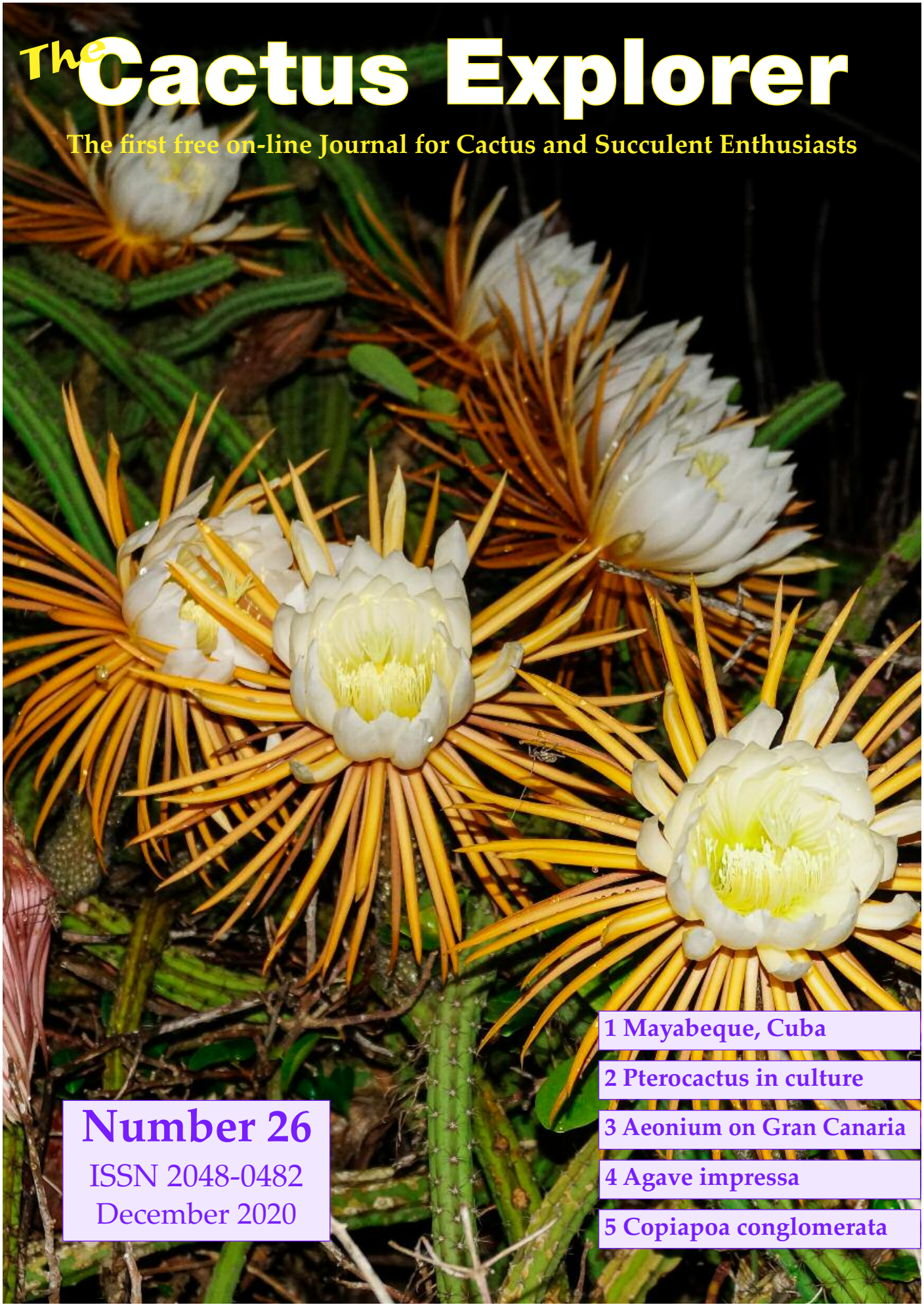
The Cactus Explorer

The first free on-line Journal for Cactus and Succulent Enthusiasts



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In this Edition

Cover Picture: *Selenicereus grandiflorus* night blooming at Rotilla, Cuba in May. See *Cactaceae on the North Coast of Mayabeque, Cuba*. on Page 62. Photograph: Diego Salas Pantoja & José Miguel Acuña

The No.1 source for on-line information about cacti and succulents is http://www.cactus-mall.com
The best on-line library of cactus and succulent literature can be found at:
https://www.cactuspro.com/biblio/en:accueil

Invitation to Contributors

Please consider the Cactus Explorer as the place to publish your articles. We welcome contributions for any of the regular features or a longer article with pictures on any aspect of cacti and succulents. The editorial team is happy to help you with preparing your work. Please send your submissions as plain text in a 'Word' document together with jpeg or tiff images with the maximum resolution available.

A major advantage of this on-line format is the possibility of publishing contributions quickly and any issue is never full! We aim to publish your article quickly and the copy deadline is just a few days before the publication date. There will usually be three issues per year, published when sufficient material is available. Please note that **advertising and links are free** and provided for the benefit of readers. Adverts are placed at the discretion of the editorial team, based on their relevance to the readership.

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This issue published on
9th December 2020

Introduction

Coping with the pandemic

I must apologise for not producing this issue earlier. It is always a lot of work and I felt like a break so I have been spending more time this year looking after my plants which were in need of attention.

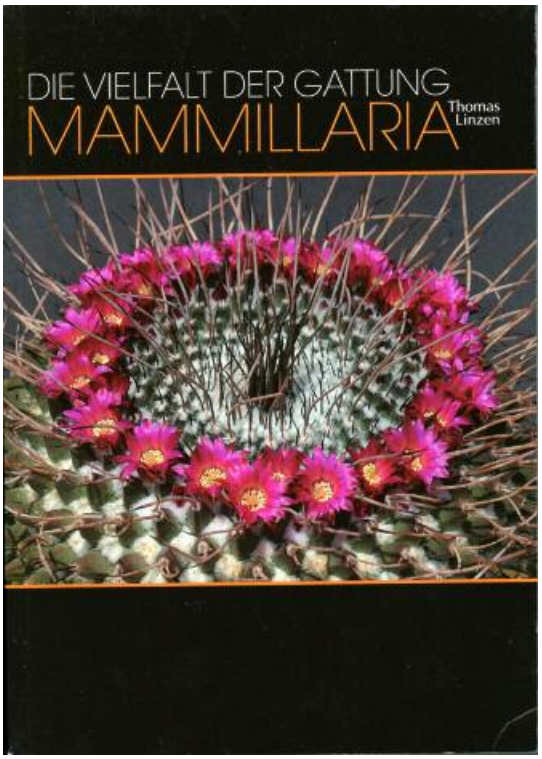
During the warmer days when our cacti were in growth, we found ourselves confined to our homes. For those of us fortunate to have a garden and perhaps a glasshouse, we could keep ourselves busy and do some of those jobs we had been putting off for years.

Most, if not all, of the cactus events planned for 2020 were cancelled or postponed. I have listed what I know about next year's events on the following pages. I decided to postpone the **Cactus Explorers** weekend until August 13–15th 2021 so if you made a booking, I have kept your booking and your money for next year.

I certainly missed the stimulation of meeting friends who share my cactus hobby and seeing fine specimens at the shows. Such encounters spur me on to work on my own plants and try to get them in the best condition I can achieve.

Now is a good time to plan seed sowing for next year so you can find adverts for seed dealers on page XX. For me, growing seedlings is one of my favourite activities and enables me to improve my collection with species that are rarely available as plants. This year, my seedlings have done particularly well, probably because I have lavished more attention on them and kept them regularly watered. Selling my spare seedlings helps me to pay my heating bill and provides fellow enthusiasts with a source of some of the more unusual cactus species.

Having edited and produced 8 editions of *Bradleya*, I decided to retire from the role this year. I have thoroughly enjoyed working with so many talented authors to produce this lasting legacy for the BCSS. However, it was a very time consuming job and stopped me



doing other things I really wanted to do.

The new editor of *Bradleya* is George Thomson, whom you may know because of his publications about *Melocactus*. He has a keen interest in succulents and his experience of design and typography as well as journal editing makes him ideally qualified to be the next editor and I thank him for taking on the task and wish him well.

My interest in books and prints about succulents continues and I have enjoyed tracking down some interesting items to add to my library. There have not been many new books published this year but the German Society (DKG) continues its impressive series of books which are exclusively available to its members. The latest title, a beautifully illustrated book about *Mammillaria* by Thomas Linzen, is outstanding and I have awarded it the **Cactus Explorer**'s 'Book of the Year'. It would be worth joining the DKG just to have the chance to buy this 512 page delight for the amazing price of just 12€!

Looking towards a better 2021

Graham Charles

News and Events

The Cactus Explorers Club 15th Meeting in 2021

August 13–15th 2021
The Conference Centre
Stamford Court, Leicester.

Following the cancellation of the 2020 event, I have booked dates in August again with the hope that it will be possible to meet.

It will be the usual mix of talks from invited speakers and attendees.

The price for the weekend is **£235** which includes two nights in en-suite single rooms, all meals, refreshments, and wine with the evening meals.

There will be sales of plants, literature and seeds, free for vendors.

Enjoy a relaxed environment, a good place to meet old friends and make new ones. The bar offers real ale, popular with Cactus Explorers.

I will send an invitation letter out early next year to regular attendees and confirm your booking status and any of your money I have retained.

Graham Charles

Central Spine

Newsletter of the Central Arizona cactus and Succuent Society

Published monthy, this newsletter provides lots of interesting reading.

Download the PDFs from

https://centralarizonacactus.org/newsletters

The New Cactus Lexicon

There are just a few new copies of the original two volume edition available. This popular book has been out of print for years so this is a rare opportunity to own a brand new copy if you didn't get one when it was published.

The price is £200 plus carriage. Please email me if you would like to buy one. G.C.

BCSS Showing & Judging Weekend

10 – 11th July 2021

Presentations by experts
Fun interactive sessions
Improve your showing and judging skills
Take a test and qualify as a judge (optional!)
Plant sales

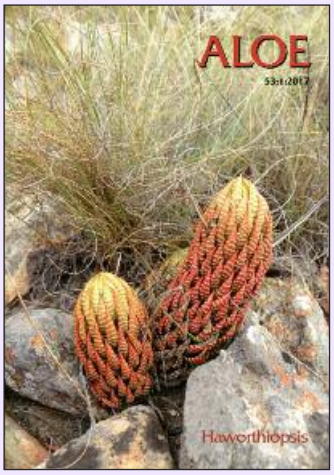
Full weekend or day delegate rates

Hilton Hotel (Next to the M1), Leicester

Bookings: Bill Darbon:
william.darbon77@btinternet.com

Aloe ceases publication

The last issue of the journal Aloe was Vol.54(1) in 2018



Lovers of succulent plants will be sorry to hear that this beautifully produced journal has ceased publication.

I am missing the last issue but hope to be able to buy it to complete my set.

GC

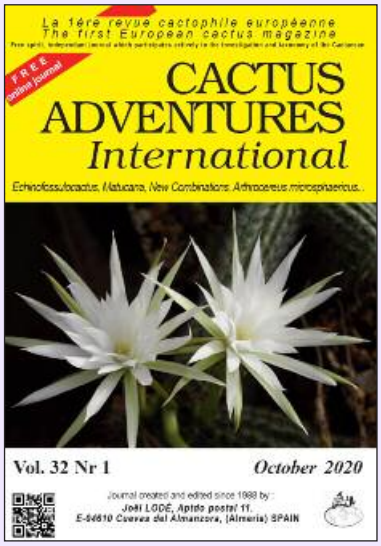
After 33 years of publication, the journal *Gymnocalycium* is switching to on-line publication.

This long-running specialist journal, published as A4 sheets with German and English text, will be available only online from 2021.

www.gymnocalycium.at

The downloads will be free of charge and will, in future, be included in the on-line journal section of the **Cactus Explorer**.

If you have not already told me and would like to be advised when each issue of the **Cactus Explorer** is available for download, please send me your E-mail address to be added to the distribution list.



Cactus Adventures International

Joel Lodé told us last year that his long-running journal would no longer be published in printed form. It was a nice surprise to find that the first on-line edition with 132 pages has appeared.

You can find it at

http://cactus-aventures.com/pageweb_ENG.html

The download is free of charge and will, in future, be included in the on-line journal section of the **Cactus Explorer**.

BEF Pots FOR SALE

Britain's favourite pots for cacti & succulents are now available again from the BCSS Manchester Branch

Prices from 15p each.

Sizes 2″ to 7″ diameter square and 3½″ to 6″ diameter round.
In Terracotta or Black.
Also a selection of larger non BEF bowls.

For prices, other details and ordering go to:
http://manchester.bcss.org.uk/home/b-e-f-pots-enquiries
or contact Peter by email:
peter@bint.myzen.co.uk

Please note orders can only be delivered to addresses in mainland UK at this time.

The 14th Spalding Cactus Mart

Saturday 24th April 2021
10.00am–3.00pm

Holbeach Community Centre,
Fishpond Lane,
Holbeach, Lincs P12 7DE

15 nurseries and growers in attendance

Ample free parking
Free admission to the Mart

Refreshments available all day

For further details please see the BCSS Spalding Branch website:
www.spalding.bcss.org.uk

Other provisionally arranged events which will go ahead if the pandemic situation allows.

North West Cactus Mart
1st May 2021

Zone 12 Convention
9th May 2021

Portsmouth BCSS Branch 70th Anniversary
Saturday 19th June 2021

Zone 6 Convention
5th September 2021

The Couleurs Cactus 2020

show is cancelled and postponed until **May 29th and 30th 2021**

It was with great sadness that the organizers took the decision, in conjunction with the town hall of Egliseneuve near Billom, to cancel our exhibition Couleurs Cactus 2020

The town hall of Egliseneuve near Billom, France has already set the date for the next event, the 13th. It will take place in the newly refurbished showroom. More information in the next Cactus Explorer.

CactusWorld is a finalist at prestigeous GMG Awards

The Garden Media Guild Awards celebrate the best of horticultural communications.

CactusWorld was a finalist in two categories (Garden publication of the year and Cover of the year). The winner was the RHS publication *The Garden,* but it is a truly remarkable achievement to be in the top five alongside such well-known journals.

Congratulations
to all the *CactusWorld* team on their achievement.

GC

The BCSS AGM

17th April 2021

In the light of the uncertainty over the Covid 19 situation, the BCSS is planning to hold a virtual AGM using Zoom in 2021 along the lines of the one held this year.

Publications of David Hunt

Following the generous donation of remaining copies of these publications to the Gordon Rowley Foundation, the following are now available for sale:

Succulent Plant Research titles
Vol.5: Seed-diversity in the Cactaceae
Softbound: £7.00
Vol.6: Studies in the Opuntioideae
Softbound: £15.00
Vol.7: Mapping the Cacti of Mexico
Softbound: £15.00
Vol.8: Further Studies in the Opuntioideae
Softbound: £25.00

Cactaceae Systematics Initiatives
The Bulletin of the International Cactaceae Systematics Group.
Printed copies of numbers 17 to 40 are available at £5 – £7 each.

Other Titles
A new review of Mammillaria names
Softbound £7.00
Lexicon Illustration volume 2nd edition (2013) Softbound £30.00
Englera 16. Cactaceae of South America: The Ritter Collections.
Softbound. £40.00

How to Order
E-mail Graham Charles for the total price of what you want to order including carriage which will be charged at cost.

An article you may have missed

A scholarly paper on *Opuntia fragilis*

Published in 1999 the subject is *Opuntia fragilis in the San Juan Islands and Puget Sound region of Washington State* by Terry Domico.

You can download the original paper here.

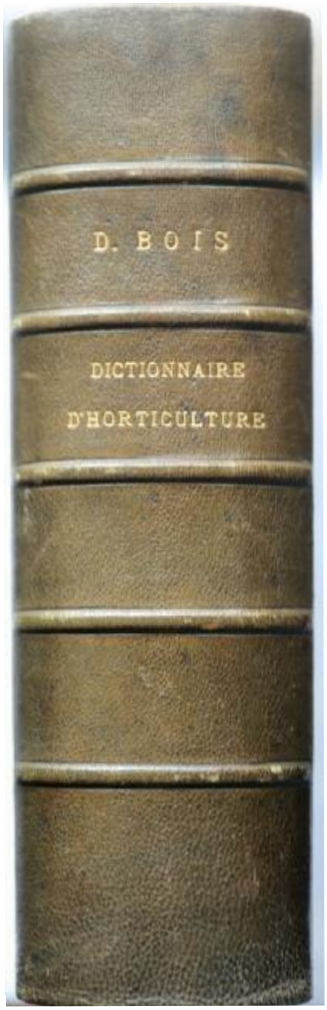
Thanks to Root Gorelick for bringing this to my attention.

Books for Sale

Paul Foster has some books for sale.

Look on page 20 for his intersting list.

The publications of Dr F.A.C.Weber



I was prompted to assemble these notes by our good friend Daniel Schweich. He told me about two new downloadable PDFs where you can find the publications of Dr. Weber. Daniel has worked with Jean-René Catrix and Roberto Kiesling to produce this new compendium. A second volume has been assembled and contains more of Weber's rare publications.

Weber's publications are spread around various journals and can be difficult to find so this new compendium is a valuable addition to our digital libraries. The text is in French but you can use an on-line translator to help understanding.

The introduction (in French) tells us a little about the man and what is in the PDF:

In the second half of the 19th century, Frédéric Albert Constantin Weber, also known by the acronym F.A.C. Weber, was at the source of the discovery of many plants of Cacti and Agaves. As a military doctor, he practised botany as an enlightened amateur during his travels and then by his correspondence with botanists and other amateur collectors.

Weber is, however, little known because he left only a few traces in the literature. This compilation aims to pay tribute to him by collecting printed and handwritten material we've been able to find out about him.

The first volume is devoted to his publications and to the correspondence sent to Engelmann and a few other American authors (although from various sources). An appendix (page 400) provides some additional details that are not vital at first reading. Throughout the PDF, the page numbers, text and web addresses in blue are hypertext links.

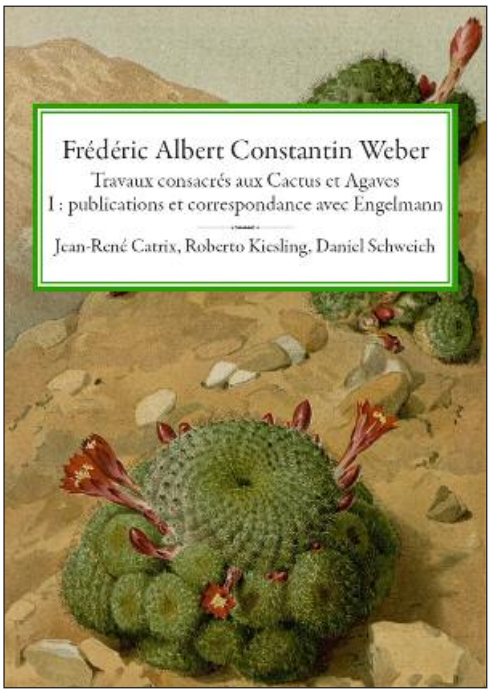
As a surgeon in the French army during its occupation of Mexico, Dr Weber travelled in nearly every part of that country and was always busy making observations and notes about the cacti. On his subsequent return to France he gathered together, in the gardens of Mr. Robert Roland Gosselin and others such as Schlumberger, Rebut and Martel, a large collection of these plants, not only from Mexico, but from other countries as well; and with these he continued his studies. He was justifiably considered as one of the best, if not the first authority on this family of plants. He was a regular correspondent of George Engelmann, the acknowledged American authority on the Cactaceae, and their exchange of opinions and specimens was an invaluable aid to them both.

Dr. Frederic Albert Constantin Weber discovered the blue agave (also known as agave azul) near the town of Tequila in the late 1800s. Prior to its discovery, tequila makers created tequila from a variety of succulent plants, but Dr. Weber encouraged them to use only blue agave because its natural sugars were perfect for the spirit. The botanical name of the blue agave is *Agave tequilana* Weber, named in his honour. Under Mexican law, no distilled spirit is real tequila unless it comes from the blue agave within designated districts in the state of Jalisco.

The compiler of Bois' *Dictionnaire d'Horticulture* was fortunate in securing Dr.

Weber publications in the PDF Volume 1:

Cactées nouvelles du genre Rhipsalis, 1892
Cactus et Agave, Dictionnaire d'horticulture illustré, 1893-99
Société Nationale d'Acclimatation de France, séance générale du 18 mai 1894
L'utilisation de l'Agave, 1894
Les Cactées de la basse Californie, 27 janvier 1895
Instructions pour les explorateurs du Mexique : Agaves et Cactées, 1896
Les Echinocactus de la Basse Californie, 28 mars 1898
Les Pereskia et Opuntia Péreskioïdes du Mexique, 26 avril 1898
Cereus Spegazzinii, ein neue Art, juillet 1899
Les Cactées des îles Galapagos, 29 juillet 1899
Notice sur la floraison de l'Epiphyllum russellianum, 1900
Le Figuier de Barbarie (Opuntia ficus indica) et ses variétés, 1900
Bulletin de la Société nationale d'acclimatation de France. Procès verbaux des séances du 23-04-1901
Bulletin de la Société nationale d'acclimatation de France. Procès verbaux des séances du 20-12-1901 et du 24-1-1902
Études sur les Opuntia. II — Le "Duraznillo" des Mexicains, et espèces voisines, 1902
Notes sur quelques Agaves du Mexique occidental et de la Basse-Californie, 1902
Les Cactées de Costarica, 1902
Bulletin de la Société nationale d'acclimatation de France. Procès verbal de la séance du 19-12-1903
Observations sur la nomenclature et la synonymie des Agaves textiles, 1903
Les Cleistocactus, 1904
OEuvres posthumes de M. le Dr Weber, médecin inspecteur de l'armée, 1904
Quatre Cactées nouvelles du Mexique, 1905
Note sur la floraison du Pilocereus celsianus, juillet-août 1879



You can download the PDFs:
Volumes 1 and 2.
https://www.cactuspro.com/biblio/en:catrixkieslingschweich

Weber as one of the many associate editors, as the authority for the Cactaceae.

The dictionary was issued in livraisons of thirty two pages from 1893 to 1899. The date of issue of each livraison (as provided by the author) is given in the listing of cacti below. All the cacti and agave entries are available in the PDF file.

