

# Xerophilia

the passion for cacti and other succulents

ISSN 2285 - 3987



17

June  
2016

# Xerophilia

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Front cover

*Echinocactus horizontalomium*.

Photo by **Ricardo Ramirez Chaparro**.



Back cover

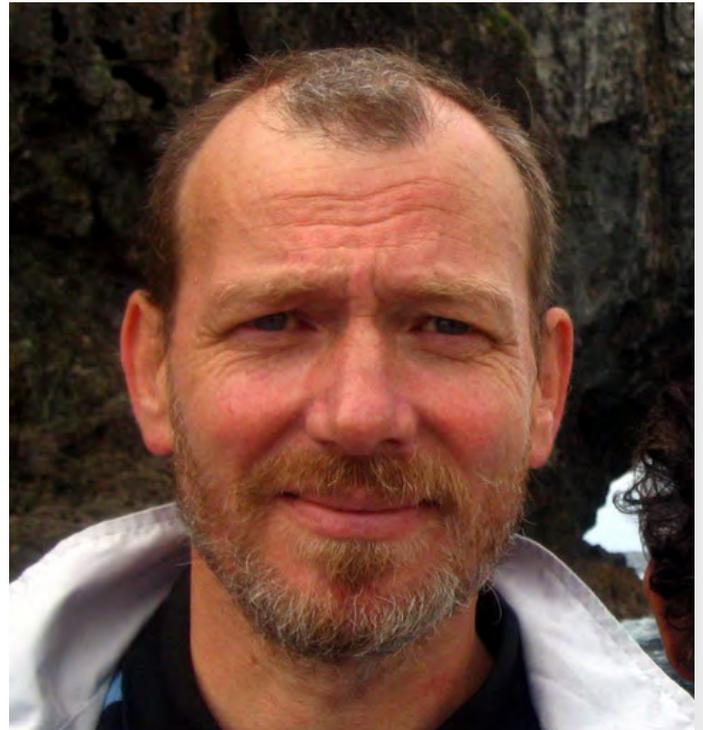
*Echinocereus palmeri*.

Photo by **Aaron González Márquez**.

# Xerophilia

the passion for cacti and other succulents

## editorial 17



I had quite an interesting reading last night: Rare cacti and their cultivation by Curt Backeberg, published in *The Cactus Journal* (Vol. 6, No. 3, March, 1938). Old writings are sometime very interesting. They come from a different level of knowledge, or from a different perspective, we read debates on commonplaces (so we see them today), or on names and places with little relevance now. However, this article reveals very little on actual cultivation but is surprising through the speculations around a less orthodox idea: the cactus cult! ... with some awkward considerations on the concept of rarity

*"I believe the cactus cult to be really a rarity cult, which only attains its full development when the demand is greater than the supply, when a plant acquired as a rarity remains a rarity and is not, in a short time, available in quantity, so that specimens formerly valuable as rarities become valueless. With the onset of mass production comes devaluation of whole collections and then the interest of the true collector wanes. A real collector does not want "everybody's plants", but specimens which represent a certain value on account of rarity"*

I don't wish to comment on this fragment (Backeberg deserves much much more than my corner critique) but it comes as a surprise the lack of reference to the rarity of some plants in their natural habitat and possible reasons why this occurs. Fortunately the in

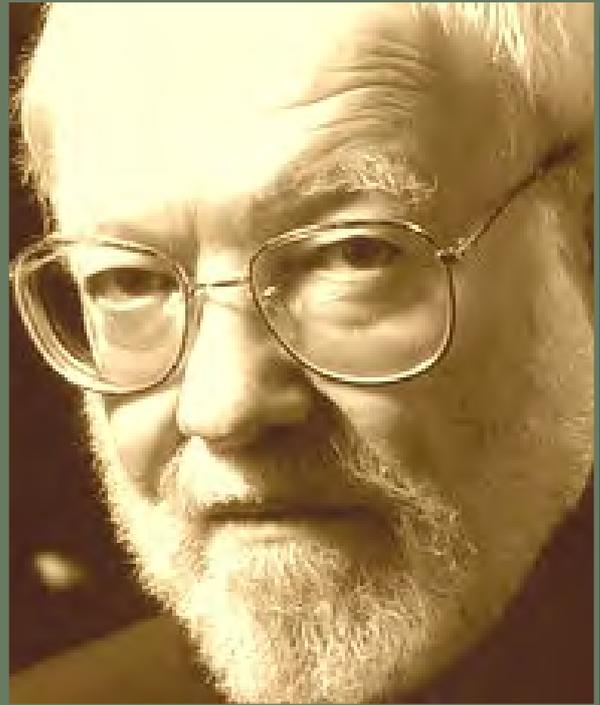
terest has shifted eighty years later, at least in some bends and turns of our cactus collector's world. We are, as a whole, more concerned on the state of nature, on the well-being of natural habitats. I am convinced this is a slow but constant positive change. Or at least I hope so.

Once again, we have to thank all of you, especially to you dear readers worldwide, from more than 100 countries and territories, who constantly show your interest and loyalty, and always give good reasons for Xerophilia's contributors to write, and our team a purpose for existing and working for you.

Eduart

summary →

**Daniel Quinn** (born October 11, 1935) is an American writer (primarily, novelist and fabulist), cultural critic, and former publisher of educational texts, best known for his novel *Ishmael*, which won the Turner Tomorrow Fellowship Award in 1991 and was published the following year.



Xerophilia 17's  
Favorite Quote

The world  
was not made  
for any  
one species.

Daniel Quinn



# Growing cacti under artificial light



Karl Ravnnaas



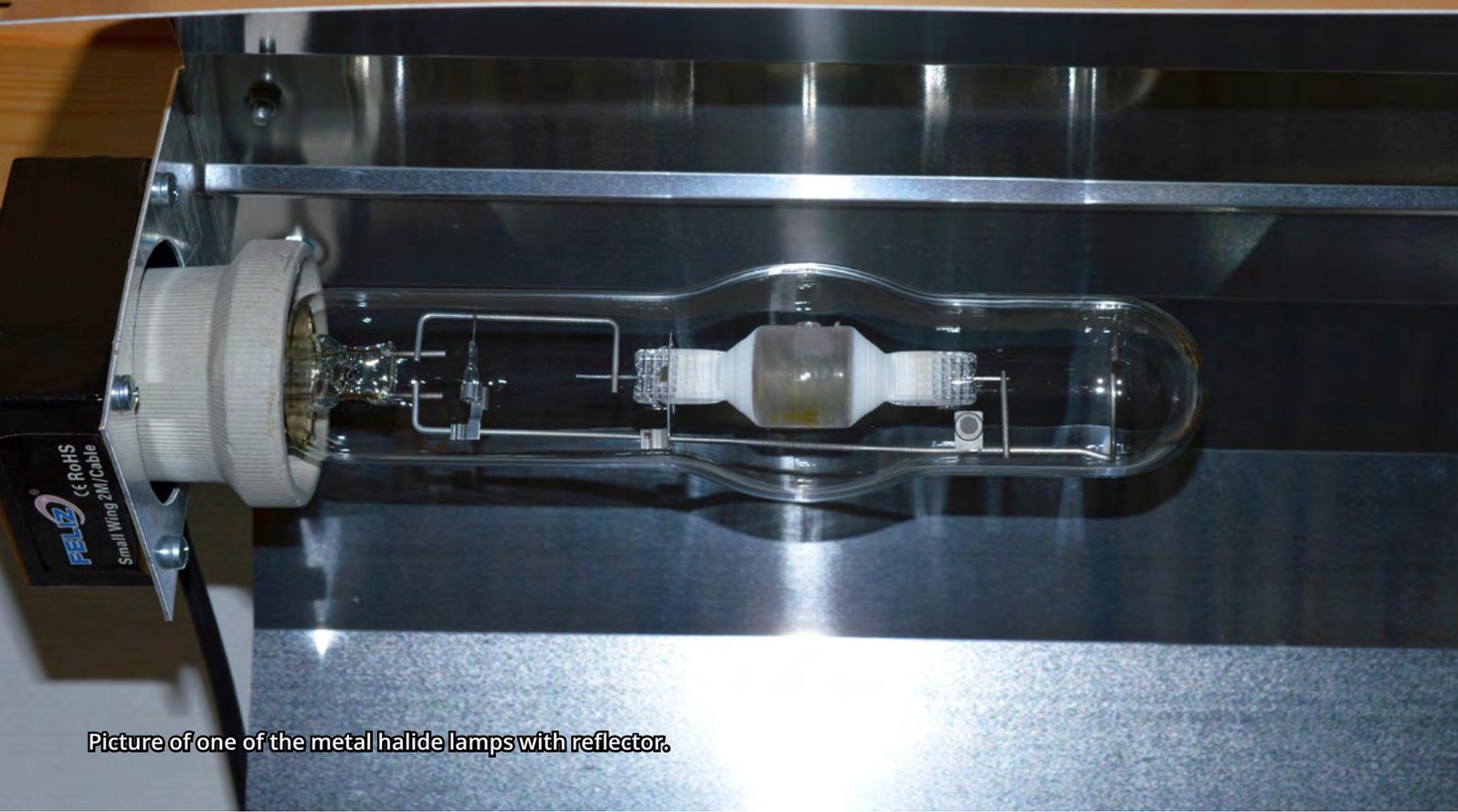
**I**n this article I want to talk a little about my experiences with growing cacti under artificial light. I first started collecting cacti some 25 years ago and it didn't take many years before two greenhouses were filled up with plants. However, leaving my hometown for university and then for work, it was difficult to spend as much time with my plants and the greenhouses as I'd like. I couldn't bring the greenhouses with me and had to content myself with a handful of plants in a windowsill for several years (while my father thankfully cared for the main collection in my absence). It was like an itch I could not scratch, but then a couple of years ago I and my wife bought an apartment with a spare bedroom, and I immediately noticed its potential as a cactus nursery and promptly proceeded to annex it before my wife could think of turning it into a walk-in closet.

summary →

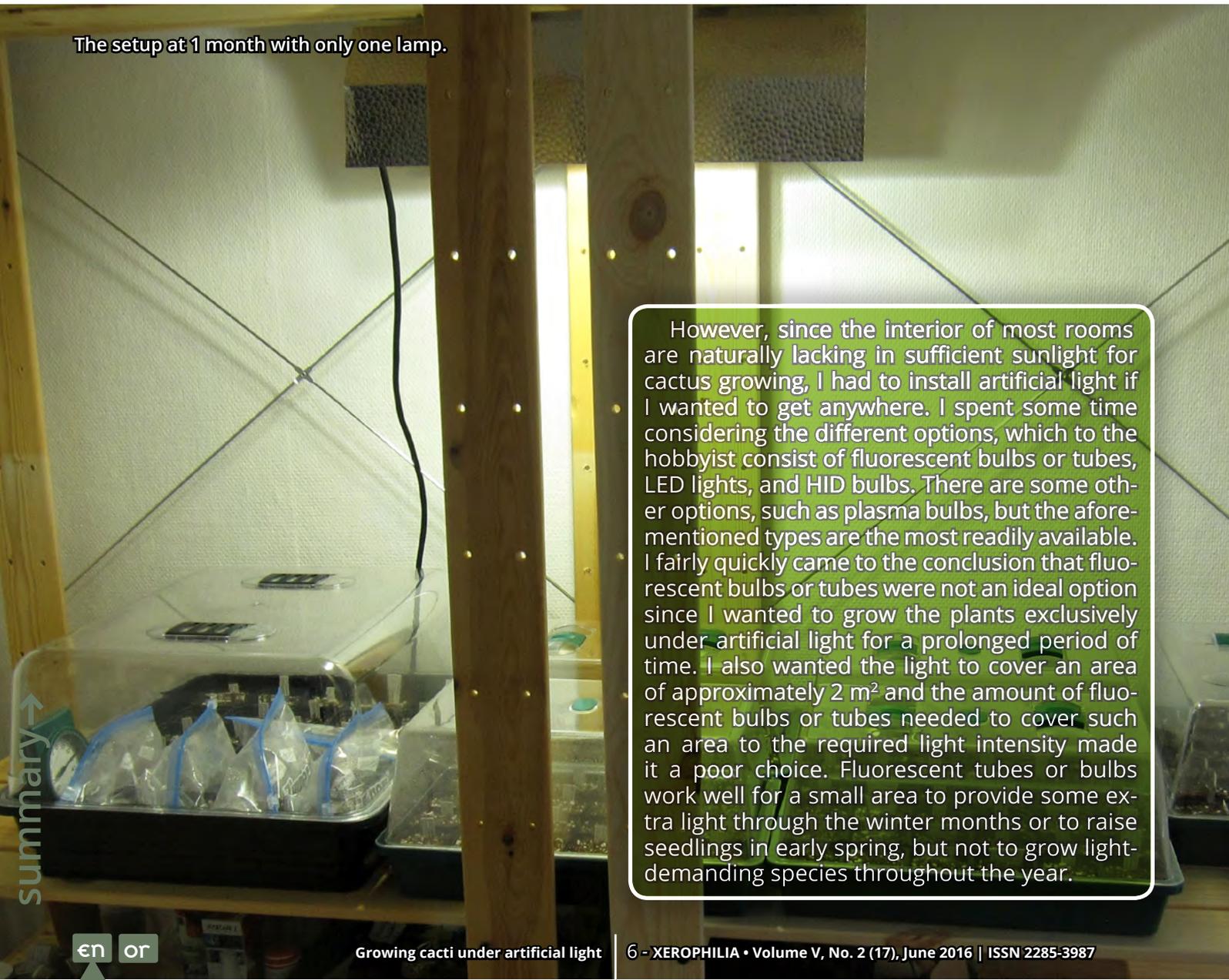


*Astrophytum asterias* 'Super Kabuto' at 2 years 8 month, in 5 cm pots.





Picture of one of the metal halide lamps with reflector.



The setup at 1 month with only one lamp.

However, since the interior of most rooms are naturally lacking in sufficient sunlight for cactus growing, I had to install artificial light if I wanted to get anywhere. I spent some time considering the different options, which to the hobbyist consist of fluorescent bulbs or tubes, LED lights, and HID bulbs. There are some other options, such as plasma bulbs, but the aforementioned types are the most readily available. I fairly quickly came to the conclusion that fluorescent bulbs or tubes were not an ideal option since I wanted to grow the plants exclusively under artificial light for a prolonged period of time. I also wanted the light to cover an area of approximately 2 m<sup>2</sup> and the amount of fluorescent bulbs or tubes needed to cover such an area to the required light intensity made it a poor choice. Fluorescent tubes or bulbs work well for a small area to provide some extra light through the winter months or to raise seedlings in early spring, but not to grow light-demanding species throughout the year.

summary →



*Adenium, Plumeria and Welwitschia* seedlings at 1 month old.



Mostly *Astrophytum* seedlings at 5 months old.



Setup at 2.5 years.



Various *Ariocarpus* at 2.5 years in 7 cm pots.



Setup at 6 months, now with two lamps.

The other option, LED (Light Emitting Diode), was more suitable. It is perfectly possible to grow plants year round under LEDs and achieve great results. It is an option used by a lot of people growing various kinds of plants (not just cacti) under artificial light. LEDs offer many advantages over other kinds of artificial light, although there are some serious drawbacks too. I have not paid attention to LED prices over the past couple of years but, at least two years ago, the price of covering 2m<sup>2</sup> with a sufficient amount of quality light was a serious drawback. I believe that LEDs would still be the most expensive option today. LEDs are quite power efficient and emit a lot less heat than other types of artificial light. In practical terms, this means that plants can be placed closer to the lights if desired as well as heat being less of an issue.

summary →

30.07.13 Lophophora  
F13-92 koehresii  
Huizache, SLP



*Lophophora koehresii* at 14 months, (for reference, the label is 8 cm long).

30.07.13 Lophophora  
koehresii



*Adenium multiflorum* in desperate need of a deeper pot, picture taken in natural daylight.

30.07.13 Astrophytum  
13-11.1 caput-medusae

*Astrophytum caput-medusae* at 14 months old (for reference, the label is 8 cm long).



Since most LEDs emit light in only one part of the spectrum (e.g. blue or red) it is possible to tailor the light produced to meet certain needs. More blue LEDs will increase the level of light in the blue spectrum and so on. It is also possible to install LEDs that emit UV-light, which would likely be beneficial for spine formation in many cacti. Most plants react to changes in the light spectrum, with the red part of the spectrum known to be associated with the flowering phase as well as helping germination in many plant species (though I am not aware of any such studies on cactus seeds). The blue part of the spectrum is associated with the growing phase of plants. Naturally, it can therefore be of great value to many plant growers to be able to alter the amount of light emitted in different parts of the light spectrum to suit specific needs.

summary →



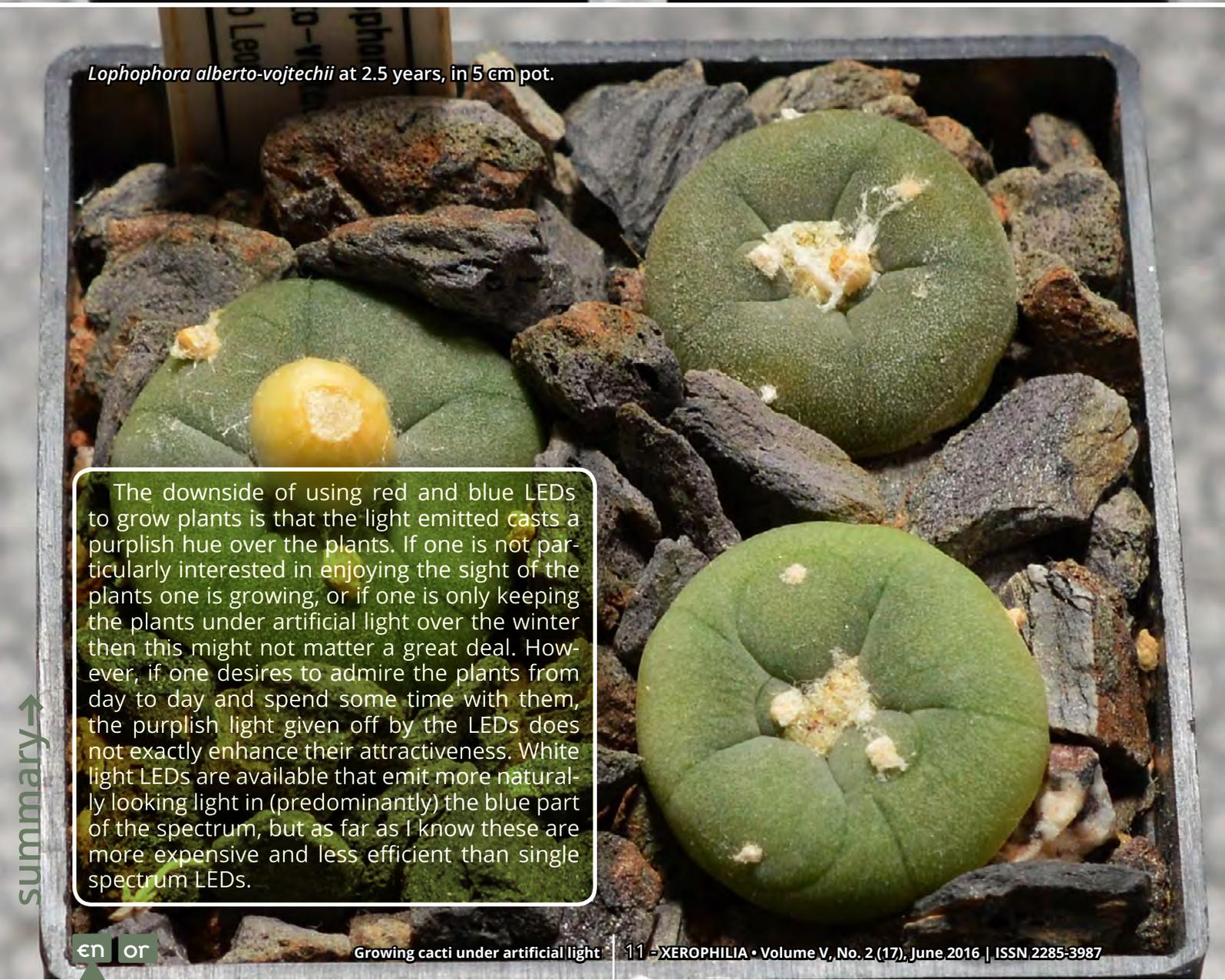
*Adenium multiflorum* at 1 year old.

summary →

en or



*Discocactus horstii* at 2.5 years, in 5 cm pots.



*Lophophora alberto-vojtechii* at 2.5 years, in 5 cm pot.

The downside of using red and blue LEDs to grow plants is that the light emitted casts a purplish hue over the plants. If one is not particularly interested in enjoying the sight of the plants one is growing, or if one is only keeping the plants under artificial light over the winter then this might not matter a great deal. However, if one desires to admire the plants from day to day and spend some time with them, the purplish light given off by the LEDs does not exactly enhance their attractiveness. White light LEDs are available that emit more naturally looking light in (predominantly) the blue part of the spectrum, but as far as I know these are more expensive and less efficient than single spectrum LEDs.

← xeromunus



Since I wanted to be able to enjoy my plants in as natural light as possible, I therefore turned to HID (High Intensity Discharge) bulbs, which come in 400-1000W ranges. The most common types of HID light are HPS bulbs (High-Pressure Sodium) and MH-bulbs (Metal Halide). In both kinds, an arc of electric current passes between two electrodes, which ignite a gas (sodium in HPS and a mixture of mercury and metal halides in MH) that emits light. While both kinds of bulbs emit light across the whole spectrum, HPS bulbs emit relatively more light in the red part of the spectrum, while MH bulbs emit relatively more light in the blue part of the spectrum. Growers of some kinds of plants often change between these two kinds for the different growth phases. In growing cacti, MH bulbs are preferable as there is no particular flowering phase to observe, and since light predominantly emitted in the blue part of the spectrum will lead to better and stronger growth.

*Lophophora koehresii* at 2.5 years in 5 cm pot (it first started flowering at 1.5 years old).

summary→



*Mammillaria humboldtii* at 2.5 years, in 5 cm pot.

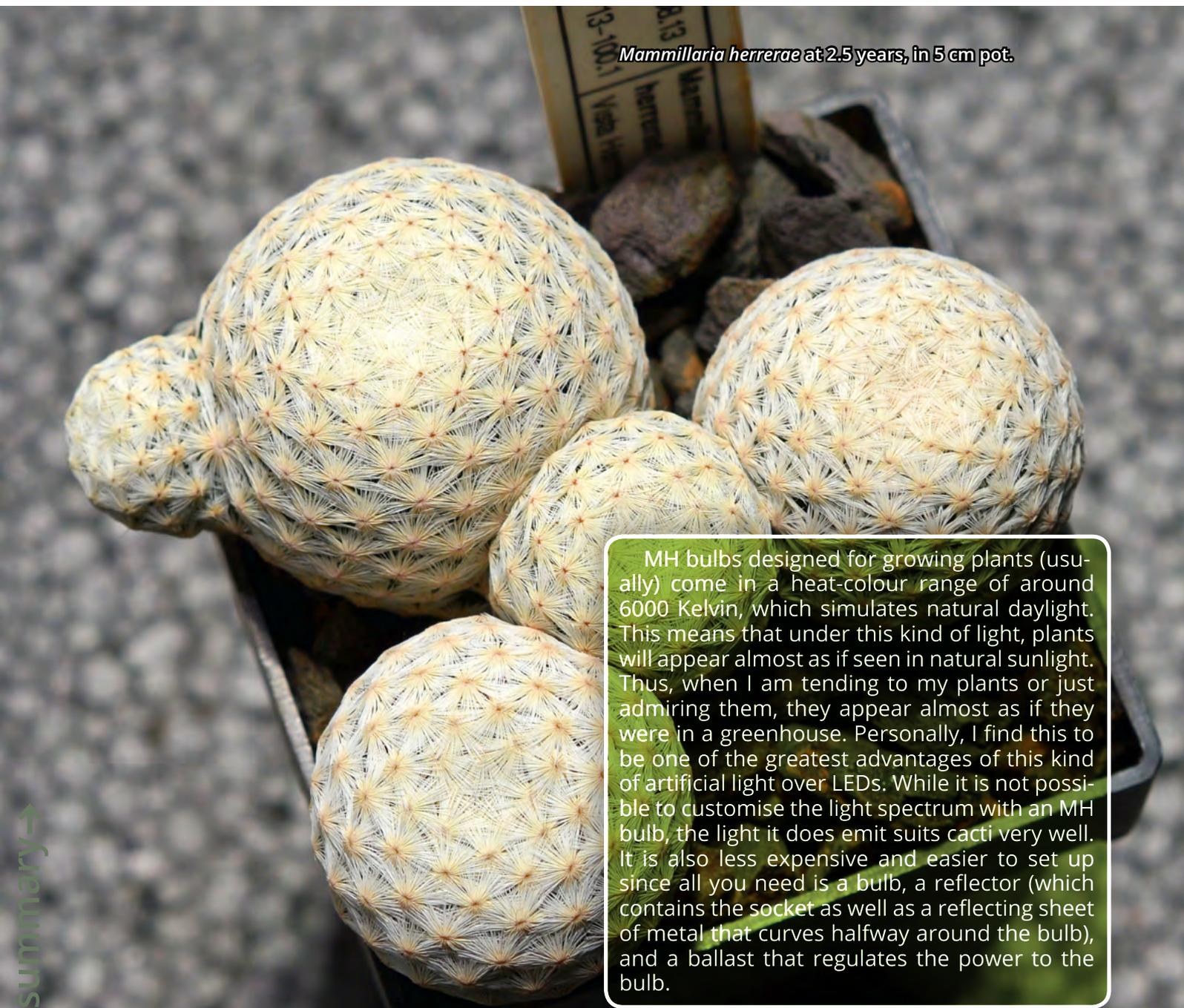


*Mammillaria humboldtii* at 2.5 years, in 5 cm pot.

summary →



*Mammillaria roemerii* at 1.5 years, in 5 cm pot (it first started flowering at 10 months old).



*Mammillaria herrerae* at 2.5 years, in 5 cm pot.

