosí.

Among other accomplishments is the rediscovery of new populations of another cactus found initially long time ago, forgotten and considered critically endangered: *Coryphantha vogtherriana*.



Wow! A *Mammillaria apozolensis*...





Photos taken at the Czech Symposium "Spiny Perspectives 2009".

Juan Manuel Sotomayor, always smiling.

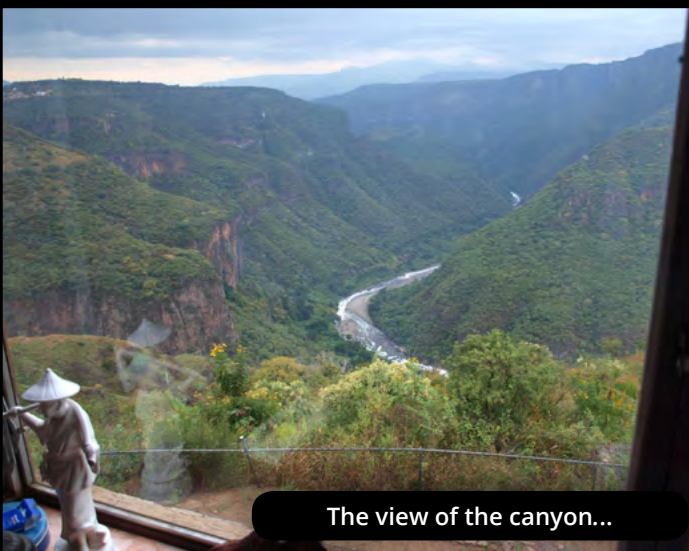
Above, left : Juan Manuel and the author.

Above: Debating. From left to right: J. Zahora, A. Hofer, J. Snicer and J. M. Sotomayor.

I got to know Manuel during the Czech Symposium Spiny Perspectives 2009 at the Prague Botanical Garden. It turned out he was a very nice and polite man. I organized an appointment with him spending several days on a common expedition in Mexico, as I wanted to see the earlier described *Mammillaria roemerii*. We also saw together in the field *Mammillaria bombycina* and *Mammillaria x perezbomba* n.n. He did not wish to travel north to Chihuahua, Coahuila and Nuevo Leon, because he was anxious of the drug gangs controlling some areas. On the farewell day he presented me the book "Cactaceas en category de riesgo del Estado de San Luis Potosi" (Threatened Cactaceae of the State of San Luis Potosi) by Alberto Arredondo G. and J. Manuel Sotomayor.



Looking for *Mammillaria roemerii*...



The view of the canyon...

Dr. Manuel Sotomayor lived in a splendid house on edge of Guadalajara. The house is built on the border of a canyon. Seen from the windows the view of the canyon is denying your breath.

You will remain in our memory, my friend!

Online magazines

The Cactus Explorer

The first free on-line Journal for Cactus and Succulent



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. 5 (2), November 2017.**

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. 10, No. 8, August 2017.**

The Cactus Explorer (English) - The first free online C&S journal. Latest issue: **No. 19, September 2017.**

Number 19
ISSN 2048-0482
September 2017

- 1 In the shadow of
- 2 Matucana aurant
- 3 Cylindropuntia xan
- 4 Opuntia orbiculata
- 5 Arthroceres hybrids



Huitzilopochtli



March 2009

Miscellaneous Mammillaria musings, brought to you by the left-handed postman

Yes, the left-handed humming-bird is on his rounds again..... ten years since his last delivery. Why now? Well, with more enthusiasts exploring in Mexico, more taxa being described (or at least named!), more discussion of documented introductions, a major reference collection of the genus being assembled, and communication by e-mail so cheap and easy, why not? No need to wait months for your comments to be published, no need to pay for printing, no need to collect subscriptions, and no need to beg for contributions to fill the next issue – the format is flexible!

The Lau mammillarias: a project to be revived?