Anhalonium trigonum Weber in Bois' *Dictionnaire d'Horticulture*: 90, June, 1893. This, in compliance with the rules of nomenclature, becomes *Ariocarpus trigonus* K. Sch. *Cereus Pasacana* Web. l.c. 281, published some time between Feb. 1894 and Feb. 1895 ; the exact date is not known. This enormous *Cereus* is the giant of the Argentine cordilleras, as *C. giganteus* is that of the Mojave desert. *Echinocactus heterochromus* Web. l.c. 466, Sept. 1896. *E. Peninsula* Web. l.c. 467, Sept. 1896. *E. Saussieri* Web. l.c. 468, Sept. 1896. *E. microspermus* Web. l.c. 469, Sept. 1896. *E. Schickendantzii* Web. l.c. 470, Sept. 1896. *Mammillaria plumosa* Web. l.c. 804, Jan. 1898. *M. valida* Web. l.c. 806, Jan. 1898. *Opuntia hyptiacantha* Web. l.c. 894, April, 1898. *O. myriacantha* Web. l.c. 894, April, 1898. *O. pilifera* Web. l.c. 894, April, 1898. *O. Quipa* Web. l.c. 894, April, 1898. *O. quitensis* Web. l.c. 894, April, 1898. *O. ursina* Web. l.c. 896, April, 1898. In this the specific name is suggested by the dense covering of long, coarse hair-like spines, which also give it the universally accepted common name of " Grizzly Bear Cactus." *O. australis* Web. l.c. 896, April, 1898. *O. Schickendantzii* Web. l.c. 898, May, 1898. *O. Spegazzinii* Web. l.c. 898, May, 1898. *Pereskia Argentina* Web. l.c. 938, July, 1898. *P. Guamacho* Web. l.c. 938, July, 1898. *P. panamensis* Web. l.c. 939, July, 1898. *P. tampicana* Web. l.c. 939, July, 1898. *P. Philippii* Web. l.c. 939, July, 1898. *Phyllocactus phyllanthus* Link. vars. *boliviensis* Web., *paraguayensis* Web., and *columbiensis* Web. l.c. 957, July, 1898.

Besides these descriptions of new species, Dr. Weber makes a number of new combinations which are listed here, with sufficient synonymy only for identification. *Anhalonium turbiniforme* Web. (*E. turbiniformis*

Pfeif.) in Bois' Dict. d'Hort., 90, June, 1893. *Echinocactus latispinus* Web. (*E. cornigerus* DC. ; *Cactus latispinus* Haw.) l.c. 467, Sept. 1896. *Echinopsis catamarcensis* Web. (*Cereus catamarcensis* Web.) l.c. 471, Sept. 1896. *Echinopsis minuscula* Web. (*Echinocactus minusculus* Web.) l.c. 471, Sept. 1896. *Echinopsis obrepanda* KSch. (*Echinocactus obrepandus* Salm.) l.c. 472, Sept. 1896 [both incorrectly attributed to Weber]. *Echinopsis Schickendantzii* Web. (*C. Schickendantzii* Web.) l.c. 473, Sept. 1896. *Mammillaria pectinifera* Web. (*Pelecyphora acelliformis* Ehrenb. var. *pectinata* Hort.) l.c. 804, Jan. 1898. *Opuntia cereiformis* Web. (*Grusonia cereiformis* Hort., *Cereus Bradtianus* Coult.) l.c. 897, May, 1898. *O. spathulata* Web. (*Pereskia spathulata* Otto) l.c. 899, May, 1898. *Pereskia Amapola* Web. (*P. horrida* Parodi., *P. Bleo* Morong) l.c. 938, July, 1898. *Pfeiffera ianthothele* Web. (*P. cereiformis* Salm., *Cereus ianthothele* Monv.) l.c. 944, July, 1898.

Weber also described many important new species of cactus in other publications, most of which we still accept today even though they may have been combined in other genera. Among them is the largest ferocactus species which is found on Isla Santa Catarina, an island off the east coast of Baja California. *Echinocactus diguetii* was described by Weber in his article *Les Echinocactus de la Basse Californie* published in the Paris journal *Bulletin du Muséum d'histoire naturelle* in 1898 accompanied by the picture reproduced here. It was based on a collection made by Léon Diguet, the reason why Weber described this remarkable plant in honour of him.

Dr Weber also had plants named for him. In 1909, Britton & Rose created *Weberocereus*, a genus of epiphytic cacti. It is still accepted today. There are also a number of species described after Dr. Weber: *Agave weberi* (Texas) described by H.L. Poisson in 1901; *Cereus weberi* (Oaxaca, Puebla, Guerrero) described by J.M. Coulter in 1896, and combined as *Pachycereus weberi* by C. Backeberg in 1960; *Opuntia weberi* (Argentina) described by C.L. Spegazzini in 1905, combined as *Tephrocactus weberi* by C. Backeberg in 1936; *Pereskia weberiana* (Cochabamba) described by K.M. Schumann in 1898.

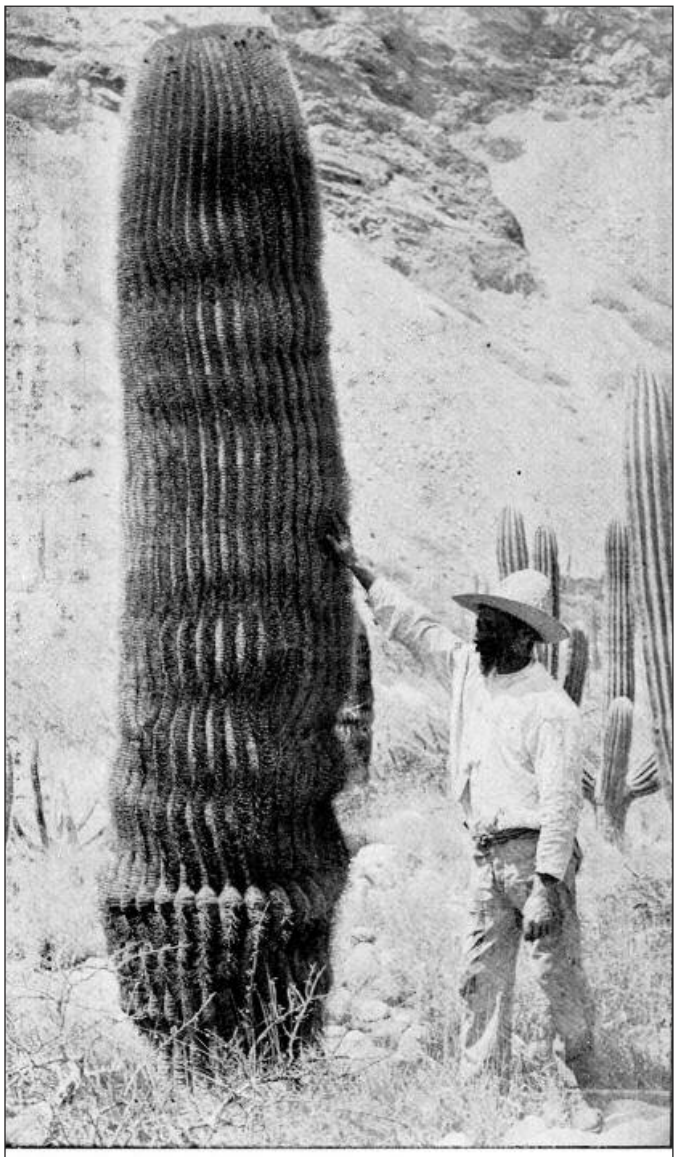


Fig. 1. — *Echinocactus Digueti.*

GC

References

C. H. T. (1899). Weber's Cacti in Bois's Dictionnaire d'Horticulture. *The American Naturalist* **33(393)**: 749–751. Retrieved from http://www.jstor.org/stable/2454373

Catrix, Jean-René (2020). Frédéric Albert Constantin Weber: la médecine militaire & la passion botanique. Downloadable here.

In The Glasshouse

Aymeric de Barmon shares his expertise at growing *Pterocactus* including valuable tips to make them grow well and flower. Their flowers are often unusual colours for cacti as can be seen in Aymeric's lovely photographs. The seeds have prominent wings, also rare in the Cactaceae (see Figure 16).
Aymeric runs a seed business which supplies excellent quality seeds including interesting and unusual species, often with data. You can find his advert on page 93 and visit his website: http://adblps-graines-cactus.com

Photographs by the author.

I've been growing plants from this group since attending a Chilean weekend in the late 1990s. Graham Charles showed wonderful photos of flowering individuals in their Argentinian habitat.

At that time material was rarely offered, except for the thin stemmed *Pterocactus tuberosus*. Unfortunately, despite being very easy to propagate, eventually proactively self-propagating, it proved very shy flowering.

As offerings steadily increased I had the opportunity to grow more plants and treated them in the way most cacti appreciate. Unfortunately, poor results resulted, and plants were far from the beautiful ones in habitat.

Figure 1. *Pterocactus araucanus.* Route Gualjaina to Cushamen, Chubut, Argentina SAR 9052.

Figure 2. *Pterocactus australis.* East La Criolla, Santa Fe, Argentina 520m RH3777a.

Figure 3. *Pterocactus australis.* Gobernor Gregores, Santa Cruz, Argentina 280m RH3773.

Figure 4. *Pterocactus australis.* Gobernor Gregores, Santa Cruz, Argentina 450m RH2307d.

Figure 5. *Pterocactus fischeri.* Buta Ranquil, Mendoza, Argentina KP168.

Figure 6. *Pterocactus gonjianii.* Los Flores, San Juan, Argentina 2200m RH2208a.

Figure 7. *Pterocactus gonjianii.* Tocota, San Juan, Argentina 2550m RH2205a.

Figure 8. *Pterocactus hickenii.* Cerro Volcan, Santa Cruz, Argentina RH2301a.

Figure 9. *Pterocactus hickenii.* Gobernor Gregores, Santa Cruz, Argentina 450m RH2307a.

Figure 10. *Pterocactus hickenii.* WP150 Sarmiento, Chubut, Argentina.

One obvious gap between my greenhouse environment and habitat is winter temperature. Subsequently, some plants were relocated in the open all year round. They did not suffer any damage from frost. Some even managed to withstand winter rainfall. Despite being interesting to save place in the greenhouse, this change did not trigger the expected results.

As time went by, their square pots slowly became more and more rounded in all parts and I had to move them to much larger containers (2 litres). Immediately, growth changed to larger stems and much better-looking plants. Flowering went the same way and nearly all mature plants displayed

Figure 11. *Pterocactus meglioli.* Termas de La Laja, San Juan, Argentina 669m RFPA 289.02.

Figure 12. *Pterocactus reticulatus.* (clone 2) GK 9693-06.

Figure 13. *Pterocactus* sp. nova aff. *tuberosus.* Fiambala, Catamarca, Argentina 2250m RH2228a.

Figure 14. *Pterocactus tuberosus.* 5km East Manzano Historico, Mendoza, Argentina 1500m RFPA500.02.

Figure 15. *Pterocactus tuberosus.* 5km East Manzano Historico, Mendoza, Argentina 1500m RFPA500.02.

Figure 16. Ripe fruits of *Pterocactus tuberosus* showing winged seeds. *Hoffman* 283-948.

bunches of flowers.

Then arose the need to prune some species to stimulate vigorous growth, avoid a messy look and prevent uncontrolled invasions of neighbouring pots. *Pterocactus tuberosus* is an obligatory candidate for a yearly pruning. *P. valentinii, P. gonjianii* and *P. reticulatus* can withstand a bit longer. *P. araucanus* and *P. hickenii* have very brittle segments and care must be taken not to touch or shake them because flowers develop only on the end of a chain of segments. The least demanding species is *P. australis* which develops neat clumps with a kind of self-pruning drying old stems.

Propagation is usually done by cuttings

Figure 17. Pterocactus tuberosus. Laguna Llancanelo, Mendoza, Argentina SAR9384.

Figure 18. Seedlings of *Pterocactus tuberosus.* RFPA500.02.

Figure 19. *Pterocactus tuberosus.* Sierra Lihuel Calel, La Pampa, Argentina 420m RH2724b.

Figure 20. *Pterocactus valentinii.*

which will all regenerate the typical huge taproot. Except *P. tuberosus*, all species require winter watering to avoid the plants shrivelling. This has no impact on frost hardiness and is important to trigger flowering in spring.

However, growing most species from seeds is not difficult. Germination is improved by bottom heating and can still occur several years after sowing. The bonus is to discover the great variability of individuals within the same species. This variability includes the willingness to flower which is often low in about 20% of individuals, medium for 60% and great for the remaining 20%.

Aymeric de Barmon

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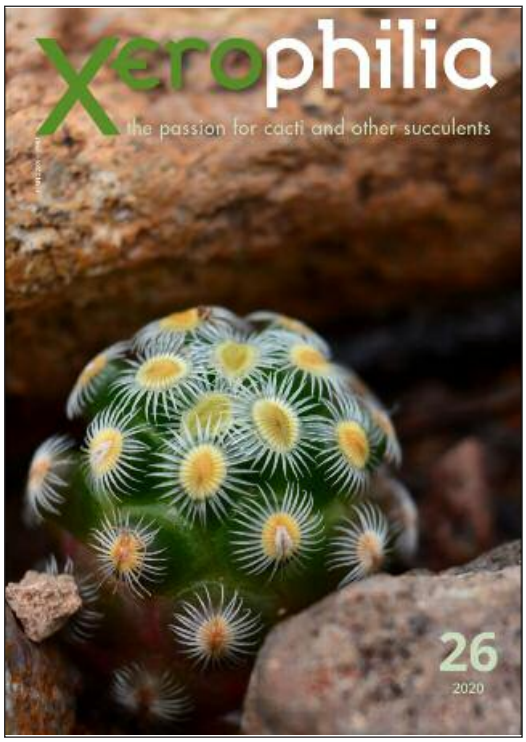
On-line Journals for you to download free

Publishing journals on the web is now very popular. Creating them is a lot of work so perhaps that is why some have ceased publication. Here are some links for you to download and enjoy.



Xerophilia

Issue 26 of *Xerophilia* appeared in June 2020. It is published in English as well as the language of the original article.

This issue has only 14 pages and is the last in this format.

Due to difficulties with contributions, the publisher will move the magazine to another format: they will follow the principle of "first come, first served". At the end of the year they will build a volume with everything that appeared in the past year. Also, when it comes to long and complex articles or species descriptions, thay will continue to publish special issues.

Contents: ·Editorial 26; *Ariocarpus kotschoubeyanus* (Lem.) K.Schumann | Juan Miguel Artigas Azas

The magazine may be downloaded free as a pdf from

http://xerophilia.ro Contact: xerophilia@xerophilia.ro

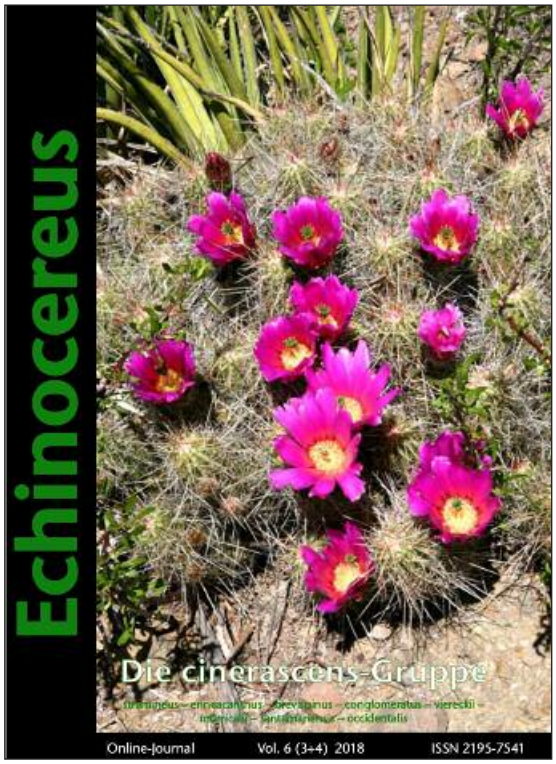
ECHINOCEREUS Online-Journal

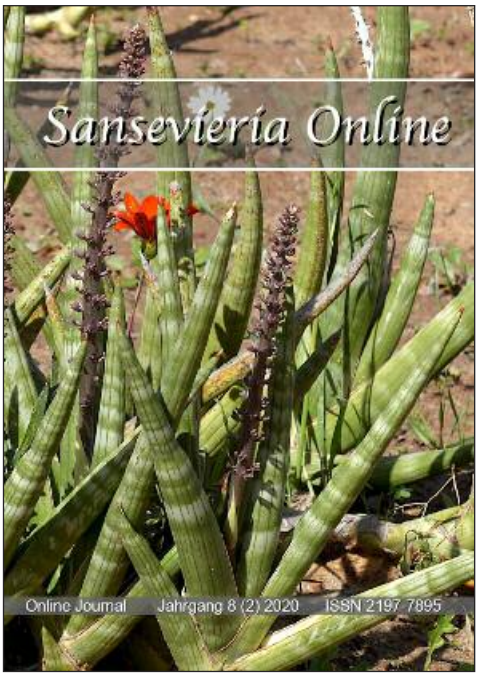
The German language on-line journal for Echinocereus lovers. The goals of this journal are to study the genus *Echinocereus*, to publish articles about the continuous research on these plants (classification, morphology, evolution) as well as to protect the genus *Echinocereus* by reproduction from seeds and distribution of the seedlings.

This issue appeared in **October 2018** and is the last to be published. It concerns the Echicereus cinerascens group: *E. stramineus*; *E. annaecanthus*; *E. conglomeratus*; *E. viereckii* and *E. occidentalis*.

The downloaded pdf file allows printing, but does not permit copying of the content. For those of us who do not understand German very well, the publishers also provide a downloadable MS Word document of the text making it possible to copy and paste it into a translation program. This is a major benefit of online journals and I thank them for this useful feature.

See website: www.echinocereus.eu





Sansevieria Online

The online journal for the growing number of enthusiasts for this genus. A small group of *Sansevieria* enthusiasts publish the first *Sansevieria* online journal in German. They welcome contributions on systematics, morphology, physiology, evolution etc.

This issue includes: Editorial; *Sansevieria varians* and the mysteries of the past; How I came to my Sansevierias; From historical descriptions; *Sansevieria gracilis* with large flowers; *Sansevieria masoniana* in my collection; Sansevierias presented.

There is a cumulative index published for 2013–19.

Download the PDF from www.sansevieria-online.de where you can also find a special issue containing field number lists and the index to the journal.

Schütziana

The latest issue of Schütziana, the specialist on-line journal for *Gymnocalycium* enthusiasts, 11(3) was published in December 2020 and features one article:

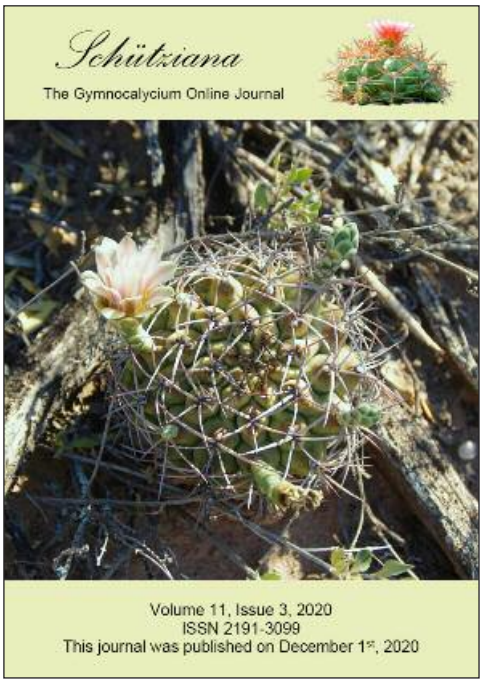
Papsch, Wolfgang:

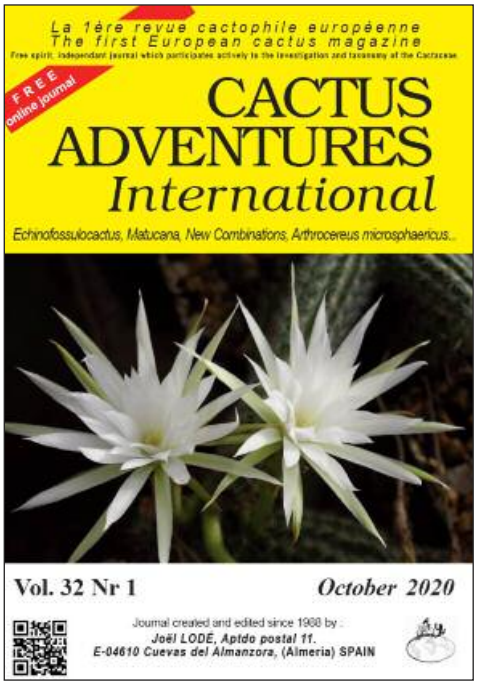
Notes on two Gymnocalycium taxa collected by A.V. Frič: *Gymnocalycium michoga* and *Gymnocalycium knebelii*.

The text of this valuable publication is available in English, German, Russian and Japanese.

You can download free all the issues from:

www.schuetziana.org





Cactus Adventures International

Joel Lodé told us last year that his long-running journal would no longer be published in printed form. It was a nice surprise to find that the first on-line edition with 132 pages has appeared.

Vol.32(1) contents: *Echinofossulocactus*; New Combinations; *Arthrocereus microsphaericus*; *Agave maria-patriciae*; Objectif Cactus (French); *Matucana weberbaueri*; Ariocarpus seedlings story; *Agave ghiesbreghtii*; *Bradleya* contents;

You can find it at

http://cactus-aventures.com/pageweb_ENG.html

The download is free of charge

Carpophyma

Four issues of this new on-line publication have appeared this year. It is the brainchild of Eduart Zimer and contains a fascinating mix of subjectes including cacti and succulent plants.