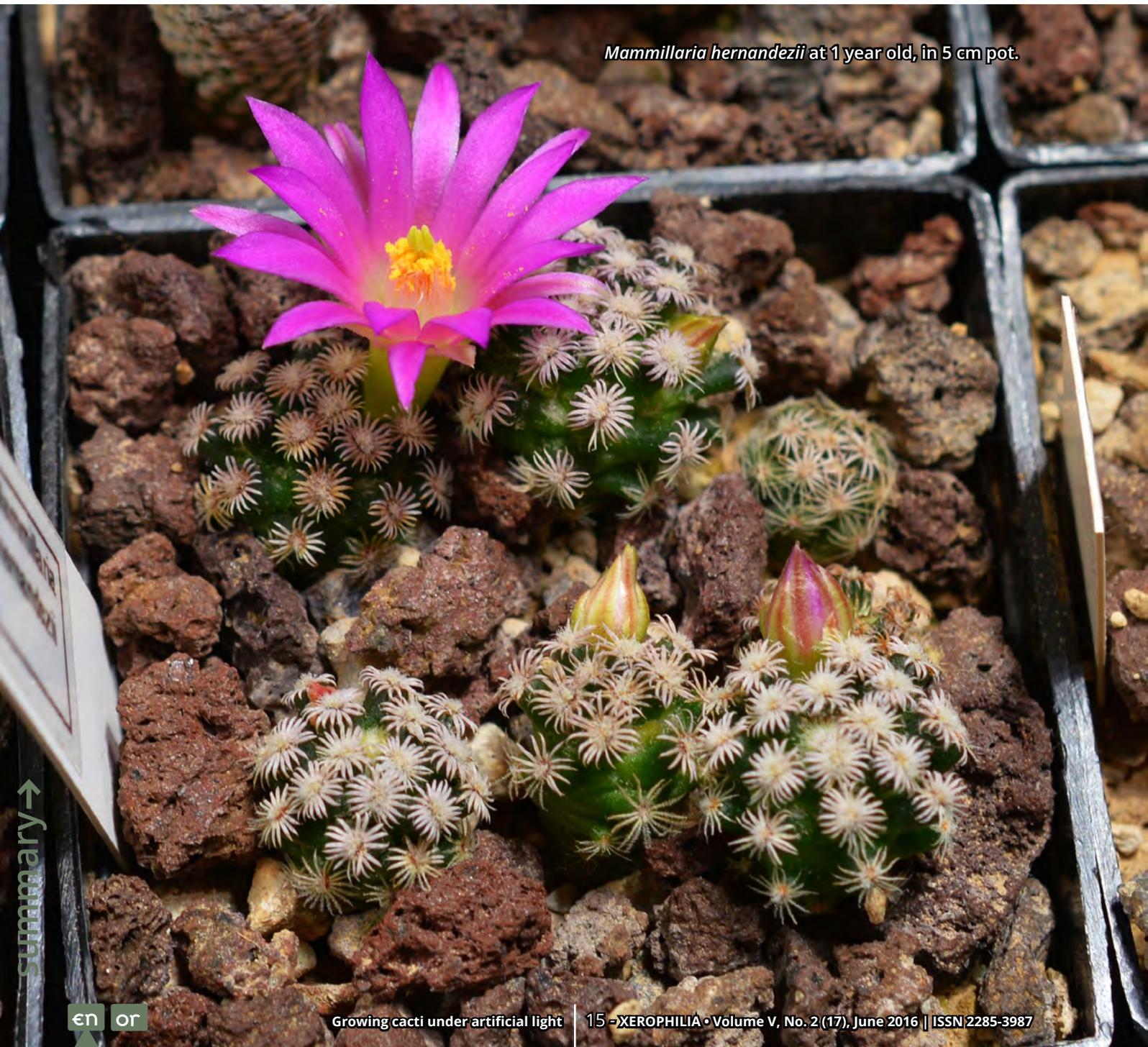
MH bulbs designed for growing plants (usually) come in a heat-colour range of around 6000 Kelvin, which simulates natural daylight. This means that under this kind of light, plants will appear almost as if seen in natural sunlight. Thus, when I am tending to my plants or just admiring them, they appear almost as if they were in a greenhouse. Personally, I find this to be one of the greatest advantages of this kind of artificial light over LEDs. While it is not possible to customise the light spectrum with an MH bulb, the light it does emit suits cacti very well. It is also less expensive and easier to set up since all you need is a bulb, a reflector (which contains the socket as well as a reflecting sheet of metal that curves halfway around the bulb), and a ballast that regulates the power to the bulb.



*Mammillaria luethyi* at 2.5 years, ca. 2 cm in diameter.



*Mammillaria luethyi* at 2.5 years, ca. 2 cm in diameter.



*Mammillaria hernandezii* at 1 year old, in 5 cm pot.

summary →

*Mammillaria pectinifera* at 1.5 years, in 5 cm pot.

With all these things going for it, why does not everyone prefer HID bulbs? The single most important reason for that is probably heat. HID bulbs produce a lot of heat, which can be a real problem in many situations. Whereas LEDs radiate fairly little energy as heat, HID bulbs do the opposite. In small spaces, such as growth tents, it is absolutely necessary to install a fan, and even in a spare bedroom temperatures very quickly increase if there is no ventilation. I have two 400W bulbs installed in an approximately 8 m<sup>2</sup> room, and the temperature will quickly go well above 30°C with a closed door and window. It is therefore necessary to keep the door open at all times, and ideally the window too (although I usually keep this closed in winter).



summary →

However, when it comes to cacti, this amount of heat need not be a problem and in some ways, it is a benefit so long as there is some form of ventilation in the room. Heat-loving species are very happy with the high temperatures and the heat helps most of the cacti I grow stay compact in shape. The soil dries out much more quickly so it is perfectly possible to water twice a week (if desired) or even more often for certain succulents, and the heat also means that it's perfectly possible to grow the plants year round. On the other hand, the heat makes it more difficult to give the plants a prolonged rest, as many will start showing clear signs of drying after only two weeks without water (some species after only a week). I keep the lights on for about 14 hours per day. This seems like a good amount to keep them growing well but also affords them a sizeable night rest to breath, as the temperature will rapidly sink to the ambient level of the rest of the apartment.

*Mammillaria solisioides* at 1.5 years old, in 5 cm pot.



*Pseudolithos cubiformis* at 2,5 years, in 5 cm pot.



*Pseudolithos mccoysi* at 2.5 years old, in 5 cm pot (first started flowering at 7 months old).

*Pseudolithos* and *Euphorbia obesa* at 1 year old, in 5 cm pots.

summary →



*Pseudolithos miguirtinus* at 2 years old, in 5 cm pot (picture taken in natural daylight, where the odour of the flowers attracted no small amount of attention).

*Pseudolithos miguirtinus* at 2 years old, in 5 cm pot.



My two 400W bulbs each cover an area of about 0.82 m<sup>2</sup> with some overlap between them, and are positioned ca. 60 cm above the plants. They both produce 35 000 lumen (a little less now that they're both nearing the end of their lives). Lumen is a measure of the quantity of visible light emitted by a light source, but when it comes to plants this unit of measurement is less interesting. Plants do not utilise the whole light spectrum, primarily using light in the wavelength of 400-700 nm which is called PAR (Photosynthetic Active Radiation). Thus, a much more useful unit of measurement for plants is PPF (Photosynthetic Photon Flux Density), measured in micromoles (μmol m<sup>-2</sup>s<sup>-1</sup>), which describes the amount of photons within the 400-700 nm light spectrum that hits a surface area of one square meter per second (it's actually calculated first in moles, but then multiplied by 1 million to reach micromoles which is easier to work with).

summary→



*Sulcorebutia albissima* (at least, supposedly so) at 2.5 years, in 5 cm pot.



*Sulcorebutia heinzii* at 2.5 years, in 5 cm pot.



*Sulcorebutia senilis* at 2 years, in 5 cm pot (flower reacting to the heat from the lamps).

*Turbincarpus schmedickeanus* ssp. *flaviflorus* at 10 months old, in 5 cm pots. This is one of the very few species that has shown some etiolation under the lamps, though it hasn't been positioned in the best of spots. It has grown so quickly that flowers forming on the uppermost tubercle haven't managed to open before new tubercles have formed above.



Converting lumens to  $\mu\text{mol m}^{-2}\text{s}^{-1}$  isn't quite as easy as converting meters to feet, but there are several online resources (including calculators) that are useful. I don't have the proper tools to measure this in an exact way, but for the purposes of growing cacti, this isn't necessary either. After some calculations I found that each of my bulbs produces ca.  $640 \mu\text{mol m}^{-2}\text{s}^{-1}$ . For comparison, during the middle of the day in high summer in mid-latitudes (without shade), the sun produces ca.  $2000 \mu\text{mol m}^{-2}\text{s}^{-1}$ .  $640 \mu\text{mol m}^{-2}\text{s}^{-1}$  might therefore seem a bit low, but that's the number produced throughout the 14 hours the lights are on for each day. It's also possible to figure out how much light this amounts to over a whole day. Without going into the calculations here, the light my two lamps produce amounts to ca.  $32 \text{ mol m}^{-2}\text{s}^{-1}$  (moles per square meter per day). As above, high summer middle of the day levels of light without shade equates to ca.  $50\text{-}60 \text{ mol m}^{-2}\text{s}^{-1}$ , so I don't think  $32 \text{ mol m}^{-2}\text{s}^{-1}$  is a bad value at all. Of course, these numbers are no more than estimates and are likely a bit lower considering that a fair amount of the light produced by the lamps does not reach the plants.

summary →

*Turbinicarpus pseudomacrolele* ssp. *minimus* at 1.5 years, in 5 cm pot.



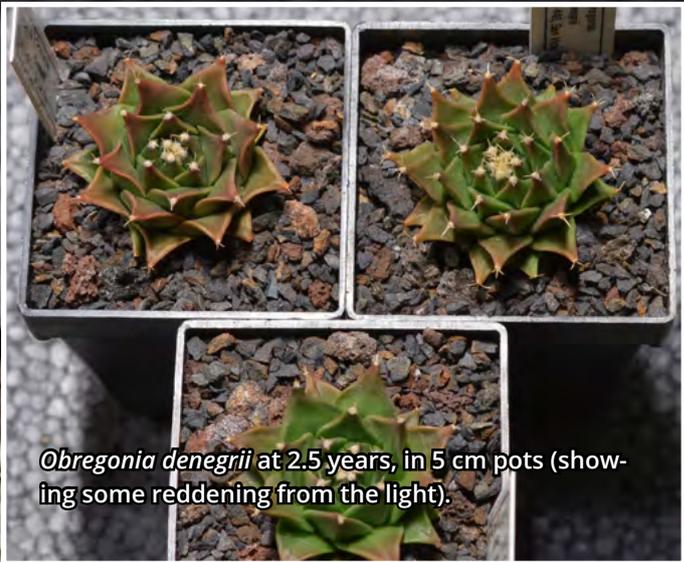
The thing that has probably surprised me the most with using artificial light is how quickly the plants grow. Perhaps it shouldn't come as a surprise when one considers that the plants are allowed to grow year-round, but when one is used to growing plants in a Nordic climate with basically just four good months of growing per year (May-August), it is remarkable to see what amounts to maybe two or three years' growth in 12 months. The artificial light coupled with the heat also means that this accelerated growth doesn't result in bloated or particularly elongated plants. Most of the plants stay nice and compact with only a very few tending towards elongation or some bloating.

Seeds germinate well under these conditions too, although I have now started using baking paper to shade the seedlings as they germinate. Without any shading, it can quickly get too hot in a propagator. Decent quality seeds have a germination percentage of 50-100% in these conditions. Since the lights are on year-round, it's of course possible to sow whenever one feels like it, which is practical. Not having to put the seedling through a rest period in their first year is also a plus.

summary→



02/06/13  
F13-178  
SON der Wälder  
Turbinicarpus  
longispinus  
n.n.



*Obregonia denegrii* at 2.5 years, in 5 cm pots (showing some reddening from the light).

A collection of *Turbinicarpus* at 1.5-2 years old, in full flower (in 5 cm pots).

The amount of flowering varies quite a lot from genera to genera, but also within genera. Some species of *Turbinicarpus* are extremely floriferous in these conditions, while other species have failed to flower at all.

*Turbinicarpus* and *Mammillaria* are generally the first to start flowering after germination, with some species flowering at a tender age of only 8-9 months. Generally, the flowering seems to follow the same pattern as ordinary greenhouse-bred plants, although some genera, like *Mammillaria* and *Turbinicarpus*, will flower year-round. One species, *T. longispinus* n.n. (probably a form of either *T. riverdensis* or *T. schwarzii* depending on who you ask),

started flowering at around 7 months old and have more or less flowered continuously in the 18 months since, with only a week's break here and there. *Pseudolithos mccoysi* has actually flowered continuously (without breaks) for almost two years now.

Of course, it remains to be seen whether these plants are burning the midnight oil at a ferocious pace, or whether this repeated flowering will have no long-term ill effects. Other genera known to flower early, such as *Lobivia*, *Aylosteria*, *Sulcorebutia* etc., have been much more reluctant to flower in these conditions. I suspect most species of these genera require a solid rest period before they will flower.



*Turbinicarpus longispinus* n.n. at 7 months old, ca. 1 cm in diameter.

**Below:** *Turbinicarpus longispinus* n.n. at 2.5 years, in 5 cm pots. It's a very floriferous species and the plants on the photo have flowered almost nonstop since they were 7 months old.



summary →



*Turbinicarpus lophophoroides* at ca. 1.5 years, in 5 cm pots.

After growing plants under artificial lights for over two years, I can safely say that it's been a very positive experience. If I had easy access to a greenhouse I would probably only use the artificial light for germination and for those plants that absolutely love the heat. The plants grow very quickly in these conditions, but using artificial light cannot in truth compete with the sun (in most cases). Setting up such a system of artificial light first of all costs a bit, and then, depending on the electricity prices in your country, powering such bulbs may quickly become a costly business. The fact that a whole room is dedicated to cacti can be problematic, and this setup isn't exactly aesthetically pleasing (as my wife keeps telling me). It's also important

to be careful with watering to avoid spilling or splashing water on the walls or other things. In addition one must consider the bleaching effects of the light on both walls and nearby furniture and such – the amount of UV-light produced is negligible compared to the sun, but it can still produce colour changes in things in the immediate vicinity.

The fact that the plants grow so quickly that there is almost a constant need for repotting can also quickly become an issue.

It can never be anything but a substitute for having a proper greenhouse but, if you live in a flat or have no room for a greenhouse, I can absolutely recommend using artificial light to grow cacti.



summary →

*Turbincarpus lophophoroides* at ca. 1.5 years, the flower wilting in the heat.

Nolte  
Every picture taken in the artificial light from the lamps, unless otherwise stated.

en or

# *Opuntia dillei* Griffiths

## first time recorded as allochthonous in Spain and Europe



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In this paper we indicate for the first time the presence in Spain and Europe of the allochthonous *Opuntia dillei* Griffiths

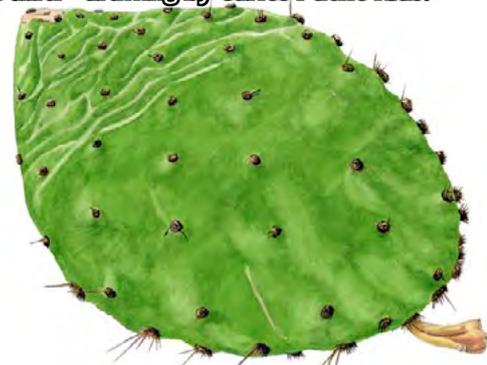
SPAIN, VALENCIA: 30SYJ2080, Godella, abandoned farm field, next to a small slope behind some houses, near the road from Campolivar to the residential area Santa Barbara and the road from Bétera to Godella, near an abandoned quarry. We noticed two plants. 44 m. D. Guillot. 25-01-2016.

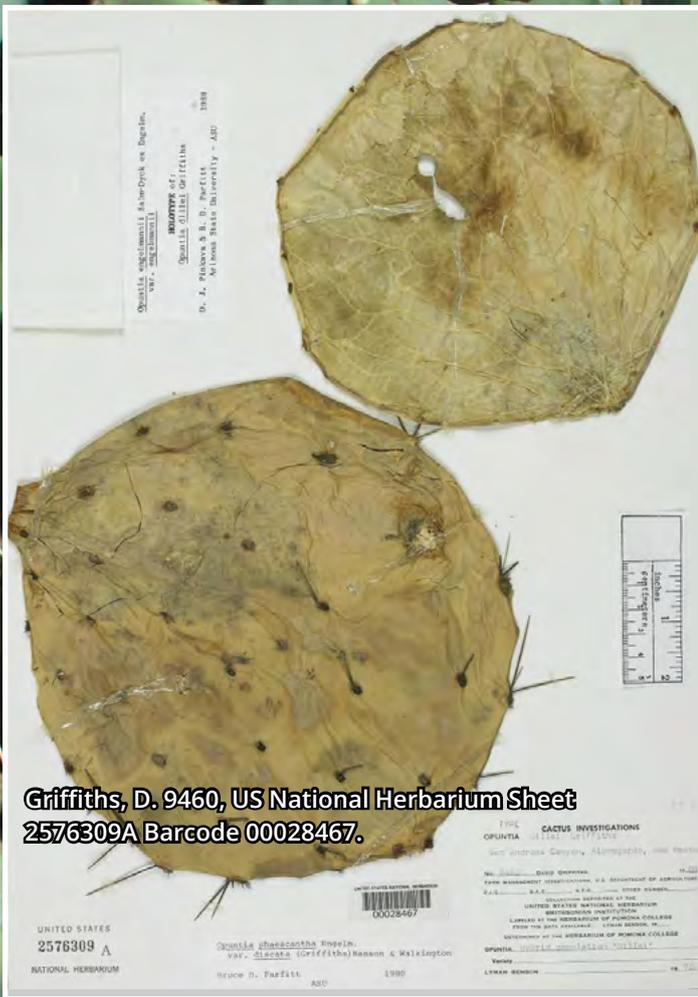
In the early twentieth century, it was known only from the type locality ("*San Andreas Canyon of the Sacramento Mountains, New Mexico, about 5 miles south of Alamogordo*"; Wootton & Standley, 1915), in the Upper Sonoran Zone. Benson (1982) points out that it inhabits rocky canyons and sand dunes in the desert, or desert grasslands, at around 1200 m, New Mexico (rare) in Doña Ana, Otero, and Eddy counties, and Texas in Canyon of Limpia Creek NE of Ft. Davis, Davis Mts., Jeff Davis County,

also indicating that the colonies are not large.

Griffiths (1909) is dedicating this species to Mr. A. B. Dille "... who forwarded specimens of it to the United States Department of Agriculture a year or two ago. The type was secured from the same locality in which the original specimens were collected by Mr. Dille".

*Opuntia dillei* - drawing by Carles Puche Rius.





Griffiths, D. 9460, US National Herbarium Sheet 2576309A Barcode 00028467.



Griffiths, D. 9460, US National Herbarium Sheet 2576303 Barcode 00028468.

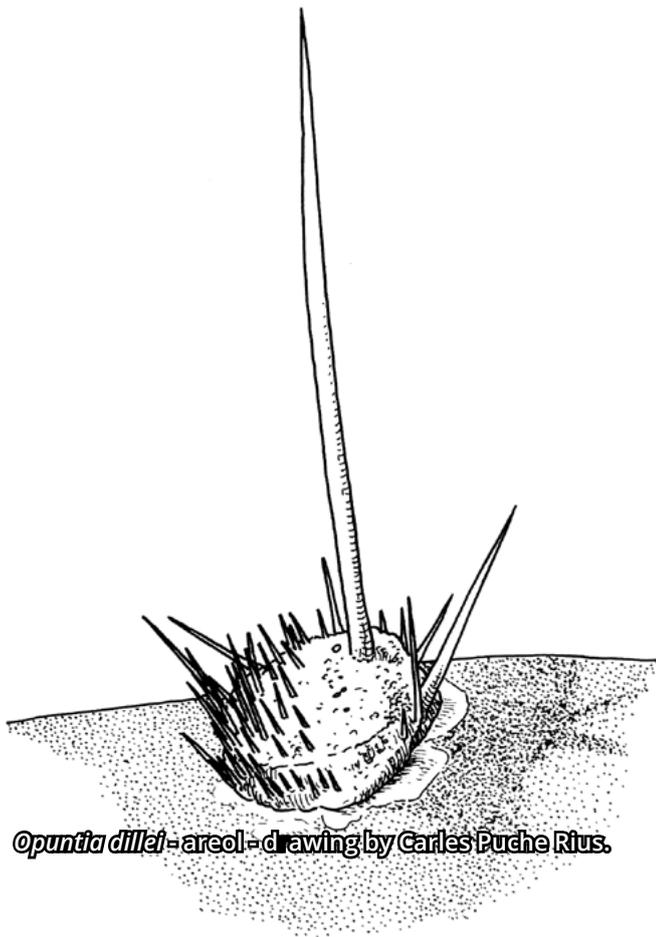
Left: Benson (1982) indicates this image is also attributed to David Griffiths "The hybrid population 'dillei' a young segment with leaves and a mature segment of plants growing in Texas. This plant has indicated that it is spinier than wild, but the observation in west Texas indicates great variability" (Image taken from <http://eol.org/>).

Griffiths (1909) describes "plant suberect or ascending, 15 dm or more high and 18 or 20 dm in diameter, open branching; joints subcircular to broadly obovate or ovate, often broader than long, sometimes 35 cm in diameter and 2.5 cm thick, but usually smaller, glaucous green turning to yellowish green and finally to scaly gray brown; areoles subcircular to obovate, about 6 mm in longest diameter, enlarging irregularly in age and becoming conspicuously subareolate, the tissues of some of them proliferating into short columnar structures, invariably surrounded by yellowish brown, apparently dead epidermal tissue not later than the second year; spicules brown with yellowish tips, fading slightly with age, not numerous, scattered, unequal, not formidable, developing very unequally, usually none on sides of joints, commonly about 9 or 10 mm long when fully developed in occasional areoles; spines mostly none or only a few, white

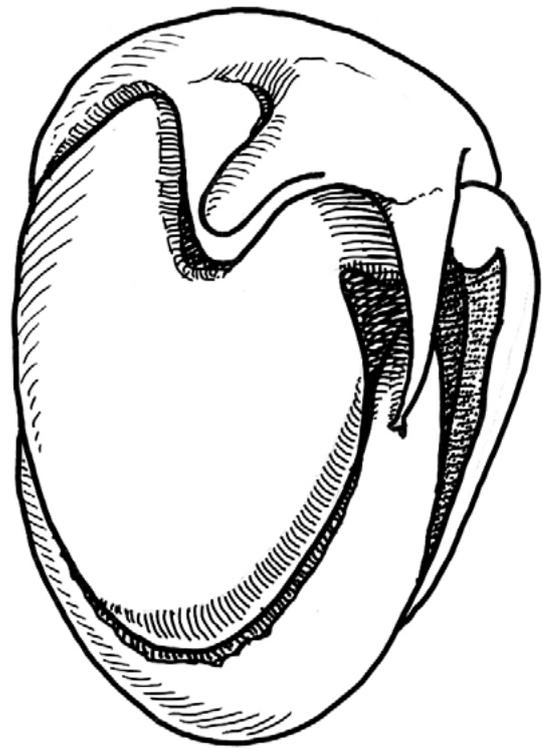


or flesh colored, deeply tinted at base, flattened, but not annular or twisted, one erect or recurved, about 2.5 cm long; flowers not seen; fruit purple throughout, large, subglobose, about 53 by 60 mm, edible, but with thick rind, smooth with subcircular areoles about 12 mm apart, tawny with a small central bunch of brown spicules; seeds flattened, slightly angular, quite uniform in size, 3 to 4 mm in diameter, with conspicuous marginal callus, about 0.5 mm wide, with a narrowly rounded margin". Wootton & Standley (1915) indicate that "large, circular, thick joints with few or no spines are characteristic". Benson (1982) notes "big segments, orbicular, and spineless, of about 20–25 cm in length".

summary



*Opuntia dillei* - areole - drawing by Carles Puche Rius.

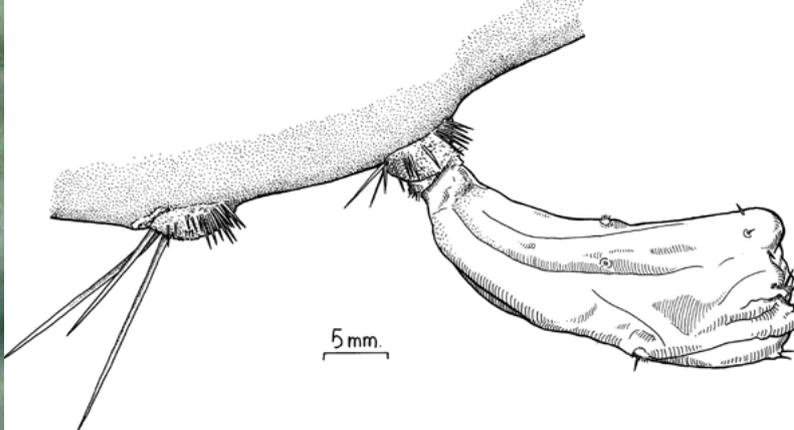


*O. dillei* - seed - drawing by Carles Puche Rius.

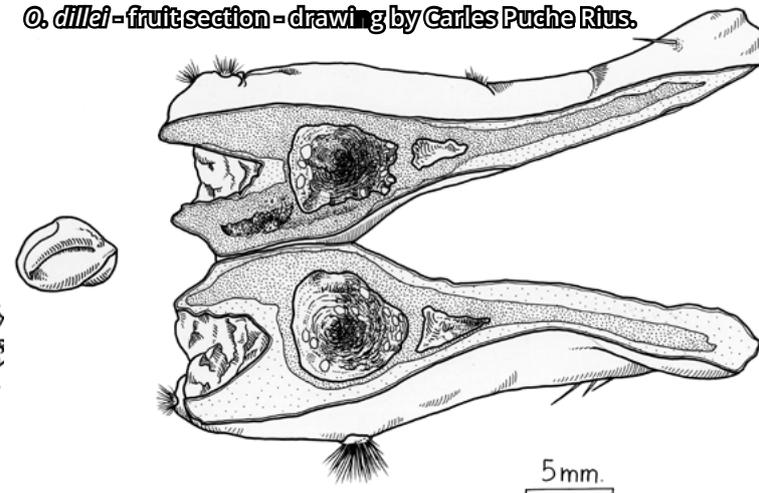
2 mm.



*O. dillei* - fruit - drawing by Carles Puche Rius.



*O. dillei* - fruit section - drawing by Carles Puche Rius.



Griffiths (1909) also states: "The species is most closely related to *Opuntia engelmannii*, from which it differs in rarity of its spines, which are very conspicuous in this species. The fruits and seeds are also different. It appears to be a rare species. I have seen what I suspect is the same thing from one locality besides the type, both on the Territory of New Mexico. In the type locality about a dozen plants were found, all in situations inaccessible to livestock. Under cultivation the species becomes much more spiny than indicated above" Britton & Rose (1919) included this taxon within the

synonymy of *O. engelmannii* Salm-Dyck and indicate that it is related to *O. cyclodes*, but has fewer spines (Britton & Rose, 1919).

Pinkava (2004) includes it as a synonym of *O. engelmannii* var. *engelmannii*. Benson (1982) indicates that the hybrid population "dillei" could have originated by hybridization of the unarmed forms of *O. ficus-indica* with *O. phaeacantha* var. *discata* or var. *major*. Shaw & al (2016) specify that it is a spineless form of *O. orbiculata* and show us different photographs of this plant.

summary



*Opuntia dillei*, Godella (Valencia, Spain) - all photos by D. Guillot Ortiz.



← four corners



*Opuntia dillei*, Godella (Valencia, Spain) - all photos by D. Guillot Ortiz.



summary



*Opuntia dillei*, Godella (Valencia, Spain) - all photos by D. Guillot Ortiz.

**Acknowledgments:**

To Joe Shaw (Opuntia Web), who has helped us to confirm the correct identity of this plant.

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Pinkava, D.J. (2004) Opuntia Miller. In: Flora of North America Editorial Committee, eds 1993+. Flora of North America North of Mexico, volume 4. New York and Oxford. Accessed on the Internet in January 2016. [http://www.eflora.org/flora\\_taxon.aspx?flora\\_id=1&taxon\\_id=123045](http://www.eflora.org/flora_taxon.aspx?flora_id=1&taxon_id=123045)  
Shaw, J.J., D.J. Ferguson, D.A. Green, N. Hussey, E. Parnis, J. Fenstermacher (2016) Opuntia orbiculata Salm-Dyck ex Pfeiffer, Enumeratio Diagnostica Cactearum 156: 1837 Opuntia Web. Accessed on the Internet in January 2016. <http://opuntiads.com/opuntia-n-z/opuntia-n-o/opuntia-orbiculata/>  
Wootton, E.O. & P.C. Standley (1915) Flora of New Mexico, volume 19. Contributions from the United States National Herbarium. Smithsonian Institution. United States National Museum. Government Printing Office. Washington.

summary →

# Notes on

# Mammillaria mainiae

M.K. Brandege



Elton Roberts

with habitat photos by Peter Breslin & Thomas Linzen

I believe it was 1985 when I saw my first *Mammillaria mainiae* (\*). The cactus nursery I was working got an order of plants from the wholesale nursery and there was a tray of 25 plants. All the plants were about 7 cm in diameter and something like 5 cm tall. The thing that impressed me is that every one of the plants was in full bloom. Each plant had a ring of flowers circling it and they were really beautiful flowers. Seeing a whole tray of 25 plants all in bloom was something I have not forgotten it impressed me so much. I have not seen a sight like that since, since I have not seen another tray of *Mammillaria mainiae* in bloom. I have seen the plants in flower many times and every time I declare them beautiful.