Those with long memories will remember that back in 1983, in the *Journal of the Mammillaria Society* (hereinafter JMS), I launched a survey of Lau and Reppenhagen plants in cultivation. Subsequently (now 20 years ago, oh dear!), in the first issue of *Mammillaria Postscripts* (1989), I mentioned that Dr Lau had supplied me with detailed collection data for virtually all his *Mammillaria* collections, with a view to the production of a booklet. I had sent him a template to photocopy and fill in for each collection and in due course he complied with my request and sent me batches of forms, two to a sheet. (By that time I had also spent an uncomfortable week at St Veit, Austria, working and sleeping in a room at the end of Reppenhagen's potting shed, poring over a set of maps of Mexico on which he had marked his collection localities, and reading out the relevant latitude and longitude coordinates. But that visit and the Reppenhagen story!)

In the 1970s and 80s, thanks to our mutual interest in correspondence with Alfred Lau (much of which was in German). Ultimately in view was, as mentioned in *Postscripts*, the lack of adequate herbarium vouchers. The booklet did not get as far as the much of the data to the *Mammillaria Society* in English, edited by Oskar Appenzeller, in 1992. and propagated and some doubtless photographs

Quite early on in our correspondence, Alfred and I went to ser. Supertextae he had found in the mountains between Teotitlán del Camino and Tomellín, in northern Mexico. Several of the localities close to the road during a collection. I sent me a draft report and photographs which I eventually published in *Postscripts* (66. 1979), followed three months later by the first issue (106-107) and other Lau novelties.

When, a few years later, as the then President of the JMS of Lau and Reppenhagen plants, I received a total list of the JMS (25(1): 5–7. 1985). In summary, 153 of the

Huitzilopochtli

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an occasional Mammillaria newsletter with continuous pagination
© David Hunt, Milborne Port, GB

Huitzilopochtli

(who is a national Aztec deity of war, sun, human sacrifice and the patron of the city of Tenochtitlan)

is an occasional *Mammillaria* newsletter published by David Hunt since March 2009. This journal started to be published a few years after finalizing the immense amount of work put into *The New Cactus Lexicon*. There are only 11 editions published so far, in sequential page numbering, but further issues are planned.

Graham Charles has introduced a link on his [The Cactus Explorers](#) website allowing free access to digitized versions.

Last issue March 2017.



THE CHILEANS 2014

VOLUME 23 NUMBER 73



Pterocactus auracanus
JL 101

Photo:- J. Lambert



The Chileans

is a journal dedicated to South American cacti published by a group founded in 1965, founded by John Donald, David Whiteley and Harry Middleitch. The aim was to exchange information, share photographs and allow to exchange plants. The journal started to be published in 1966, in a time when more information was becoming available and access to remote habitats was much easier than in previous decades. Very popular, the journal was appearing several times a year and included exquisite information on new species just discovered by explor-

ers such as Ritter, Horst, or Buining. The group was in fact very active and weekly meetings were held, where talks were given by members, followed by discussions. The weekly meetings were held until 2003. With the mid-1970's The Chileans appeared once or twice a year, and with 1985 (excepting for two editions in 2006) only once a year. Graham Charles was involved in the production of the journals since 1994. He has introduced two links on his [The Cactus Explorers](#) website allowing free access to digitized versions of this bibliographical marvel!





**Dumnezeu
să te odihnească
în pace, Nick!**

Aflăm cu tristețe că, la scurt timp după ziua sa de naștere, Nicușor "Nick" Ajder, din Galați, Romania, a dispărut mult prea repede dintre noi, răpus de o boală necruțătoare.

Nick a descoperit lumea fascinantă a cactușilor și a altor plante suculente, devenind mai apoi, membru al fostului forum Cactuși.com, un loc în care, timp de mai mulți ani, s-au întâlnit majoritatea colecționarilor români. Ulterior, Nick s-a afiliat forumului specializat Stapelia.ro, atras fiind de Asclepiadaceae, pentru ca, la scurtă vreme, să se orienteze spre genul *Haworthia* – gen care a constituit, în anii care au urmat, principala sa preocupare.