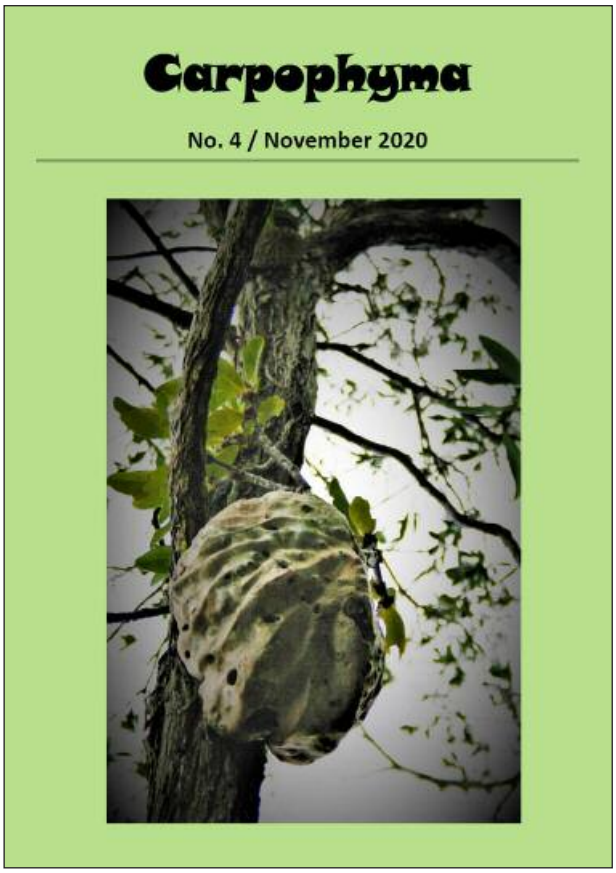
Contents of No.1

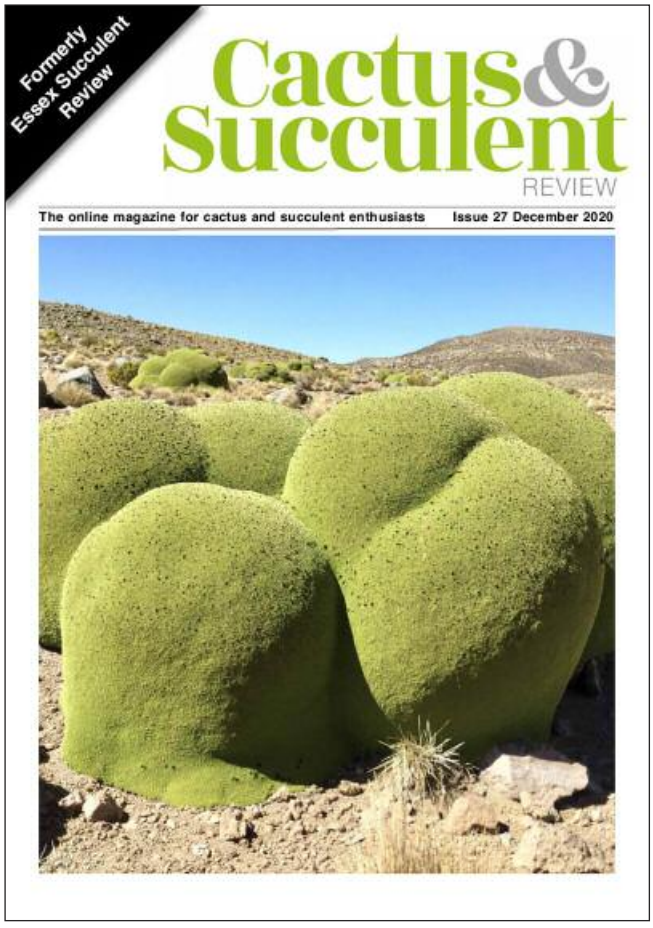
Why the need for Carpophyma?
Sydney Parkinson: a Quaker in pursuit of botanical explorations
What are the REAL environmental weeds?
Turbinicarpus lophophoroides change in growth pattern
The Gathering Place (O'ahu Island, Hawaii)

Contents of No.4

You had me at free ponies for all!
Recent revisions in *Sulcorebutia*: a NZ amateur's view
An Introduction to Myrmecophytes (part 1)
Grafting *Mammillaria theresae*
The Blue Spring

Download free from here.





Cactus & Succulent Review

(Formerly Essex Succulent Review)

The *Cactus & Succulent Review* is a high quality quarterly magazine featuring non-technical articles on all aspects of cacti and succulents.

Issue 27, published December 2020, features 60 pages of: *Azorella compacta* – a plant from another dimension; *Huernia pillansii*; Climate change: – A warming climate and us; The Atacama; Risks to dwarf succulents from climate change; What's in a name? *Haworthia splendens*; More interesting euphorbias; Cactus flowers – do they make scents? Black aeoniums; A trip to Chile – Part 2.

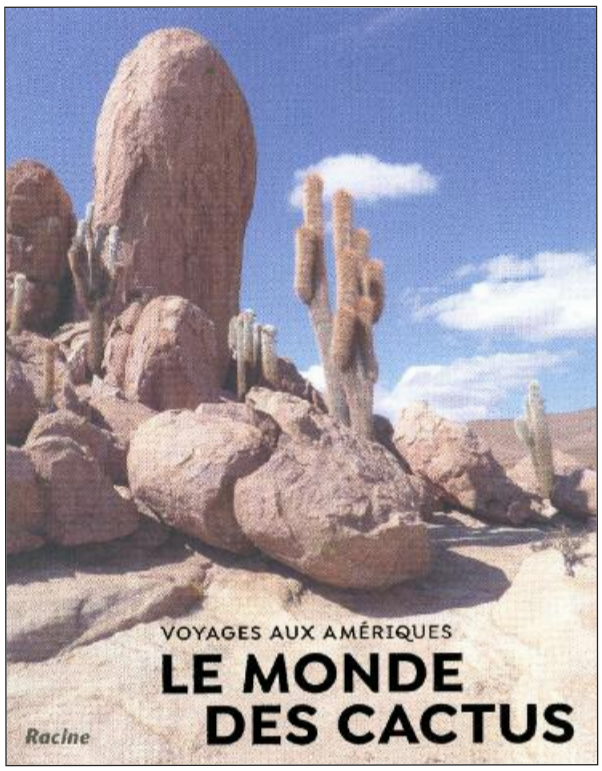
You can subscribe to the mailing list to be notified by email when each issue is ready to download. Subscription is free and you can unsubscribe at any time.

Further details and back issues are available to download from the website: https://www.cactusandsucculentreview.org.uk/ or email: contact@cactusandsucculentreview.org.uk

The Love of Books

Here you will find information about new publications together with some that were published years ago and remain a valuable source of information.

Le Monde des Cactus



Here we have a book that is about Cactus Exploring! What could be more appropriate for this journal? Five enthusiasts who enjoy searching for cacti in far-away places tell us about their journeys and illustrate their adventures with spectacular pictures.

South West USA: *Denis Diagre-Vanderpelen*
Mexico: *Philippe Corman*
Northern Peru: *Philippe Corman*
Chile: *Norbert Rebmann*
North West Argentina: *Thomas Guerry*
Brazil: *Jean-Marie Solichon*

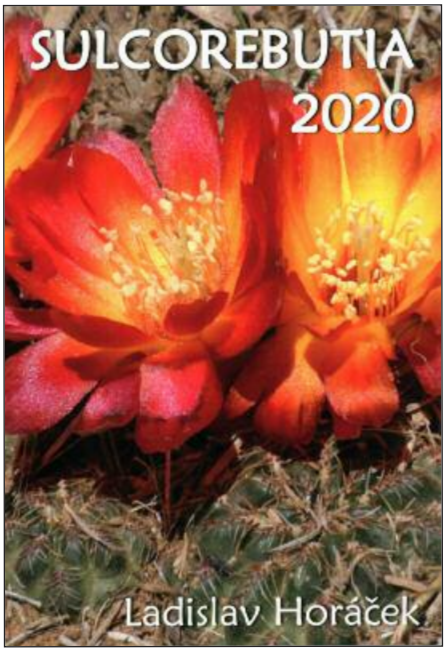
There are also chapters on the botany of cacti, their history and finally their culture written by *Aymeric de Barmon*.

French language, 256 pages 280 x 225mm, hardback with picture covers, 267 pictures (many large) and 6 maps.

Available from https://www.racine.be/fr/le-monde-des-cactus for €39.95 plus shipping.

Sulcorebutia 2020

Ladislav Horáček



Sulcorebutia is a genus with easy to grow, easy to flower, easy to propagate small-growing plants with lots of forms to collect. It is no wonder that they are so popular. The variation between populations and even plants in a single population has resulted in an explosion of names that have no botanical significance. Amateur growers like names and here is a book with lots more, a splitter's delight!

Much of the book is taken up with long descriptions in Czech with English summaries. It is not thoroughly researched, for instance *Sulcorebutia hilmanii* is named after Ralf Hillmann but the author didn't bother to find out how to spell his name!

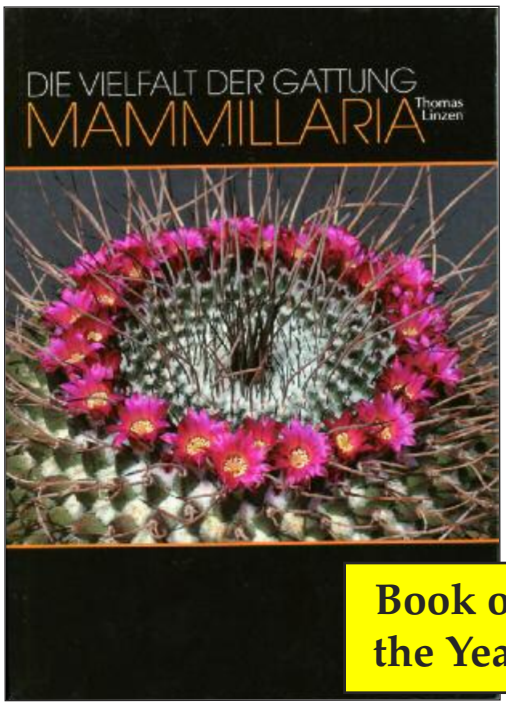
The large number of habitat pictures of plants in flower are very good.

Czech with English summaries, 256 pages, 230 x 160mm, hardback with picture covers, over 650 pictures and 17 maps.

Available from Keith's Cactus Books for £30.

Variety in the genus Mammillaria

Thomas Linzen



Here is the latest in the series of books published by the German Cactus Society (DKG), ideal for amateur enthusiasts, but only available to members of the DKG. All books in the series are produced to a high standard and this one is excellent in every respect.

Mammillaria is the most popular genus of cacti and this book splendidly displays their diversity and appeal. It comprehensively covers all the species, each illustrated with outstanding quality pictures in habitat and cultivation. There are also brief notes and a simple coded reference to cultivation requirements that are so varied in this large genus.

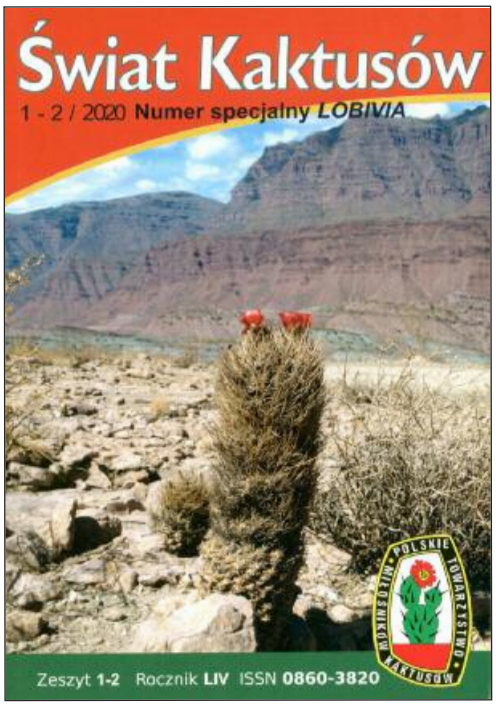
Most of the book is taken up by the presentation of the accepted species but there is also a brief introduction, history and classification, distribution and cultural requirements.

German language, 512 pages 240 x 170mm, softbound with picture covers, 978 excellent pictures. I think that this is the best new book published this year so I am awarding it the **Cactus Explorer**'s **Book of the Year**.

It is a good reason to join the DKG so, as a member, you can buy it for the amazingly low price of **12€**. GC

Special issue of the Polish Society Lobivia

Tomasz Blaczkowski



This is another book which is only available to members, this one from the Polish Society 'świata kaktusów' (Cactus World).

It is a survey of *Lobivia*, the first to be published for many years. (See **Cactus Explorer** 10: 23 for information about Walter Rausch's books, previously the standard reference).

Tomek Blaczkowski has travelled extensively to photograph *Lobivia* species in habitat. All the taxa are well illustrated with interesting brief notes about each one. There are introductory texts about History; Taxonomy; Distribution; Characteristics and Cultivation. The geographic arrangement makes a specific plant difficult to find and I would have liked an alphabetical index including synonyms.

Most lobivias are easy to grow and flower in a bright location and this book helps you choose which you would like to grow. Most species are available as seeds which you can buy from dealers such as Succseed who offer TB seeds derived from the author's collections.

Polish, English and German text, 146 pages 227 x 159mm, softbound with picture covers, 180 good quality pictures and 18 maps.

This book is already out of print but you may be able to get a copy from the author: tomekbla@wp.pl

New offer of books for sale

Paul Foster has some interesting books for sale. The very reasonable prices exclude carriage so please contact him at ppfoster@aol.com if you are interested in any of the titles. A rare chance to buy important and rarely available titles.

Kakteen in Sudamerika. Ritter F. 1st Ed. 1979–81. 4 Vols. SC. **£50**

Cactaceas En la flora silvestre de Chile. Hoffmann & Walter. 2nd Ed. 2004. SC. **£30**

Les Cactees. Lemaire C. 1st Ed. 1868. SC. A rare book. **£100**

Las Cactaceas De Mexico. Bravo H. 1st Ed. 1937 SC (previous owner inscription). **£60**

Las Cactaceas De Mexico. Bravo H. *et al*. 2nd Ed. 1978–1991 3 vols. HB DW. **£150**

Wunderwelt Kakteen. Backeberg C. 1st Ed. 1961. HB DW. **£10**

Cactaceae of the Boundary. Engelmann G. 1st Ed. 1858. HB. A classic antiquarian book. **£90**

Rock Plants. Davids A. 2nd Ed. 1948. HB DW. **£15**

Lithops: Treasures of the Veld. Hammer & Barnhill. 1st Ed. 1999. SC. **£8**

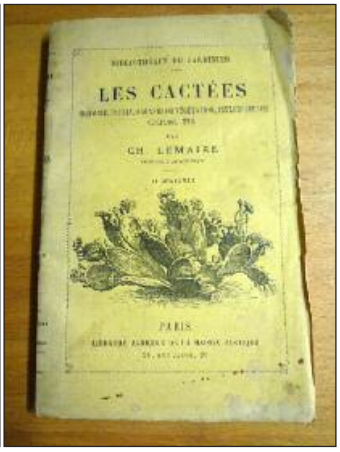
Schlumbergera. Supplie & Van der Zee. 1st Ed. 2005? HB. **£5**

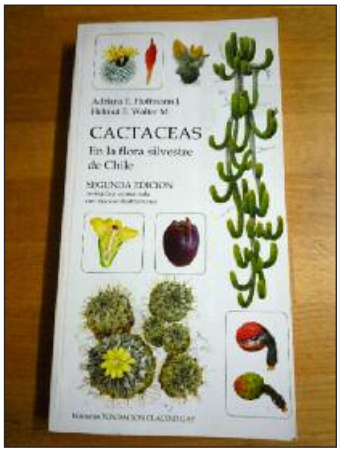
Excelsa: Taxonomic Series No. 4. 1988. SC. **£10**

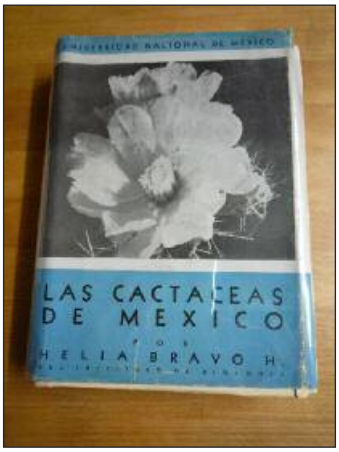
Cacti: Biology and Uses. Noble P. 1st Ed. 2002. HB DW. **£15**

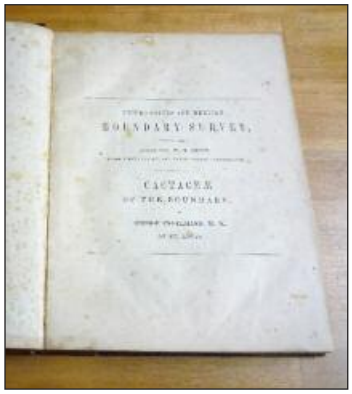
Blühende Kakteen. Schumann & Gurke (1980's reprints) Parts 1–60 HB: £40 Parts 1–12 SC: Parts 13–24 SC: Parts 61–72 SC: Parts 73–84 SC. **£40**

Sage of the Desert. Bonker & Thornber. 1st Ed. 1930. HB. **£8**









Succulents on a Plate

Graham Charles tells us about the Belgian publication *Flore des Serres et des Jardins de l'Europe* which includes over 2,500 splendid plates.

Plate 896 – 897. (Volume 9, 1854)
Cereus Mac Donaldiae. Copied from plate 4707 in *Curtis's Botanical Magazine* (1853). The plant first flowered at Kew in July 1831.

Flore des Serres et des Jardins de l'Europe

This Belgian botanical publication ran for 23 volumes from 1845 to 1880, and is similar to Curtis's Botanical Magazine which was featured in the **Cactus Explorer** 24 on page 28.

It was founded by Louis van Houtte, a Belgian nurseryman, who edited it with Charles Antoine Lemaire and Michael Joseph François Scheidweiler. It featured splendid hand-finished engravings and lithographs depicting and describing botanical curiosities from around the

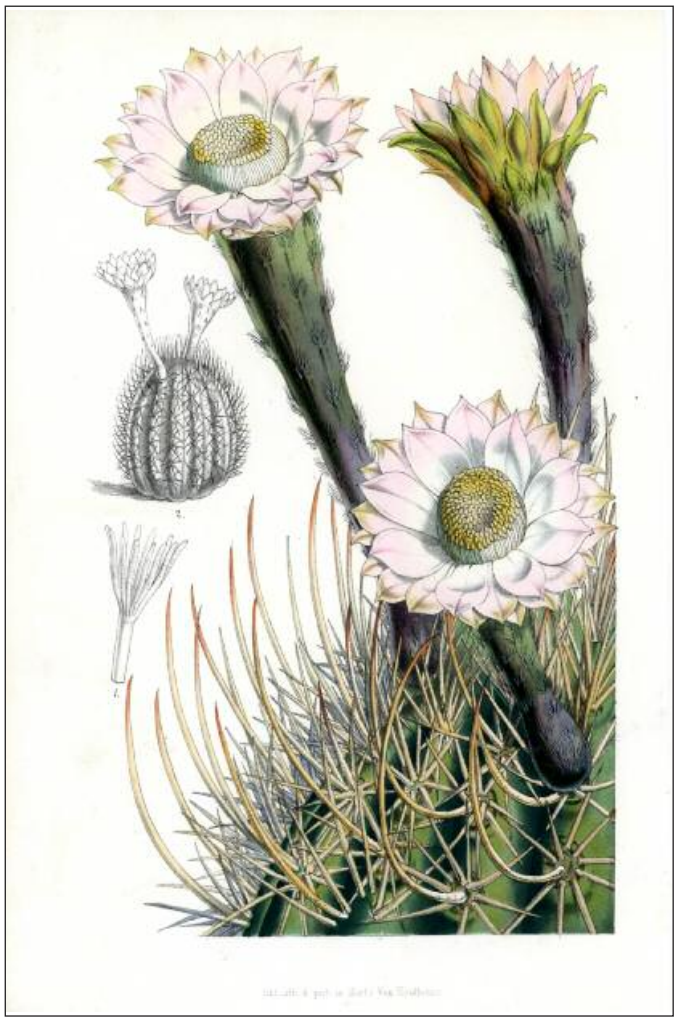


Plate 635. Volume 6, 1850–51.
Echinopsis campylacantha (= *Echinopsis leucantha*)
Copied from Plate 4567 in *Curtis's Botanical Magazine* (1851)

world. Most illustrations show flowers and plants for sale in van Houtte's nursery including many exotic species. Van Houtte's knowledge of botany, his commercial aptitude and language skills made his nursery very successful. From about 1845 he began sending out plant collectors to bring back orchids and other exotic plants from South and Central America. His company propagated many plants for European greenhouses. By 1870, Van Houtte owned the most flourishing nursery in Belgium, with an area of 14 hectares and 50 greenhouses

This work has 2481 numbered plates and some extra, mostly uncoloured plates, without a number. Some of these drawings are by Lemaire and Van Houtte, but most of them are by Guillaume Severeyns, Louis Constantin Stroobant and Pieter de Pannemaeker.