*Mammillaria mainiae*, in habitat near Sells, Arizona.

Photo by Peter Breslin



summary →

129. *Neomammillaria mainae* (K. Brandegee).

*Mammillaria mainae* K. Brandegee, Zoe 5: 31. 1900.

Globose or somewhat depressed, 5 to 8 cm. broad; tubercles pale green, naked in their axils; spines all puberulent, at least when young; radial spines about 10, widely spreading, yellowish or white except the brownish tips; central spines usually stout, yellowish except the strongly hooked tip; flowers from upper part of plant but in old axils, about 2 cm. long, with a broad open throat; outer perianth-segments with a brownish stripe, inner ones with a reddish central stripe with broad nearly white margins; acute inner perianth-segments more or less spreading; stamens purplish; style also purplish, stout, much longer than stamens; stigma-lobes 5 or 6, purplish, elongated, linear; fruit red, globose to obovate, not projecting beyond the tubercles; seeds dull black, obovate, 1 mm. long, punctate, with a narrow basal hilum.

*Type locality:* South of Nogales, Sonora, Mexico.

*Distribution:* Northern Sonora.

For a long time it was known only from material collected by Mrs. F. M. Main, near Nogales, Mexico. It has been offered in the trade under the name of *Mammillaria galeottii*, to which, according to Mrs. K. Brandegee, it is not at all related. It was observed by Rose, Standley, and Russell in two localities near Hermosillo, Sonora, Mexico, and living plants were sent to Washington, which flowered in August 1910. This is not very close to any of the other species. It was collected again in Sonora by C. R. Orcutt in 1922.

*Illustration:* Monatsschr. Kakteenk. 22: 19, as *Mammillaria mainae*.

Figure 172 is from a photograph of a specimen sent by Dr. Trelease from the Missouri Botanical Garden in 1910.

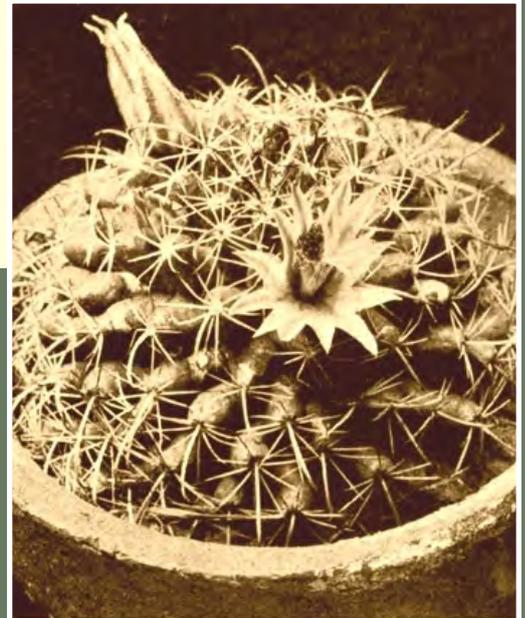


FIG. 172.—*Neomammillaria mainae*.

Description of *Mammillaria mainae* from N. L. Britton and J. N. Rose in *The Cactaceae*, The Carnegie Institution of Washington 1923, volume IV, pages 153-354 - public domain.

***Mammillaria mainae* description from the *Mammillaria Handbook* by Craig;**

Body simple and branching from base and body, hemispherical to conic globular, to 10 cm high. **Tubercles** .....more or less firm in texture, somewhat incurved, varies from pale to bluish gray-green, sometimes reddish in axils, cylindric becoming conic, terete, with watery sap, 10 - 15 mm long, 8 - 10 mm wide at base. **Areoles** round to slightly oblong, with very little wool, very soon becoming naked. **Axils** naked. **Central spines** 1 - 2 rarely 3, 15-20 mm long, hooked, somewhat twisted, stout acicular, smooth or sometimes pubescent in youth, yellowish with dark tip, to all black (in type from Sinaloa), porrect, hook often turned to side. **Radial spines** 10 - 15, 6 - 10 mm long, upper ones shorter, all straight, stiff, slender acicular, sometimes pubescent in youth (not constant in Sinaloa type), yellowish with brown tips, becoming chalky, horizontal. **Flowers** funnelform, broad open throat, in crown in upper part of

plant, 10 - 20 mm long to 25 mm wide. **Outer perianth-segments** pinkish cream margins, brownish green mid-stripe at point, greenish ventrally, linear-lanceolate, tip obtuse, margins ciliate, 2.5 mm wide. **Inner perianth-segments** broad nearly white margins, pink to reddish tapering mid-stripe lanceolate, tip acute, margins entire. **Filaments** purplish rose to red. **Anthers** yellow to orange. **Style** white to light pink. **Stigma lobes** 5 - 6 rose-red to purplish, 7 mm long. **Ovary** green, smooth, globular. **Fruit** red, globular to obovate 8 x 5 mm, not protruding beyond tubercles but retained under spines. **Seeds** dull black, obovate with narrow basal hilum, pitted little more than 1 mm. **Roots** fibrous.

I am not too sure that a better description is to be found. The above description does not give the diameter range of the plants. Anderson says in his description that the plants are to 12 cm in diameter and 6 to 7 cm tall, John Pilbeam says the plants are 10 to 12 cm diameter. The plant description being 6 to 10 cm tall is for habitat plants. I have a very old plant and it has stems that are 11 cm in diameter and 31 cm long. Another plant I have has a half dozen stems and these are 16 to 30 cm long. If habitat plants grew stems that long in habitat they would be growing lying on the ground. The tips of the stems want to grow towards the sky but the branches are heavy and so over they lean.

*Mammillaria mainiae* 9.5 cm dia, 10.5 cm tall.

On my large plant the stems kept on leaning and then rested on the bench the pot was sitting on.

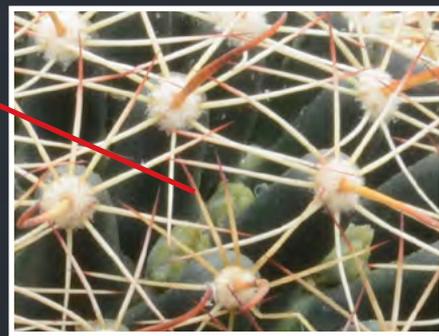
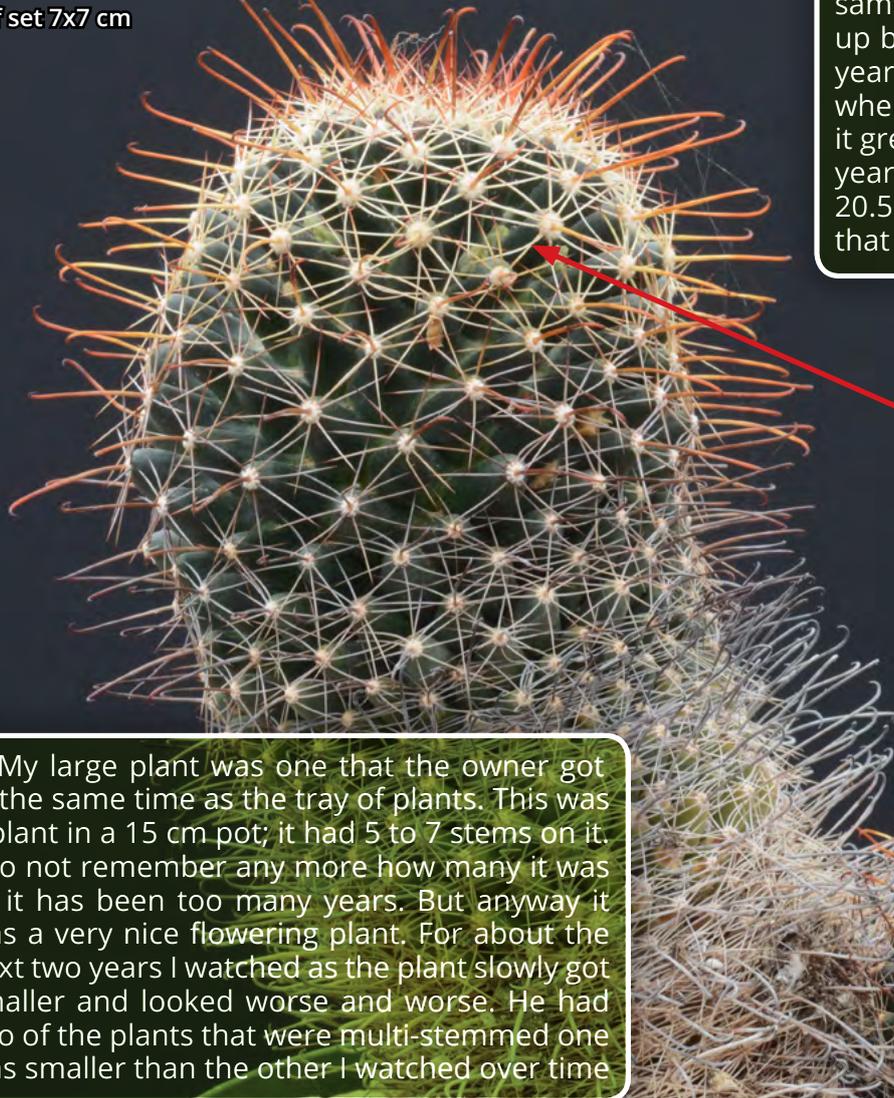


Cluster of *Mammillaria mainiae*, in habitat near Sells, Arizona.

Photo by Peter Breslin

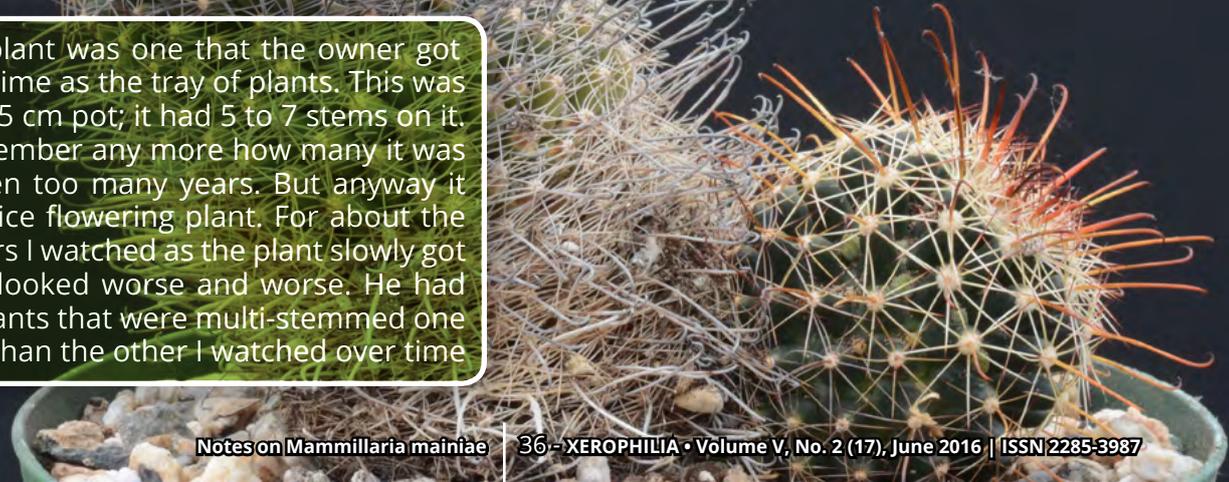
as the smaller plant died. I asked the owner if I could take the last one home and try to save it. He refused for quite a while but as it got to looking like it was going to die he let me take it. At the time I had pH balanced fertilizer so the plants were getting acidic water and fed at the same time and so the plant perked up before too very long. In the first year it got back to looking like it did when I first saw it. For several years it grew right well and bloomed each year. After some time I put it in a 20.5 cm bulb pan. It has stayed in that pot for at least 20 years now.

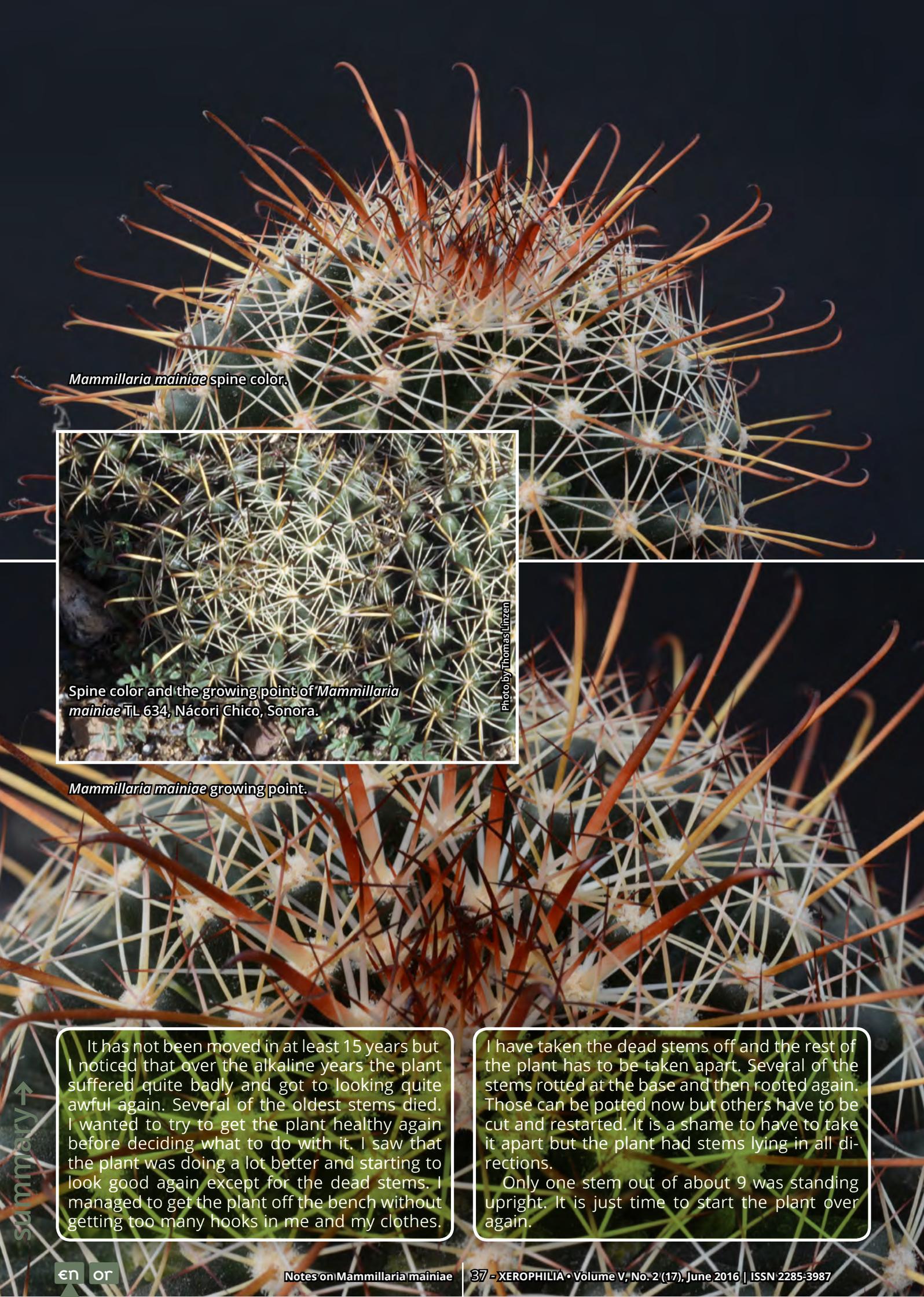
*Mammillaria mainiae* 10 cm dia x 15 cm tall, off set 7x7 cm



My large plant was one that the owner got at the same time as the tray of plants. This was a plant in a 15 cm pot; it had 5 to 7 stems on it. I do not remember any more how many it was as it has been too many years. But anyway it was a very nice flowering plant. For about the next two years I watched as the plant slowly got smaller and looked worse and worse. He had two of the plants that were multi-stemmed one was smaller than the other I watched over time

summary →





*Mammillaria mainiae* spine color.



Spine color and the growing point of *Mammillaria mainiae* TL 634, Nácori Chico, Sonora.

Photo by Thomas Linzen

*Mammillaria mainiae* growing point.

summary →  
It has not been moved in at least 15 years but I noticed that over the alkaline years the plant suffered quite badly and got to looking quite awful again. Several of the oldest stems died. I wanted to try to get the plant healthy again before deciding what to do with it. I saw that the plant was doing a lot better and starting to look good again except for the dead stems. I managed to get the plant off the bench without getting too many hooks in me and my clothes.

I have taken the dead stems off and the rest of the plant has to be taken apart. Several of the stems rotted at the base and then rooted again. Those can be potted now but others have to be cut and restarted. It is a shame to have to take it apart but the plant had stems lying in all directions.

Only one stem out of about 9 was standing upright. It is just time to start the plant over again.

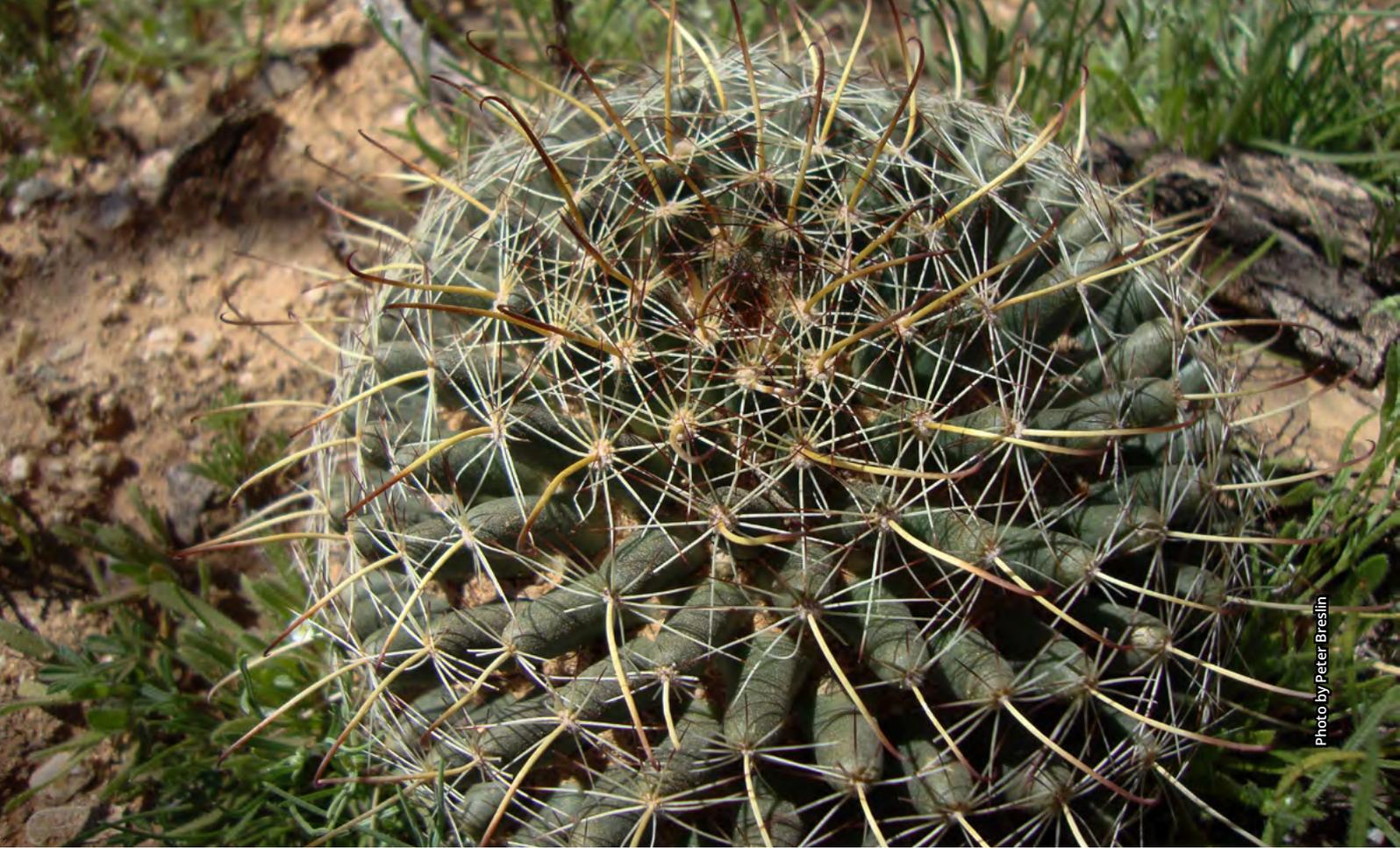


Photo by Peter Breslin

Comparison between two similar plants of *Mammillaria mainiae* in habitat, above in near Sells, Arizona and below the TL 634 field number, Nácori Chico, Sonora.



Photo by Thomas Linzen

summary →



*Mammillaria mainiae* TL 6323, Movas, Sonora.

*Mammillaria mainiae* TL 634, Nácori Chico, Sonora.



*Mammillaria mainiae* TL 6323, Movas, Sonora.

Specimens of *Mammillaria mainiae* in habitat, displaying different habits and clustering modes.

summary

All photos on this page by Thomas Linzen



Photo by Peter Breslin

*Mammillaria mainiae* spines in habitat near Sells, Arizona.

*Mammillaria mainiae* spines.

The picture on page 35 is of a young plant that is 10.5 cm tall and 9.5 cm in diameter. Many people do not include the spines as part of the size of a cactus plant. The spines on this plant are mostly 15 mm long or 1.5 cm. If you take 3 cm off the diameter of the plant then you have a 6.5 cm diameter plant and that is what some people see. Many people would just as well have cactus without the spines. With the size of the plant in the description it is plain to see that the spines are counted as part of the diameter of a plant. I have seen descriptions of plants that differed so much from my plants that I had to think they did not count the spines as part of the height or diameter of the plant. I love the color of the central spines; they are chestnut color fading toward the base. On page 36 (the picture below) there is a larger plant, this one is starting to lean a bit and I guess it is trying to balance its self by growing the offset. The spines on this plant are mostly 18 to 20 mm or 1.8 to 2 cm long. That plant is 10 cm in diameter and it is 15 cm tall. The spines on

this plant are lighter in color than the spines on the plant in photo 1. Midway down the stem the spine color changes from chestnut color to medium ash color. Also there is no rhyme or reason as to what way the hooks face. They can be facing any way they want and this helps them get hold of a body or whatever is brave enough to take hold, pass by too close or crawl on it. I have seen lizards and mice caught and held fast on the plants. I have also been caught on the spines and it is not fun getting lose. A pencil or a shaft of steel like a 3 inch long nail or even a screwdriver is really handy when you need to be unhooked. If you get a sweater caught it can take quite a while to get all the hooks out so you can go free. You no sooner get one hook out and three more will grab the garment. I have seen where some people will clip off all the hooked spines.

Their excuse is that they got tired of being hooked by the plant. I had to ask; why didn't you just move the plant away from the edge of the bench? They did not think of that!

summary →

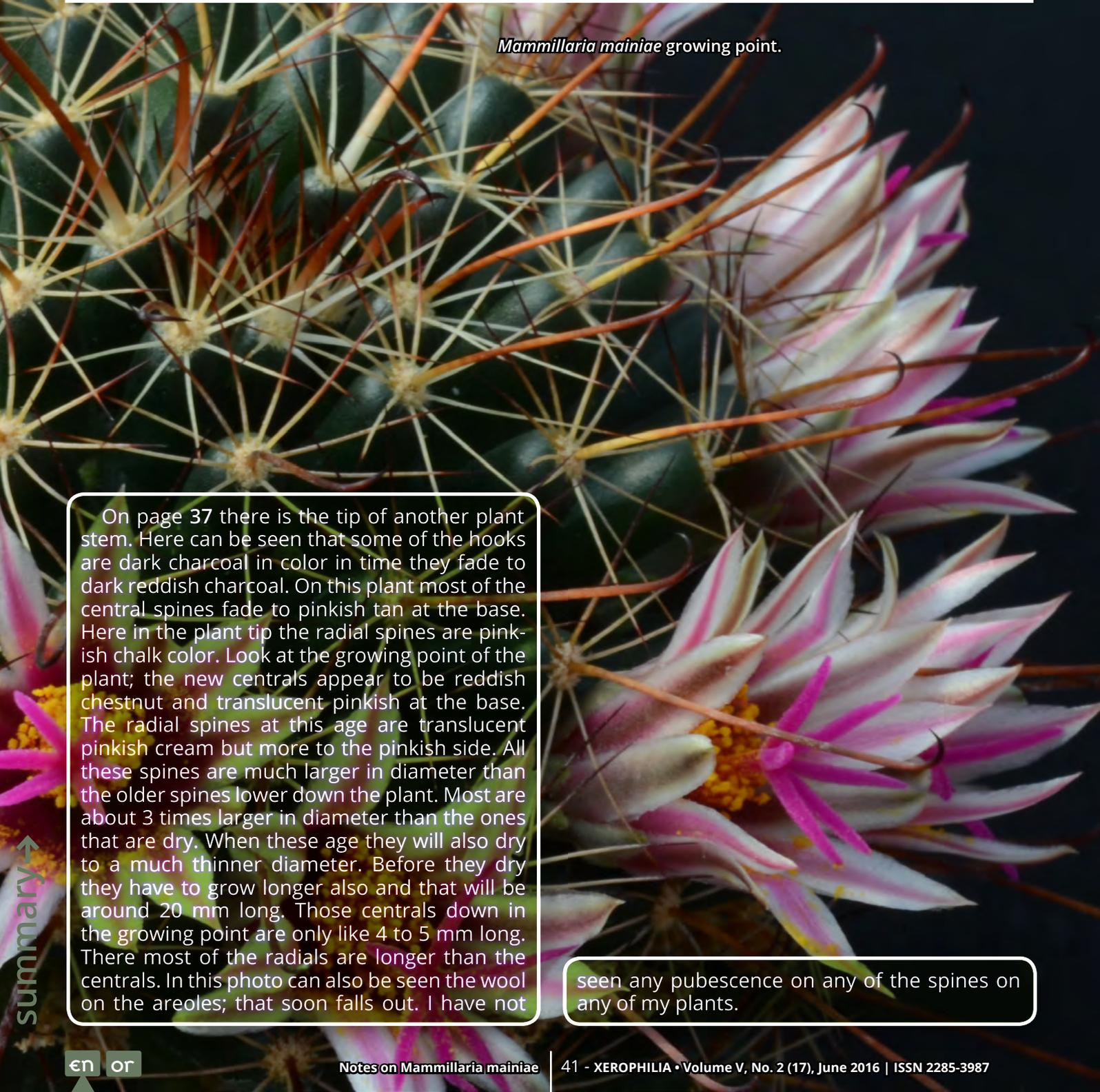


*Mammillaria mainiae* seed pods.



*Mammillaria mainiae* growing point in habitat near Sells, Arizona.

Photo by Peter Breslin



*Mammillaria mainiae* growing point.