A fost cunoscut ca un extraordinar om de familie, un iubitor al genului SF și un foarte apreciat artist local, specializat în pictura de icoane. Nu în ultimul rând, a fost unul din puținii colecționari români, de cactuși și suculente, care au cutezat în 2012, atunci când abia demara proiectul „Xerophilia”, să scrie pentru o revistă în care, la acea dată, nimeni nu credea cu adevărat.

Echipa redacției Xerophilia prezintă familiei sincere condoleanțe.

Dumnezeu să te odihnească în pace, Nick!

ABSTRACT - scurtă sumarizare a articolelor

***Aeonium cuneatum* Webb & Berthelot, suculenta care coboară din nori** pagina 5 Marco Cristini

În acest număr, Marco Cristini revine cu un articol foarte bine documentat, despre o specie succulentă mai puțin cunoscută în colecțiile noastre. Parcurgând textul foarte ilustrat, veți putea afla cam totul despre taxonomia, distribuția geografică, ecologia și particularitățile speciei.

Vizitând *Copiapoa* pe Costa Esmeralda, Antofagasta, Chile pagina 33 Heike & Robert Bader - traducerea din germană de Eduart Zimer

Cei doi autori, călători împătimiti prin zonele aride ale Americii de Sud, împărtășesc iubitorilor plantelor din genul *Copiapoa*, un pictorial cu plante magnifice. Veți vedea *Copiapoa longistaminea*, *C. grandiflora*, *C. columna-alba*, alți cactuși și plante ale deșertului.

***Encholirium*: rarele bromelii din Cadeia do Espinhaço** pagina 55 Marcelo Mattos Cavallari & al.

Articolul interesant și documentat al unui grup de cercetatori brazilieni, ne prezintă un gen de specii extrem de rare ale caror populații cunoscute numără doar câteva zeci de exemplare.

***Echinocactus platyacanthus* Link & Otto, biznaga de dulce** pagina 67 Juan Miguel Artigas Azas

Un alt foarte interesant articol despre unul dintre cei mai frumoși cactuși mari, documentat, cu fotografii pe măsură. Sunt splendori în natură, dar imposibil de avut, la fel, în colecțiile noastre.

Note despre *M. egregia* și *M. zephyranthoides* pagina 81 Elton Roberts

Motivat de o pasiune mereu vie pentru cactuși, după o viață plină de experiențe, trăită alături de ei, Elton Roberts, continuă să-și împartă cunoștințele și experiența, acumulate în peste 50 de ani de cultură profesionistă. De astă dată, notele sale ne vorbesc despre două specii, pe care nu toată lumea le are în colecții: *Mammillaria egregia* și *M. zephyranthoides*.

Cactuși, flori, peisaje și... șerpi pagina 105 Ricardo Ramirez Chaparro

Iubitor al Xerophiliei, de câte ori scapă în natură, Ricardo Ramirez Chaparro caută ocazia de a face un pictorial pentru revista noastră.

In memoriam pentru un prieten: Juan Manuel Sotomayor s-a dus! pagina 125 Grzegorz Matuszewski

Colecționarul și exploratorul polonez Grzegorz Matuszewski ne împărtășește sentimentele sale despre dispariția neașteptată a lui Juan Manuel Sotomayor, autorul mai multor cărți și studii despre cactuși.



Huitzilopochtli »»» un link spre site-ul The Cactus Explorer pagina 130

The Chilean »»» un link spre site-ul The Cactus Explorer pagina 131

Cele două linkuri de mai sus vă vor îndrepta spre o pagină a site-ului susmenționat permițându-vă să accesați o serie de 11 broșuri editate de David Hunt despre genul *Mammillaria* (primul) și o serie de 73 de linkuri către o publicație consacrată cactușilor din Chile (al doilea).



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