GC

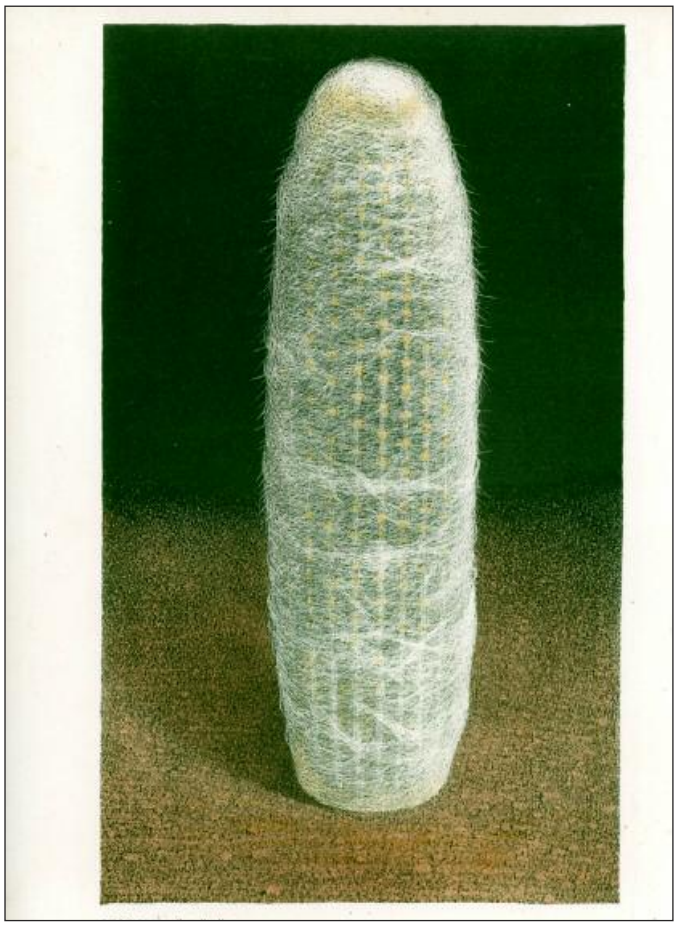


Plate 2163. Volume 21, 1875.
Pilocereus dautwitzi (= *Espostoa lanata*)

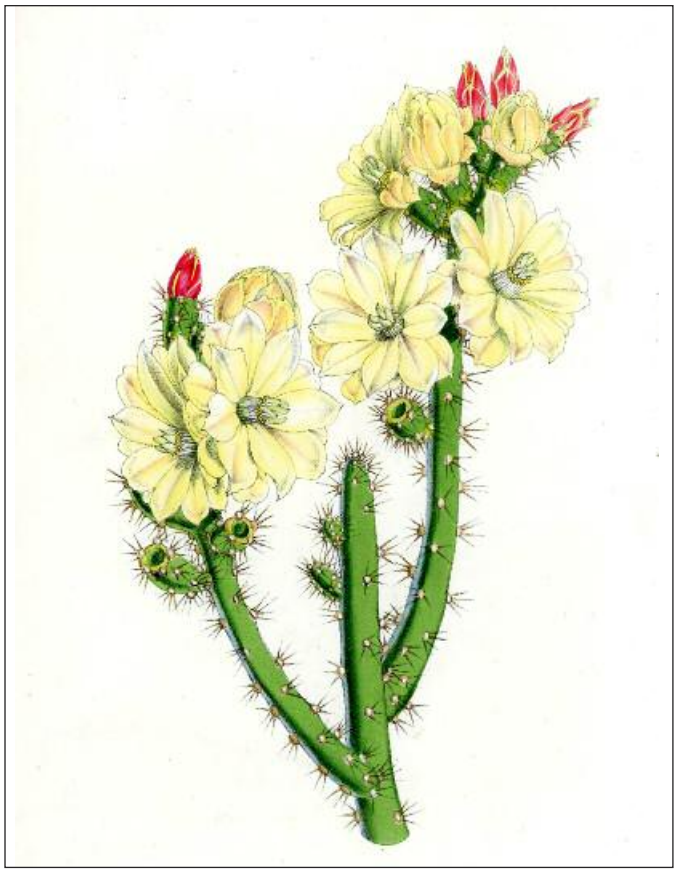


Plate 670. Volume 7, 1851.
Opuntia salmiana. Copied from Plate 4542 in *Curtis's Botanical Magazine* (1850)

A trip to the habitat of Agave impressa Gentry - a great and rare agave

Michael Greulich describes his visit to the habitat of one of the most beautiful agaves, a planned destination during tours through Mexico in 2014 and 2016. The area is located near Escuinapa, Sinaloa, Mexico, on small hills with semi-tropical flora, not far away from the coast of the Gulf of California. **Photos by the author**

In 2016 I made a tour through Mexico with two friends from the South of Germany, Wolfgang Metorn and Michael Bechtold. They were interested to see *Agave impressa* in its habitat. Two years before, I had already been there, together with three other travelling companions from the Netherlands. So I had some knowledge about this habitat, which we had discovered in 2014 with our guide Bertus Spee. This time Wolfgang, Michael and I went to Escuinapa, a town in Sinaloa, not far away from the border to Nayarit.

We arrived late in the evening and found a hotel where we slept for one night. Next morning, we started our walk after having had breakfast. It was a day at the end of February 2016. *Agave impressa* grows on top of some hills in that area, south of the town at a height of 100 to 300m. The climate is semi-tropical and very hot, even in winter. I would say it was nearly 30°C and that was at ten o'clock in the morning, so the walk to these lovely plants was accompanied by a lot of sweat. And I'd like to mention that the way was not at all easy. If you don't know the right direction or the correct path, you'll end up in a thick forest of thorny shrubs and get never near the agave.

The hills are in front of you with *Agave impressa* at the edge of the rocks, but it is very difficult to climb up and reach them. Even if you make it and find a way up to the top of the hill, you are inside a jungle. There, it isn't easy to get to the right place, where *Agave impressa* grows. These were the experiences I had learnt in 2014. My traveling companions and I spend a long time on top,. We walked around in those deep and spiky shrubs, looking for the agaves but were very much diappointed. We found only 3 specimens with very long leaves under big shrubs, not really nice, because of the darkness.

Figure 1. *Agave impressa* growing under big trees with Raymond Laporte.

Figure 2. Adult rosettes of *A. impressa.*

Figure 3. View at one habitat of *A. impressa*.

Figure 4. Dense semi-tropical flora surround the steep hills.

Figure 5. young rosette of *A. impressa*.

Figure 7. *Acanthocereus occidentalis*.

Figure 6. A young plant of *Pilosocereus alensis*.

Figure 8. *Pilosocereus alensis* with cephalium.

We couldn't find a bigger population of *Agave impressa*. Not a single plant more. They had to be nearby, but you can't see them. You see agaves on top of the next hill, but you can't find them on yours. It's a very hard job, to discover *Agave impressa* in its habitat. At the last minute, we were on the way back and two travel companions had already gone down. Raymond and I found the right way to a population on top of the neighbouring hill. *Agave impressa* grows there in the full sun, rooting on the rocks. No shrubs any more. A nice place and many great plants!

There were some other plants of interest associated, for example *Acanthocereus occidentalis*, *Pilosocereus alensis*, *Hechtia* spec., three different *Opuntia* spec. and species from the Bromeliaceae.

But it was late in the afternoon and we had

Figure 9. View towards the sea

Figure 10. *Hechtia* spec.

Figure 11. *A. impressa* - a younger specimen, slightly wet.

not much time to take good photos of the plants. Many dark clouds were on the way from the sea heading in our direction. Fine rain started somewhat later. But it gave the spines of those agaves a nice dark colouration. Pure beauty! The shape and colouration of the leaves became even more intensified.

Soon we had to go down in order to get back before the darkness overcame us. We arrived at the car scratched and tired, but with many photos in the bag. Raymond and I were well satisfied and we shared our photos with our friends, who hadn't seen the plants.

When we visited the place once more in 2016, I already had an idea how to get somewhat more easily to the rock where the habitat of *Agave impressa* is found. There is much dense vegetation around, as it was the case two years ago. First we walked through fields with mango trees. We looked for a small, dried up riverbed, which we

Figure 12. A variegated rosette of *A. impressa.*

Figure 13. *A. impressa* on volcanic rocks.

Figures 14 – 16. Various rosettes of *A. impressa* - overview of the diversity in its rocky habitat, mainly on the edges of the volcanic hills; partly stressed by sun and dryness.

Figure 17. *A. impressa*, stressed by sun.

used as path in order to get near to the mountain. Here, the vegetation was less dense so you could walk in the right direction, if you followed the creek. The only problem was to find the right point to leave the creek.

You have to go left in order to find a path or to follow your nose to the hill, always walking up. This time we had to walk only for a short time through the dense vegetation. We reached soon a rocky area and went along the big rocks uphill. Partly the way up was very steep, but we made it. At the end we had to climb a bit. But here we saw not far away the first rosettes of *Agave impressa*. So we knew that we were on the right way. Getting on top of the plateau, we encountered first a variegated rosette, with more white coloration than normal.

Some steps away many rosettes grew on that rocky plateau. As you stand in front of them, you forget all the sweat and enjoy the beauty of these jewels of the Agavaceae. Some of these photos will give you an idea of that and what I mean and felt when standing next to these plants of extraordinary beauty.

Especially the bud prints, sometimes connected with red coloured leaves are so impressive - the right name for this agave. There is little variation in the population; not all specimens have the strong white colouration and the spines are sometimes smaller.

Wolfgang and Michael enjoyed the place with those lovely plants as much as I did (Figures 12–17). From the edge of the hill, you have a very nice view to the sea. There were many more nice agave plants which I can't show because the space is limited. But we also saw some cacti and other succulents in the same habitat. Again *Pilosocereus alensis* even with a branch that grew as a cristate, an unknown opuntia in flower, *Aechmea* or *Bromelia* spec. and *Stenocereus thurberi*.

After having taken many photos of the population of *Agave impressa* (Figures 18–24) and other associated plants, we walked a bit around and saw that on top of a neighbouring hill, separated only by a forest-area, had to be another population. A yellow inflorescence with the typical panicle, raised up above the shrubs. We followed a small but easy path, probably made by animals, and soon got to that second habitat of *Agave impressa*. Unbelievable that it was so easy this time. Why did we wandered around last time so long with little success? It was great to find now a rosette of *Agave impressa* in full flower. Again, our cameras didn't rest for long at that population of such lovely agaves.

At the place I took a series of photos of flow-

Figure 18. *Pilosocereus alensis* - cristate at the foot of a columnar stem.

Figure 20. *Pilosocereus alensis* - a young offset.

Figure 21. *Opuntia decumbens*.

Figure 19. *Pilosocereus alensis* with cephalium.

Figure 22. A member of the Bromeliaceae - probably from the genus *Bromelia* or *Aechmea.*

Figure 23. A young offshoot of the *Bromelia* / *Aechmea*.

Figure 24. *Pachycereus pecten-aboriginum.*

Figure 26. Rosette burnt out by flowering-, heat- and dryness- stress.

Figure 25. The author next to a flowering *A. impressa.* Photograph: Wolfgang Metorn.

Figure 27 Top of the inflorescence of *A. impressa*.

Figure 28. Flower detail of *A. impressa*.

ers in different stages to show the development. Agaves are rare in flower and *A. impressa* especially so it was a good chance to make this record.

Many nice photos were taken before we went back downhill (Figures 25–29). It was not easy to find a way back to the small riverbed because now we went down directly from the last location, not the place where we climbed up. We followed our noses, but in the end we took a much harder way than before. We came through many thorny shrubs again and in the end we were surprised at the place where we entered the mango fields. It was unexpected, much more northwards than we planned.

You can wander around and get lost in this jungle. Good to have a GPS with you to find the way back. We were lucky to be successful and full with such great impressions. Blood from several scratches was mixed with our sweat, the price for that adventure. But the pain was soon gone after a quarter of an hour and with many deep swigs of mineral water and a cold beer afterwards. A machete would have been very helpful, but was omitted from our trip. It's on my checklist now, if I ever go back again.

We drove northwards somewhat later to Sonora; the next adventures were waiting but that's another story.

Figure 29. Overview of the development of the flowers of *A. impressa*.

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The genus Aeonium on Gran Canaria

Marco Cristini tells us about the genus *Aeonium* on Gran Canaria and illustrates his observations with excellent pictures. We can see that this popular holiday island has a lot more to offer the plant lover than splendid weather and beaches. Photographs by the author.

Introduction

Gran Canaria is home to a rich flora and hosts several species of succulents which can be found in almost every part of the island. As far as the Crassulaceae family is concerned, the most important genus is doubtless *Aeonium*, with seven species (five are endemic). While the aeoniums of Gran Canaria have been well studied during the last century, chorological data is often sketchy and paths far from major roads can reveal highly interesting populations.

Gran Canaria has been deeply transformed by the Spanish colonization. The laurel forest, which once covered the majority of the island's northern part, has disappeared almost completely and the pine forest was severely reduced before a few attempts at reforestation took place during the twentieth century (Figure 1). On the other hand, man-made structures such as tiled roofs, stone walls or road embankments provided some *Aeonium* species with ideal habitats, enabling them to grow in a greater number of places. Unlike La Palma or El Hierro, human activities have had a lasting impact on almost all areas of Gran Canaria and influenced also the distribution of *Aeonium* species, which is now almost certainly quite different from what it was before the fifteenth century.

Figure 1. Gran Canaria (adapted from Gobierno de Canarias - Consejería de Educación, Universidades, Cultura y Deportes).

Aeonium arboreum ssp. *arboreum* (Linné) Webb & Berthelot

Once known as *Aeonium manriqueorum*, *Aeonium arboreum* ssp. *arboreum* (Figure 2) is an endemic of Gran Canaria where it grows from 200 to 1850m. It is a few-branched subshrub up to 2m tall, with erect or ascending, smooth branches without reticulations. Its rosettes are 12–25cm in diameter during the growing season, but much smaller in summer, when the

Figure 2. Caldera de Bandama, *Aeonium arboreum* ssp. *arboreum*.

Figure 3. Rincón de Tenteniguada, a rosette of *Aeonium arboreum* ssp. *arboreum*.

Figure 5. Path between San Mateo and Valsequillo, *Aeonium arboreum* ssp. *arboreum* (left) growing side by side with *A. undulatum* (centre) and *A. percarneum* (right).

Figure 7. Rincón de Tenteniguada, an inflorescence of *Aeonium arboreum* ssp. *arboreum* in full bloom, 4th August 2020.

Figure 4. Valsequillo, a medusa-like *Aeonium arboreum* ssp. *arboreum*.

Figure 6. Agaete, *Aeonium arboreum* ssp. *arboreum*.

Figure 8. Hoya del Gamonal, *Aeonium aureum*.

Figure 9. Hoya del Gamonal, an offsetting *Aeonium aureum*.

Figure 10. Hoya del Gamonal, a healthy group of *Aeonium aureum*.

Figure 11. Cruz de Tejeda, Monte Constantino, *Aeonium aureum* covers a rocky outcrop at around 1700m.

plant sheds the previous season's leaves and retains almost only the younger ones, tightly appressed to each other (Figure 3). It is widespread in the central and northern part of Gran Canaria, often in areas which were covered by the laurel forest before the Spanish colonization of the island.

Differentiating *A. arboreum* ssp. *arboreum* from *A. undulatum* can seem difficult at first

Figure 12. Path leading from San Mateo to Valsequillo, *Aeonium aureum*.

sight, since both species develop shrubs made up by 10–20 tall stems looking quite similar, especially during the summer dormancy. The main distinguishing feature mentioned in the literature, namely that *A. undulatum* branches only from the base, is often not very helpful, since a damaged specimen of *A. undulatum* can develop several branches and I saw plenty of such plants (see below, Figure 44). However, *A. arboreum* ssp. *arboreum* is usually much more branched than *A. undulatum*, resulting in tangled shrubs with a greater number of stems (Figure 4). In addition, the stems of *A. undulatum* are thicker (see below, Figure 46) and grow often upright, whereas those of *A. arboreum* ssp. *arboreum* can be quite tortuous.

A. arboreum ssp. *arboreum* thrives in sunny and dry locations such as stone walls, rocky outcrops and lava fields (Figure 5). In the literature, I read that it grows up to 1600m, but

Figure 13. *Aeonium aureum* growing on the dam of Embalse de los Homos.

Figure 14. Tenteniguada, near Roque Grande, *Aeonium aureum* (perhaps a cross with *A. undulatum*)

Figure 15. Tenteniguada, near Roque Grande, *Aeonium aureum* (perhaps a cross with *A. undulatum*)

I found it at around 1630m near Mirador de Bécerra and at 1850m east of Pico de las Nieves, growing together with *A. percarneum* in a sheltered position. I saw many healthy specimens of *A. arboreum* ssp. *arboreum* on Caldera de Bandama (an impressive extinct volcano not far from Las Palmas), where I sometimes spotted it growing as an epiphyte on palm trees. On the other side of the island, this succulent grows near Agaete (Figure 6),

Figure 16. Hoya del Gamonal, a quite open rosette of *Aeonium aureum*.

Figure 17. Barranco de la Virgen, Montaña Doramas, *Aeonium canariense* ssp. *virgineum*.

Figure 18. Barranco de la Virgen, Montaña Doramas, a rosette of *Aeonium canariense* ssp. *virgineum*.

Figure 19. Barranco de la Virgen, along the road GC-305, *Aeonium canariense* ssp. *virgineum*.

Figure 20. Barranco de la Virgen, along the road GC-305, *Aeonium canariense* ssp. *virgineum* growing on a road embankment.

Figure 21. Barranco de la Virgen, *Aeonium canariense* ssp. *virgineum* growing in the pine forest.

but only from 400m upwards, whereas it can be found as low as 250m in nearby San Pedro, a few kilometres from the ocean.

The literature is quite inconsistent as far as the flowering time of *A. arboreum* ssp. *arboreum* is concerned. According to Praeger (1932: 162), it flowers between January and February (February–March according to Suárez 1994: 331; November–February according to Maire 1976: 298), whereas Bañares Baudet (2015: 30) prefers autumn (September–November), following Bramwell (1997: 42). Liu (1989: 66, followed by Piens 2002: 114 and Carbonell 2007: 45) writes that the species flowers from October to April, Lodé (2010: 78) includes eight months (November–June) and Muer *et al*. (2016: 272) nine (October–June). On the other hand, Burchard (1929: 136) mentions only spring (April–May) and Kunkel (1978: 44) summer (June–August/September). During my stay on Gran Canaria (early August 2020), I saw many spent inflorescences, but also quite a few in bloom (Figure 7). It seems to me that many botanists observed flowering plants at the time of their visits to Gran Canaria and wrote about the anthesis of *A. arboreum* ssp. *arboreum* accordingly. In my opinion, it is likely that the succulent flowers throughout the year, depending on local circumstances such as water, soil and exposure.

Aeonium aureum (C. Smith ex Hornemann) Mes

Once considered a member of genus *Greenovia*, *Aeonium aureum* is a stemless succulent whose cup-shaped rosettes have a diameter of 8–30(–40)cm and become tightly closed during the dry season (Figure 8). The plant is often solitary, yet if conditions are good it can produce offsets (Figures 9–10). It grows mostly in the pine forest zone, but can be found also in the laurel forest and subalpine zone. It occurs on Gran Canaria, Tenerife, La Gomera, La Palma and El Hierro.

A. aureum is widespread in the central part of Gran Canaria, often covering whole outcrops (Figure 11) or stone walls, also inside towns and villages. I found it from around 700m (Barranco de los Mirales, near San Mateo) up to 1700–1800m (for instance on Monte Constantino or in the area around Roque Nublo). There are many good-looking populations of this species between Hoya Viciosa and Montaña de los Cardos, on the path leading from San Mateo to Valsequillo (Figure 12), growing together with *A. arboreum* ssp. *arboreum*, *A. percarneum*, *A. undulatum* and *Monanthes brachycaulos*. This is one of the most Crassulaceae-rich areas of Gran Canaria and the plants grow on the rocks along the track, so it is very easy to observe and photograph them. At Embalse de los Homos, an artificial lake south of Tejeda, I saw *A. aureum* growing on a huge dam together with *A. simsii* (Figure 13). The species is also common along the path leading from San Mateo to Pico de las Nieves.

Near Roque Grande (Tenteniguada), at around 1300m, I observed a few unusual specimens (Figures 14–15) which were neither folded up like the majority of the neighbouring plants nor open like other *A. aureum* specimens I saw in shaded and damp localities (Figure 16). The rosettes were somewhat compressed, half folded-up and their colour was a shade of green a little brighter than the average *A. aureum*. There were many *A. undulatum* growing nearby, so there exists the possibility that the specimens I saw were a cross between it and *A. aureum*, although it would be necessary to see the plants outside their summer dormancy to be more certain.

Aeonium canariense ssp. *virgineum* (Webb ex Christ) Bañares

Often growing in open clusters of ten to twenty rosettes, *Aeonium canariense* ssp. *virgineum* is an endemic of Gran Canaria, up to 1000m (Figures 17–18); it belongs to a species growing also on Tenerife, La Gomera, El Hierro and La Palma. Its cup-shaped rosettes have velvety, occasionally undulated, 10–15cm long and 5–7cm wide light green leaves sometimes with reddish to yellowish tinge. It grows in the northern part of the island, often on rocks and rocky outcrops.

A. canariense ssp. *virgineum* was in all likelihood much more common before the destruction of the laurel forest, its main habitat. Now it survives only in a few locations scattered throughout the northern part of Gran

Figure 22. South of Cruz de Tejeda, Degollada Bécerra, *Aeonium percarneum*.

Figure 24. Agaete, a small and heavily-branched specimen of *Aeonium percarneum*.

Figure 26. Tenteniguada, near Roque Grande, *Aeonium percarneum*.

Figure 23. South of Cruz de Tejeda, Degollada Bécerra, tall specimens of *Aeonium percarneum*.

Figure 25. San Mateo, *Aeonium percarneum* growing quite happily on a roof.

Figure 27. Tenteniguada, near Roque Grande, *Aeonium percarneum*.

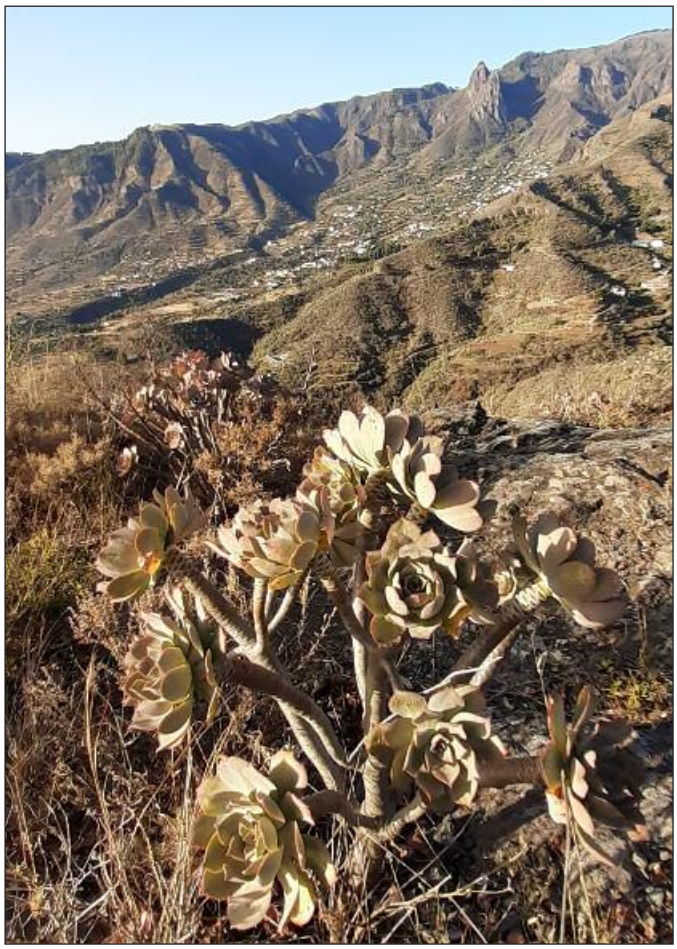

Figure 28. Near Montaña de los Cardos, *Aeonium percarneum*.

Figure 30. Pico de Bandama, *Aeonium percarneum* growing as an epiphyte on a palm tree.

Figure 29. A nice view from Pico de Bandama.

Figure 31. Caldera de Bandama, *Aeonium percarneum*.

Figure 32. Pico de Bandama, *Aeonium percarneum* growing as an epiphyte on a palm tree (close-up).

Figure 33. Hoya del Gamonal, *Aeonium simsii*.

Figure 34. Cruz de Tejeda, *Aeonium simsii*.