On page 37 there is the tip of another plant stem. Here can be seen that some of the hooks are dark charcoal in color in time they fade to dark reddish charcoal. On this plant most of the central spines fade to pinkish tan at the base. Here in the plant tip the radial spines are pinkish chalk color. Look at the growing point of the plant; the new centrals appear to be reddish chestnut and translucent pinkish at the base. The radial spines at this age are translucent pinkish cream but more to the pinkish side. All these spines are much larger in diameter than the older spines lower down the plant. Most are about 3 times larger in diameter than the ones that are dry. When these age they will also dry to a much thinner diameter. Before they dry they have to grow longer also and that will be around 20 mm long. Those centrals down in the growing point are only like 4 to 5 mm long. There most of the radials are longer than the centrals. In this photo can also be seen the wool on the areoles; that soon falls out. I have not

seen any pubescence on any of the spines on any of my plants.

summary→



*Mammillaria mainiae*, flower detail.

Looking at the spine clusters you notice that the radial spines are not white but chalky pink. This is near the top of the plant but still down the side a little way and the spines are still translucent near the base. At the base enough of the wool had fallen out to show that the central spine has a bulbous base that is about 3 times the diameter of the spine shaft. Some spines that have hardened off and lost the translucent pinkish color they are now ash gray with darker tips. Also there is the red berry like seed pods. None of them are taller than the tubercles and I cannot see that any of them interrupt the lay

of the spines like seed pods do on many kinds of cactus plants.

If you look really carefully you can see in picture page 36 (detail) that there are flower buds starting to show. In time the plant will open a ring of flowers. Many times there will be 2 rings and sometimes a good healthy plant will open 3 rings of flowers. That hot pink stigma really stands out and to me makes the flower really something to look at. The description calls for 5 to 6 stigma lobes but the flowers do not read the description and they will have different numbers like 4 or even 7 lobes like in this picture.

summary →

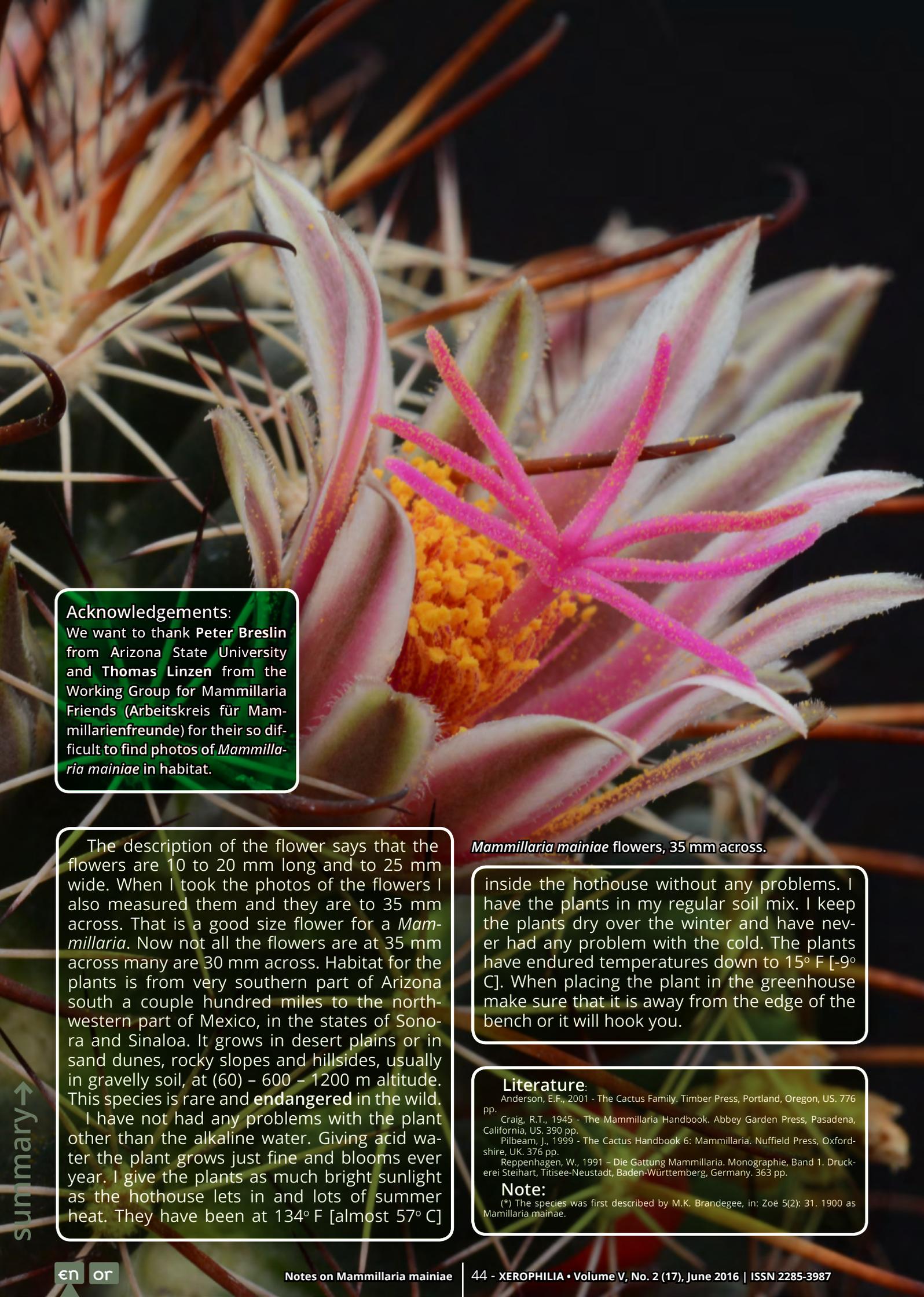


*Mammillaria mainiae* flowers.

There it is easy to see the colors of the flower. The stigma is what I am calling hot pink the style is not visible in this photo. The pollen is yolk yellow and the filaments are rose pink. Depending on how the light hits them the petals are cream pink with a dark rose tan midstripe. The midstripe widens out and takes in the entire base of the petals so the flower has a dark center. The outside of the inner petal at the bottom of the flower is rose pink all the way down. This picture shows the style on to the flower on the right and one on the left of the photo. There the style is more rose color than pink. The next

picture on page 44 shows the pink or rose color of the style a lot better since it holds the stigma up so high above the anthers. The description says that the style is white to light pink I guess my plants do not know they are supposed to have light pink to white styles.

summary→



#### Acknowledgements:

We want to thank **Peter Breslin** from Arizona State University and **Thomas Linzen** from the Working Group for Mammillaria Friends (Arbeitskreis für Mammillarienfreunde) for their so difficult to find photos of *Mammillaria mainiae* in habitat.

The description of the flower says that the flowers are 10 to 20 mm long and to 25 mm wide. When I took the photos of the flowers I also measured them and they are to 35 mm across. That is a good size flower for a *Mammillaria*. Now not all the flowers are at 35 mm across many are 30 mm across. Habitat for the plants is from very southern part of Arizona south a couple hundred miles to the north-western part of Mexico, in the states of Sonora and Sinaloa. It grows in desert plains or in sand dunes, rocky slopes and hillsides, usually in gravelly soil, at (60) – 600 – 1200 m altitude. This species is rare and **endangered** in the wild.

I have not had any problems with the plant other than the alkaline water. Giving acid water the plant grows just fine and blooms ever year. I give the plants as much bright sunlight as the hothouse lets in and lots of summer heat. They have been at 134° F [almost 57° C]

*Mammillaria mainiae* flowers, 35 mm across.

inside the hothouse without any problems. I have the plants in my regular soil mix. I keep the plants dry over the winter and have never had any problem with the cold. The plants have endured temperatures down to 15° F [-9° C]. When placing the plant in the greenhouse make sure that it is away from the edge of the bench or it will hook you.

#### Literature:

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#### Note:

(\*) The species was first described by M.K. Brandegee, in: Zoë 5(2): 31. 1900 as *Mamillaria mainae*.

# *Carpobrotus edulis*

## the ancipital alien



Eduart Zimer



*Carpobrotus edulis* invading the beach (Tutukaka Coast)

**A**fter reading the very interesting article “*Carpobrotus, the carpet of death*” by Gérard Dumont and Antoine Mazzurati in *Acta Succulenta* 3(1) 2015, I recalled my first encounters with *Carpobrotus edulis*, sometime in 2002 and 2003, shortly after arriving here in New Zealand. It was in Long Bay, a busy (mostly) recreational seaside park some 20 km north of Auckland City, a place we used to go during the weekends. I was impressed by the large patches of yellow flowering *Carpobrotus edulis* covering part of the sand dunes, and it was actually the first time I was seeing this plant (initially I didn't even know exactly what it is). The place looked magnificent to me back then, but everything was new to me.

However, now, many years later, I feel quite sorry that I don't have pictures of the beach from that period, just to document the changes. Yes indeed, a decade later the place has been radically transformed. All *Carpobrotus* plants are long gone, being replaced by native coastal and sand dune vegetation, and protected ar-

reas for nesting birds have been established. A strict and consistent conservation approach can make wonders... not always, but at least in this case it did.

I guess in Europe conservation work is a different beast. Habitat alteration goes back thousands of years; too many large areas are now covered in generic vegetation, being logged, farmed and abandoned and farmed, abandoned or developed again, not even closely resembling their original condition. The later you start worrying, the more difficult it becomes to do something about. And less cost effective. I guess this is the huge advantage of the relatively New Worlds. However, I find the above mentioned article extremely important for addressing conservation issues and raising awareness among people and (hopefully) will motivate local councils and decision makers.

summary →



*Carpobrotus edulis* - young flower (Motutapu Island).



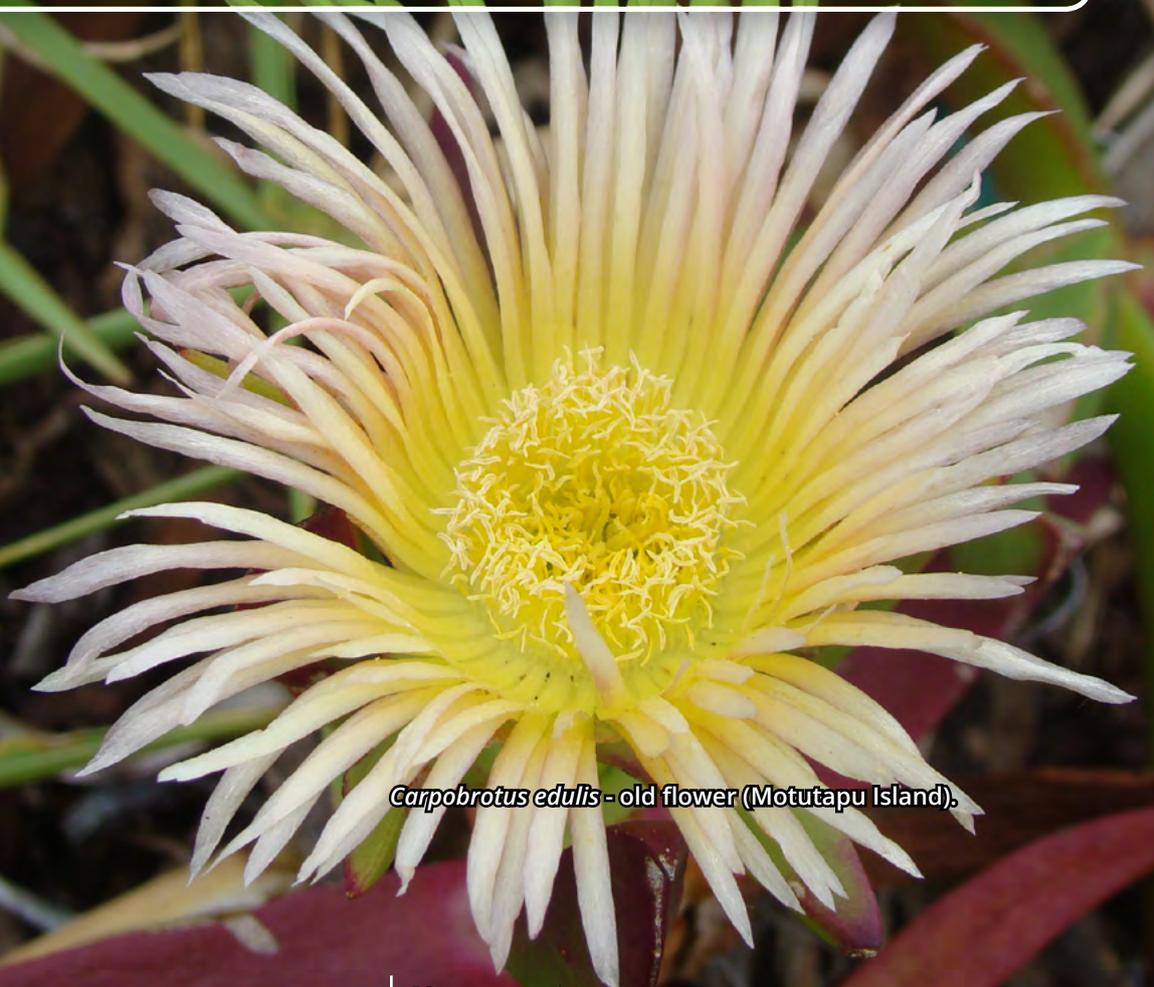
*Carpobrotus edulis* - ageing flower (Pauanui, Coromandel Peninsula).



From what I read on the *Carpobrotus* issue in Europe, it looks pretty daunting. But I guess there are a number of circumstantial factors that make exotic plants to become aggressive invaders in some regions and more or less innocuous in other countries. Take several *Opuntia* species for instance: they are invasive in parts of Kenya or South Africa, not to mention the dramatic Australian invasion in the early 20th century, and almost harmless, truly maintaining their exotic casual status, across the ditch in New Zealand! (If you ask me our worst enemy is gorse – *Ulex europaeus* – scattered infestations covering over 1.7 mil. acres nationwide, introduced from Scotland in the 19th century, go figure!). However, it seems that *Carpobrotus* is posing indeed a real threat for European coastal habitats and the lack of action and disinterest does not help at all. From this point of view I am extremely appreciative for the above mentioned article: it provides information, enlightenment and incentive.

Nevertheless, I also remember me writing in 2007-2008 a chapter of my "Succulents from downunder" series called "*Carpobrotus edulis*, a friendly alien?" ... well, I'm not necessarily the advocate of the devil here, I even adjusted a bit my view since, but still I consider interesting enough to listen to a somewhat different story.

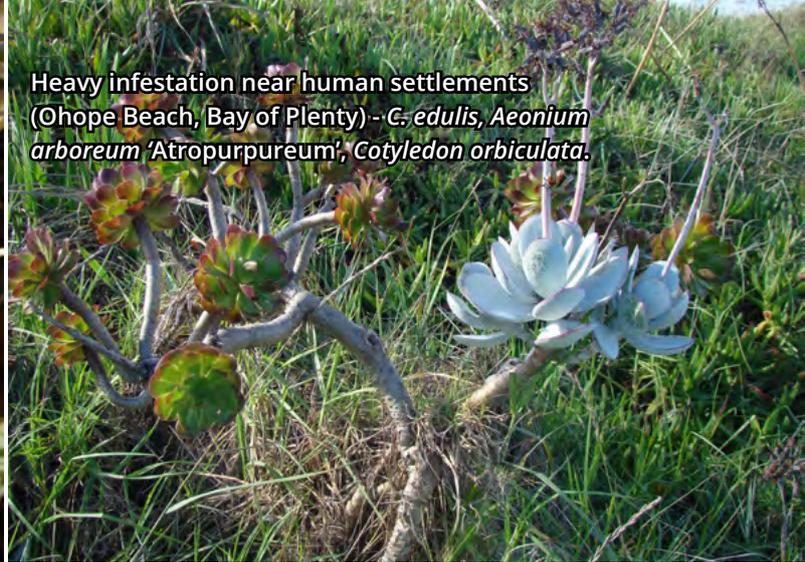
summary→



*Carpobrotus edulis* - old flower (Motutapu Island).



*Carpobrotus aequilaterus* (Te Awanga, Hawkes Bay).



Heavy infestation near human settlements (Ohope Beach, Bay of Plenty) - *C. edulis*, *Aeonium arboreum* 'Atropurpureum', *Cotyledon orbiculata*.

*Carpobrotus edulis* (and less frequently *C. aequilaterus*) was a deliberate introduction in New Zealand, mostly mid to late 19th century, mainly to fix a problem and not for relevant horticultural purposes (which we cannot completely exclude). In many coastal areas massive deforestation took place, extending farmlands to right where the sand dunes began. This was the final straw for many settled coastal habitats, mostly very fragile and exposed, with ecological imbalances forcing sand dunes to disappear in a matter of years, months and even weeks. Not that the farmers were too concerned about the disappearing sand dunes, but dealing with shifting sands on their farmlands over and over again wasn't good for business. Trying to fix the sand dunes somehow

was a pragmatic approach and in many cases *Carpobrotus* was used for the job. At some stage it was intensively used to protect sandy soils from erosion and stabilize sand dunes in coastal areas. It spread quickly, and by being able to spread quickly it formed occasionally large monotypic vegetation mats with a highly destructive impact on invaded habitats, smothering the existent native vegetation and reducing the chances of natural regeneration of the native flora. And – if that's not bad enough – potentially triggering changes to soil pH and nitrogen fixation which could possibly lead to tertiary successions. Most of the sandy beaches near old settlements are still infested with *Carpobrotus*, while in Regional Parks plants have been mostly removed in recent years.



*Carpobrotus edulis* - an unusual occurrence on a stabilized sandstone slope (roadcut) in Nelson, with *Graptosedum Francesco Baldi*.



Far from human settlements sand dunes have maintained their pristine state (Kawhia, Ocean Beach).

The positive farming lesson opened new doors. It is very important to understand that some of the coastal habitats have a very fragile nature; salt marshes and sand dunes for example are probably the most exposed to weathering or erosion. A slight change of currents (for salt marshes) or strong storms with battering winds (for sand dunes) can dramatically alter the environmental balance – dunes are relocated, shores are reshaped and lagoons are appearing or disappearing. There are definitely more chances of stability when well settled vegetation occurs and less damage is done by weathering or erosion.

*Carpobrotus edulis* was successfully used in New Zealand for erosion control – initially on unstable soils or sand dunes near farmlands, but later on also for erosion control and dune stabilization in coastal area, in attempts to save whatever could be saved. It may look strange now, but *Carpobrotus* was used for conservation work in a somewhat empiric way.

In my view *Carpobrotus* has actually saved many coastal habitats from complete destruction, by stabilizing sand where no other alternative was available and stopping the advance of pastoral weeds which had the potential to take

over, such as scrub weeds, thistles, ragworts, groundsels, chickweeds, and others. Once the pastoral weeds settled in it would have been even harder or even impossible for the native flora to recover without human assistance.

Luckily, the fragmented and varied nature of the New Zealand terrain, the relative lack of vast and monotonous landscape features especially on the coastlines, the lack of browsing mammals, and possibly the poor seed production of *Carpobrotus* plants, may have limited the expansion beyond reasonable limits.

In many places consistent conservation work started in the '60s and '70s and intensified over the last decade, sustained planting programs and reintroduction of native plants and birds have produced good results, corrected pauperized habitats and largely improved their condition. However, as someone said to me, “keeping New Zealand ecology in a pre-colonial state is foolish”. We have to accept certain changes indeed and make the best out of it. I think this is not a defeatist attitude, but pragmatic, based on social, economic and financial considerations. In the end it's a matter of balance between wishful thinking and affordability, but this is a different discussion.



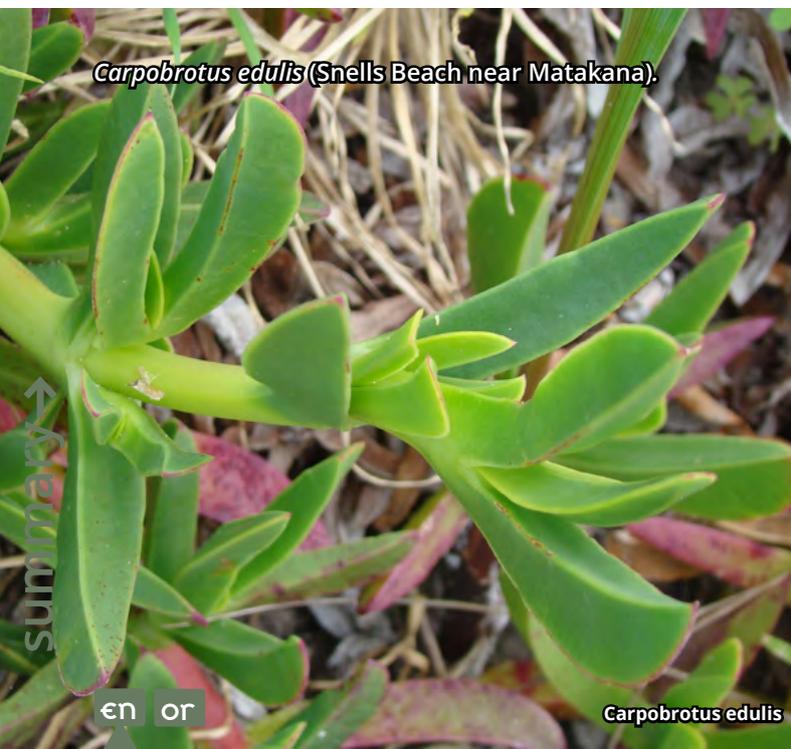
*Carpobrotus edulis* (Muriwai).



*Carpobrotus edulis* (Ohope Beach, Bay of Plenty).



*Carpobrotus edulis* and the indistructable *Agave americana* on the infested beach at Whangamata, Coromandel Peninsula.



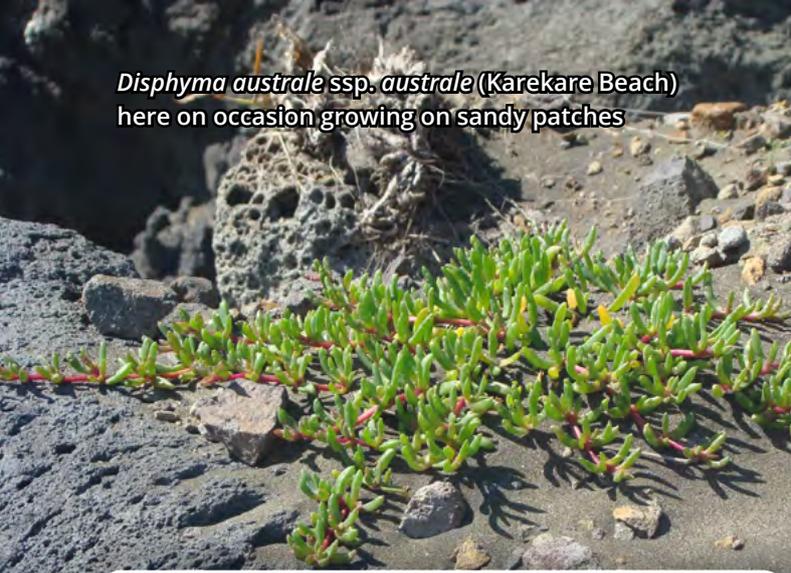
*Carpobrotus edulis* (Snells Beach near Matakana).



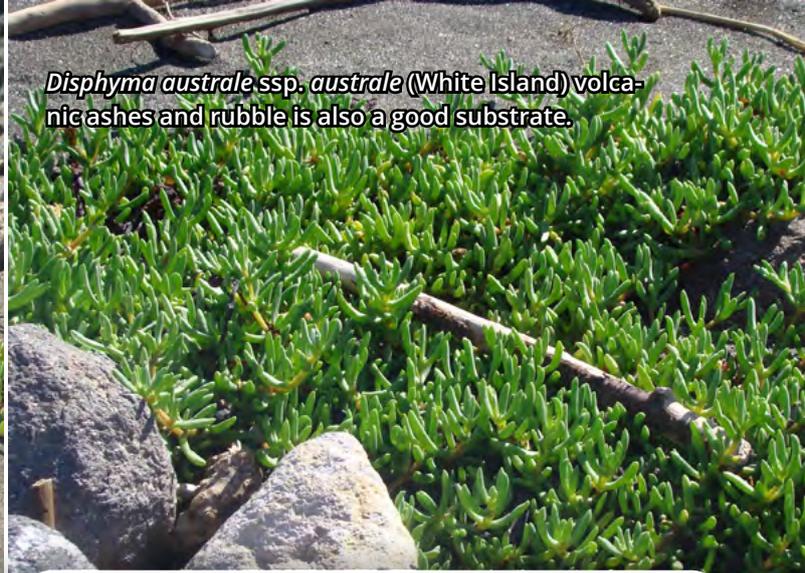
*Carpobrotus edulis* (Rangitoto Island) few shoots on mat of dead stems.

summary →

*Disphyma australe* ssp. *australe* (Karekare Beach)  
here on occasion growing on sandy patches



*Disphyma australe* ssp. *australe* (White Island) volcanic  
ashes and rubble is also a good substrate.



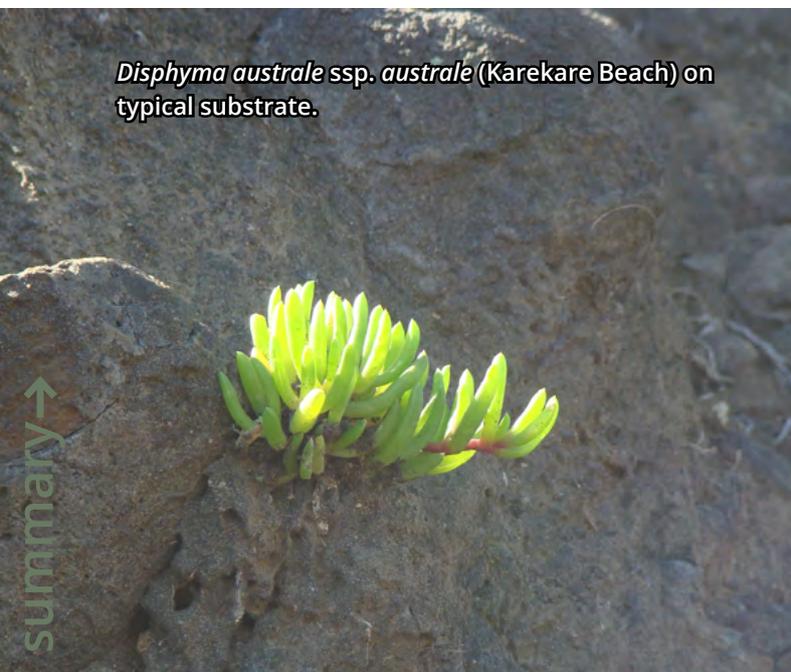
However, if we look at *Carpobrotus*, the real danger may come from a totally different direction. There is a New Zealand ice plant, *Disphyma australe* ssp. *australe*, which shares habitat with *Carpobrotus* in many places. They are not really competing for the same spot as *Carpobrotus* prefers the sandy soils, loose slope grasslands or even better the fine sand of the dunes, while *Disphyma* grows almost exclusively on rocks and shingle. I have rarely seen *Disphyma* growing on sand, and likewise, rarely seen *Carpo-*

*brotus* growing directly on rocky substrate. In fact there is a place on Rangitoto Island, named Yankee Wharf, where I have seen *Carpobrotus* on lava rubble, but it seems to have switched on survival mode here ... only few young shoots on a more or less compact mat of dead stems (I guess this acts like a protection from the overheating lava rubble). Nevertheless, sandy patches next to rocky outcrops or shingle beaches are common in New Zealand and as a result the two plants are often neighbours.

*Carpobrotus edulis*, on typical substrate, invading  
the beach at Whangamata, Coromandel Peninsula.



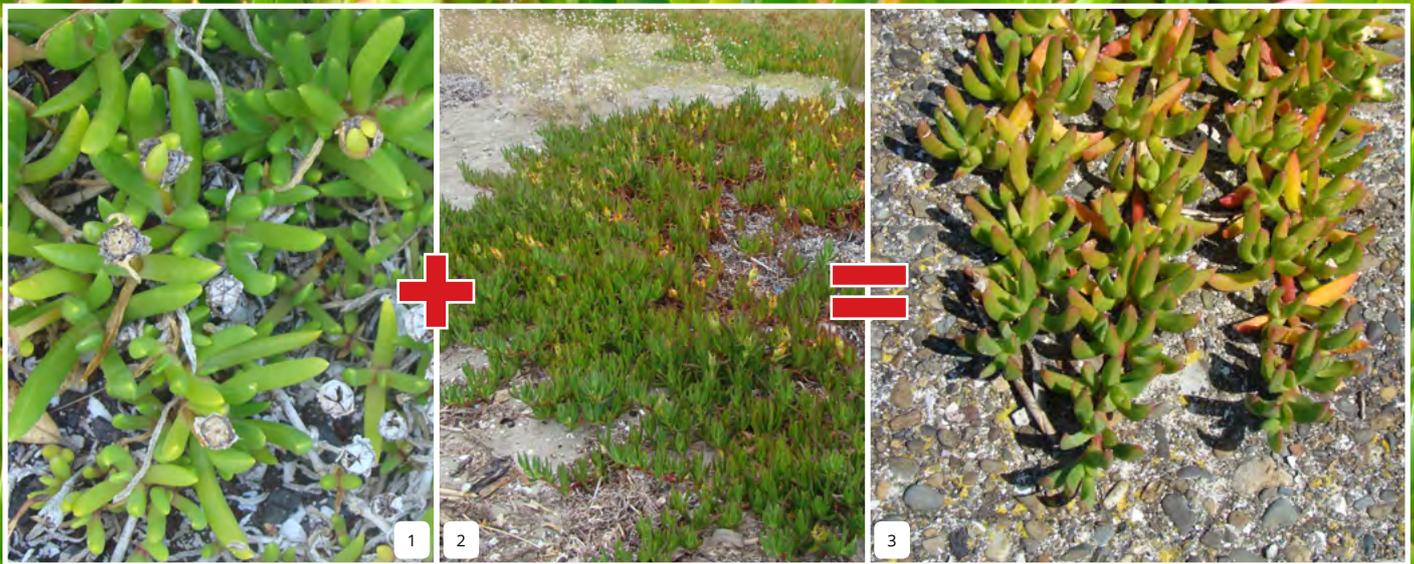
*Disphyma australe* ssp. *australe* (Karekare Beach) on  
typical substrate.



*Disphyma australe* ssp. *australe* (Rakino Island) on  
typical substrate.



summary →



*Disphyma australe*, Islington wharf, Rangitoto Island.  
 2 - Typical stand of *C. edulis* on a sandy beach (Motutapu Island). 3 - *xCarpophyma mutabilis* invading a boat ramp (Motutapu Island). 4 - A dense mat of *xCarpophyma mutabilis* (Motutapu Island) - note the triangular thin leaves.

Even if these two genera have been separated for millions of years, they are able to form hybrids: *xCarpophyma mutabilis* (= *Carpobrotus edulis* x *Disphyma australe*) and *xCarpophyma pallida* (= *Carpobrotus aequilaterus* x *Disphyma australe*), difficult to distinguish without flower. The first is more common, scattered nationwide, while the latter has a more restricted occurrence only in Canterbury and the Chatham Islands.

They only extremely rarely form fruits (I haven't seen any) and if so they are reportedly seedless. Their pollen is reportedly highly sterile, but still there are serious concerns that an uncontrolled back-crossing to *Disphyma australe* is actually happening, altering therefore the genetic information of our native plant. There is no fundamental study on this matter as far as I know, mostly educated opinions, but if proven correct there is a chance to helplessly assist, in

time, to the disappearance of our native ice plant as we know it. The second problem with *xCarpophyma* is that it seems to be more aggressive than the native *Disphyma* helped by a more vigorous growth, longer internodal stems and a higher rate of lateral branching. As the stems root easily at the nodes, this is increasing dramatically the chance of forming new functional individuals. To make things even worse the hybrids have a similar ecology with *Disphyma* and therefore they are in direct competition for the same rocky substrate. Of course, the faster growing hybrid will smother the slower growing *Disphyma* and eventually completely replace it. As a matter of fact the hybrid has been reported in several instances (e.g. Motutapu Island) as growing only next to one of the parents... *Carpobrotus!* This would suggest that the native *Disphyma* has been already eliminated from all those places.

summary →

Some still pristine sand dunes of the iconic Ninety Mile Beach.



To conclude this – the South African *Carpobrotus* species proved to be a nuisance, to say the least, outside their natural distribution range, becoming a massive threat for native coastal vegetation in some parts of the world. Even worse, as it happened in New Zealand, they might be useful at some stage for very practical immediate reasons, but as time goes it becomes a dangerous game and without the adequate conservation measures they might simply take over. Sometimes silently, through their hybrids.

There are few spots on Ninety Mile Beach where *C. edulis* is present (here near Waipapakauri).



Ninety Mile Beach (Waipapakauri) - where sea and land meet.



summary →

# *Ariocarpus fissuratus* (Engelm.) K. Schum.

the star  
among stones  
in Snakeland



Ricardo Ramirez Chaparro

summary →

**A**

star among stones. In this pictorial I present a series of photographs from different localities of *Ariocarpus fissuratus* (Engelm.) K. Schum. in the west side of the Mexican State Chihuahua, as well as some other common dwellers of this rich and vast Chihuahuan Desert.





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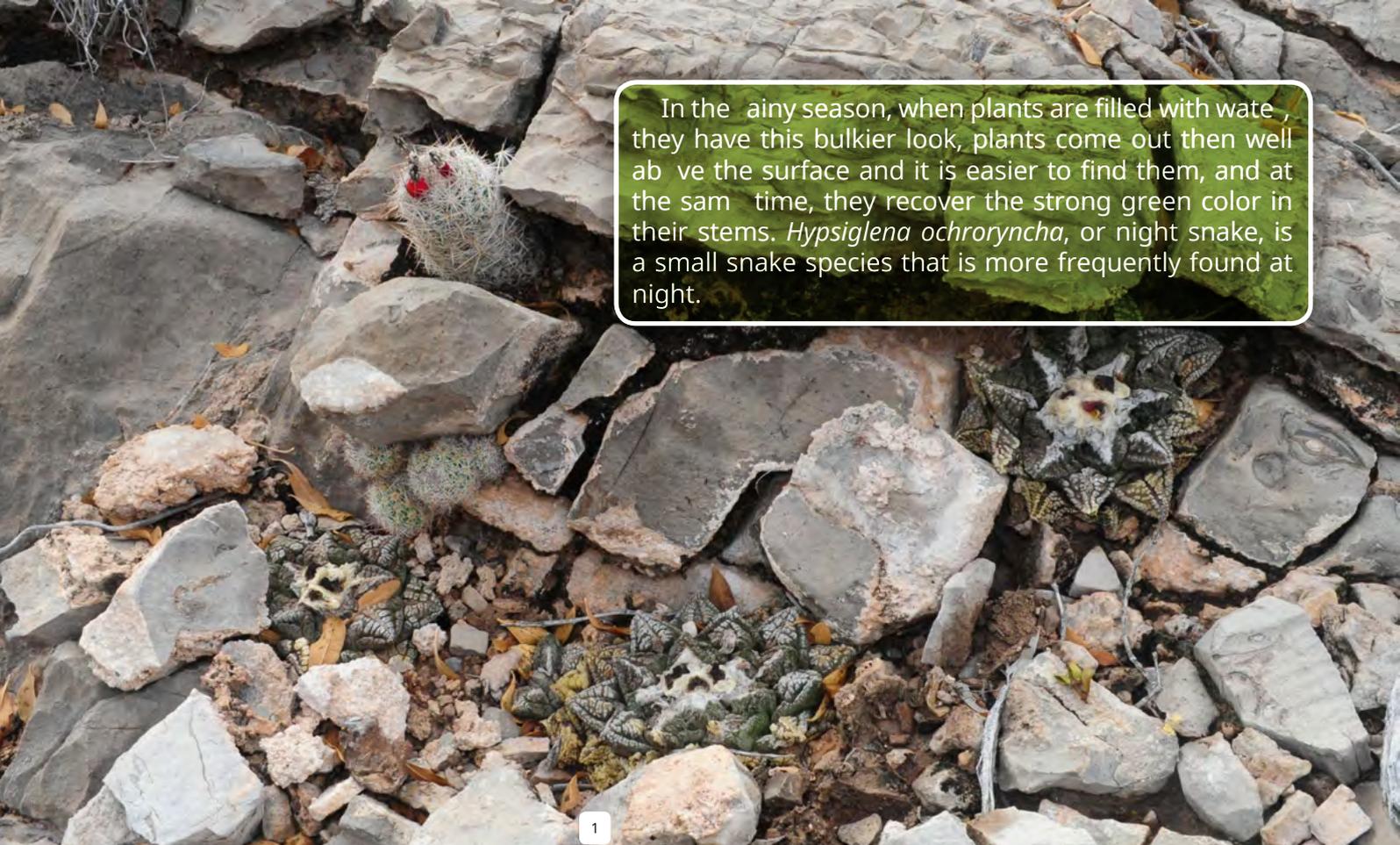
As it is seen in the photos, this species is commonly found on rocky slopes in the mountains, which makes the plants hard to spot, due also to the fact that these plants have a big resemblance to surrounding rocks which sometimes they mimic.

*A. fissuratus* among stones and rocks.



It is not uncommon to see individuals growing in cracks in the big rocks, which makes their shapes a little deform, because they mould the walls that contain them. (Photo: an adult specimen showing enlargement signs of growing due to the narrow space between the rocks)

In the rainy season, when plants are filled with water, they have this bulkier look, plants come out then well above the surface and it is easier to find them, and at the same time, they recover the strong green color in their stems. *Hypsiglena ochroryncha*, or night snake, is a small snake species that is more frequently found at night.



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1 - *A. fissuratus* & *Escobaria tuberculosa*.  
2 & 3 - *A. fissuratus*. 4 - *Hypsiglena ochroryncha*.



4

Summary



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1 & 2 - *A. fissuratus*. 3 - *Lampropeltis splendida*, the desert king snake.



summary →

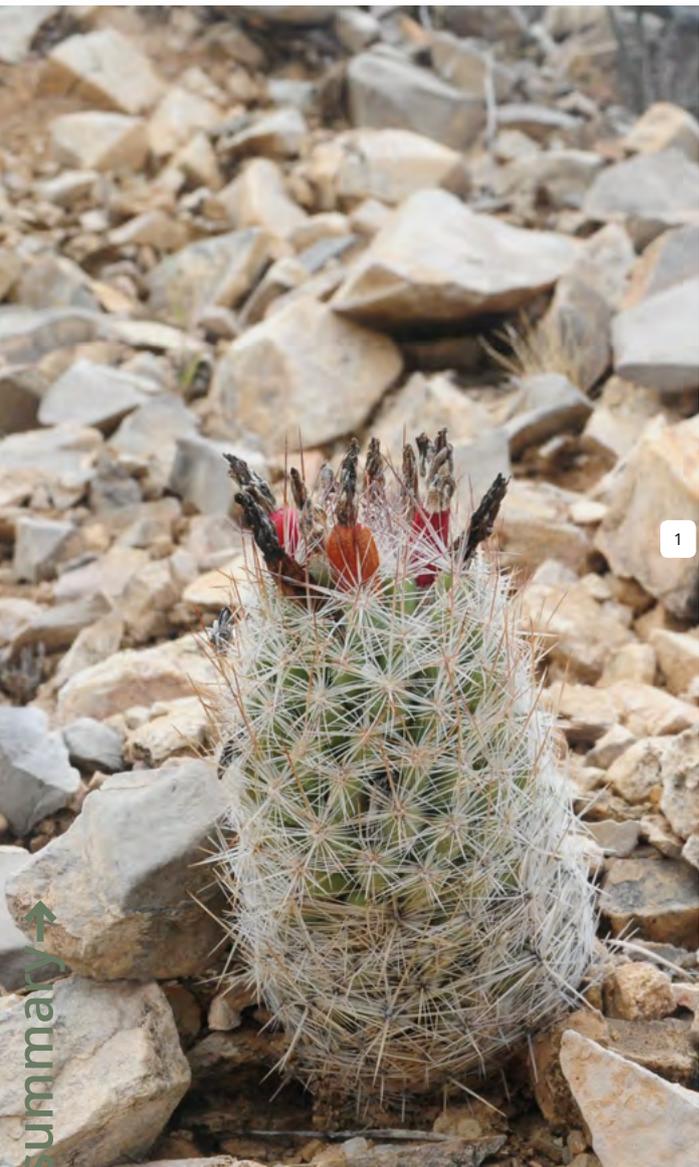
Usually you can see big groups together or multiple headed plants, as well as *A. fissuratus* growing next to other species or genera of cacti, like *Coryphantha* sp.

The flowering season for these northern populations comes in October-November, depending on weather and rain in the region. Flowers have a characteristic magenta pink color.

*Escobaria tuberculosa* and *Mam. pottsii*, are growing in the same site as *A. fissuratus*.



*Ariocarpus fissuratus.*



1-2-*Escobaria tuberculosa.*



*Mammillaria pottsii*

summary ↑



*Echinocereus dasyacanthus.*

Some of the other cacti and succulents that can be found in the same habitat are: *Mammillaria pottsii*, *Escobaria tuberculosa*, *Echinocereus dasyacanthus*, *Echinocereus enneacanthus*, *Thelocactus bicolor*, *Sclerocactus uncinatus*, *Agave lechuguilla*, *Yucca carnerosana* among others and small lizards like this *Phrynosoma modestum*.



*Phrynosoma modestum.*



*Thelocactus bicolor.*



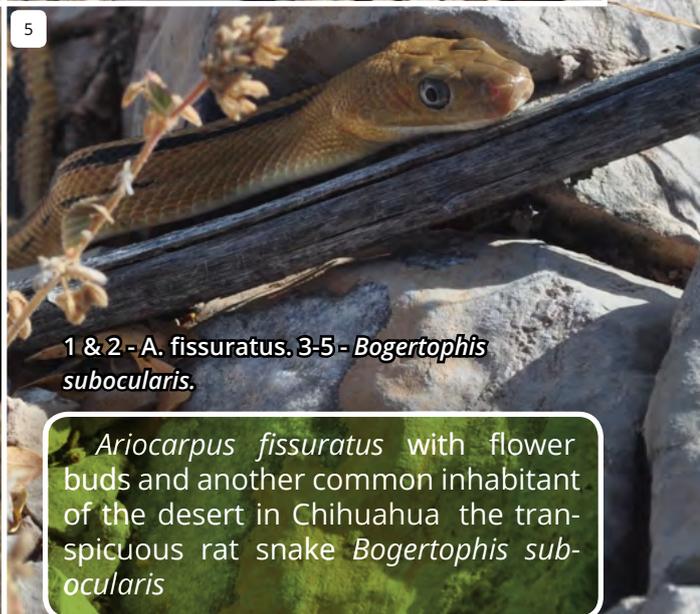
*Escobaria tuberculosa.*



In these photos we can see how well they blend in with their natural environment. In the first photo, the plants are almost imperceptible, hidden in the vegetation and debris; it is not until we take a closer look, that these living rocks come to sight. It is also noteworthy how hard the conditions and weather can be in this habitat, the exposed portion of the plant shows more signs of dehydration and weariness from the sun than that other hidden in the shade portion.



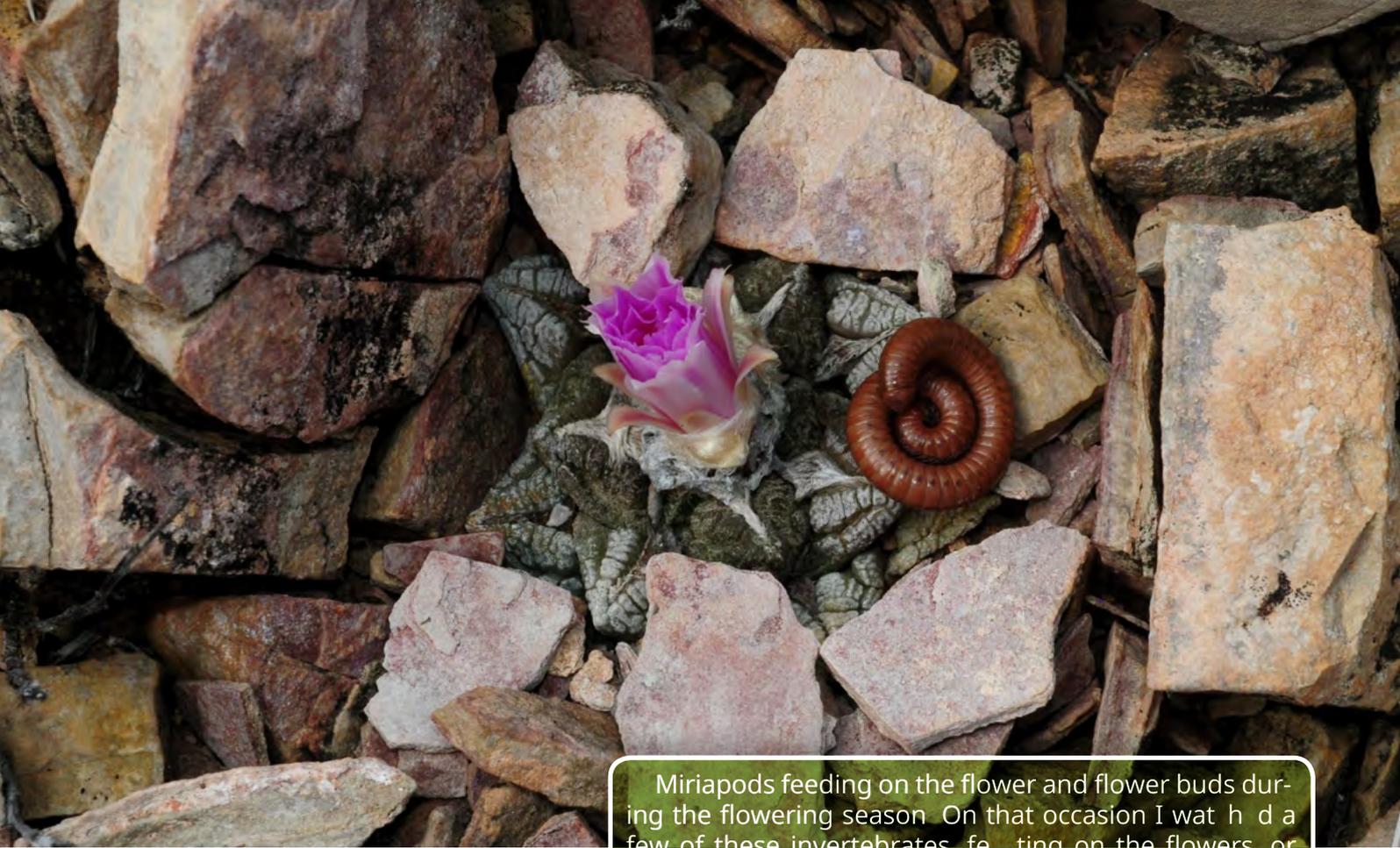
summary →



1 & 2 - *A. fissuratus*. 3-5 - *Bogertophis subocularis*.

*Ariocarpus fissuratus* with flower buds and another common inhabitant of the desert in Chihuahua the translucent rat snake *Bogertophis subocularis*

summary →



Miriapods feeding on the flower and flower buds during the flowering season. On that occasion I watched a few of these invertebrates, feeding on the flowers, or were at least seen near them, which suggests that it is not an isolated event, but happens customarily.



summary



Flowering *Echinocereus stramineus* in the same habitat.



summary



1

1 - Flowering *A. fissuratus* in the cracks, with *Mammillaria pottsii* and *Agave lechuguila* in the back. 2 - *Thelocactus bicolor*. 3 & 4 - *A. fissuratus*.



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4

summary →



*Ariocarpus fissuratus* & *Opuntia microdasys* 'rufida'.



*Crotalus scutulatus* (Mojave rattlesnake).



*Ariocarpus fissuratus*.



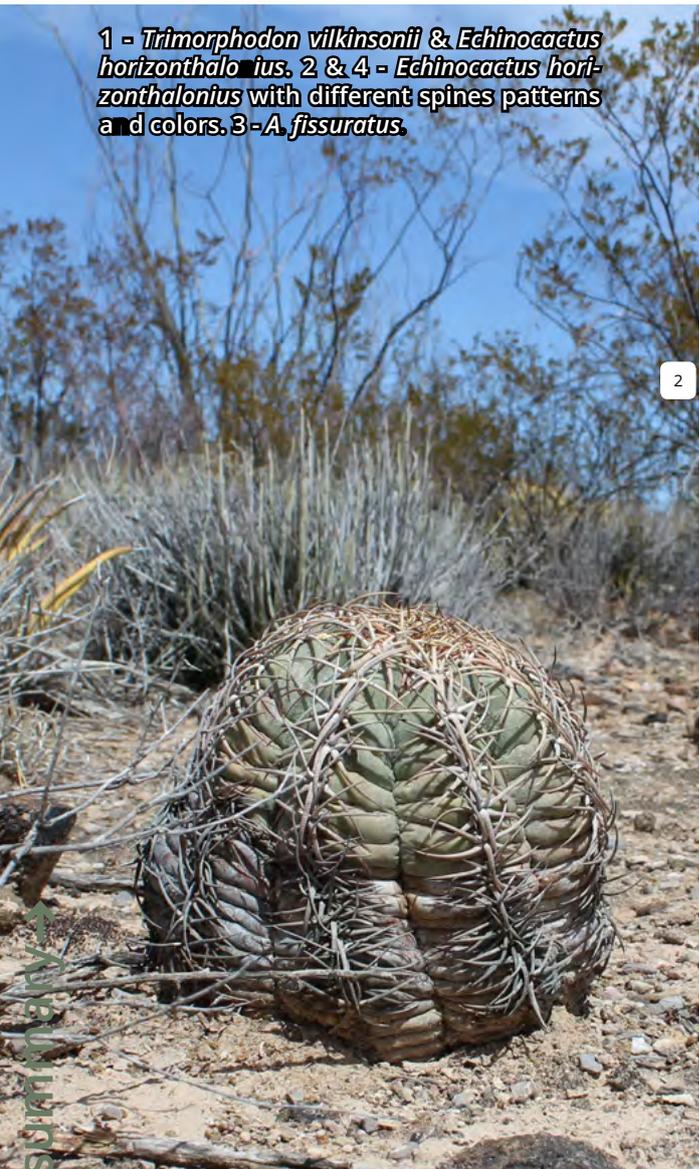
*Opuntia* sp.

summary →



1

1 - *Trimorphodon wilkinsonii* & *Echinocactus horizontalis*. 2 & 4 - *Echinocactus horizontalis* with different spines patterns and colors. 3 - *A. fissuratus*.



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SUMMIT



*Ariocarpus fissuratus.*

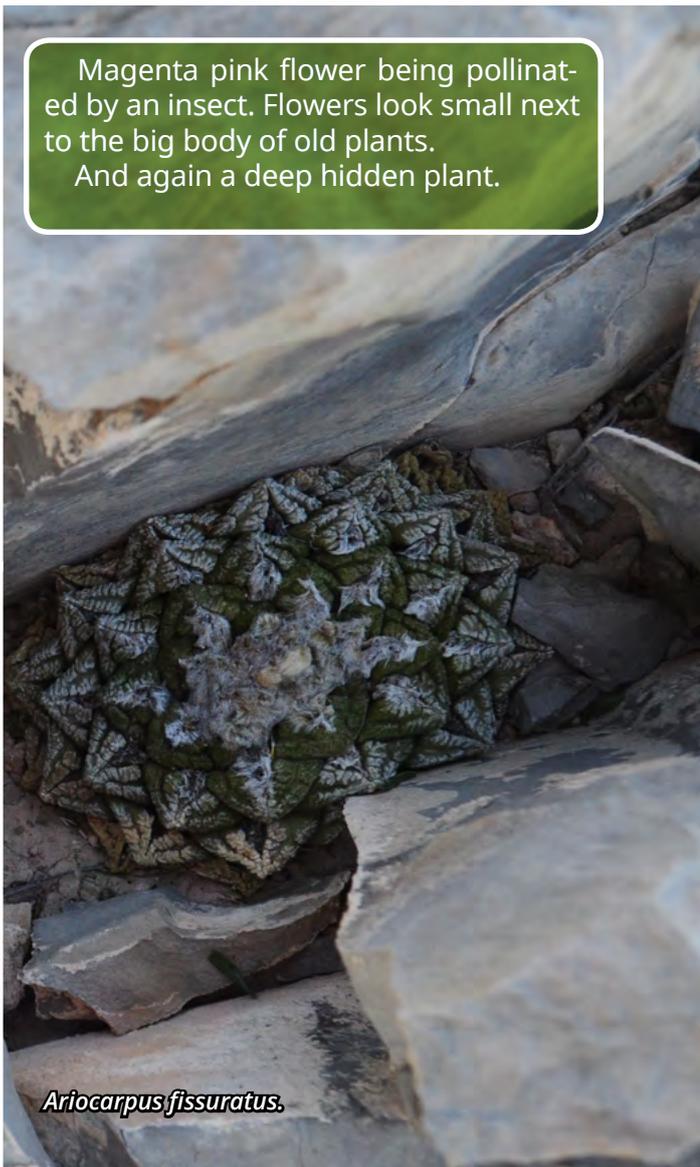
*Crotalus ornatus* (Black-tailed rattlesnake).



Magenta pink flower being pollinated by an insect. Flowers look small next to the big body of old plants. And again a deep hidden plant.



*Ariocarpus fissuratus.*



*Ariocarpus fissuratus.*

summary →

A group of four plants growing in the same crack. Seed dispersal happens in a very local way, one can often see small plants growing around or near the old plants, or various individuals in the same spaces like in the photo

Another black tailed rattlesnake (*Crotalus ornatus*) from the mountains where *A. fissuratus* can also be found.

*Ariocarpus fissuratus*.

*Crotalus ornatus* (Black tailed rattlesnake).



*Ariocarpus fissuratus*.



*Ariocarpus fissuratus*.



*Ariocarpus fissuratus.*

Somet mes local people confuses *A. fissuratus* with Peyote (*Lophophora williamsii*) wh h also grows in the region; some believe they are true peyote and some peop e think it is a different kind of peyote and call them, peyotillo. However I do not know that people regularly ingests *A. fissuratus* for hallucinating purposes.



*Thamnophis marcianus.*



*Ariocarpus fissuratus.*



*Ariocarpus fissuratus.*

summary →



*Selaginella* sp (center photo). Different plants with flower buds about to bloom or that have just withered. More visits are needed to the places where *A. fissuratus* lives. In order to determine its conservation status and rearing range, because they are usually taken from poachers or from people who seldom finds them in the field and considers them to be pretty. More awareness is also required in order to protect them and to keep them for generations to come.



summary →

# Ant-plants

## of Milne Bay Province, Papua New Guinea

part 1

## The Mainland.



Derrick Rowe

**M**ilne Bay Province comprises the tip of the Papuan Peninsula and some 600 islands, atolls and cays. The provincial capital is Alotau Town on the mainland with its airport situated 19.3 k (12 mi) to the west on a sealed road.

After flying from Cairns, North Queensland, Australia, we overnighted at Napatana Lodge, which is within walking distance of Alotau's shops and post office. An Avis rental car base is just meters away but they do not have email!

Napatana Lodge has quiet, secure rooms, ensuite toilets and good food in a pleasant dining room/bar. Yet the only air conditioning is provided by ceiling fans. There are hot showers but that seems superfluous in tropical heat. Staff and service were excellent and they provide pickups from Gurney Airport.