Canaria. I observed it only in Barranco de la Virgen, its locus classicus. I first found a few rosettes on Montaña Doramas (around 650m), on the watershed between Barranco de Azuaje and Barranco de la Virgen, then I spotted many more plants on the slopes of the latter barranco, from 500 to 750m. A very good place to observe *A. canariense* ssp. *virgineum* is the road GC-305 (Figure 19). At km 6, there is a rock face covered by it next to the road and the plant is common up to the outskirts of Firgas (Figure 20). It prefers road embankments and rocky slopes, but I found it also in a zone covered by the pine forest, with many specimens half-hidden by pine needles (Figure 21).

This succulent is reported also in the natural park of Tamadaba (Barranco Oscuro, Riscos de Guayedra, Barranco del Palo), yet it seems to grow in areas which are very hard to reach. I tried to walk from Agaete to Tamadaba, but at around 850m I got lost and had to turn back, having found not a single specimen of *A. canariense* ssp. *virgineum* and very few plants of *A. arboreum* ssp. *arboreum* and *A. percarneum*. My Kompass map shows no paths leading to the aforementioned barrancos from the camping area of Tamadaba (which is reachable by road), so I suggest to choose other parts of the island (such as Cuesta de Silva, Cenobio de Valerón, Cabo Verde, Cueva Corcho or Mirador de Andén Verde / Mirador del Balcón) if you are interested in this species.

***Aeonium percarneum* (R.P. Murray) Pitard & Proust**

A shrub up to 1.5m tall, *Aeonium percarneum* is doubtless the most variable *Aeonium* species of Gran Canaria. Its flattish rosettes, 8–25cm in

Figure 35. An open rosette of *Aeonium simsii* in cultivation.

Figure 36. Cruz de Tejeda, Monte Constantino, *Aeonium simsii*.

Figure 37. Roque Nublo; inset: *Aeonium simsii* growing immediately under the peak.

Figure 38. Hoya del Gamonal, over Lomito Blanco, *Aeonium simsii*.

diameter, bear obovate- to oblanceolate-spatulate, apically acute, glaucous leaves which can be almost white, light green, yellowish green or reddish (Figure 22). This succulent is very widespread in central and northern Gran Canaria, where it can be found from 100 up to 1850m. In the literature, I read that the species grows up to 1600m, yet I found many well-developed specimens south of Mirador de Bécerra (at 1700) and at 1850m east of Pico de las Nieves, growing together with *A. arboreum* ssp. *arboreum* in a sheltered position. Its overall appearance and extreme variability are somewhat reminiscent of *A. davidbramwellii* of La Palma. I rarely found unbranched adult specimens, yet the degree of branching and the size of the plants vary considerably: sometimes there are massive specimens almost 2m tall with 4–6 rosettes (Figure 23), other times there are bushes 40–50cm tall with 20–30 little rosettes (Figure 24).

A. percarneum is most likely the first *Aeonium* species to be seen upon arriving on Gran Canaria, since it commonly grows along the main roads of the island. In San Mateo, it can be found on tiled roofs and stone walls (Figure 25), but it thrives almost everywhere there is enough light and soil. I found plenty of healthy specimens between Hoya Viciosa and Montaña de los Cardos (Figure 28), yet the most interesting population I saw is that growing on volcanic soil under Roque Grande (Tenteniguada), around 1100–1200m, where I spotted many different forms of the plant in a quite small area (Figures 26–27), including a possible hybrid with *A. undulatum* (see below). In spite of the arid and sunny environment, the succulents looked healthy, often reaching a considerable size. I suspect that most of the water they need is provided by the clouds coming from the ocean and bringing moisture to the north-facing mountains of the Canary Islands.

Figure 39. Tenteniguada, Roque Grande.

Caldera de Bandama is another good place to look for *A. percarneum*, since the species is widespread both along the road to Pico de Bandama, a mountain with a nice panoramic view (Figure 29), and on the ridge of the caldera itself, where it thrives in a very sunny, arid and windy environment (Figure 31). I was at first surprised to see that *A. percarneum* grows frequently as an epiphyte on the palm trees (*Phoenix canariensis*, if I am not mistaken) bordering the road to Pico de Bandama (Figures 30 & 32), yet the bark of the palm tree is full of fissures and hollows, resembling thereby a rocky outcrop. Together with *A. arboreum* ssp. *arboreum*, I found *A. percarneum* on a few slopes facing the sea in Agaete, but only from 400m upwards, whereas it can be seen as low as 250m in nearby San Pedro, a few kilometres from the ocean.

***Aeonium simsii* (Sweet) Stearn**

One of the most interesting *Aeonium* species, *A. simsii* looks quite similar to a *Sempervivum* at first sight (Figure 33). A caespitose and often stemless plant, it forms low mounds on rocky outcrops, sheer cliffs, stone walls and old roofs. It has lanceolate, highly toothed and thin leaves with longitudinal brownish tannic stripes on the lower face (Figure 34).

Widespread in the pine forest zone, it is said to grow up to the summit of Pico de las Nieves (1950m), although I found it only up to 1800m. It prefers shaded places, but enjoys a remarkable resistance to drought and frost. It occupies the same ecological niche of many *Sempervivum* species. During the summer dormancy many plants look dried up and seem dead, yet they are only trying to reduce to the bare minimum the loss of water by protecting the core of the rosette with a shell of dried leaves, a strategy adopted also by *A. aureum*. Unlike this species, however, I was unable to spot "open" rosettes of *A. simsii* (see Figure 35).

A. simsii can be found very easily in the central part of Gran Canaria, over 900m. It is widespread around Cruz de Tejeda (where I spotted a possible hybrid with *A. undulatum*, see below), especially on Monte Constantino

Figure 40. Tenteniguada, near Roque Grande, *Aeonium spathulatum*.

Figure 41. Hoya del Gamonal, *Aeonium spathulatum*.

Figure 42. Tenteniguada, near Roque Grande, *Aeonium spathulatum*.

Figure 43. Barranco de la Virgen, along the road GC-305, *Aeonium undulatum* growing in the pine forest.

(Figure 36), and I found a nice population at the very end of the path leading to Roque Nublo, immediately under the peak (Figure 37). Another good place to look for *A. simsii* is the path leading from San Mateo to Pico de las Nieves. This species is very widespread near Hoya del Gamonal and higher up (between 1700 and 1800m, see Figure 38) it grows together with an *Umbilicus* species which I was unable to identify with certainty since there were only dried inflorescences in August. However, I think that it could be *U. heylandianus*. *A. simsii* is common also in Tenteniguada, from the last houses of the village up to 1400m. The path leading from Tenteniguada to Paso de la Caldera crosses one of the most botanically interesting areas of the island (Figure 39) and allows a glimpse of all

Figure 44. Hoya del Gamonal, a branched *Aeonium undulatum*.

Figure 45. Rincón de Tenteniguada, an *Aeonium undulatum* growing on a stone wall bordering a cultivated field.

Figure 46. South of San Mateo, *Aeonium undulatum* (note the thickness of the stem).

Figure 47. The so-called "sea of clouds" covering central Gran Canaria shortly after dawn.

Figure 48. Near Montaña de la Caldereta, a group of *Aeonium undulatum* growing in the pine forest.

Figure 49. Tenteniguada, near Roque Grande, *Aeonium* ×*bollei* (*A. percarneum* × *A. undulatum*).

Aeonium species of Gran Canaria except *A. canariense* ssp. *virgineum*. Like *A. aureum*, *A. simsii* does not dislike man-made structures: I found it on roofs, stone walls and even on the dam of Embalse de los Homos.

***Aeonium spathulatum* (Hornemann) Praeger**

A densely branched shrublet up to 60cm tall, its rosettes are flattish during the growing season but entirely folded up in summer (Figure 40), when the stems can sometimes be wholly bare. With obovate-spatulate, ciliate and not very succulent leaves, *Aeonium spathulatum* is often found in the pine forest zone, under the trees, on rocks and stone walls. It grows on all the Canary Islands with the exception of Lanzarote and Fuerteventura, up to 2400m.

Reported only in Tenteniguada in the literature, I found it in two other localities, namely near Montaña de los Cardos (on the path leading to Valsequillo, at 900m) and near Hoya del Gamonal (Figure 41), in two places between 1350 and 1550m (for more information, see my forthcoming paper about the distribution of *A. spathulatum* on Gran Canaria). The best place to observe this species is doubtless the area of Tenteniguada. I spotted it only twice in a nearby hamlet, but it is quite common under Roque Grande (on the path towards Paso de La Caldera, see Figure 42), between 1150 and 1450m, where it is often sheltered by surrounding vegetation.

A. spathulatum is not easy to find in summer since its rosettes are tightly folded up and the plant looks like a dried shrublet from a distance. The best way to quickly identify it is to look for its dried inflorescences, which are usually upright, undoubtedly aeonium-like and taller than the stems. I often found this plant on stone walls on the other islands, so it was quite interesting to see it growing on the ground and reaching a height of almost a metre on Gran Canaria. Although I observed it together with *A. percarneum* and *A. undulatum*, I was unable to spot any hybrid.

Figure 50. Tenteniguada, near Roque Grande, *Aeonium ×bollei* (close-up).

Aeonium undulatum Webb & Berthelot

Growing up to 2m, *Aeonium undulatum* is one of the tallest species of the genus (Figure 43). According to the literature, it is often unbranched or produces only basal side branches, yet I observed plenty of specimens which had developed branches after the stem has been damaged (Figure 44), for instance by grazing animals. Its rosettes, 10–25cm in diameter, are formed by oblanceolate-spatulate or oblong-spatulate, apically acute, dark green leaves. It grows in the northern part of Gran Canaria between 300 and 1600m, on rocky outcrops or north-facing slopes, often in the laurel or pine forest. It prefers somewhat cool and wet places, but I found it also in arid environments such as under Roque Grande, where it possibly thrives thanks to the moisture brought by the "sea of clouds" (see Figure 47).

During my stay on Gran Canaria, almost all rosettes I saw were quite small because of the summer dormancy. *A. undulatum* does not fold up entirely like *A. aureum* or *A. spathulatum*: its rosettes become somewhat cone-shaped (Figure 46), with all surviving leaves tightly packed in order to avoid any unnecessary loss of water through evaporation. On the other hand, I observed a few more open plants growing near gardens or farms (Figure 45), benefiting from the irrigation water.

One of the most characteristic *Aeonium* species of Gran Canaria, *A. undulatum* is not always readily distinguishable from *A. arboreum* ssp. *arboreum*, especially during the summer dormancy, yet after seeing a few plants of both species the identification becomes easier (see above, the paragraph about *A. arboreum* ssp. *arboreum*). I found plenty of *A. undulatum* on the path from San Mateo to Valsequillo, especially between Hoya Viciosa and Montaña de los Cardos, and on the path leading to Pico de las Nieves, especially from Montaña de la Caldereta to Hoya del Gamonal (Figure 48). On this track, the succulent grows also in the pine forest, where it reaches a sizeable height (1.5 or even 2m). Near Roque Grande (Tenteniguada) I spotted a possible hybrid with *A. percarneum* (see below). *A. undulatum* grows up to 1500–1600m near Cruz de Tejeda, sharing the same habitat with *A. simsii* and sometimes crossing with it.

Figure 51. Tenteniguada, near Roque Grande, *Aeonium ×bollei* differs considerably from neighbouring specimens of *A. percarneum*.

Hybrids

During my stay in Gran Canaria I was able to observe crosses between different species of *Aeonium* only a couple of times. I possibly found *Aeonium ×bollei* Kunkel ex Bañares (*A. percarneum* × *A. undulatum*) under Roque Grande (Tenteniguada) at around 1200m (Figures 49–50): I spotted a plant as tall as *A.*

Figure 52. 1km east of Cruz de Tejeda, *Aeonium ×praegeri* (*A. simsii* × *A. undulatum*).

percarneum, but with not as many rosettes and leaves of a lighter colour, different from all other specimens growing nearby (Figure 51). Since *A. percarneum* and *A. undulatum* are both common in this area, I believe that the plant I saw is *A. ×bolle*i.

While walking from Cruz de Tejeda to Las Lagunetas, I observed another unusual aeonium growing in the middle of a group of *A. simsii* around 1400m (Figures 52–53). It looked like a small *A. arboreum* or *A. undulatum*, less than 10cm tall, but its leaves showed the characteristic tannic stripes of *A. simsii* (Figure 54). I observed *A. undulatum* nearby, so there is a good degree of likelihood that I found a specimen of *Aeonium ×praegeri* Kunkel (*A. simsii* × *A. undulatum*).

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Figure 53. Close-up of the rosette of *Aeonium ×praegeri*.

Figure 54. The leaves of *Aeonium ×praegeri* are intermediate between those of *A. simsii* (with long tannic stripes and cilia, inset above left) and *A. undulatum* (usually without or with very short tannic stripes and cilia, see inset below right).

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Appendix 1

Selected locations of Aeonium species growing on Gran Canaria

In the following appendices, I indicate the position of most *Aeonium* species which I observed in Gran Canaria. Of course, I make no claim to completeness; these data refer exclusively to the parts of the island which I visited in 2020.

Agaete: *A. arboreum* ssp. *arboreum*, *A. percarneum* (both from 400m upwards).

San Pedro: *A. arboreum* ssp. *arboreum*, *A. percarneum* (both from 250m upwards).

Cruz de Tejeda: *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum*, *A. simsii*, *A. undulatum*.

Monte Constantino: *A. aureum*, *A. simsii*.

Las Lagunetas: *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum*, *A. simsii*, *A. undulatum*.

Embalse de los Homos: *A. aureum*, *A. percarenum*, *A. simsii*.

Roque Nublo and path leading to La Culata: *A. aureum*, *A. simsii*.

La Culata – Tejeda: *A. percarneum*, *A. simsii*.

San Mateo: *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum* (growing often on roofs), *A. undulatum*.

Barranco de Mireles – La Bodeguilla: *A. arboreum* ssp. *arboreum*, *A. aureum* (only in the lowest part of the barranco), *A. percarneum*, *A. undulatum*.

Between La Asomada and Hoya del Gamonal: *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum*, *A. simsii*, *A. spathulatum*, *A. undulatum*.

Between Hoya Viciosa and Montaña de los Cardos (path leading to Valsequillo): *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum*, *A. spathulatum*, *A. undulatum*.

Near Embalse Toronjo: *A. arboreum* ssp. *arboreum*, *A. percarneum*, *A. undulatum*.

Valsequillo: *A. arboreum* ssp. *arboreum*, *A. percarneum*.

Tenteniguada – Roque Grande: *A. arboreum* ssp. *arboreum*, *A. aureum*, *A. percarneum*, *A. simsii*, *A. spathulatum* (from 1050m, especially near Roque Grande), *A. undulatum*.

Caldera de Bandama: *A. arboreum* ssp. *arboreum*, *A. percarneum* (growing often as an epiphyte on palm trees).

Barranco de la Virgen – Montaña Doramas: *A. canariense* ssp. *virgineum* (common in the lowest part of the barranco until Firgas), *A. percarneum*, *A. undulatum*.

Appendix 2

Aeonium species growing on Gran Canaria

Aeonium arboreum ssp. *arboreum*: Agaete, San Pedro, Cruz de Tejeda, Las Lagunetas, San Mateo, Barranco de Mireles – La Bodeguilla, between La Asomada and Hoya del Gamonal, between Hoya Viciosa and

Montaña de los Cardos, near Embalse Toronjo, Valsequillo, Tenteniguada, Caldera de Bandama.

Aeonium aureum: Cruz de Tejeda, Monte Constantino, Las Lagunetas, Embalse de los Homos, Roque Nublo and path leading to La Culata, San Mateo, Barranco de Mireles – La Bodeguilla, between La Asomada and Hoya del Gamonal, between Hoya Viciosa and Montaña de los Cardos, Tenteniguada – Roque Grande.

Aeonium canariense ssp. *virgineum*: Montaña Doramas (750m), Barranco de la Virgen (along the road GC-305 from km 6 until the outskirts of Firgas, 500–650m, also in the pine forest).

Aeonium percarneum: Agaete, San Pedro, Cruz de Tejeda, Las Lagunetas, Embalse de los Homos, La Culata – Tejeda, San Mateo, Barranco de Mireles – La Bodeguilla, between La Asomada and Hoya del Gamonal, between Hoya Viciosa and Montaña de los Cardos, near Embalse Toronjo, Valsequillo, Tenteniguada – Roque Grande, Caldera de Bandama, Barranco de la Virgen – Montaña Doramas.

Aeonium simsii: Cruz de Tejeda, Monte Constantino, Las Lagunetas, Embalse de los Homos, Roque Nublo and path leading to La Culata, La Culata – Tejeda, between La Asomada and Hoya del Gamonal, Tenteniguada – Roque Grande.

Aeonium spathulatum: near Montaña de los Cardos (path leading to Valsequillo, 900m), Hoya del Gamonal (between 1350 and 1550m), Tenteniguada (on old stone walls and a ruined house, 1050–1100m), under Roque Grande (1150–1450m).

Aeonium undulatum: Cruz de Tejeda, Las Lagunetas, San Mateo, Barranco de Mireles – La Bodeguilla, between La Asomada and Hoya del Gamonal, between Hoya Viciosa and Montaña de los Cardos, near Embalse Toronjo, Tenteniguada – Roque Grande, Barranco de la Virgen, Montaña Doramas.

Gymnocalycium
"fedjukinii" vs "meregallii"

In March, 2012 a new subspecies of *Gymnocalycium carolinense* (Neuhuber) Neuhuber was published in the Russian C&S journal *Kaktus-Klub*. *G. carolinense* subsp. *fedjukinii* Gapon & Neuhuber was described from the eastern slopes of the Sierra de Comechingones in the Argentinean province of Córdoba. It differs from the typical subspecies *carolinense* by a larger stem, thicker, lighter, more or less straight and usually more numerous (9–11) radial spines, larger flowers (up to 60mm in diameter) and a larger ovary (4–6mm). At the same time in the on-line journal *Schützziana* a new species, *G. meregallii* Bercht was published. Victor Gapon discusses the taxonomic relationship of the new finds. **Photographs by V. Gapon except where stated.**

The high mountain ridge of the Sierra de Comechingones lies along the border of the Argentinean provinces Córdoba and San Luis. To make ones way from the eastern slopes to the western ones you can travel by the traditional route through Achiras in the south or by Ruta 20 from the north. However, there is a little-known dirt road leading from a settlement called Lutti to Merlo straight through the Sierra de Comechingones. In 2007 a Russian expedition managed to pass by that road and consequently traverse the ridge by the shortest route.

At altitudes ranging from 1500 to 1800m asl interesting cacti belonging to genus *Gymnocalycium* were found [Figs. 1–3]. After intensive studies of plants in culture and nature (2009, 2010, & 2011) the new find was published in March, 2012 as *Gymnocalycium carolinense* subsp. *fedjukinii* Gapon & Neuhuber (Gapon & Neuhuber, 2012). The cactus got its name in memory of Nikolay Fedjukin, a well-known cactus collector from Moscow Region, untimely deceased in 2011.

Figure 1. Habitat of *Gymnocalycium carolinense* subsp. *fedjukinii*: Sa. de Comechingones, Córdoba, 1590m asl.

Figure 2. *G. carolinense* subsp. *fedjukinii* VG-475, Sa. de Comechingones, Córdoba, 1552m.

Figure 4. *G. carolinense* subsp. *fedjukinii* VG-475 in culture.

Figure 6. *G. carolinense* subsp. *fedjukinii* VG-475 in culture.

Figure 3. *G. carolinense* subsp. *fedjukinii* VG-475, Sa. de Comechingones, Córdoba, 1552m.

Figure 5. *G. carolinense* subsp. *fedjukinii* VG-475 in culture.

Figure 7. *G. carolinense* subsp. *fedjukinii* VG-475 in culture.

Figure 8. *G. andreae* VG-298, El Rincon, Córdoba, 2124m.

Figure 10. *G. carolinense* subsp. *ludwigii* var. *entrebolense* VG-1411, Va de Carmen, San Luis, 1108m.

Stems of these gymnocalyciums are flat-globular, 4–6cm in diameter (up to 8cm in old plants) and 2–4cm high (up to 6cm in old plants). Mature plants excluding those with a damaged growing point produce only a few root offsets. Stem is matte, bluish-green to dark green, becomes slightly bronzed in the sun. Root is napiform up to 10cm long. Ribs are 11–13, straight, rounded, divided by furrows into small humps. Radial spines 9–11, with one of them is directed downwards. Spines are light-coloured, bent towards the body, flexible, up to 25mm long. Central spines (1–3) are up to 25mm long, with a thicker and darker base, absent in young plants.

Flowers white with slightly yellowish throat and faintly violet petal tips, 30–40mm long and 60mm in diameter, lightly scented, in most cases unisexual, either male or female. As a rule, flower has underdeveloped filaments and

Figure 9. Comparison of (left) *G. carolinense* VG-1245 (El Arenal, San Luis, 1671m) and *G. carolinense* subsp. *fedjukinii* VG-475 (right).

Figure 11. Buds of *G. bruchii* subsp. *matznetteri* VG-048, El Mirador, Córdoba, 1800m.