The gardens are very well maintained and a small mob of cute Wallabies roam the grounds during daylight hours. Even here close to the town centre, there are many tropical bird species. I particularly enjoyed the tiny but gorgeous sunbirds

that reminded me of Hummingbirds.

There are plans to introduce more backpacker accommodations with construction to begin soon. This may encourage more visitors because places to stay in Papua New Guinea are vastly overpriced when compared to such popular destinations such as Cairns in nearby Australia.

Perhaps surprisingly, even remote villages had mobile phones, email and even persons with Facebook accounts. Devices and lighting systems were charged using tiny solar power units.

After leaving Alotau a few days were spent in the rustic Hilltop Guest House, a fundraising project for a primary school, run by Breakthrough Mission, near Siasiada Village, almost across the peninsula to the southwest. This is a very new venture; indeed, we were the first guests, so it was something of a learning curve for everyone involved. However, the service was exemplary except that they were too giving. I even had to insist that I pay for having my clothes washed.

The "Bungalows" are perched on a ridge top with excellent views and brisk, cooling daytime breezes, something I found so helpful in the summer heat and high humidity.

summary→





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1- The rustic dining room with a kitchen behind photographed from my bungalow. These hilltops positions provided most welcome breezes during the daytime heat.. 2- This exposed tree right beside my bungalow was festooned with ant-plants and mistletoes.. 3- Napatana Logde.

# ANANA LODGE

Enoch Bulunamur is the mission's eco guide and I heartily recommend him. His wife is the primary school teacher. I gave the kids a little talk about the fascinating ant-plants growing in the mission grounds. Enoch's young son was particularly interested. They are very intelligent people that learn FAST.

The drive there from Alotau with frequent stops took a few hours and was often through immense oil palm plantations but there were areas of 'wild' vegetation left.

Not that much of the rainforest is anywhere near being natural when in reach of any habitation.

And these super fit people rapidly walk long distances! Forests are drastically modified; certainly, slash, burn and the machete rule supreme here.

Yet not a single ant-plant was seen until we arrived at the mission, which is but a few meters uphill from the vast oil palm plantations filling much of the Sagarai River Valley. Indeed, the very first tree I looked at as I got out of our vehicle was loaded with a large myrmecophyte (ant-plant) guild that included *Hydnophytum moseleyanum*, *Lecanopteris sinuosa*, *Myrmecodia platytyrea* subsp *antoinii* and what I have provisionally labelled *M. tuberosa* "Siasuada Village".

summary →



Trees that bordered the rainforest at rear were loaded with myrmecophyte (ant-plant) guilds, as were some of the trees scattered throughout the mission grasslands. Above: Four species may be seen here. Breakthrough Mission, Siasia Village, Sagarai Valley, Milne Bay Province, Papua New Guinea.

## *Myrmecodia tuberosa* Jack.

### An ochlospecies.

Simply put, this species is so widespread and its many populations are so variable that C. R. Huxley & Jebb found it too difficult to fit them into subspecies and/or varieties in their 1993 revision.

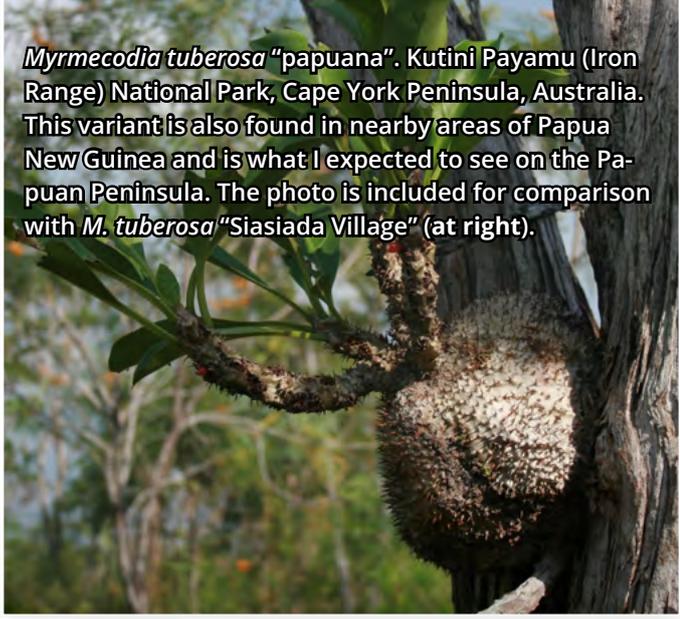
Their concept of *M. tuberosa* and I quote, "is extended here to include the whole variable continuum from Indochina and the Philippines to Australia and the Solomon Islands. This species does not fall readily into discrete, replacing units and should therefore be regarded as an ochlospecies."

They sank many 'names' previously considered to be individual species into *M. tuberosa* but added them as taxonomically unofficial "nicknames" (their word) in a bid to describe these largely in-

discrete populations. However, H&J mostly used the word 'variant' in their revision, something I will now adopt.

For example, the variant found in northern Australia and in nearby areas of New Guinea was named by them as *M. tuberosa* Jack 'papuana' (sic) and is what I expected to find on the Papuan Peninsula. *M. papuana* Becc., was one of the previous individual species mentioned above. Yet what I found in the mission grounds is a 'variant' that seems not to fit any of those populations currently published.

Furthermore, C. R. Huxley & Jebb's use of single quotation marks creates confusion because it implies they are registered horticultural cultivars, which they most certainly are NOT.



*Myrmecodia tuberosa* "papuana". Kutini Payamu (Iron Range) National Park, Cape York Peninsula, Australia. This variant is also found in nearby areas of Papua New Guinea and is what I expected to see on the Papuan Peninsula. The photo is included for comparison with *M. tuberosa* "Siasiada Village" (at right).

*M. tuberosa* "papuana" as I prefer to write it (with double quotation marks) has translucent ruby red fruits and brown very spiny tubers, often with clypeoli, albeit frequently somewhat indistinct ones.

This is very different from the variant I found near Siasiada Village, which has fruits usually of a more orange-red colour and largely spineless, grey tubers with distinct, albeit fine ridges.

Therefore, I prefer to provisionally identify this possibly new variant as,

*M. tuberosa* "Siasiada Village". Indeed, it may not even be a *M. tuberosa* variant.

That H&J used single quotation marks rather than double ones, should not deter from their truly enormous contributions to our knowledge regarding these bizarre plants. Yet it is sad that their ant-plant works rarely reach beyond academia these days. If shown an A4 paper with nothing but a small central black dot. Never forget there is an enormously greater expanse of white to be seen that is often overlooked.



summary →



*Myrmecodia tuberosa* "Siasiada Village".  
Sagarai Valley, Milne Bay Province, Papua New Guinea.  
Note the lack of pedicels (leaf stalks).

summary →



*Myrmecodia tuberosa* "Siasiada Village".  
Note the stellate spines.

*Myrmecodia tuberosa* "Siastada Village".

Detail: Note that some short branches somewhat resemble flower peduncles. Leaves are small and quite xerophytic if not succulent and have unusually short petioles.





1 - *Myrmecodia tuberosa* "Siasiada Village". Again growing pendent and obviously suffering from the El Nino drought that was so evident in late November 2015. The scandent vine above with 'button' leaves is *Dischidia nummularia*. 2 & 3 - *Myrmecodia tuberosa* "Siasiada Valley". Grows in varied positions with its ubiquitous companion *Dischidia nummularia*.



summary →

*Myrmecodia tuberosa* "Siasiada Valley" with *Hydnophytum moseleyanum* and *Myrmecodia platytyrea* subsp. *antoinii*. 2 - *Myrmecodia tuberosa* "Siasiada Valley".



## *Hydnophytum moseleyanum* Becc.

Published in *Malesia Raccolta* 2, p125, (1884- 6)

Synonym, *H. papuanum* Becc., which was also published in *Malesia Raccolta* 2, p124, (1884- 6).

*Hydnophytums* differ from myrmecodias in usually having tubers with smooth, non-spiny surfaces. Nevertheless, there are currently three *Hydnophytum* 'species' with spiny tubers but a future revision will probably merge some of these names.

*Hydnophytum moseleyanum* ant entrances usually measure about 5mm in diameter, but holes situated lower on tubers can be larger and tubers are very frequently ant-occupied.

**Habitats.** Can be high in the canopy of tall rainforest trees, yet this species and other myrmecodomitic (ant-house) species do occur in areas with much lower growing trees such as mangroves or scrubby savannahs on nutrient poor soils. Here plants are often very low perched; even below head height.

**Range.** Currently Australia, New Guinea and its islands including the Admiralty Islands (Manus etc.) that sits near the equator to the north of the PNG mainland. Future lumping (amalgamation) of currently separate species may enlarge this distribution.



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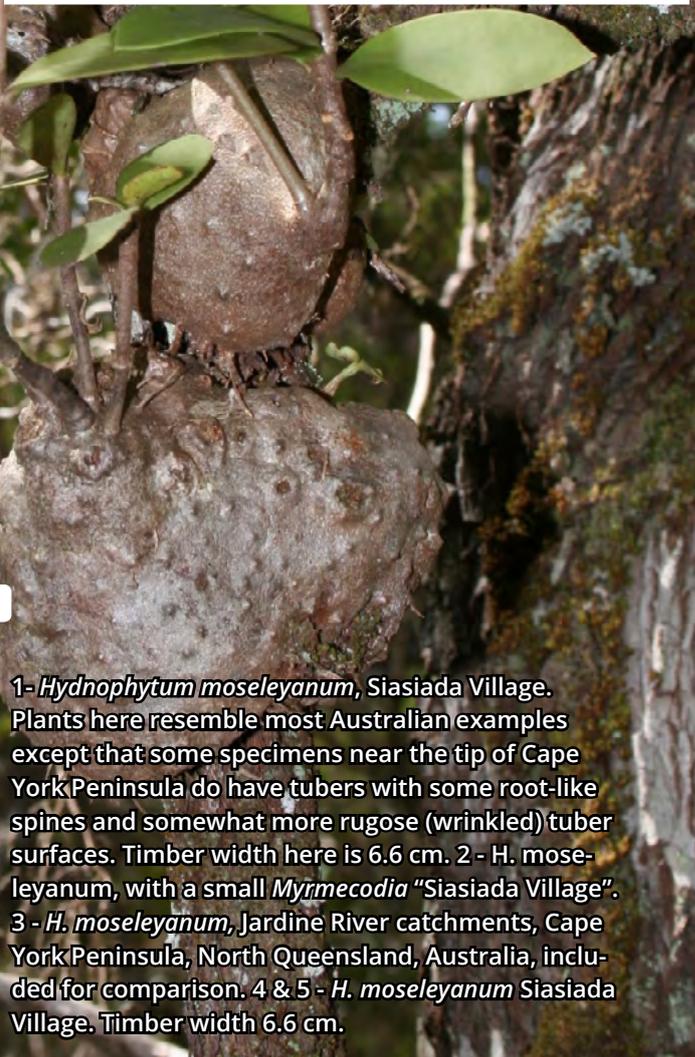


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1- *Hydnophytum moseleyanum*, Siasiada Village. Plants here resemble most Australian examples except that some specimens near the tip of Cape York Peninsula do have tubers with some root-like spines and somewhat more rugose (wrinkled) tuber surfaces. Timber width here is 6.6 cm. 2 - *H. moseleyanum*, with a small *Myrmecodia* "Siasiada Village". 3 - *H. moseleyanum*, Jardine River catchments, Cape York Peninsula, North Queensland, Australia, included for comparison. 4 & 5 - *H. moseleyanum* Siasiada Village. Timber width 6.6 cm.

summary →



*Hydnophytum moseleyanum*, Siasiada Village.  
Accompanied by its frequent companion *Dischidia nummularia* that often sends its roots into ant-plant domatia (it means little homes) to steal moisture and nutrients from decomposing ant debris within.  
Detail: *H. moseleyanum*, Siasiada Village.



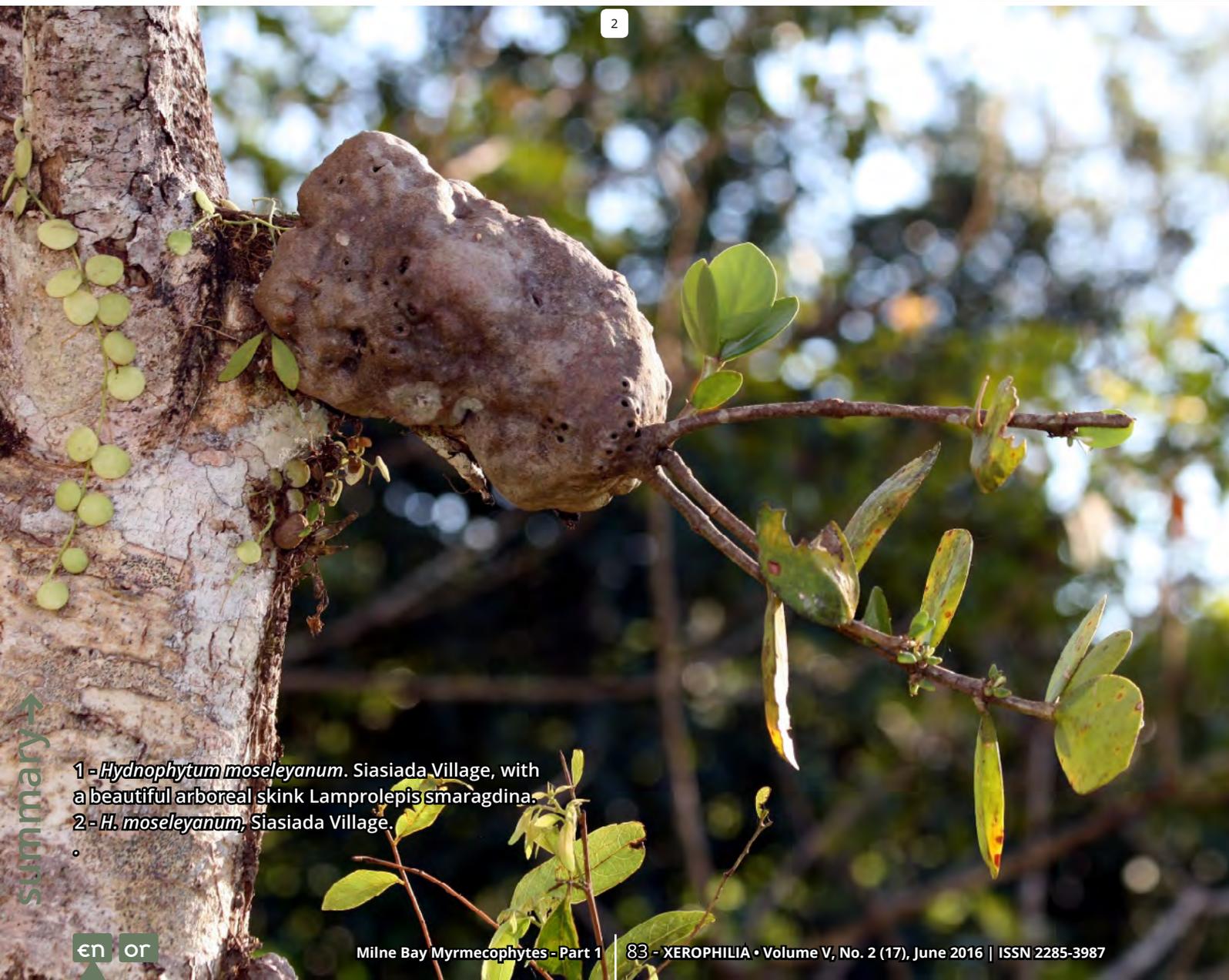
*Hydnophytum moseleyanum*, Siasiada Village, Nov 2015.

summary →

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1 - *Hydnophytum moseleyanum*. Siasiada Village, with a beautiful arboreal skink *Lamprolepis smaragdina*.  
 2 - *H. moseleyanum*, Siasiada Village.

summary →



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1 & 2 - *Hydnophytum moseleyanum*, Siasiada Village. The white coating on many of these ant-plants is probably a lichen. Sagarai Valley, Milne Bay Province, Papua New Guinea. 3 - *H. moseleyanum*, Jardine River catchments, Cape York Peninsula, North Queensland, Australia. Included for comparison.



summary →

***Myrmecodia platytyrea* (Becc.) subsp. *antoinii* (Becc.) C.R.Huxley & Jebb.**

This was published as a new combination by C. R. Huxley & Jebb in *Blumea*, 37, (2) p302, (1993.)

Tuber irregular, globose, grey with mounds having fine spines to 1cm long, pores many, entrance holes few. Stems few, clypeola ± isodiametric, spines again to 1 cm. Leaves are wider in their upper half in this subspecies according to C. R. Huxley & Jebb.

**Habitat/Range.** On the New Guinea mainland, this subspecies occupies the seasonally much drier (rain shadowed) south and east of the species range. Often it is low-perched, especially in scrubby savannahs on poor soils, but it is a high-perched epiphyte in rainforest on Cape Vogel on the north coast of the Papuan Peninsula, Milne Bay Province, Papua New Guinea.

In North Queensland, Australia, preference is for somewhat coastal (but not littoral) & hill savannahs to about 600 m. (1969 ft.) altitude. It occurs in isolated communities from Torres Strait islands and the tip of Cape York Peninsula, to as far south as popular Mossman Gorge in Daintree National Park, 80k north of Cairns. It also occurs at other

sites in Daintree National Park, sometimes perched on rocks. The population at tourist popular Mossman Gorge, is unusual for its multi branched habit and for it being perched high in canopied rainforest in Australia's Wet Tropics Zone, where competition from faster growing leafier epiphytes and lianas is surely acute. Many thousands of tourists from all over the world are usually oblivious to its unique presence in the canopy.

**Records.** Papua New Guinea, Central Province, Hombrom Bluff. Western Province, Daru Island and Tarara, Gulf Province, Maipenairu. Milne Bay Province, Cape Vogel and now the Sagarai Valley.

Australian collections have been made on Saibai, Horn & Thursday Islands in Torres Strait. On Cape York Peninsula, it is reported from Bamaga and Newcastle Bay (3 km south of Somerset) near the tip of the peninsula. To the south bordering beautiful creeks flowing into the Jardine River where it is very low growing as it often is further south on the east coast at Kutini Payamu (Iron Range) National Park and further south again at Scrubby Creek, Cook District. There is a record from Kuranda above Cairns but I have never located any there.



*Myrmecodia platytyrea* subsp. *antoinii* Siasiada Village.



*M. platytyrea* subsp. *antoinii* Siasiada Village. Note leaves are wider in their upper halves.



*M. platytyrea* subsp. *antoinii* Siasiada Village. Note leaves are wider in their upper halves.



*M. platytyrea* subsp. *antoinii* Siasiada Village. Note the prominent rows of spine rimmed clypeoli (leaf insertion scales) along stems.

summary →

## *Lecanopteris* Reinw.

Published in Flora oder Botanische Zeitung: welche Recensionen, Abhandlungen, Aufsätze, Neuigkeiten und Nachrichten, die Botanik betreffend, enthält /herausgegeben von der Königl. Botanischen Gesellschaft in Regensburg. (2, Beil.) p48. (1825.) (Flora) p48.

**Basionym** *Onychium carnosum* Reinw. in Sylloge Plantarum Novarum 2, pp2/3 (1825). [http://reader.digitale-sammlungen.de/en/fs3/object/display/bsb10303603\\_00010.html](http://reader.digitale-sammlungen.de/en/fs3/object/display/bsb10303603_00010.html).

**Type** *Lecanopteris carnososa* (Reinw.) Blume (Carl Ludwig von Blume) published in Enumeratio Plantarum Javae (1828.) <http://www.biodiversitylibrary.org/page/31162953#page/154/mode/1up>.

This genus is yet another of the widespread, innovative and often epiphytic *Polypodiaceae* fern family. Currently there are 18 names but only 13 generally accepted species.

**Habit:** *Lecanopteris* range from having only slightly thickened and rather lengthy rhizomes (*L. sinuosa*) to having enlarged, convoluted and compactly intertwined rhizome masses. Indeed, some *Lecanopteris* rhizomes trend toward the highly complex chamber and tunnel systems of *Rubiaceae*, sub-family Hydnophytinae - [LINK](#)

*Lecanopteris sinuosa* (Wall. ex Hook.) Copel. (Edwin Bingham Copeland) published in University of California Publications in Botany 12, p123, (1929.) Basionym *Polypodium sinuosum* Nathaniel Wallich ex Sir William Jackson Hooker in Species Filicum 5, p61, plate 284, (1864.) See plate CCLXXXIV - [LINK](#)

**Synonyms:** *Myrmecopteris sinuosa* (Wall. ex Hook.) Rodolfo Emilio Giuseppe Pichi Sermolli published in Webbia 31, (1) p240, (1977.) *Myrmecophila sinuosa* (Wall, ex Hook.) Nakai ex Ito, in J. Jap. Bot. 11: 98 (1935). *Pleopeltis sinuosa* (Wall, ex Hook.) Beddome, Ferns of British India pi. 8 (1865) & Alderw. In Bull. Dept. Agric. Ind. Neerl. 27, p3, (1909). *Phymatodes sinuosa* (Wall. x Hook.) J. Sm. (John Smith) in Ferns British and Foreign, 2nd ed., p296 (1877.)

**Habit:** This species has the most complex domatium (ant home) organisation of all sub genus *Myrmecopteris* species. Hollow, usually elongated and densely scaled rhizomes are equipped with many hollow phyllopodia chambers. Such rhizomes create rather more loosely interconnected ant homes than do those of its congeners. Its growth system is very adaptable and plants are able to spread over large areas of host trees, thereby creating suitable habits for other myrmecophytes.

**Description:** Rhizomes 1-2 cm Ø, are mostly hollow and spread along and around branches, they are little to very branched and usually thickly covered with round, 1- 2 mm Ø, dark-centred peltate scales with translucent edges. The usually stronger growth of rhizome apexes mainly subdues lateral branching; indeed, to the greatest amount found in the entire genus, thus rhizomes can reach much longer lengths than those of congeners. Occa-



sional side branches are mostly separated from each other and each has a narrow connection to its main shoot. Nevertheless, both condensed and expanded growth forms occur in nature.

A main tunnel runs the length of both main and side rhizomes with many tiny dorsal phyllopodium chambers opening off it; however, 1- 2 cm of a rhizome's apex is solid meristem. Main tunnels measure 5-8 mm wide, but are only 2- 4 mm high with walls about 2 mm thick; hence, they are mostly cavity. Phyllopodia are cone-shaped, hollow, and protrude to heights of 1-1.5 cm and it is here that both ant larvae and ant debris will collect.

Stipes are brown to green and 3- 8 cm long. Leaves are mid to pale bright green, not lobed and sometimes slightly crenate (having a scalloped or notched edge), especially if fertile, bases are winged, glabrous, 2- 3 x 15- 30 cm, leathery, of one form, apex rounded; veins forming a series of large areoles with a branching recurrent vein. Sori sunken, round or rarely oval, in single rows on leaf blades on either side of rachis, 3-5 mm Ø, and forming projections on dorsal leaf blade surfaces. Sporangia c. 300 µm long with biconvex spores. (Gay 1993b.) (Gay et al. 1994.) A New Guinea form has a glabrous (smooth) rhizome.

**Range.** It is the most widespread *Lecanopteris* species being found not only throughout the Malesian floristic zone, but as far northeast as southern Taiwan, and as far south east as North Queensland, Australia, as well as on islands of the Solomon and Vanuatu archipelagos in the south-west Pacific Ocean. Within Malesia, it is reported from Peninsular Malaysia and the islands of Borneo, (sometimes in seasonally very arid sites), Sumatra, Moluccas, Sulawesi, Philippines and New Guinea, where it forms more or less distinct races on each of the major landmasses, one of which is currently recognised by some as a separate species *L. philippinensis*.

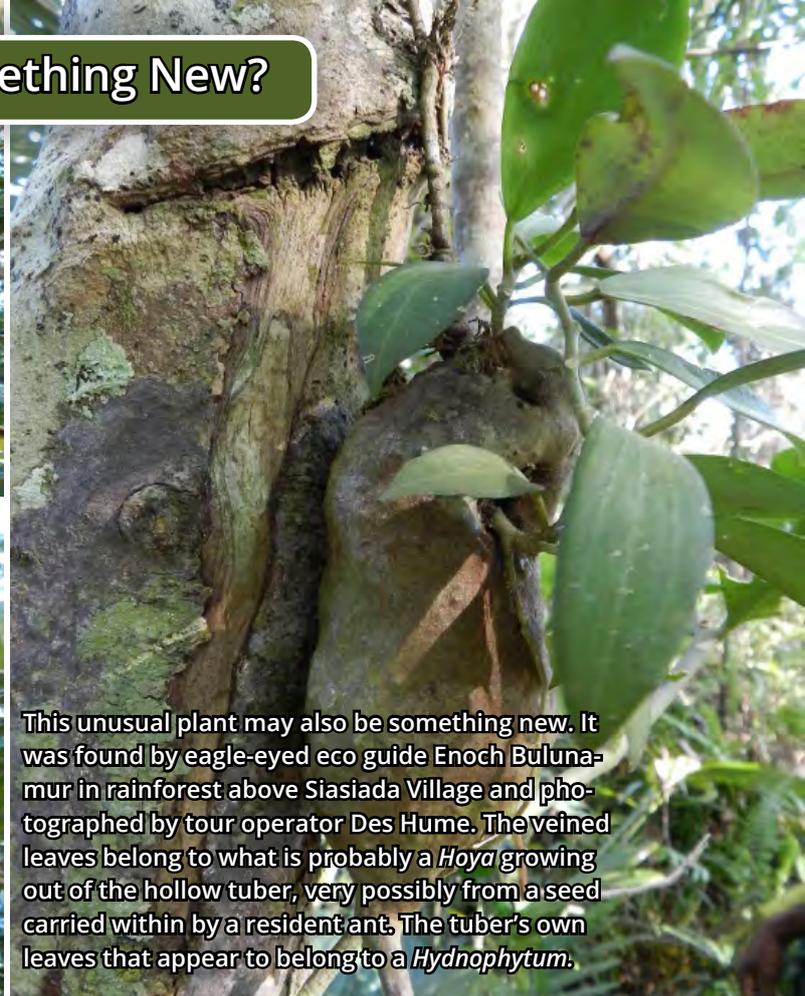


*Myrmecophyte* guilds. Orchids and ferns also gain survival benefits from nearby ants and their ant-plant homes.]

summary →

en or

## Is This Something New?



This unusual plant may also be something new. It was found by eagle-eyed eco guide Enoch Bulunamur in rainforest above Siasida Village and photographed by tour operator Des Hume. The veined leaves belong to what is probably a *Hoya* growing out of the hollow tuber, very possibly from a seed carried within by a resident ant. The tuber's own leaves that appear to belong to a *Hydnophytum*.

### References, further reading and contacts

- This previous xerophilia article is worth re-reading for its background information.
- <http://xerophilia.ro/wp-content/uploads/2014/02/epiphytic-myrmecophytes-revised.pdf>
- This article starting on page 54 provides an overview of the fascinating survival strategies of ant-plants [http://www.cactusexplorers.org.uk/Explorer5/Cactus%20Explorer%205\\_complete.pdf](http://www.cactusexplorers.org.uk/Explorer5/Cactus%20Explorer%205_complete.pdf)
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- Huxley, C. R; Jebb, M. H. P. 1993. The tuberous epiphytes of the Rubiaceae 5. A revision of *Myrmecodia*. *Blumea*, 37, pp271- 334. <http://www.repository.naturalis.nl/document/565633>
- Des Hume, Gondwana Connection Wildlife Tours [www.gondconnect.com.au](http://www.gondconnect.com.au).
- Enoch Bulunamur is a highly respected eco guide who now adds both mainland and island ant-plants to his extensive knowledge of the regions nature. He is based at the Breakthrough Mission, Siasida Village, home of Hilltop Bungalows (village stays) and numerous epiphytic ant-plants.
- <http://www.gondconnect.com.au/index.asp?pagename=milne+bay+contacts>
- The provincial capital is Alotau on the mainland. <https://en.wikipedia.org/wiki/Alotau>
- A guide to Milne Bay Province. <http://www.papuanewguinea.travel/MilneBay>
- A special thanks to Dr Andreas Wistuba, Germany; Aurelien Bour of the Nancy Botanical Gardens, France and Frank Omilian, USA, for invaluable corrections and advice.