Figure 12. *G. bruchii* subsp. *melojeri* var. *rubroalabastrum* VG-1467, Yacanto de Calamuchita, Córdoba, 1376m.

anthers, or pistil and stigma, and either combination determines its conditional sex. Flowering time is in the early spring –

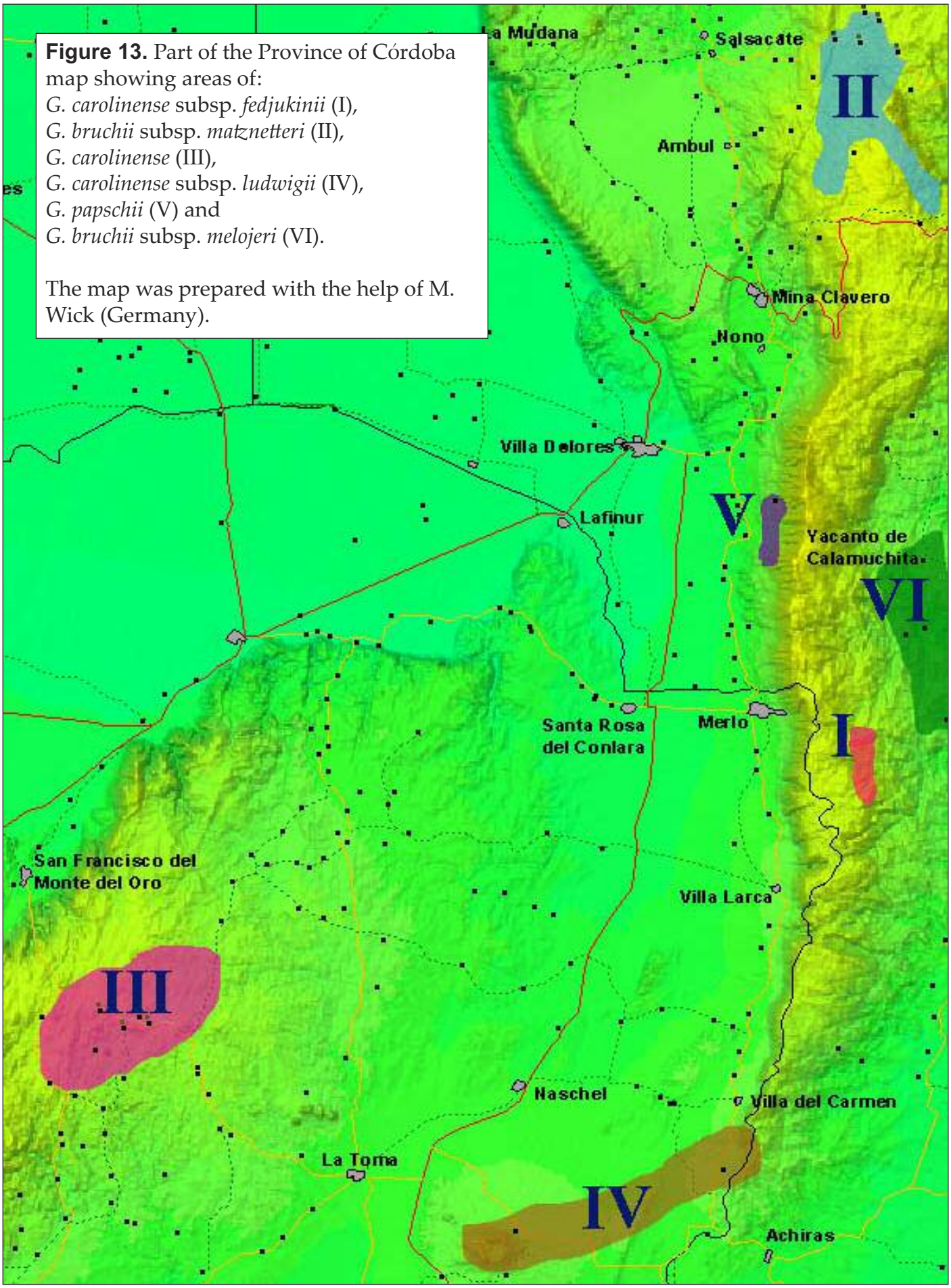

Figure 13. Part of the Province of Córdoba map showing areas of:
G. carolinense subsp. *fedjukinii* (I),
G. bruchii subsp. *matznetteri* (II),
G. carolinense (III),
G. carolinense subsp. *ludwigii* (IV),
G. papschii (V) and
G. bruchii subsp. *melojeri* (VI).

The map was prepared with the help of M. Wick (Germany).

November in nature and April in culture in northern Europe.

Fruits are almost round, up to 17mm in diameter. The type specimen was collected at the locality designated as VG07-475 [Figs. 4–7].

The new gymnocalycium shows certain similarities to several already known taxa, at the same time it has some noticeable distinctions:

- *G. andreae* (Boed.) Backeb is found in the same area but at higher altitudes, and is characterized by a glossy stem, offsets easily, and has less spines in an areole. But this species has yellow flowers, and cannot be treated as a related taxon [Fig. 8];

- *G. carolinense* (Neuhuber) Neuhuber has less spines, they are thinner and darker, flower and ovary smaller, throat is usually pale pink [Figs. 9, 10];

- *G. bruchii* subspec. *matznetteri* (Rausch) Neuhuber has short cylindrical stem, which is smaller in size, offsets heavily, radial spines are shorter and thinner, flowers are smaller [Fig. 11];

- *G. bruchii* subspec. *melojeri* Neuhuber has a smaller stem, offsets heavily, radial spines are thinner and shorter, flowers are smaller [Fig. 12].

The nearest *G. carolinense* can be found 110km to the south-west [Fig. 13], but the habitat of *G. carolinense* subsp. *ludwigii* Neuhuber is situated much nearer, by the southern spurs of Sierra de Comechingones, approximately 70km to the south...

In 2010 Massimo Meregalli from the University of Torino practically repeated the route of the Russian expedition-2007. His find was published in March 2012 as *Gymnocalycium meregallii* Bercht (Bercht, 2012), with type specimen MM1200 [Figs. 14–16].

The distance between localities VG-745 and MM1200 is less than 3 km as the crow flies. On close examination of the description it becomes obvious that the described taxon is the same as *G. carolinense* subsp. *fedjukinii*! Though in the diagnosis of the new taxon, *G. papschii* H.Till emend Gapon & Neuhuber was chosen as the

Figures 14 –16. *G. meregallii* MM1200: plant, flower and fruit. Pictures from the publication in *Schütziana* (Bercht, 2012).

closest relative of the new species, not *G. bruchii* subspec. *matznetteri* nor *G. carolinense*. It is quite easy to determine which taxon has a larger claim to affinity by comparing the illustrations Figs. 17–19.

Of special interest is the choice of the rank for the new find in the protologue. Shortly before Massimo Meregalli had completed his work on merging practically all of the Uruguayan gymnocalyciums into single

Figure 17. Comparison of *G. carolinense* subsp. *fedjukinii* VG-475 (left) and *G. papschii* VG-295 (Luyaba, Córdoba, 1035m).

species, i.e. *G. hyptiacanthum* Britton & Rose. Soon after that a new species, which a non-specialist can hardly distinguish from *G. bruchii* subspec. *matznetteri* or *G. carolinense*, is named in his honour!

Both names were published independently in the same year, moreover, in the same month! *G. meregallii* was published in the on-line journal *Schütziana*, *G. carolinense* subsp. *fedjukinii* – in the print journal *Kaktus-Klub*. It is quite possible that publication for the Russian journal was ready much earlier, but print journals always have longer publishing cycles. Partly because of that, the *Kaktus-Klub* has moved to the Web and now exists only in electronic form.

To sum up, there is no priority problem in this case. From a scientific standpoint, both names of this new find are absolutely valid and may be treated as taxonomic synonyms. It is just that one of them (of "Italian" provenance) has priority at species rank, and the other one (of "Russian" provenance) has priority at subspecies rank. Each specialist may choose any of these two names depending on which level in the nomenclatorial system he places this taxon. Those not interested in taxonomical subtleties should remember the different names when studying seed catalogues.

The author expresses his special gratitude to Larisa Zaitseva (Chelyabinsk) for assistance in preparation of these notes for publication.

Figure 18. Comparison of flowers: *G. carolinense* subsp. *fedjukinii* VG-475 (left) and *G. papschii* VG-031 (San Javier, Córdoba, 1250m).

Figure 19. Comparison of fruits: *G. carolinense* subsp. *fedjukinii* VG-475 (left) and *G. papschii* GN4190 (type locality).

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Note: This article was submitted to the **Cactus Explorer** in December 2019.

×Austronotia batesii n.n.

Chris Sherrah tells us about a remarkable natural hybrid between two iconic plants of the high Andes. **Photographs by the author except where shown.**

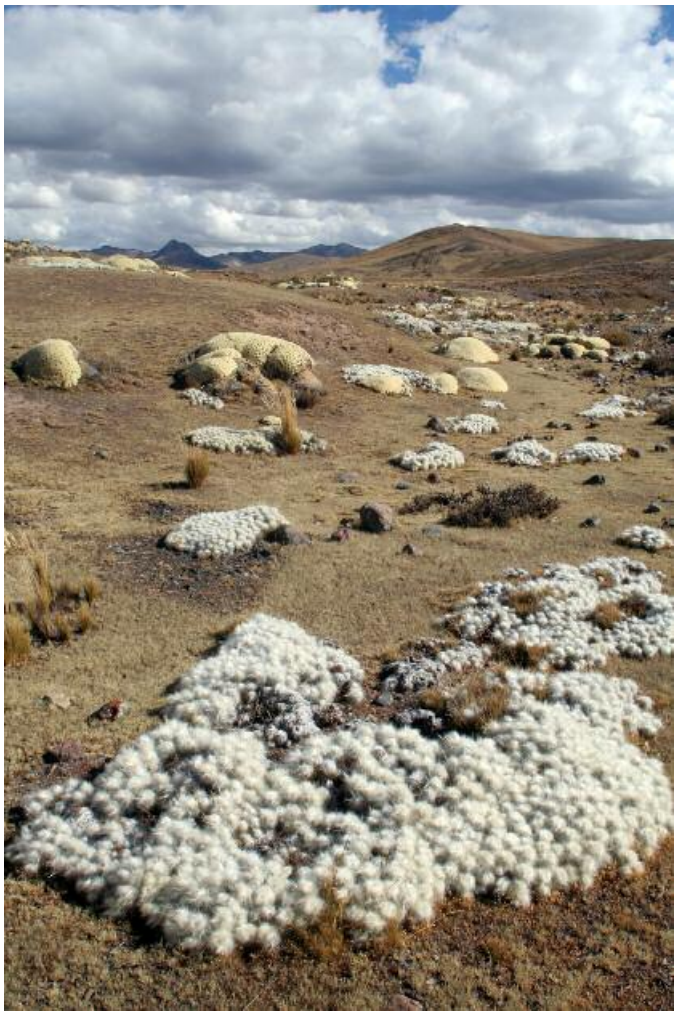

Figure 1. Habitat near Macusani: *Austrocylindropuntia floccosa* (foreground) mixed with *Punotia lagopus* (cream-coloured mounds)

Whilst visiting the well known *Punotia lagopus* locality on the approaches to Macusani, Peru, my travelling partner, Brian Bates noticed an unusual Opuntioid clump with the characteristics of both *Punotia lagopus* and *Austrocylindropuntia floccosa*. At the time, 2010, Hunt had not created the genus *Punotia* for what was then *Austrocylindropuntia lagopus* and Brian made mention of this clump in the Tephrocactus study group journal *Tephrocactus* Volume 17 (2011) as an infraspecific *Austrocylindropuntia* hybrid.

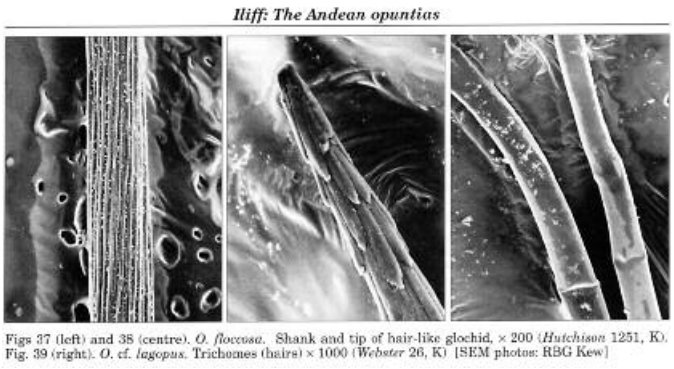

Figure 2. SEM images of the glochids of *A. floccosa* (left and centre); *P. lagopus* (right).

From Iliff: 'The Andean Opuntias' in *Studies in the Opuntioideae*. SPR 6 (2002).

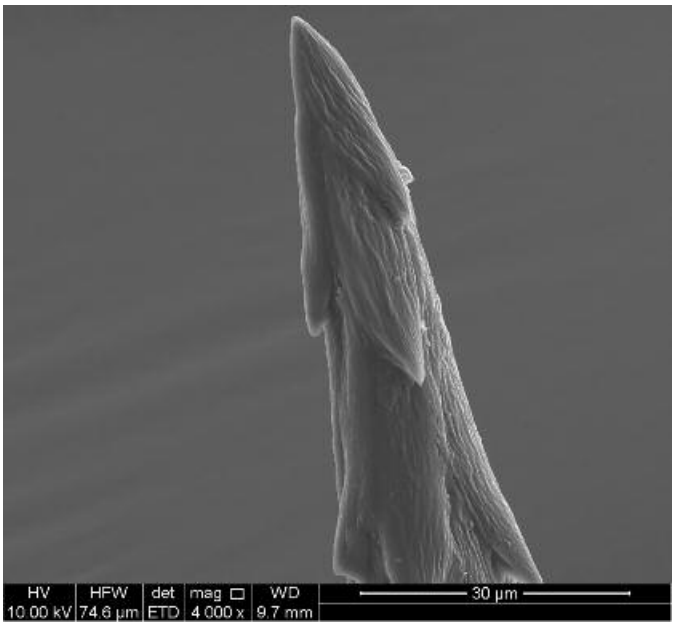

Figure 3. ×*Austronotia batesii* n.n. trichome SEM photograph by Ken Neubauer 2019 clearly showing same structure as *A. floccosa*.

Historically there had been confusion between the two species, with conjecture that they were one and the same. As with many cacti, mislabelled plants of unknown provenance added to this confusion. Fortunately, any misunderstandings surrounding the two taxa were put to rest by Crook, I., Arnold, J & Lowry, M., in their paper

Punotia lagopus	
Body structure	Tightly packed stems
Trichome surface	Uniseriate, not barbed
Trichomes	Cream shorter
Spines	Shorter less
×*Austronotia*	
Body structure	intermediate
Trichome surface	Multiseriate, barbed
Trichomes	Intermediate
Spines	Prominent, long
Austrocylindropuntia floccosa	
Body structure	sprawling
Trichome surface	Multiseriate, barbed
Trichomes	White long
Spines	Prominent long

Figure 4. Comparison of features.

Austrocylindropuntia lagopus - clarification of nomenclature and observations in habitat , *Bradleya* 21: 87–92 (2003). As can be seen from the accompanying photographs they are very different plants and the hybrid has morphological characteristics of both.

The two taxa have very different structures, with *Punotia lagopus* forming large mounds capable of holding a man's weight without breaking. *Austrocylindropuntia*, on the other hand, is more sprawling in habit and the stems break off quite easily. This is due to *Punotia* having a cylindrical branching structure packed tightly together whereas the *Austrocylindropuntia* has oval-shaped segments branching at various angles.

Additionally, the two taxa have different trichome structures as described by Illif in *Studies of the Opuntioidea* Hunt and Taylor (editors).

A. floccosa and *P. lagopus* are hybridising, which is not surprising, as *Punotia* has been shown by molecular analysis to be sister to the remaining species of *Austrocylindropuntia* and *Cumulopuntia* by Ritz *et al* (2112) and both taxa have been seen in fruit at the same time. The

×*Austronotia batesi n.n.*	*A. floccosa*	*P. lagopus*	*P. lagopus*	*A. floccosa* not from Macasani
×*Austronotia batesi n.n.*	*A. floccosa*	*P. lagopus*	*P. lagopus*	*A. floccosa* not from Macasani
×*Austronotia batesi n.n.*	*A. floccosa*	*P. lagopus*	*P. lagopus*	*A. floccosa* not from Macasani
×*Austronotia batesi n.n.*	×*Austronotia batesi n.n.*	*P. lagopus*	*P. lagopus*	*A. floccosa* not from Macasani

Figure 5. Showing similarity between ×*Austronotia* and *Punotia* in new growth.
Photograph: Aymeric de Barmon.

Figure 6. *A. floccosa (*left) growing with ×*Austronotia batesii* n.n. (right) June 2010.

Figure 7. *A. floccosa* showing openness of segments, prominent spines December 2017.

condition of the hybrid plant between 2010 and 2017, no observation of flowers nor fruits at each visit and that only two hybrid plants have been seen amongst the populations of the parents indicates that the hybrids will remain rare.

Figure 8. *P. lagopus* in flower June 2010.

Figure 9. *P. lagopus* showing elongated fruit, less prominent spines June 2010.

Figure 10. *A. floccosa* enveloping *Lobivia maximilliana*. Note the long white hairs and comparatively squat fruit of *A. floccosa* June 2010.

Figure 12. ×*Austronotia batesii* n.n. June 2010.

Figure 11. *P. lagopus* showing tightly packed segments, cream-coloured hair June 2010.

Figure 13. ×*Austronotia batesii* n.n. December 2017 showing spines typical of *A. floccosa* with compact heads of *P. lagopus* just starting new growth.

Acknowledgements

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Figure 14. *P. lagopus* showing new growth December 2017.

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Cactaceae on the North Coast of Mayabeque, Cuba

Diego Salas Pantoja & José Miguel Acuña present a brief analysis of species, threats, new discoveries and conservation projects. **Photographs by the authors.**

For a few years, the fascinating world of succulent plants and their cultivation has caught my attention. As a result of this, I have become increasingly involved in the search for this group of plants, obtaining satisfactory results for my personal development. With this passion, I have also developed another of my favorite hobbies, nature photography. Thanks to this I have be able to expand my knowledge and taste for the photography of the plant world.

A couple of years ago I went on a trip to the province of Matanzas, while on the bus and passing near a coastal area full of xeromorphic vegetation, I saw in the distance some columnar cacti that stood out above the vegetation and the marine terraces so catching my attention. All this motivated me later to go to that impressive place.

One day I woke up early, prepared the camera and said "I'm going to photograph the cacti and the marine terraces that I saw from the bus on that occasion," and so it was. Hoping for success because as I arrived at the place, knowing that it was right one without recognising the cacti, I began to enter the vegetation. It was uncomfortable because in this place spiny bushy plants grow making it difficult to cross. But in a few minutes I arrived at the place where the columnar cacti were, when I saw them up close I knew they were *Pilosocereus robinii* and *Harrisia eriophora*. At

Figure 1. La Jíjira eastern cliff located at kilometer 43 of the highway to Matanzas shows varied vegetation made up of microphilous bushes, tillandsias, orchids and cacti.

Figure 2. In Rotilla a small peninsula of coral limestone summarizes the regional native vegetation years ago.

that time, I was very excited to see the beauty of these plants and their relationship with the environment where they grow together with other interesting flora and fauna.

The sites visited and photographed by Diego Salas are located along approximately 20 kilometers of coast of the Santa Cruz del Norte municipality, in the western province of Mayabeque in Cuba. The predominant vegetable formations are coastal and sub-coastal xeromorphic scrubland where the rocky coast vegetation complex is interspersed, and some relics of microphilic thickets and semi-deciduous dry forests (Capote and Berazaín, 1984). The climate is considered to be plains and heights with relatively stable seasonal humidification, high evaporation and high temperatures (de la Colina *et al.*, 2009).

In the area that concerns us, limestone rocks of marine origin have been eroded by the sea, air and rivers in joint action. The main coastal features that can be seen from east to west, between Playa Rotilla and El Rincón de Guanabo, are the next: To the east and west of

Figure 3. *Pilosocereus robinii* is the most abundant cactus in the area and also the most striking. This individual in Rotilla has replaced with new branches the damage suffered by the recent Irma Hurricane.

Figure 4. The presence of *P. robinii* seedlings show their productive capacity and viability in La Jíjira and Rotilla populations, where more adults than juveniles can be observed.

Figure 6. Despite the absence of seedlings and *P. robinii* specimens decrease, in Boca de Jaruco there is the presence of pre-adult plants produced by branches that accidentally come off and take root.

Figure 5. In Boca de Jaruco surroundings, the amount of *P. robinii* is low, only three adult plants in the coastal area (one of the them his giant shaped like a chandelier), in the monitoring carried out, no young plant was found produced by seeds.

Figure 7. Details of flowers and fruit. The low presence of wool in areoles, red-purple fruits and growth of branches in glaucous green, among others are differences that separate *P. robinii* from *P. brooksianus*.

Figure 8. *Harrisia eriophora* in dry forests, near the Boca de Jaruco aqueduct several kilometers from the coast. Differences between wet (left) and dry (right) seasons.

Figure 9. Branches of adult *Harrisia eriophora* together with Vanilla barbellata (Orchidaceae) growing in full sun in La Jíjira.

Figure 11. Details of flower and fruits of *H. eriophora* at the Boca de Jaruco aqueduct.

Figure 12. A solitary specimen of *Leptocereus wrightii* in La Jíjira, kilometer 43 of the Matanzas Highway. For a time, it was the only one known in habitat.

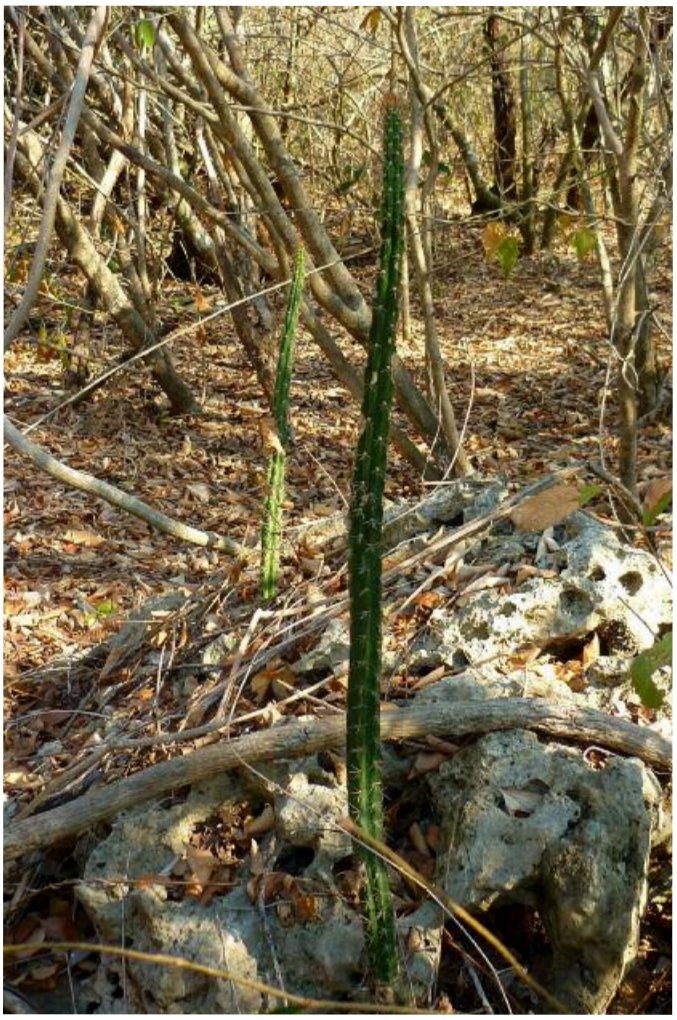

Figure 10. In dry forest H. eriophora has a greater presence of seedlings and juveniles. The opposite happens on the coast where there are mostly adults.

Figure 13. Detail of the characteristic night flowers of L. wrightii in the specimen at kilometer 43. The absence of other L. wrightii in the surroundings prevents the production of fruits as they are not self-fertile.

Figure 14. In the dry forest relict of the Boca de Jaruco aqueduct, separated by 2km from La Jíjira, the presence of more than a dozen newly discovered *L. wrightii* specimens is a boost for the survival of this rare species.

Figure 16. Excellent progress of a small *L. wrightii* on the western cliff of La Jíjira. A few months ago, the National Botanical Garden and Planta¡ initiative conservations group, introduced hundreds of seedlings on both cliffs to propagate this cactus.

Figure 17. *M. prolifera* subsp. *texana*, common in cultivation, a new report for Cuba of this cactus in habitat. Just a matter of time to find it.

Figure 15. The presence of fruits in almost all *L. wrightii* at the Boca de Jaruco aqueduct provides a variety of genetic material for conservation specialists.
As for other *Leptocereus* species, the bats *Monophyllus redmani* Leach (Phyllostomatidae) (Barrios, 2008) must be the potential pollinators that inhabit several caverns in the surroundings.

Figure 18. In 2019 the small mammillaria colony expanding its range. No searches have been made for more specimens in the area.

Figure 19. The young *Dendrocereus nudiflorus* show its branches above the vegetation.

the main municipal city also named Santa Cruz del Norte, the first level of terrace forms a coastal plain that has as a southern limit a chain of hills below 100 meters, considered as the elevated surface of an old marine terrace (de la Colina *et al*., 2009). To the east of the Jaruco River a series of emerged marine terraces was observed, where the end of second western terrace is formed by cliffs (named La Jíjira) a product of the recent erosive processes of landslides in the upper part. The surface action of the Jaruco River has eroded its river bed causing a small canyon. To the west of Jaruco River, the coast extends forming a plain of marine origin (to Guanabo in Havana province), with a coastal boundary composed of marine terraces of the Quaternary (Iturralde-Vinent *et al*., 2007).

The native vegetation is adapted to the climate and geology but is directly affected by socio-economic development. Along the coast a highway connects Havana city with the

Figure 20. Diego Salas climbs the main trunk of *D. nudiflorus* to be at the height of the dense vegetation that covers this cactus.

Figure 21. In the vegetative period corresponding to the rainy season, between the months of May and October, the new growing branches of *Dendrocereus* spread the new epidermis and the lignification is reduced.

important port city of Matanzas and the famous Varadero beach. There is a presence of fishing ports at Boca de Jaruco and Santa Cruz del Norte, live stock activity is notable and the cultivation of *Agave fourcroydes* was intense in past decades. At present in the area, the electricity generating and petrochemical industries are prospering with the extraction of gas and oil; there are also soda and Havana Club Rum factories. In de la Colina *et al*., (2009) this coastal section is considered one of the most anthropized in the Cuban archipelago due to its diversity of uses, sometimes

Figure 22. *Selenicereus grandiflorus* on the trunk of *Pilosocereus robinii* in Boca de Jaruco.

Figure 24. Natural seedlings of *Selenicereus grandiflorus* on fossil coral limestone.

Figure 26. *Opuntia dillenii* is another common success in this area.

Figure 23. S. grandiflorus on *Coccoloba uvifera* (L.) L. (Polygonaceae) (Seagrape) at Rotilla. Detail of the fruit of this successful epiphytic cactus that manages to thrive in all coastal environments regardless of the type of support or ecological degradation, both in full sun and in shady places.

Figure 25. *Selenicereus grandiflorus* night blooming at Rotilla, in May. The common name 'Queen of the Night' is indeed justified.

Figure 27. A seedling of *Opuntia dillenii* on the Rotilla coast.

Figure 28. Within the local flora *Vanilla barbellata* Rchb. and *Plumeria obtusa* L. (Apocynaceae) predominate.

Figure 30. Fruits and details of *Plumeria obtusa* seeds.

Figure 32 *Anastraphia ilicifolia* D. Don. (Asteraceae).

Figure 29. *Plumeria obtusa* can flower all year round, perfuming these arid ecosystems in the afternoons.

Figure 31. *Plumeria obtusa* is the natural host of the *Pseudosphinx tetrio* moth. Occasionally this plague can completely defoliate some plants resulting in death.

Figure 33 *Cattleyopsis lindenii* (Lindl). Cogn (Orchidaceae)

These interesting specimens of Caribbean flora can still be seen in some undisturbed spots on the Santa Cruz del Norte coast.

Figure 34. *Scolosanthus nannophyllus* Borhidi. (Rubiaceae)

Figure 35. *Tabebuia myrtifolia* (Griseb.) Britton, Bull. (Bignoniaceae)

Figure 36. *Thrinax radiata* Lodd. ex Schult. & Schult. f. (Arecaceae)

Figure 37. *Tillandsia balbisiana* J.A. & J.H. Schult. (Bromeliaceae)

Figure 38 *Tillandsia flexuosa* Sw. (Bromeliaceae)

Figure 39 *Tillansia fasciculata* Sw. (Bromeliaceae)

These interesting specimens of Caribbean flora can still be seen in some undisturbed spots on the Santa Cruz del Norte coast.

Figure 40. *Vanilla barbellata* Rchb.

competitive and conflictive.

However, in these highly damaged areas there are small relics of native vegetation that hide surprises. On the coast of Santa Cruz del Norte municipality we can still find species that once dominated these areas, successful populations of plants that have adapted to survive habitat degradation and specimens that have their last refuge here. I have travelled to these places several times, sometimes alone or accompanied by friends and botanists, enthusiasts of the Cactaceae, and there are always reasons for wonder and enjoyment. From the last visit with our friend Diego Salas arose the idea of this work and to share photographs, observations and discoveries we have made in our explorations.

The aforementioned *Pilosocereus robinii* [1] prospers on the tops and edges of coastal cliffs, on the cliffs of the Jaruco River and on the coastal plains in Rotilla. Some of these very old specimens show shapes of candlesticks with trunks 30cm wide and total height close to 5m. *P. robinii* grows in Cienaga de Zapata, in the keys and north coast of Cuba; the population of the coast of Santa Cruz del Norte are now the nearest ones to its type locality (Britton & Rose, 1920) because those once present to the east of Havana have already disappeared. So far they are the most western populations of the genus *Pilosocereus* in Cuba. Meanwhile, *Harrisia eriophora*, distributed in other locations in central and western Cuba, prefers the less steep areas of the cliffs and the plains with dense vegetation in the coastal microphilic thickets and dry deciduous forest further from the coastline. The adult population density of *H. eriphora* is lower than *P. robinii*. Notable for these cacti with small but prominent populations is that they manage to reproduce successfully, as evidenced by the production of fruits in adult plants and the presence of seedlings in various growth stages.

Among the most relevant findings is the report of a population of *Leptocereus wrightii* León, made up of more than 15 adult specimens located near the aqueduct of the Boca de Jaruco town. One individual discovered by the collector Guillermo Guzmán was reported in October 2013, the remainder of those *L. wrightii* were later found in May 2018 by this author and the collector Juan Carlos Daguerre. It should be noted that until that moment the existence of only a single specimen of *L. wrightii* was known in La Jíjira, a few meters from the highway (Acuña, 2018). For two decades this species was not reported so that it was believed to be extinct and today is the most threatened cactus in Cuba.

I made my first trip to La Jíjira with the MSc. Duniel Barrios from the National Botanic Garden and specialist in *Leptocereus.* The objective was to monitor the solitary specimen of *L. wrightii*. In April 2016, during my second visit to that site in the company of the collector Lázaro Zardiñas, we observed a grouped cactus colony in a hole in the limestone; on that occasion the cactus discovered in the east ridge of La Jíjira was *Mammillaria prolifera* (Miller) Haworth, and immediately notified to the cactus conservation group of the National Botanical Garden. The initial disbelief gave way to astonishment because the *M. prolifera* found corresponds to the yellow spine shape of the *M. prolifera* subsp. *texana* and not the type that grows in Cuba with white spines *M. prolifera* subsp. *prolifera* (Pilbeam, 1999). Motivating skepticism about the possible

[1] According to Hunt *et al.* (2006) *P. robinii* (Lem.) Byles & Rowley is considered synonymous with *P. polygonus* (Lem.) Byles & Rowley. In this work we maintain the criteria followed by Barrios and Romero-Jiménez (2015) and Franck *et al.* (2019) in accepting *Pilosocereus robinii*.

Figure 41. *Oeceoclades maculata* (Orchidaceae).

Figure 42. *Sansevieria trifasciata* Prain. (Dracaenaceae).

Figure 43. *Ipomoea nil* (L.) Roth. (Convolvulaceae)

Figure 44. *Bryophyllum delagoense* (Eckl. & Zeyh.) Schinz (1900) = *Kalanchoe verticillata* Scott-Elliot (1891)

Four figures above: Invasive alien species colonize spaces altered by human activity, reproducing successfully. In the photos,4 species that are among the most abundant and little mentioned of the usual invasive for the region, where *Dichrostachys cinerea* and *Acacia farnesiana* also grow.

origin of the small colony, it has been monitored in recent years. When he saw the *Mammillaria,* Diego Salas was surprised by the question we all asked ourselves. What is this doing here? This *Mammillaria prolifera* form is very abundant and popular in cultivation. In conversation with Duniel Barrios, it is thought that some migratory bird could have dispersed it when feeding in a garden. Santa Cruz town is only 5 kilometers away.

However, he would show me a picture taken on his first tour of these cliffs and I would be surprised. The plant photographed by Diego from afar is another cactus that stands out among the spiny and stunted vegetation. In the expedition that we carried out together we had the job of approaching and gladly checking the presence of a "young"[2] *Dendrocereus nudiflorus* (Engelm. ex Sauvalle) Britton & Rose who reports Diego Salas in the current work:

D. nudiflorus on the west cliff of La Jíjira grow in a remnant of xeromorphic microphyll

[2] *Dendrocereus nudiflorus* is a slow-growing tree cactus, it is believed that older individuals are hundreds of years old, with wooden trunks of more than 1 meter in diameter can reach heights of 10 meters. In nature, the few specimens with heights below 3 meters are not reported to flower (Barrios *et al.*, 2009).

Figure 45. *Agave fourcroydes* Lem. Decades ago it was cultivated in the area for industrial production of fibres and detergent. Today it thrives naturally, also being a victim of the intentional fires that take place every year to clean the edges of the highway and that threaten the few remnants of native flora.

Figure 46. For the installation of the oil pumps, extensive areas of the coast are cleaned and cleared. After the machines are removed, invasive plants such as *Yucca aloifolia* L. are planted on some occasions, evidence of poor management of coastal recovery.

scrub in good conservation environment. 2.15m tall, 2.70m long and an average width of 30cm. Trunk inclined at approximately 45° following the direction of the foliage of the surrounding vegetation whipped by the wind. The longest branch measures 83cm x 11cm and the smallest 11cm x 4cm. Trunk and branches show wounds and necrotic parts common in these cacti under the effect of impacts from other branches by the effects of storms. No traces of flowers nor fruits are observed.

The discovery of this young individual on

Figure 47. The new drilling in Rotilla, the eternal rivalry "development" vs. conservation.

Figure 48. The *Cerion mumia* snail, a coastal inhabitant, protects itself in *Pilosocereus robinii*.

Figure 49. In the semi-deciduous forest *Ligus fasciatus* takes protected rest in *Harrisia eriophora* and feeding on *Leptocereus wrightii*.

the cliffs of La Jíjira is important for the area, because it is the *D. nudiflorus* in its natural habitat that is closest to the type locality in

Figure 52. A huge *Ameiva auberi* on fallen dry leaves of *Coccolob auvifera*.

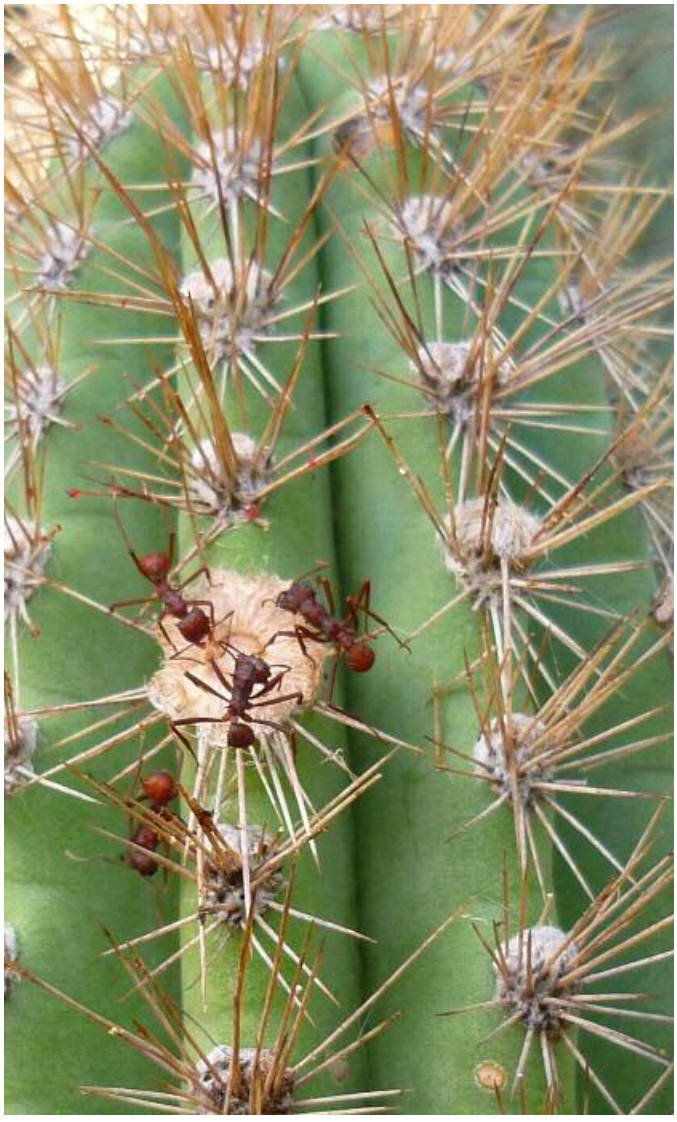

Figure 53. Leaf cutter ants *Acromyrmex octospinosus* Reich, a regional inhabitant that benefits from cactus resources, pollen of flowers, fruits and wool from the areoles that bear their nests without apparently affecting the cacti.

Figure 54. Another very common reptile *Anolis porcuatus* take a sun bathe protected by the spines.

Havana[3] (Britton & Rose, 1920). Another contiguous population of *D. nudiflorus* is located approximately 40 kilometers east, on the coast of Punta Guano in Matanzas province, consisting of 47 individuals of which 6 are juveniles with an average height of 2.5m (Barrios *et al.*, 2009). It is widely known that a problem is that this giant cactus throughout its distribution on the island of Cuba produces few young specimens, so the existence of this plant, perhaps with several decades of life, surviving hurricane attacks and cold fronts, shows us the viability of the ecosystem and the possibility of regeneration.

In Cuba there are areas included in a National System of Protected Areas that with different management categories group varied ecosystems throughout the Cuban archipelago.

[3] Cuban Administrative Political Division in the early twentieth century was considered to be part of Havana the current territories of the north coast in Mayabeque province. It is an unknown detail if the type locality was closer to Havana city.

The 103 approved protected areas cover an area that represents 15.84% of the national territory, hoping to increase this coverage in the near future (Martínez, 2016). The National System of Protected Areas has demonstrated its effectiveness in the study, conservation and management of endemic floristic values as well as the control of invasive species.

With the presence of the *Pilosocereus* populations further north-west in Cuba, of the endemic *D. nudiflorus*, *H. eriophora* and *L. wrightii*, the usual and successful *Opuntia dillenii* (Ker-Gawl.) Haw. (Britton & Rose) and *Selenicereus grandiflorus* (L.) Britton & Rose, in addition to the unexpected colony of *Mammillaria prolifera*, add 7 species of Cactaceae only on La Jíjira cliff. The existence of other botanical families demonstrates the ability to recover or resist these small fragments of xerophytic mountains. Some of these relics of the coast of Santa Cruz del Norte, such as La Jíjira, Rotilla and the redoubt of dry deciduous forests in the surroundings of Boca de Jaruco could be part of some of the variables of protected areas. Otherwise, only the horizon of industrialization and extinction will be our sight when we drive along the highway to Matanzas.

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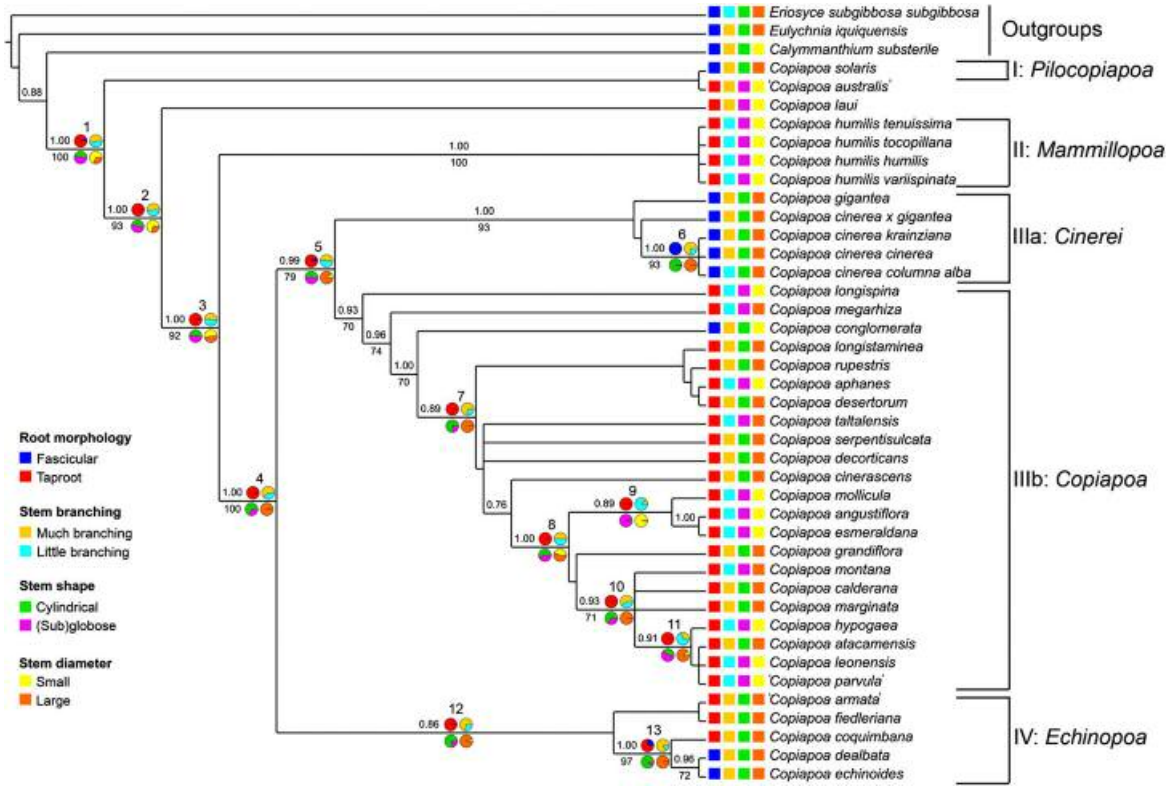
What is Copiapoa conglomerata?

Grzegorz Matuszewski discusses the application of this old name. Since the original description doesn't match well with any species recognized today, it will never be possible to assign it with any certainty so it is probably best forgotten. Photographs by the author.

While preparing a lecture about the genus *Copiapoa* I stumbled on a species that was unknown to me; *Copiapoa conglomerata*. I found it in a cladogram (below) of species relationships based on molecular DNA analysis made by a research team led by Isabel Larridon in 2015. I started a search in the literature. Soon, on the webpages of www.ipni.org I found that this name was created in 1966 by Hans Lembcke in KuaS 17(2): 29–31 based on much earlier description of *Echinocactus conglomeratus* Phil. Lembcke claimed that *Copiapoa ferox* Lembcke et Backeb. and *Pilocopiapoa solaris* F.Ritter are only synonyms of *Copiapoa conglomerata* (Phil.) Lembcke, a name he chose. This statement can be found as of today in both *Cites Cactaceae Checklist* by D. Hunt and a vast work *Taxonomy of the Cactaceae* by J.Lodé. However, in the aforementioned cladogram one can find *Copiapoa solaris* in a completely different relationship group. So what plant is hidden behind the name found in the title?

Finally I got to the source - the book *Florula Atacamensiis* by Dr R. A. Philippi from 1860, where one can find the first description of *Echinocactus conglomeratus* on the 23rd page. A very short one: E. globosus, conglomeratus, viridis, globis circa 15—25 lin. crassis, viginticostatis; aculeis 8, stellatis, mediocribus; aculeis centralibus, superiores 3 vel 4 peripheriae aequantibus; floribus pulchre citrinis. Inter loca Chaguar de Jote c. 24°24' lat. m. et Cobre frequens In rupibus litoralibus occurrit.

Translates to: Echinocactus spherical (round), branched, green, spheres (heads) ca 30



The cladogram from Larridon, I. *et al*. (2015) showing the relationships between *Copiapoa* species.

Figure 1. *Copiapoa ahremephiana* at Caleta Botija 50m above sea-level.

Figure 3. *Copiapoa atacamensis* at El Cobre

– 56mm in diameter, 20 ribs; 8 spines, radiating, medium; 3–4 central spines same in size on exterior; flowers beautifully lemon. Between Chaguar de Jote 24° 24' latitude and Cobre, often found in coastal rocks.

In the area between Caleta Botija and El Cobre there are known to occur *Copiapoa solaris*, *C. tenuissima*, *C. atacamensis*, *C. ahremephiana*, *C. decorticans* or even further to the south *C. variispinata* and *C. paposoensis*. If we take into consideration the diameter of shoots, number of ribs and spines, the only possible species are: *C. ahremephiana*, *C. decorticans* and perhaps *C. paposoensis* or *C. tenuissima*. According to the description, skin

Figure 2. *Copiapoa decorticans* at Caleta Botija 260m above sea-level.

Figure 4. *Copiapoa solaris* at El Cobre.

Figure 5. *Copiapoa tenuissima* aff. at Blanco Encalada.

Figure 6. *Copiapoa variispinata* at Punta Plata.

colour should be green, so ones that match are *C. decorticans* and the currently not accepted Ritter description of *C. paposoensis*. *C. tenuissima* has a brown colour, while *C. ahremephiana* is greyish or bluish, like *C. cinerea*, though young growths on tops of the plant are green too. The description states that heads are spherical and only *C. ahremephiana*, *C. tenuissima* and *C. paposoensis* have ones like that. *Copiapoa decorticans* has long, lying shoots.