# Notes on species at risk

# *Echinocereus palmeri* Britton & Rose



Aaron González Márquez

Habitat of *Echinocereus palmeri*.

summary →  
**A**t the present time the study of the wealth for the floristic and phytogenetic ecosystems is vital in order to improve the level of protection of our resources; its contribution to the knowledge of the species that are susceptible to disappear is of great importance for the conservation of biodiversity.

Although we are aware that there are aggravating factors that disrupt the perpetuity of some species, such as the introduction of exotic

species, overgrazing, urban sprawl, industrial concessions or illegal extraction of specimens, which occur in extremely important regions for the development of natural populations, there is no certainty that really is taking the subject of conservation by a right path.

The state of Chihuahua is located north of México; its territory consists of 24 million hectares, which has been studied only about 5% (Melgoza et al., 2012). There have been registered approximately 4,000 plant species of which only 59 are registered in the Nom-059-SEMARNAT 2010 (Royo et al., 2014).





*Echinocereus palmeri* Britton & Rose.



*Echinocereus palmeri*.

One of these species is *Echinocereus palmeri* Britton & Rose which, unfortunately, is registered under the "Endangered Species" status. Its habitat has been reduced to such a degree that if immediate protection measures are not implemented, the risk to disappear completely is devastating.

summary →



1-3 - *Echinocereus palmeri*.

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summary →

en or



*Echinocereus palmeri.*

summary →



*Echinocereus palmeri.*

Commonly solitary or branched stem can measure up to 18cm in height, blooms from April to July the flowers can be large, up to 12cm in diameter which open only one day, color being purple, pink or magenta, providing one of the most impressive flower shows when referring to cacti.



*Echinocereus palmeri.*

summary →



*Echinocereus palmeri.*

Habitat of *Echinocereus palmeri.*



Distributed to the foothills of the Sierra Madre Occidental in the states of Chihuahua, Durango and Zacatecas, in the latter it occurs the ssp. *mazapil* H.M. Hern. & Gómez-Hin.

summary →



Habitat of *Echinocereus palmeri*.



*Echinocereus palmeri*.

summary →



It grows between igneous rocks in the woods with *Quercus* and *Quercus-Pinus* forests, in the moderate arborescent grasslands, which represents the transition between grassland and oak forest and in the medium of open grassland, and open tillering grasslands (Estrada et al, 2010), but it has been adapted to microphyllous

desert scrub, from 1400 to 2200 meters. By having this capacity for adaptation to the fragmentation of their habitat, it indicates levels of degradation that local ecosystems suffered, plant succession affected by deforestation, opening land for grazing and other anthropogenic impact

1



1-2 - *Quercus emoryi*. 3 - *Echinocereus palmeri*.

2



3

Summary



1 - *Bouteloua gracilis*. 2 - *Bouteloua curtipendula*.  
3 - *Quercus chihuahuensis*. 4 - *Lycurus phleoides*. 5 -  
*Quercus chihuahuensis*.

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4

It associates with species like *Chondrosium gracile* Kunth, *Bouteloua cutipendula* (Michx.) Torr, *Heteropogon contortus* (L.) P Beauv. ex Roem & Schult., *Quercus chihuahuensis* Trel, *Q. emoryi* Torr., *Q. arizonica* Sarg., *Pinus cembroides* Zucc., and can be seen along with other cactus species such as *Echinocereus coccineus* Engelm., *Mammillaria heyderi* Muehlenpf., *Mammillaria viridiflora* (Britton & Rose) Boed., *Echinocereus pectinatus* Engelm., *Coryphantha robustispina* (Schott ex Engelm.) Britton & Rose and *Coryphantha compacta* Engelm.

5



summary →



*Echinocereus palmeri.*

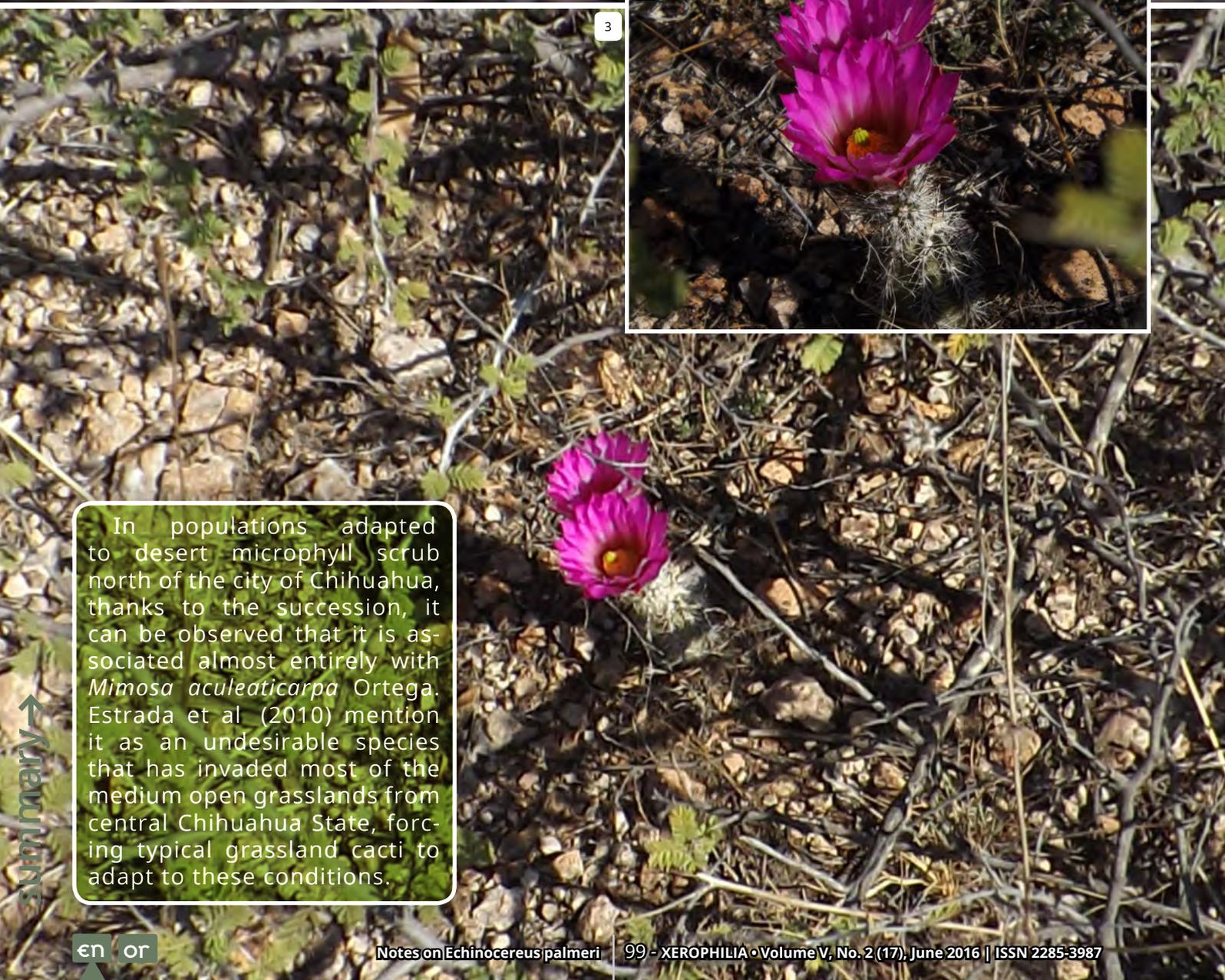


1 - *Mimosa aculeaticarpa* var. *biuncifera*. 2 - *Echinocereus palmeri*. 3 - *Echinocereus palmeri* & *Mimosa aculeaticarpa* var. *biuncifera*.

1

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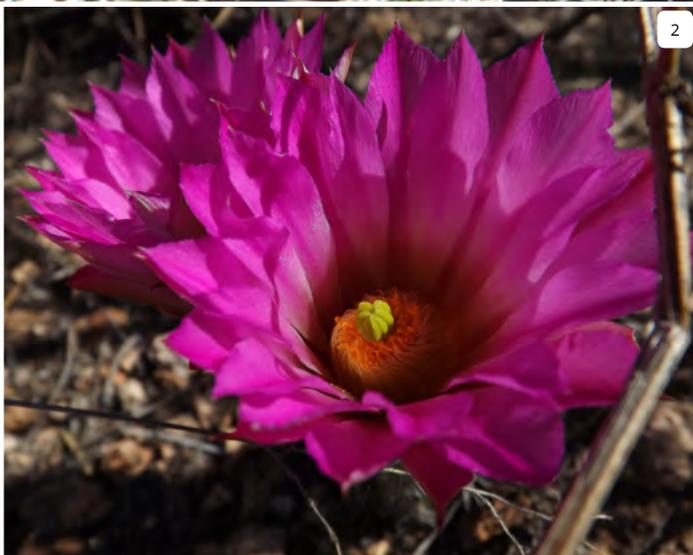
In populations adapted to desert microphyll scrub north of the city of Chihuahua, thanks to the succession, it can be observed that it is associated almost entirely with *Mimosa aculeaticarpa* Ortega. Estrada et al (2010) mention it as an undesirable species that has invaded most of the medium open grasslands from central Chihuahua State, forcing typical grassland cacti to adapt to these conditions.

summary →



1-3 - *Echinocereus palmeri*.

1

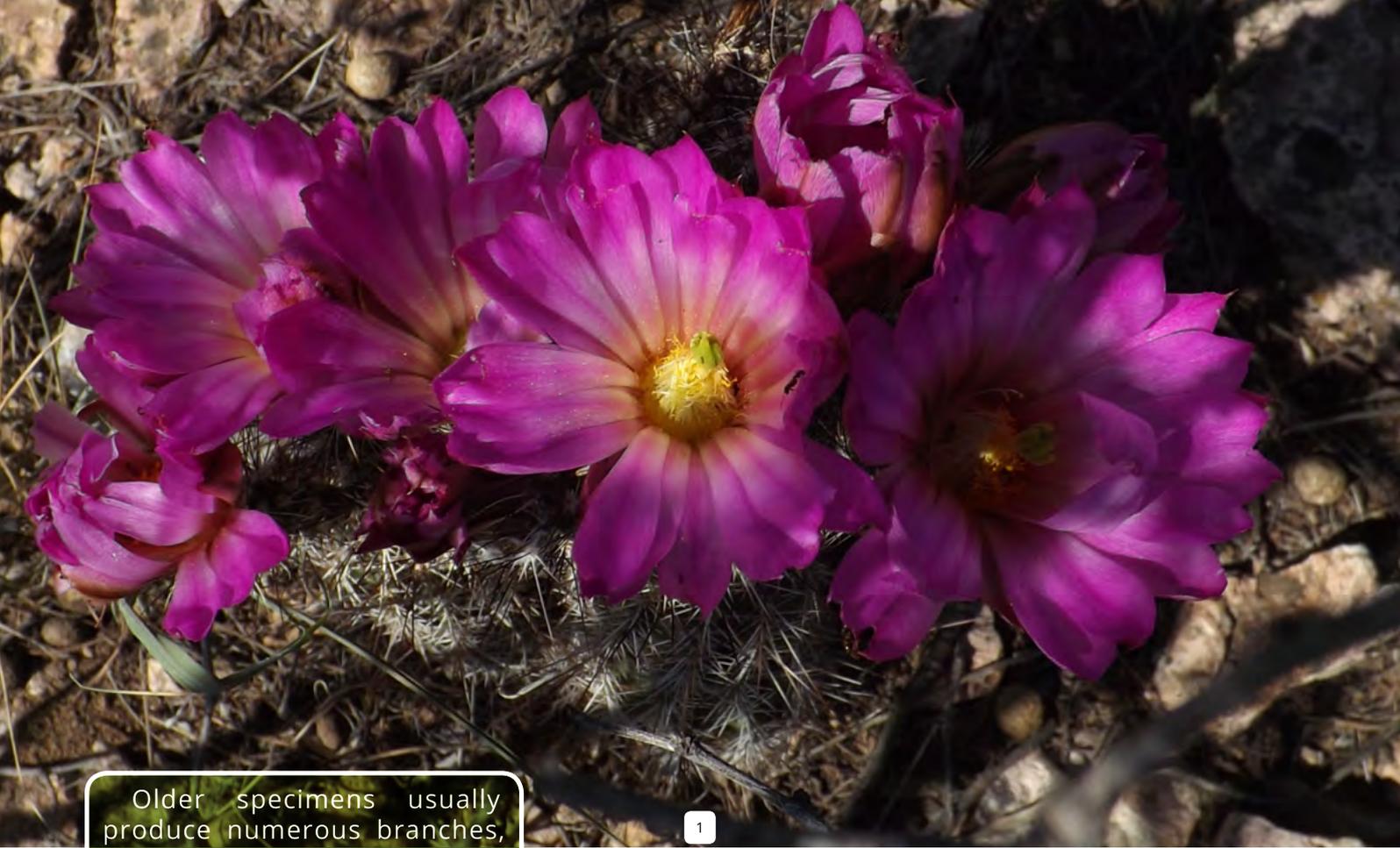


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summary

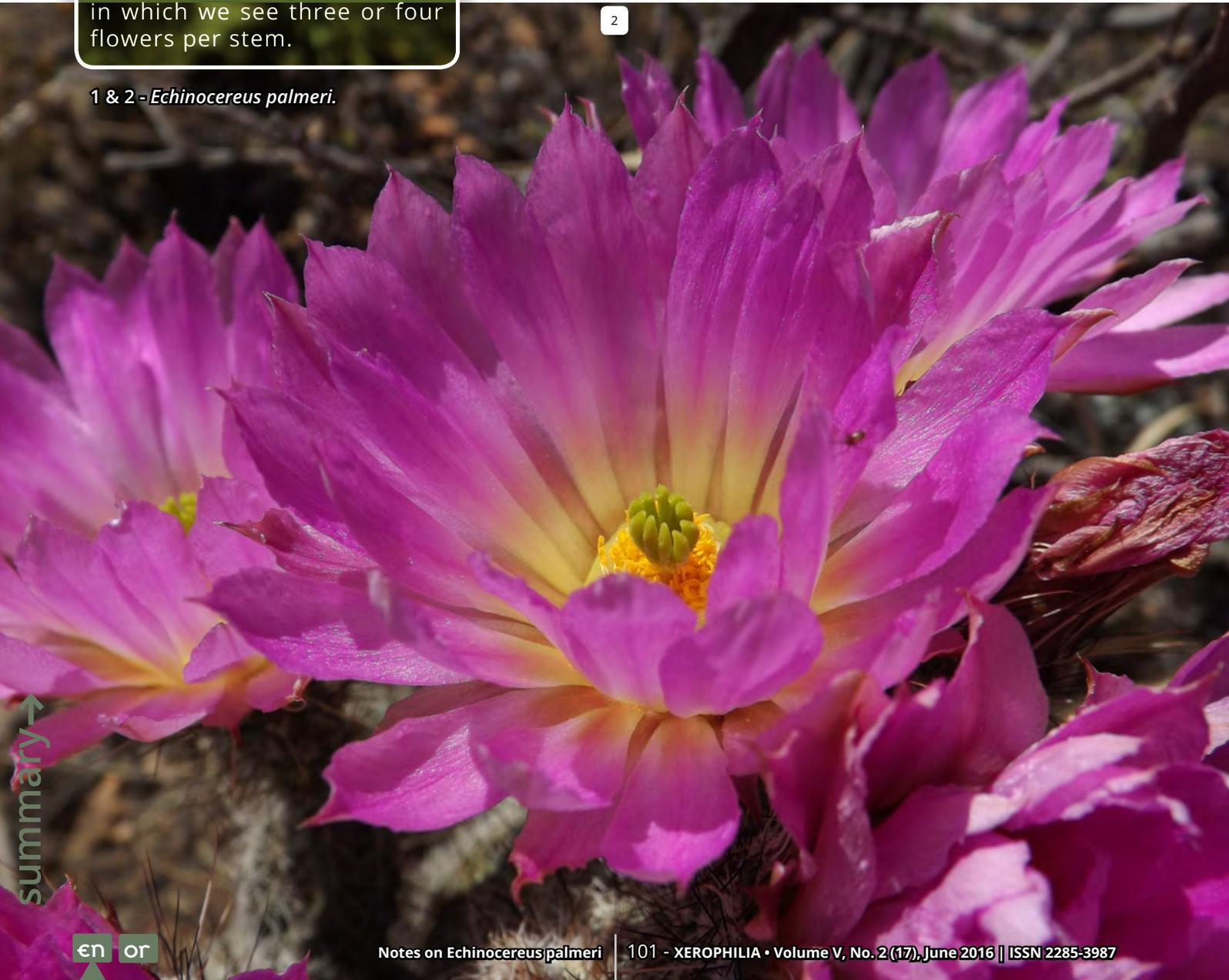


Older specimens usually produce numerous branches, in which we see three or four flowers per stem.

1

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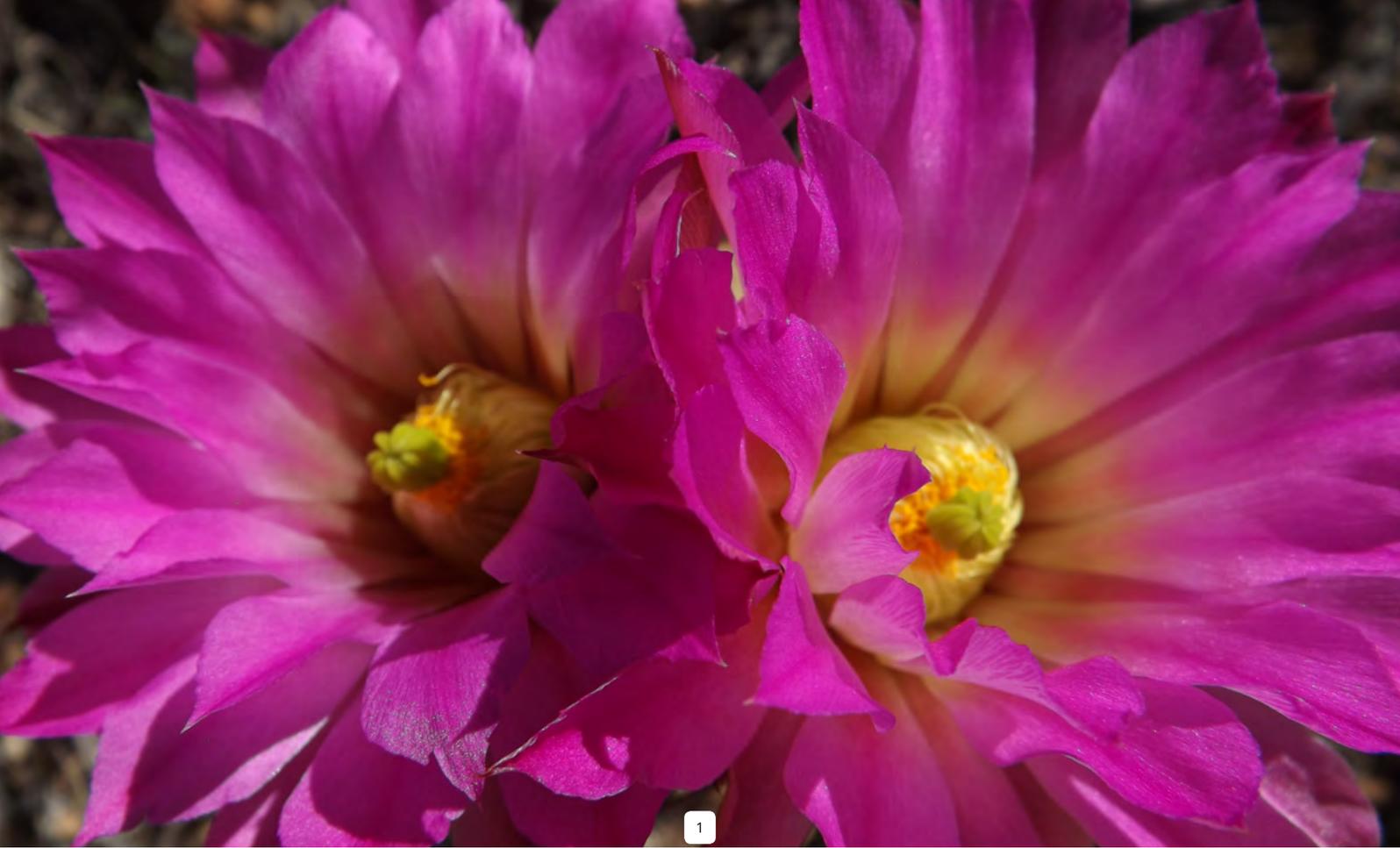
1 & 2 - *Echinocereus palmeri*.



summary →

*Echinocereus palmeri* Britton & Rose is very slow growing, they reach reproductive maturity though a very small plant, less than 2cm high, the perianth of the flower can grow to 5 times more than the same plant, I have observed individuals who do not support the weight of the flower bud bending to reach the ground

*Echinocereus palmeri.*



1



2

1 & 2 - *Echinocereus palmeri*.

summary →

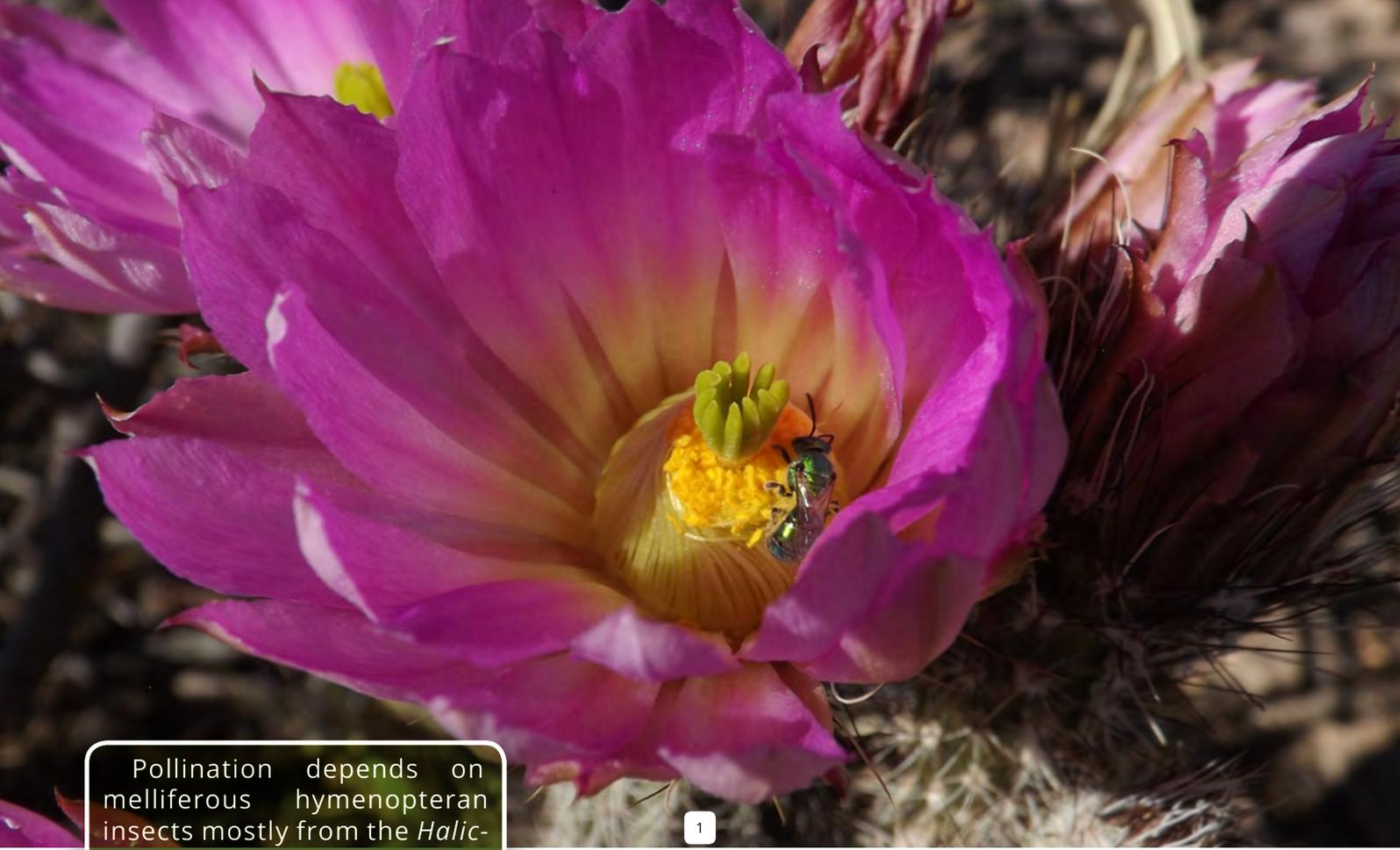
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*Echinocereus palmeri.*

It flowers following the course of the sun. As the sun reaches its highest point flowers are fully open.

summary→



1

2

Pollination depends on melliferous hymenopteran insects mostly from the *Halictidae*, *Apidae* and *Formicidae* families emphasizing the biotic relationship holding the survival of the species.

1 - *Echinocereus palmeri* & *Colletes* sp.. 2 - *Echinocereus palmeri* & *Agapostes* sp..

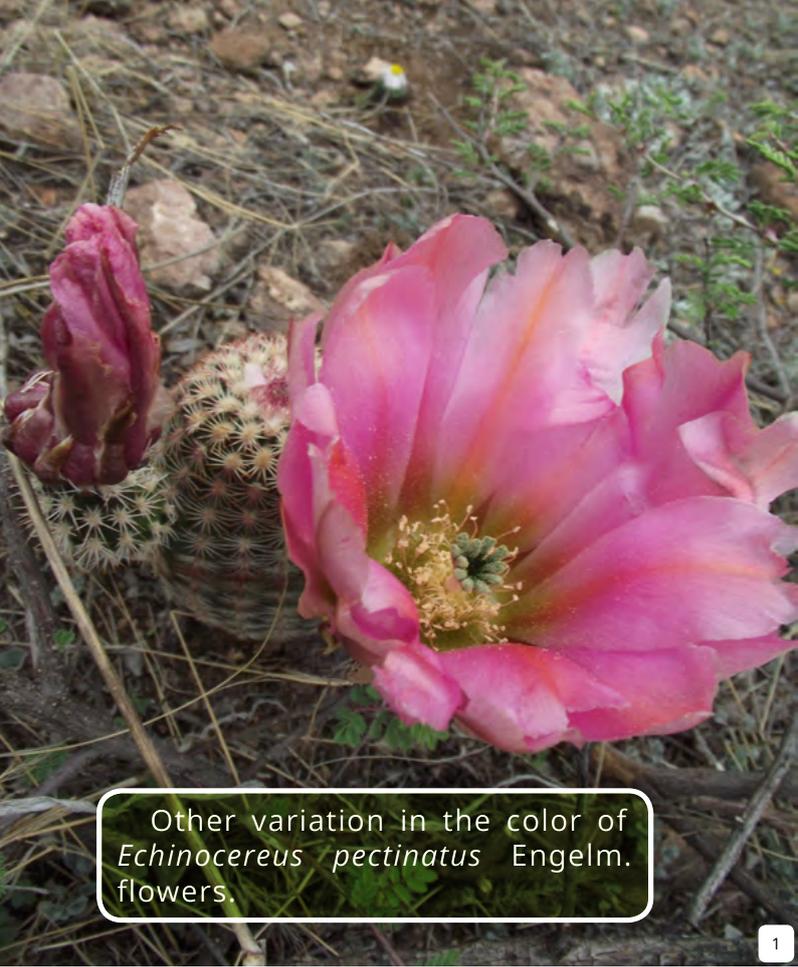
summary →

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*Echinocereus pectinatus* Engelm., common in the low hills with scrub and grassland areas, widely coexists with *Echinocereus palmeri* Britton & Rose., In several areas of the state of Chihuahua

*Echinocereus pectinatus.*





Other variation in the color of *Echinocereus pectinatus* Engelm. flowers.

1 2



3

1 & 2 - *Echinocereus pectinatus*. 3 - *Echinocereus coccineus*.

*Echinocereus coccineus* Engelm., is a species that lives in the forests of *Quercus*, at higher altitudes to 1650 m in the upper parts of watersheds of Sacramento and Chusviscar.



summary

It also coexists with other endemic species in the region, with large fitogenetic, ecological and cultural value such as *Escobaria chihuahuensis* Britton & Rose and *Escobaria sneedii* Britton & Rose in the city of Chihuahua, and *Echinocereus adustus* Engelm. in Cusiuhiriachi (Lebgue & Quintana 2013).



*Escobaria sneedii*.

*Escobaria chihuahuensis* & *Echinocereus pectinatus*.



*Escobaria chihuahuensis* Britton & Rose, endemic to the central region of the state of Chihuahua, present in only 3 of the 67 municipalities. Populations have been surrounded by the growing urbanization as *Echinocereus palmeri* Britton & Rose habitat is shrinking and the conservation of this bio-cultural heritage is not granted.

1



2

1 & 2 - *Escobaria chihuahuensis*.

SUMMARY  
ARTICULOS



1 2  
3



1 - *Mammillaria heyderi*. 2 - *Mammillaria heyderi* & *Echinocereus palmeri*. 3 - *Mammillaria heyderi*.

*Mammillaria heyderi* Muehlenpf., the central plateau of Chihuahua state is the meeting place for this species with *E. palmeri*, this mammillaria presents a coastal habit (riparian) It is uncommon to find together in one place, even so there are small geographical areas in which you can see the two coexisting.

summary



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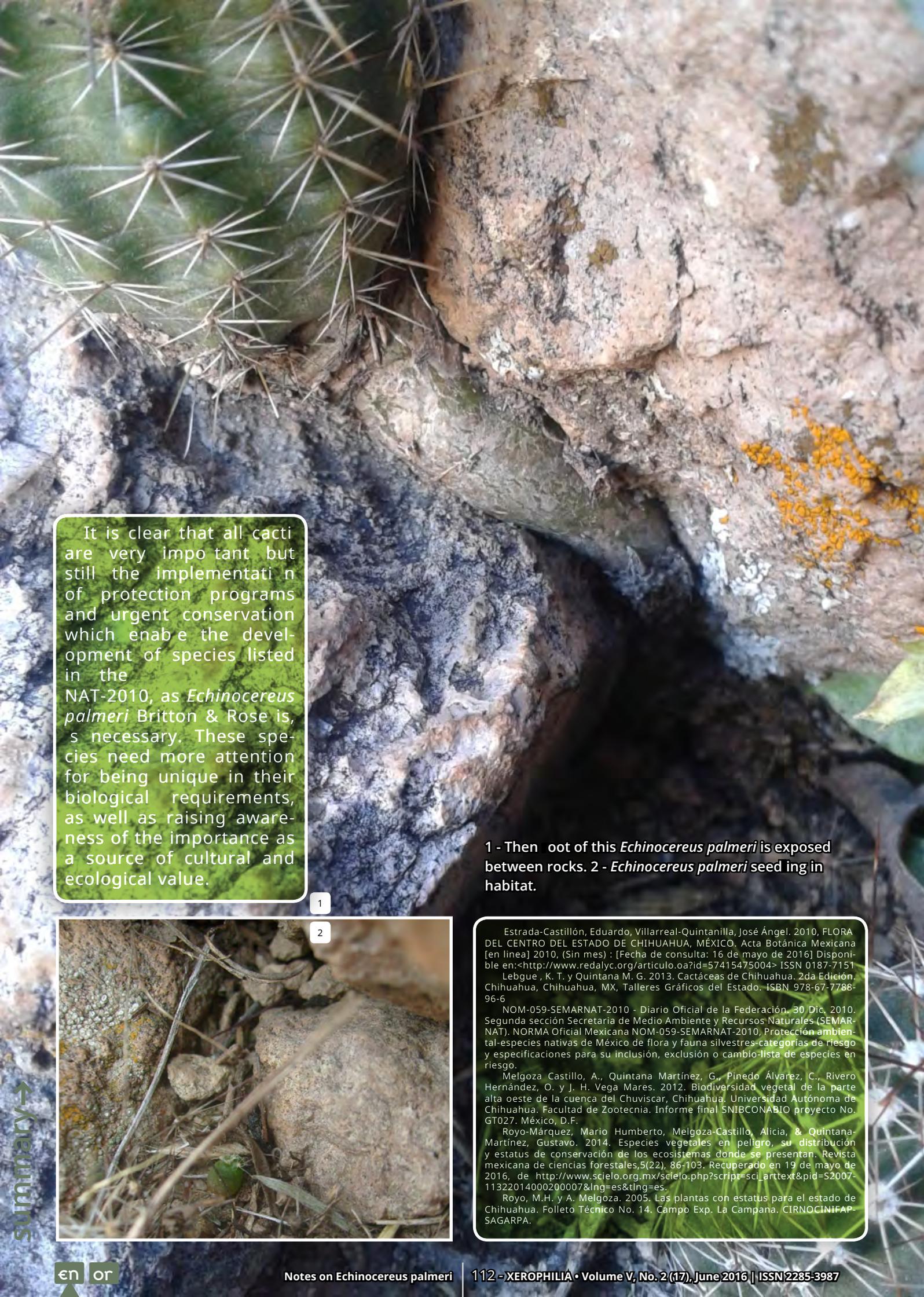
3

1 & 2 - *Coryphantha robustispina* (Schott ex Engelm.) Britton & Rose. 3 - *Mammillaria viridiflora*.



*Mammillaria viridiflora* (Britton & Rose) Boed., common species in upland areas in forests of *Quercus* and *Pinus-Quercus*.

summary →



It is clear that all cacti are very important but still the implementation of protection programs and urgent conservation which enable the development of species listed in the NAT-2010, as *Echinocereus palmeri* Britton & Rose is, is necessary. These species need more attention for being unique in their biological requirements, as well as raising awareness of the importance as a source of cultural and ecological value.

1

1 - Then root of this *Echinocereus palmeri* is exposed between rocks. 2 - *Echinocereus palmeri* seedling in habitat.

2



Estrada-Castillón, Eduardo, Villarreal-Quintanilla, José Ángel. 2010. FLORA DEL CENTRO DEL ESTADO DE CHIHUAHUA, MÉXICO. Acta Botánica Mexicana [en línea] 2010, (Sin mes) : [Fecha de consulta: 16 de mayo de 2016] Disponible en: <<http://www.redalyc.org/articulo.oa?id=57415475004>> ISSN 0187-7151

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Melgoza Castillo, A., Quintana Martínez, G., Pinedo Álvarez, C., Rivero Hernández, O. y J. H. Vega Mares. 2012. Biodiversidad vegetal de la parte alta oeste de la cuenca del Chuviscar, Chihuahua. Universidad Autónoma de Chihuahua. Facultad de Zootecnia. Informe final SNIBCONABIO proyecto No. GT027. México, D.F.

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summary →

# Two unusual annual *Sedum* in Italy:

## *Sedum caespitosum* (Cav.) DC.

and

## *Sedum aetnense* Tineo



Massimo Aferni

In the past the genus *Sedum* consisted of taxonomic subdivisions (Pignatti, 1982) linked to the species, depending on whether they were annual or perennial: today, instead, the classification consists of groups called Series (Hart, 2003), although the life duration of these small *Crassulaceae* has, in many respects, a quite distinctive significance.

Among the many *Sedum* that grow wild in the Italian peninsula, some have a strictly annual life cycle, in the sense that their evolutionary cycle is restricted to a certain number of months, usually between late autumn and the end of the following spring. In this period these plants are born, grow, flower, set fruit (samaras) and die, perpetuating their species exclusively through propagation from seed.

We can exclude among them the species being sometimes annual, or sometimes biennial, depending on certain circumstances, such as *Sedum atratum* L., but need to include among the annual *Sedum* species in Italy *Sedum litoreum* Guss., *Sedum rubens* L., *Sedum andegavense* (DC) Desv., *Sedum caeruleum* L., *Sedum alsinefolium* All.

To these already mentioned species we also

must add, in Italy, the rare *Sedum caespitosum* and the even rarer *Sedum aetnense* (Pignatti, 1982) (\*).

For their particular botanical characteristics *Sedum caespitosum* and *Sedum aetnense* were both placed into specific series, in each of which they are the only components, namely in Series Rubra Boriss. the first, and Series Macrosepala (Regel & Schmalh.) Boriss., the second one.

### The Italian distribution area of *Sedum caespitosum*

*Sedum caespitosum* is present only in small distribution areas in Tuscany, Lazio and Campania and Puglia and in greater concentration in the main Italian islands, such as Sicily and Sardinia, missing instead in the northern part of the peninsula and almost the entire Adriatic coast. It grows frequently on rocks, walls and rocky limestone substrates, up to about 800 m altitude.

I tried to find many times this little *Sedum* in some places in Tuscany where it is reported, particularly in Radda in Chianti, Province of Siena, as mentioned by Pignatti (1982), but without ever being able to find it.

I could be probably my inability to find them, al-





Photo by Pablo Alberto Salguero Quijles (Wikipedia).

1



Photo by Emilio Laguna.

2



3

Photo by Emilio Laguna.

1-3 - *Sedum caespitosum*.

summary →

though now I have a pretty trained eye to search for these small succulent plants, but as so, I believe, because *Sedum caespitosum* is an annual plant and an exasperated therophyte, as reported by Turrisi (1991). In fact the seed germinates, the plant grows, develops, flowers and dries out in a very short time span of about four months, i.e. roughly from mid January to mid-May, but particularly dries out completely in a matter of 10-15 days.

This short period of his life, combined with the fact that it normally reaches only 4 cm in height in its flowering stage, makes this plant not easily identifiable on the rocks or old walls, except for the reddish colour of its leaves and white flowers tending to pink. As previously mentioned *Sedum caespitosum* can be found in Tuscany, although

only in small populations, in contrast to larger populations in Sicily (Turrisi, 1991) in Gravina (320 m), in Tremestieri (340 m) and in Mascali (420 m), where it grows sometimes on areas of rocky outcrops formed in sunny and open meadows, namely, in addition to Radda in Chianti, in the Province of Florence, for example in Poggio S. Romolo (Giuliani, 2003), in some islands of the Tuscan Archipelago such as Pianosa (Baldini, 2000) and the Elbe (Wre Lovers, 1983), in the Tuscan-Emilian Apennines (Gallo, 1997) and in the Province of Grosseto near Saturnia in Poggio Bagno Santo.

To facilitate the identification of this species, below is presented its description synthesized from descriptions of several authors:

***Sedum caespitosum* (Cav.) DC..**

Annual plant, glabrous, generally with reddish slender stems, erect (2-5 cm). The leaves (3-6 mm) are alternate, imbricated, semi-cylindrical to wide ovoid, fleshy about 3 mm long and 2 mm wide, arranged two leaves per node. The plant can start producing buds as early as in late March: they open about a month later. The heads are generally helical and in number of 2-3 per plant, with 2-3 flowers arranged alternately on different levels (cincinni) for each head. The inflorescences have 1 or 2 bracts per flower. The flowers are 4-5-merous, sessile and produced on rather short stems; narrowly lanceolate to elliptic petals (3 mm), with acuminate apex, are white-greenish, flecked with

pink and about twice as long sepals which are triangular, acute, pale green. On the axis of the main branch is a central flower (always the first to open) and in many cases the number of its petals (6-7) is higher than that of others. The main stem may be accompanied by branches that start from below. The filaments are white. Foliocles are smooth, brown; the seeds are void, costate and acute apex (t Hart, 1991). Chromosome numbers  $2n = 12$  and  $24$  (t Hart, 1991; Stephenson, 1994). Evans (1983) indicates flowering in May

This species is found in Central and Southern Europe and in all the countries bordering the Mediterranean basin.



Photo by Ray Stephenson.

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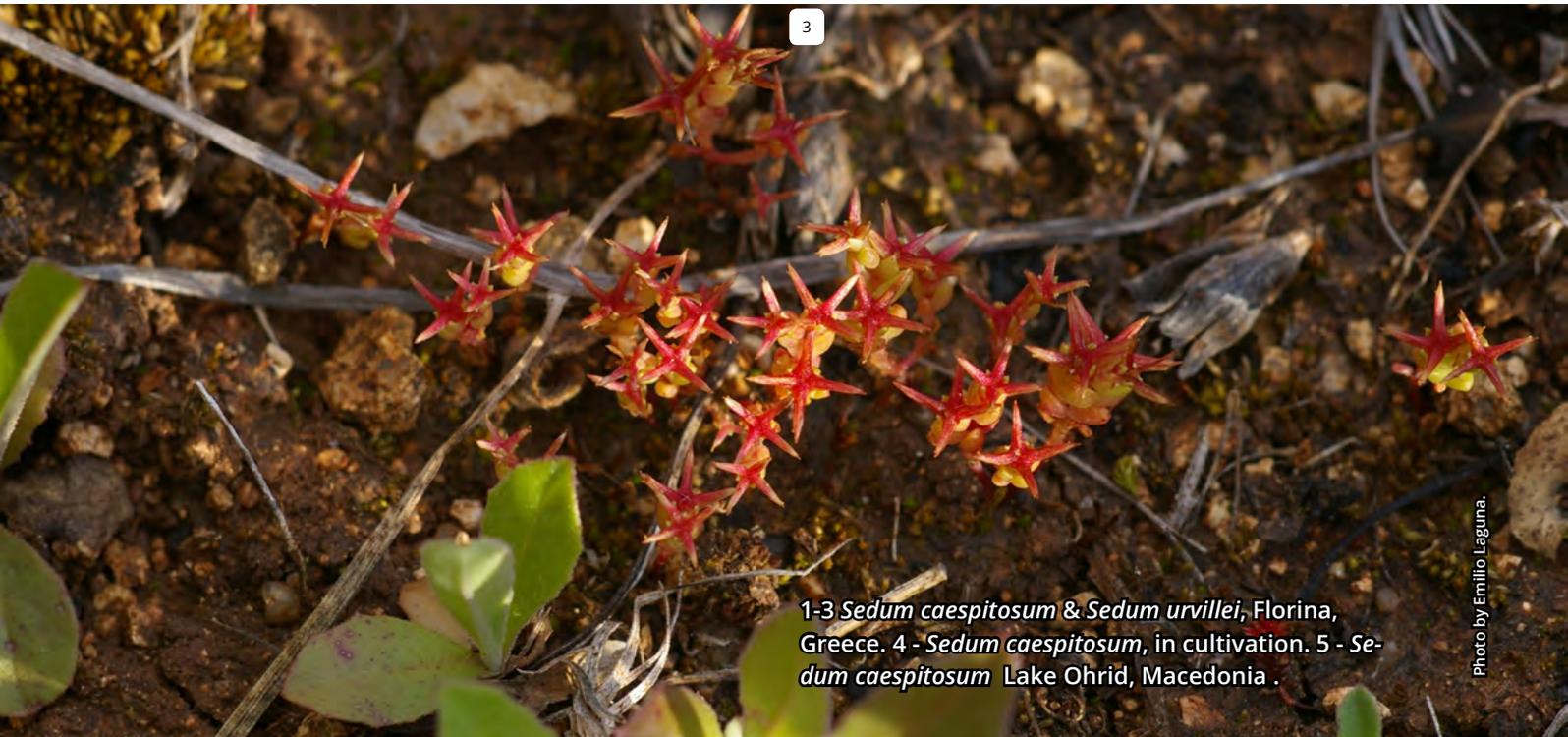


3

Photo by Emilio Laguna.

1- *Sedum caespitosum* & *Sedum urvillei*; Florina, Greece. 2- *Sedum caespitosum*. 3 - *Sedum caespitosum* & *Crassula tillaea*.

summary



summary →

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*Sedum aetnense*, Madari, Cyprus.

### The Italian distribution area of *Sedum aetnense*

The first specimens of *Sedum aetnense* were collected in Italy, in Sicily, on the slopes of Mount Etna near Nicolosi by botanist Palermo Vincenzo Tineo in the early forties of the 19th century. Just because the place where discovered the plant was awarded this name. As mentioned, this is a small annual plant, a scape therophyte, present in a habitat with little inclined compact lava rocks having a pH value of around 5.8 which has, at 1500 to 1700 m altitude, a Mediterranean alpine distribution. Unfortunately, it is at high risk of extinction in the locality where it was found for the first time (Conti, Manzi; Pedrotti; 1993), on Mount Etna, the only Italian distribution area of this species

It would also be notable that some other species, attributable perhaps to *Sedum aetnense*, has

been rediscovered in the late 50's of last century, in a few other locations in the Etna National Park, but according to some scholars, perhaps it is in certain aspects of similar to *Sedum hispanicum* L.

*Sedum aetnense*, whose Sicilian entities are attributable to the variety genuinum, flowers between April and May (Conti, Manzi; Pedrotti; 1993)

Despite being rare and localized and, more, easy to be overseen, in Europe this species is also present in Spain (Llamas, 1983; Carrasco & Estrada, 1987; Bourguignon, 2010), in the southern part of the Balkans and the Crimea (Bourguignon, 2010), in Turkey (Anatolia) (Karahan, Oz, Demircan and Stephenson, 2006; Bourguignon, 2010) and, finally, in Iran and probably its origin is the East Mediterranean.

It Hart's book '*Sedum of Europe*' (2003) provides the following description of this species

summary →

## *Sedum aetnense* Tineo.

Annual herbaceous plant of short duration, glabrous, high up to 6 cm, with erect to ascending branches, usually simple. Leaves alternate, imbricated and vertically appressed to stem, sessile, green, oblong-conical, 3-5 mm long, cylindrical or nearly cylindrical subacute, with margin often with cilia or serrated, basally with thin spur. Cimose inflorescences, with 1 (-2) cincinni, bracts large and similar to the leaves. Flowers 4- or 5-meous,

sessile, haploid (i.e. have only one set of chromosomes); sepals free and spurred at baseline, highly irregular in size, up to 4 mm long, acute, margins often with cilia; petals free, oblong, 2-3 mm long, white, sometimes with a pink tinge; white filaments. Almost erect fruits, dark reddish-brown.

Seeds small obovate, dark brown to blackish, reticulated (kidney-shaped). Chromosome numbers  $2n = 26$  and  $52$  (t Hart, 1991).



Photo by Jesus Vilchez Rodriguez.

1

2

3

1 - *Sedum aetnense*. 2 - *Sedum aetnense*, Turkey.  
3 - *Sedum aetnense* (*S. tetramerum*), Lake Van, Turkey.



Photo by Ray Stephenson.

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# Online magazines

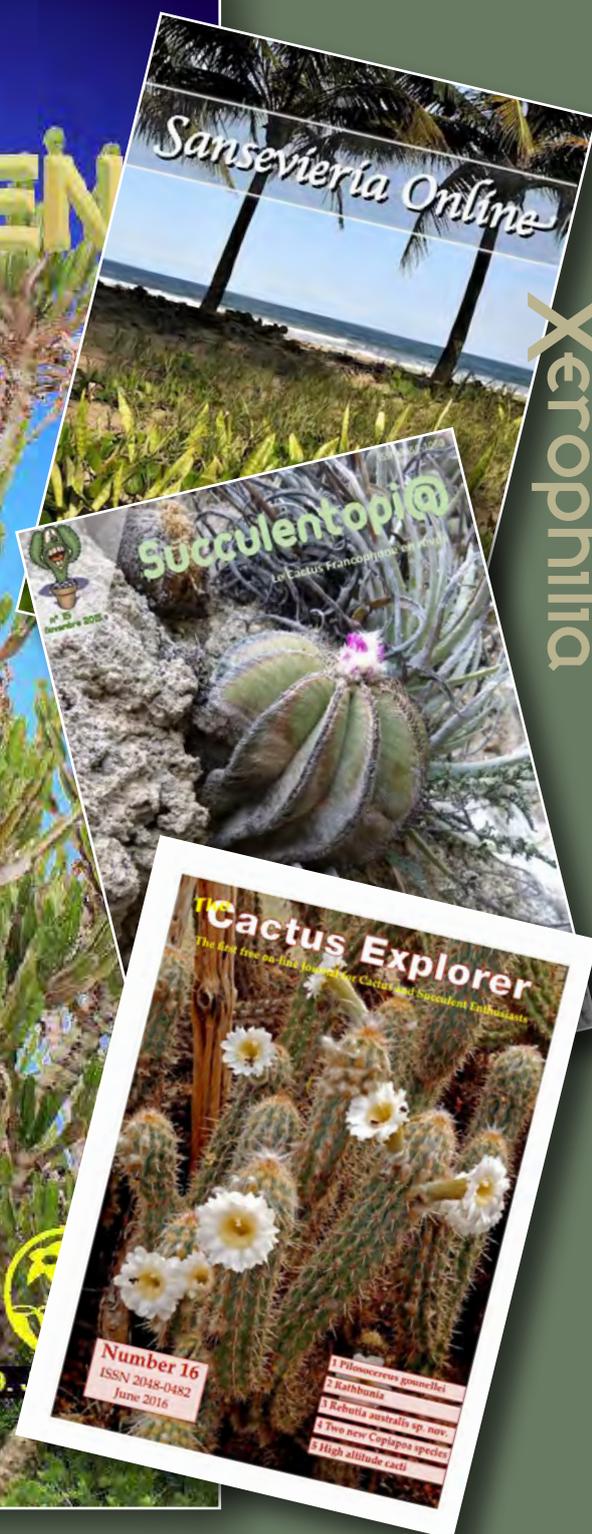


**Sansevieria Online** (German) - the free online journal about the genus *Sansevieria*. Latest issue: No 4 (1), May 2016.

**Succulentopi@** (French) - Quarterly online magazine of the Cactus Francophone. Latest issue: No 15, November 2015. There was no new issue from our last presentation.

**Sukkulenten** (German) - Monthly free online journal of the FGaS - Fachgesellschaft andere Sukkulanten (formerly Avonia-News). Latest issue: Vol. 9, No 6, June 2016.

**The Cactus Explorer** (English) - the first free online C&S journal. Latest issue: No 16, June 2016.



Xerophilia



## ABSTRACT - scurtă prezentare a articolelor



**Karl Ravnaas**

### **Cultivarea cactușilor sub lumină artificială (pag. 5)**

Tehnic, documentat și la obiect, splendid ilustrat, articolul ne dezvăluie o lume nouă a cactușilor, așa cum pot fi ei cultivați, acolo unde e frig și nu există decât 4 luni de soare anemic, pe an, undeva, la nord, în Norvegia. Folosind lumina artificială a unor lampi halide, autorul schimbă total ciclul de viață al locuitorilor deșertului: lumină 14 ore pe zi, tot anul, caldura ziua și răcoare noaptea, tot anul, udări dese tot anul și... nicio pauză de iernat. Rezultatele sunt surprinzătoare, plantele având dimensiuni duble și perioade de maturizare înjumătățite, față de plantele crescute în mod clasic, așa cum le știm noi.

Este de menționat însă că, din punctul de vedere al consumului de curent electric, costurile sunt pe măsură, dacă ținem seama că într-o cameră de 8 m<sup>2</sup>, în care își are amândouă mesele cu plante, autorul folosește două lampi de câte 400 de W... câte 14 ore pe zi, în toate zilele anului. De menționat că lampile produc și căldura necesară plantelor, aproximativ 30°C.



**Daniel Guillot Ortiz**



**Joel Lodé**



**Jordi López-Pujol**



**Carles Puche Rius**

### **Prima înregistrare pentru *Opuntia dillei* Griffiths în Europa (pag. 27)**

O comunicare științifică scurtă și foarte tehnică despre locul în care a fost înregistrată specia *Opuntia dillei*, pentru prima dată pe teritoriul Spaniei și al Europei. Este prima publicare a înregistrării facute în ianuarie 2016.



**Elton Roberts**

cu fotografii din habitat de Peter Breslin și Thomas Linzen

### **Note despre *Mammillaria mainiae* M.K. Brandegees (pag. 33)**

Elton Roberts, cultivatorul, colecționarul și exploratorul american, pe care-l cunoașteți, revine cu prezentarea unei specii interesante și mai puțin cunoscută în colecții: *Mammillaria mainiae*.

Încă o dată, autorul discută atât latura taxonomică, cât și despre modul de a cultiva specia în discuție.





**Eduart Zimer**

***Carpobrotus edulis* - străinul cu două fețe (pag. 45)**

Editorul Xerophiliei se întoarce între paginile noastre cu un articol interesant despre aspectul dual al uneia dintre plantele invazive care face ravagii în multe colțuri ale lumii, inclusiv în Noua Zeelandă. Abordarea este nu numai originală, dar și plasată din punctul de vedere al observatorului neutru, nevoit să recunoască valoarea practică a unor alegeri pe termen scurt, indiferent de impactul lor, pe termen lung.



**Ricardo Ramirez Chaparro**

***Ariocarpus fissuratus*, steaua dintre pietre (pag. 53)**

Autor al unei serii de pictoriale cu plante din habitat, herpetolog pasionat, Ricardo Ramirez Chaparro ne prezintă în acest număr atât unul dintre cei mai iubiți membri ai genului *Ariocarpus*, cât și plantele și șerpii care viețuiesc în același habitat cu el.



**Derrick Rowe**

**Mirmecofitele din Milne Bay, Paua-Noua Guinee (pag. 71)**

O serioasă nouă contribuție a unui cunoscut autor al genului , privind plantele din Milne Bay Province, Papua-Noua Guinee. Partea a doua și ultima va fi publicată în numărul viitor.



**Aaron González Márquez**

**Plante periclitate: *Echinocereus palmeri* (pag. 89)**

Un nou autor în paginile noastre, student la inginerie ecologică, cu specializare în studiile de impact asupra mediului, publică un articol scurt și concis despre situația speciei *Echinocereus palmeri* într-un habitat pe cale de dispariție, mai ales din cauze antropogenice.

Articolul este grefat pe un splendid pictorial realizat în habitat.





Massimo Afferni

Doi *Sedum* anuali, rar întâlniți în Italia: *Sedum caespitosum* (Cav.) DC. și *Sedum aetnense* Tineo (pag. 113)

Articol scurt și documentat, tehnic, despre rara prezență, în Italia, a două specii de *Sedum* anuale, întâlnite mai des în alte zone ale bazinului Mediteranean și chiar dincolo de acesta, spre est. Artricolul are mai ales valoare de reper pentru cei interesați să scrie despre subiect.



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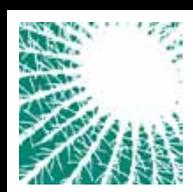
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*Acanthocalycium, Borzicactus, Cereus, Cleistocactus,  
Echinopsis, Frailea, Gymnocalycium, Harrisia, Lobivia,  
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Xerophilia – Volume V, No. 1 (16), March 2016

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ISSN 2285-3987