It is worth mentioning that in my opinion the name *C. conglomerata* in the sense of Lembcke where he considered *Echinocactus conglomeratus* equal to *C. solaris* should not be used because of a total difference in body diameter, number of ribs and spines. I think that Lembcke being in El Cobre saw only *C. solaris* (though he could have seen other species too) and without further analysis he assumed that this was the plant discussed. He made a cardinal error, since if he had read the original description thoroughly, he would have noticed that *C. solaris* has way less ribs, while the body diameter is at least twice the size and the number of spines doesn't match either.

There is also another possibility, as shown by H. Middleditch (*The Chileans* 2011 Vol. 22 No. 70), who claims to have found the journals of Philippi and deduced from them that these plants are still unknown and grow (or had grown 160 years ago - the climate changes) on an altitude of 400m above sea level near the no longer existing road going South from El Cobre past the coast. Since there is no known accessible road so the mystery is still unsolved.

In another publication *Copiapoa 2006*, Rudolf Schulz placed photos of *Copiapoa* sp. aff. *paposoensis* from the Botija Peak at 800–900m altitude. He mentioned this plant and added a photo in an earlier book which he wrote with A. Kapitany. This plant also grows in clusters

and has small heads. It differs (at least on the photo) in skin colour, smaller number of ribs and number of spines from the original description, thus it is not the one, unless there is another kind further North which Philippi mentioned. In this case *C. paposoensis* would be a synonym of *Echinocactus conglomeratus*.

At the same time one should notice that the plant named *C. conglomerata* that was DNA tested and put in the cladogram was most probably *C. ahremephiana* since *C. decorticans* and *C. solaris* are placed under different taxa. [Yes it was *C. ahremephiana* - Ed.] I doubt that plants originally found by Philippi can be found in any collection in the world and that those plants were DNA tested.

In 1982 Fred Kattermann made a neotype of *C. conglomerata* FK382, the altitude being 20m. above sea level and the place of occurrence Quebrada Botija, road to Paposo. He considered the species to be the same as *C. ahremephiana* so if those plants are indeed identical then *C. ahremephiana* should be abandoned as a synonym of *E. conglomeratus*.

I must admit that (apart from the H. Middleditch idea) *C. ahremephiana* is the most matching plant though only young tops are green. D. Hunt and J. Lodé assumed the opinion of H. Lembcke with no criticism, though in 2016 Hunt skipped the problematic name in *Cites Cactaceae Checklist*. Also E. F. Anderson agreed with the name proposed by Lembcke, though he added the new synonym *C. variispinata* with a photo of *C. ahremephiana*. The description however fits *C. variispinata* F. Ritter not *E. conglomeratus*.

Therefore one should assume, according to botanical nomenclature that the correct names are: *Echinocactus conglomeratus* Phil., *Copiapoa ahremephiana* N.P.Taylor & G.J.Charles, *C. decorticans* N.P.Taylor & G.J.Charles, *C. humilis* ssp. *tenuissima* (F.Ritter ex D.R.Hunt) D.R.Hunt, *C. humilis* ssp. *variispinata* (F.Ritter) D.R.Hunt, *C. paposoensis* F.Ritter and *C. solaris* (F.Ritter) F.Ritter. On the other hand the existing description by Lembcke of *Copiapoa conglomerata* (Phil.) Lembcke should be proclaimed as incorrect and be revoked. One can only be astounded that some recognized botanists use species names without criticism, like D.Hunt or J.Lodé. To excuse them it is worth noting that they worked on a great volume of data found in publications and had insufficient time to verify everything. Still one of the botanists co-workers should have checked this.

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Cylindropuntia leptocaulis x versicolor

Root Gorelick visited a park in Arizona to enjoy the cacti but didn't realize exactly what he had seen until he looked at his pictures. Photographs taken on 24 February 2020 by the author.

When out in the field, especially far from home, it pays to take many more photos than you intended, label those photos later, and look for surprises. I had a very short visit to an urban park on the west side of Tucson, namely Greasewood Park, where I followed my own advice. While there, I had only noticed fairly pedestrian cacti, at least until a week or two later when trying to label Figures 1 and 2. To my surprise, this plant was clearly a hybrid, probably an F1, of two common chollas at that site: *Cylindropuntia leptocaulis* (Figure 3) and *C. versicolor* (Figures 4 & 5), with the offspring inheriting many of the best traits from both its putative parents. The hybrid had the gorgeous red fruits of *C. leptocaulis* plus the lovely red stem pigments of *C. versicolor*. The hybrid was a spherical shrub that stood a meter tall and about a meter in diameter, so not as statuesque as *C. versicolor*, but you cannot ask for everything. And now I feel bad to have not taken more photos of

Figure 1. *Cylindropuntia leptocaulis* x *C. versicolor* - Greasewood Park.

Figure 2. *Cylindropuntia leptocaulis* x *C. versicolor* - Greasewood Park.

Figure 3. *Cylindropuntia leptocaulis* - Greasewood Park.

Figure 4. *Cylindropuntia versicolor* (foreground), *Cylindropuntia fulgida*, *Carnegiea gigantea* - Gates Pass.

Figure 5. *Cylindropuntia versicolor* - Greasewood Park.

this elegant hybrid that was even vibrantly colourful in February.

Cylindropuntia leptocaulis has a reputation for being promiscuous, which I have always found odd insofar as it has light green flowers that are primarily open at night, whereas most other chollas, including *O. versicolor*, have flowers that are open during the day. However, the flowers of *C. leptocaulis* often stay open until a few hours after sunrise and this species has hundreds of flowers per plant and seeds that seem to volunteer in lots of nearby places. Its seeds probably get disseminated by birds because of the small bright red fruits. Years ago, when living in a second-story apartment in Las Cruces, New Mexico, *C. leptocaulis* would germinate in hanging pots on my balcony wherever house finches nested, but I never saw a hybrid there.

Root Gorelick

My Mexican memories (2)

Zlatko Janeba continues his explorations in Mexico and shows us some familiar plants in their natural habitats. Photographs by the author.

In the morning of Monday, 12th February 2007 we left Saltillo quite early. Saltillo is the capital of the Mexican state of Coahuila and is also the largest city of that state. It is quite an interesting city, but very industrialized, so we preferred to spend our precious time in the field, studying plants.

We drove along Federal Highway 54 and we made our first stop some 35–40km south of Saltillo. The landscape seemed to be attractive enough for a botanist – limestone hills covered with rich desert vegetation (Figure 1). We climbed a little bit higher (an elevation of some 520m) and we could observe numerous cactus species, like huge *Echinocactus platyacanthus*, *Ferocactus pilosus* with its typical red spines, *Echinofossulocactus* aff. *multicostatus* in flower, white *Mammillaria formosa* ssp. *chionocephala* with copious flower buds (Figure 2), nicely spined *Neolloydia conoidea* ("*ceratites*"), quite widespread *Agave lechuguilla* and *Opuntia microdasys*, but also some echinocerei, yuccas and dasylirion.

Then we drove further south, crossing the Coahuila-Zacatecas border and later we turned westwards towards Concepción del Oro, one of the oldest cities in the whole of Mexico (it was founded in 1587). We took the cobblestone road up but we had to stop to take pictures quite often, since the scenery was just gorgeous (Figure 3). We could clearly see Concepción del Oro, as well as surrounding mountains and valleys as we headed further up and finally reached Ruinas de Aranzazú (Figure 4). A very nice and photogenic place, indeed. But in a while, we were more interested in the limestone rocks above the ruins. It was quite easy to climb there and we could observe some interesting

Figure 1. A view of the landscape and typical vegetation south of Saltillo (Coahuila) along Hwy 54, at an elevation of some 520m.

cacti, as well as enjoy wonderful views of the landscape around us.

There, at an elevation of 2680–2690m among juniper and pine trees, we found *Neolloydia conoidea*, nice white balls of *Escobaria chaffeyi* (Figure 5), and numerous agaves, yuccas, dasilirion and opuntias. What I really enjoyed was quite a rich population of relatively small mammillarias with flattened bodies and in flower (Figures 6 & 7). Originally, I though that they could be *Mammillaria formosa*, growing at higher altitudes around the Aranzazú ruins, while typical (and closely related) *Mammillaria formosa* ssp. *chionocephala* (or simply *Mammillaria chionocephala* if you wish) was, on the other hand, quite common nearby, but at lower elevation. Nevertheless, the immediate identification was quite problematic (at least for me) since the plants were very variable in their spination.

Figure 2. A nice specimen of *Mammillaria formosa* ssp. *chionocephala* with flower buds, hidden below *Agave lechuguilla* plants, south of Saltillo (520 m), Coahuila.

We observed the same plants (*Escobaria* and *Mammillaria*) even higher, at an elevation of some 2830m, at the highest point of the winding road. The cacti grew on the limestone rocks in the pine forest. There, the mammillarias exhibited the same variability of spination as before (Figures 8 & 9).

Much later it has been suggested to me that the plants could actually be *Mammillaria lloydii* and I started to believe that. This quite interesting species was described by Britton and Rose (*The Cactaceae* IV: 89, 1923) as *Neomammillaria lloydii* to honour its discoverer F.E. Lloyd. In 1926, the species was transferred by Orcutt into the genus *Mammillaria*. Recently,

Figure 3. A lovely view of Concepción del Oro (Zacatecas) through the succulent and spiny vegetation.

Figure 4. A photogenic view of Ruinas de Aranzazú in Zacatecas.

Figure 5. A white ball of *Escobaria chaffeyi* (which looks very much like a small specimen of *Mammillaria candida*!) above Concepción del Oro (Zacatecas) at an elevation of 2690m.

Figure 6. Two plants of *Mammillaria* aff. *lloydii* above Concepción del Oro (Zacatecas) at an elevation of 2690m. The plants were quite variable regarding the colour of their epidermis (green to reddish) and number of spines.

this species was reported by various explorers from the mexican states of San Luis Potosí and Zacatecas at altitudes between 1900–2500m.

So how can we distinguish these two mammillaria species? Both of them have been reported from Zacatecas (but *M. formosa* has a much more extended distribution range). *Mammillaria formosa* ssp. *formosa* is supposed to have 4–7 (usually 6) centrals and 20–22 white radials (sometimes absent!). *Mammillaria lloydii* has central spines absent and should have 3–4 radials. Only for comparison, related *Mammillaria formosa* ssp. *chionocephala* is reported to have 2–4 (rarely as many as 6) centrals and 22–24 bristle-like, white radials (as a source here I used the excellent website about Mammillarias: http://www.mammillarias.net).

So, what about the plants from the area above Concepción del Oro? The flowers were almost identical, varying from almost pure white, creamy, to a pinkish colour. But as

Figure 7. Another specimen of *Mammillaria* aff. *lloydii* above Concepción del Oro (Zacatecas) at an elevation of 2690m. Notice the pollinator (a small species of bee) in one of the flowers.

Figure 8. *Mammillaria* aff. *lloydii* growing among limestone rocks in the pine tree forest above Concepción del Oro (2830m), Zacatecas.

Figure 9. Flowering *Mammillaria* aff. *lloydii* above Concepción del Oro (Zacatecas) at an elevation of 2830m. Notice, that some areoles are spineless, some bear only centrals, and others produce both central and radial spines.

Figure 10. Flowering *Echinofossulocactus* aff. *multicostatus* growing in grass in the limestone gravel, just below the pine tree forest at an elevation of 2690m, between Concepción del Oro and Mazapil, Zacatecas.

Figure 11. A nice specimen of *Coryphantha palmeri* (or *C. delicata* if you prefer) at an elevation of some 2690m east of Mazapil, Zacatecas.

Figure 12. *Echinofossulocactus* aff. *lloydii* in flower at an elevation of 1760m near Los Tecolotes, Zacatecas.

already mentioned above, the spination was very variable, and even on a single plant (tubercules on a single plants had various numbers of radial spines). The plants mostly had 2–4 (usually 2) central spines and either (almost) no radial spines or quite numerous (about 10–16) thin white radials.

At this moment, I must admit that I am not sure and I am confused again. Strictly speaking, the plants do not fit the *M. lloydii* nor *M. formosa* description perfectly. The plants could actually be just a mountain form of *Mammillaria formosa* ssp. *chionocephala* as well, right? (and if *formosa* and *chionocephala* really are two distinct taxa). So, for the time being (and within this text), I shall call these interesting cacti *Mammillaria* aff. *lloydii*. And at this point I want to ask readers for their valuable opinions on these plants. Thank you for any suggestions in advance.

Back to our explorations. We started to descend on the other side and when the last pine trees had disappeared, we noticed *Echinofossulocactus* aff. *multicostatus* in flower (Figure 10), just next to the road. We stopped there at an elevation of 2690m to check the plants. Echinofossulocacti were mostly adorned with nice long papery spines, some of them being nicely camouflaged in dry grass and only the flowers making them clearly visible. There was also the same mammillaria as before (*M.* aff. *lloydii*), *Coryphantha* aff. *palmeri*, and *Agave lechuguilla*.

We made several more stops along the road. East of Mazapil (2690m) we found *Mammillaria* aff. *lloydii* again (although not as common as before at higher elevations), *Coryphantha palmeri* (Figure 11), *Ferocactus pilosus*, *Cylindropuntia tunicata*, agaves and yuccas, including a large *Yucca carnerosana*. West of Mazapil at a lower elevation (2180m) we observed *Coryphantha palmeri*, *Echinocactus horizonthalonius*, *E. platyacanthus*, *Echinocereus pectinatus*, *Ferocactus pilosus*, *Neolloydia conoidea*, *Cylindropuntia tunicata*, some other cylindropuntia, agaves and yuccas. A little bit further in a flat area we tried to look for ariocarpus (it looked like a perfect habitat for them), but we found only (and again) *Coryphantha palmeri*, *E. horizonthalonius*, *E. platyacanthus*, *F. pilosus*, *Mammillaria grusonii* with scarlet fruits, *Cylindropuntia leptocaulis* bearing typical red berries, as well as some other opuntias and agaves.

As for *Coryphantha palmeri* mentioned above (like the specimen in Figure 11), the plants could also be called *Coryphantha delicata* (a newer name created by Bremer, probably superfluous, but many authorities consider *Coryphantha palmeri* to be just a synonym under *C. delicata*). *Coryphantha palmeri* (*delicata*) is distributed over a large geographic area and thus can be quite variable (especially in number and colour of the radial and central spines). We saw many of them in the area between Concepción del Oro and Los Tecolotes, but it never seemed to be very abundant there. Many of them had only radial spines (but were adult specimens, some bearing fruits), others were adorned with a more or less thick hooked central spine (these were really very attractive). There is another name for these (or related) plants, *Coryphantha jaumavei* (used by A.V. Frič). And very similar is another species, *Coryphantha cornifera*. Whatever the right name is, I really enjoyed seeing these relatively small cacti in the wild.

Near Cedros (San Juan de Los Cedros, at an elevation of some 1700m) we made only a quick stop and found only *Cylindropuntia leptocaulis* growing on barren white limestone hills. But later, east of Los Tecolotes (General Felipe Ángeles), we observed again numerous cactus species: *Coryphantha palmeri*, *Echinocactus horizonthalonius*, *Echinocereus pectinatus*, *Ferocactus hamatacanthus*, *Mammillaria grusonii*, and *Opuntia microdasys*.

We reached Los Tecolotes when the sun was quite low to the horizon and light was not good for taking pictures anymore. We found some last cacti of the day, namely *Echinocactus platyacanthus*, *Echinofossulocactus* aff. *lloydii* (Figure 12), *Escobaria* sp., *Ferocactus hamatacanthus* with fruits, *Ancistrocactus* (*Glandulicactus*, or do you prefer *Sclerocactus*?) *uncinatus*, *Lophophora williamsii*, flowering *Mammillaria formosa* ssp. *chionocephala*, *Neolloydia conoidea*, *Agave lechuguilla*, and *Yucca* sp.

We were setting up our camp (well, a mat and a sleeping bag, to be precise) in a flat area west of Los Tecolotes already at dusk. The night was warm and quiet.

Zlatko Janeba

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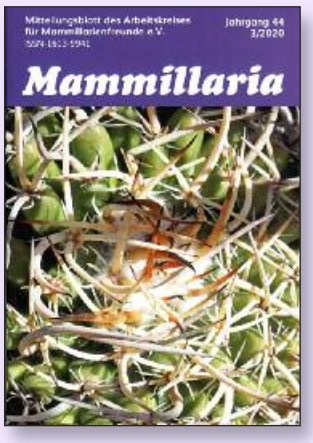

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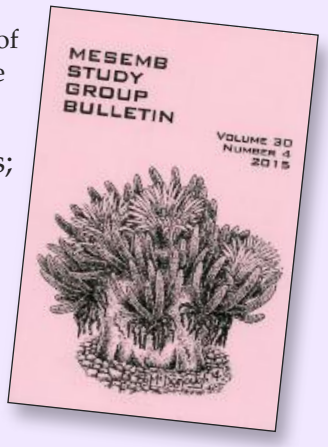

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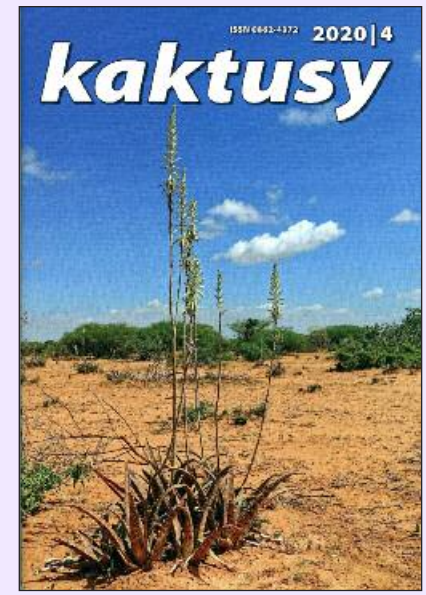

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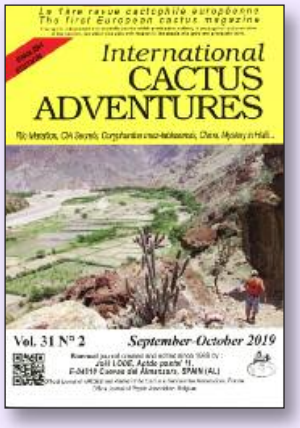

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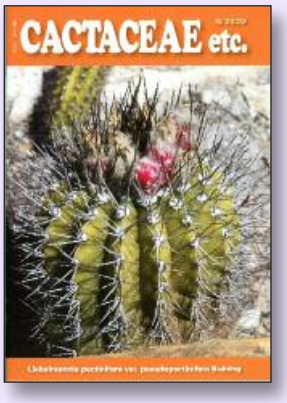

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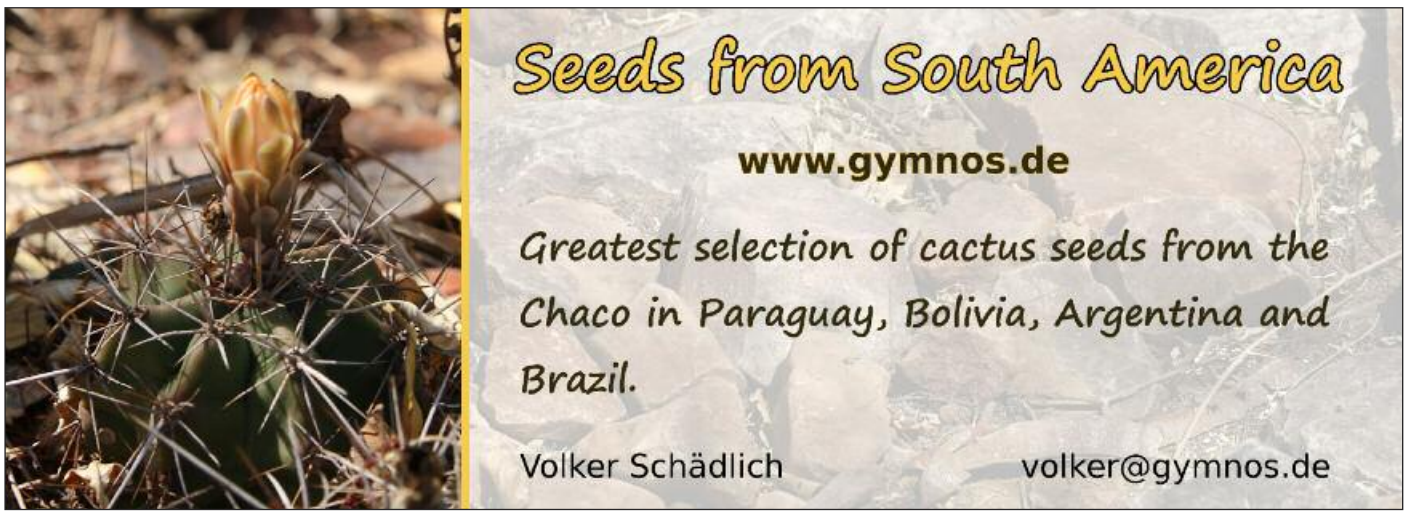

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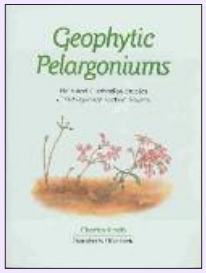

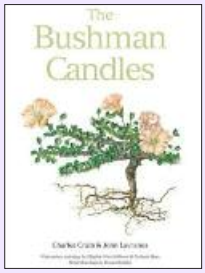

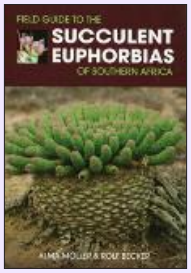

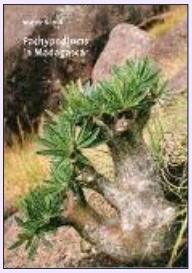


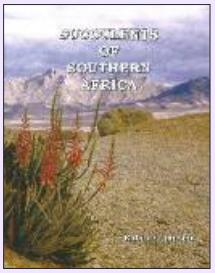

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Baker *Amaryllideae* (1888) ex Libris; Paul C. Hutchison, Berkeley California. **75€**

Please contact w.a.alsemgeest@hetnet.nl if you are interested.

Reprints etc. from Alessandro Guiggi

I need space in my library so I am offering various items for sale.

You can download my list as a MS Word document here.

Secondhand books for sale

Paul Foster's interesting list on page 20.

Gymnocalycium

IN HABITAT AND CULTURE

Copies of my book are still available from dealers around the world or from me.

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