The Cactus Explorer

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

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September 2018

In this Edition

Cover Picture: A flowering specimen of *Sclerocactus nyensis* in its habitat south of Tonopah, Nye County, Nevada. Photograph by Zlatko Janeba. See his article on page 33.

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
25th September 2018

Introduction

What a Year!

It doesn't seem long ago that I got back from a trip to Peru in April with the growing season ahead of me. When I got home, the plants were starting to grow really well and there was a lot of repotting to do. In light of my later start, I decided not to sow any seeds this year. For me, it is one of the best parts of the hobby and it is the main way I add to my collection. Many species are only available as seed since the range of seedlings grown commercially tends to be the most populat species and those that are easier to grow.

Seed raising is a very satisfying activity and results in lots of spare plants to sell or exchange. It is quite surprising that so few young plants are offered for sale at cactus events. What happens to all that seed that cactus societies distribute?

There are many dealers offering a wide range of cactus and succulent seeds. You can see links to some of them starting on page 46. An inexpensive way to get seeds is to join a specialist society, most of which publish a list of seeds. These lists often include species which are difficult to find. The Society pages can be found from page 42.

So, as the growing season comes to a close, I reflect on all the things I hoped to do but which never got done. It is the same every year so I have come to the conclusion that I must reduce the number of plants in my collection and grow fewer plants better. I am encouraged that plants I did get around to potting have grown very well in this unusually warm summer.

For the last five years I have been working on a book about *Matucana* and *Oroya*, similar to the one I published in 2009 about the genus *Gymnocalycium*. It is nearing completion and I plan to finish it this winter so that it can be published early next year.

As I write this, I am preparing to leave for Australia where I have been invited to speak at the Succulenticon 2018 which is being held in Perth at the end of September. It is my first time speaking in Australia and I am looking forward to meeting people there who share our facination with succulent plants.

The popularity of succulent plants at the moment is unprecidented. They are really fashionable and the demand for plants is at an all time high. Who knows how long this trend will last but it is a great opportunity for Cactus Societies to expand their membership and recruit younger people who may make growing succulents a life-long hobby.

Just as this edition is about to be published, I have heard the very sad news that Myron Kimnach died on 21st September. he was aremarkable man.

Graham Charles

Myron Kimnach 1922–2018

Myron was Curator and Director of the Huntington Botanical Gardens for 25 years, appointed to his position in November 1962 by William Hertrich.. During his tenure at The Huntington, Myron oversaw many important improvements, including development of the Jungle, Subtropical, and Australian Gardens, as well as creation of the Zen Garden and Bonsai Court, and construction of the Desert Garden Conservatory. Myron guided the creation of the Gardens' Herbarium, the Annual Plant Sale, and the Succulent Symposium.

His contributions to botany and horticulture spanned decades before and after his time at The Huntington, from an early age through to his last days. He is recognized for important plant discoveries, authorship, participation in many professional and plant-related organizations and, for 10 years, editorship of the Cactus and Succulent Journal. In 2011, he was awarded the Cactus d'Or at the 9th IOS Inter Congress at Monaco (picture) for his contribution to succulents.

Myron will be remembered as a true gentleman and scholar. [Thanks to Jim Folsom for some of this text]

News and Events

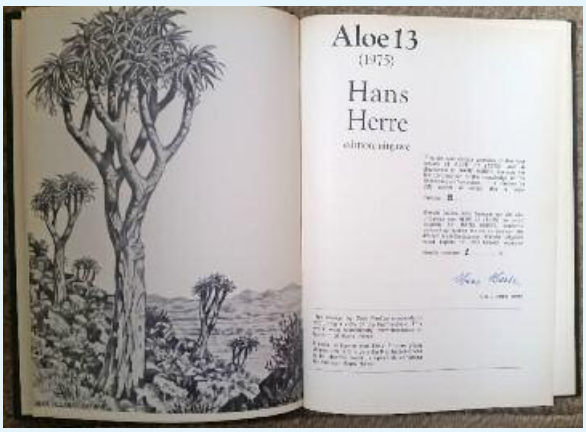
South East Cactus Mart

Sunday October 14th 2018
Crockham Hill Village Hall ,
Church Lane, Edenbridge TN8 6RP.
Open 10am till 3 pm
Admission £1 (children free)
More info. from davejappleton@hotmail.com

M.S.G. Auction
Banstead September 29th 2018

Absentee Bids Auction
(You can also bid on the day)

Volume 13 of *Aloe* (South African Succulent Society publication) which was dedicated to Hans Herre on his 80th birthday and signed by him, specially bound in dark green in a limited edition, in excellent condition, this is copy 15 of 200. Published in 1975.



If you are interested in bidding for this rather rare publication, please email Terry Smale (terry@smale1.demon.co.uk) who will receive commission bids and the book will be sold for £1 more than the second highest bid. Postage is extra and will be advised if you are the successful bidder.

The 13th Spalding Cactus Mart

Saturday 27th April 2019
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

An Apology

Photographs in my books:

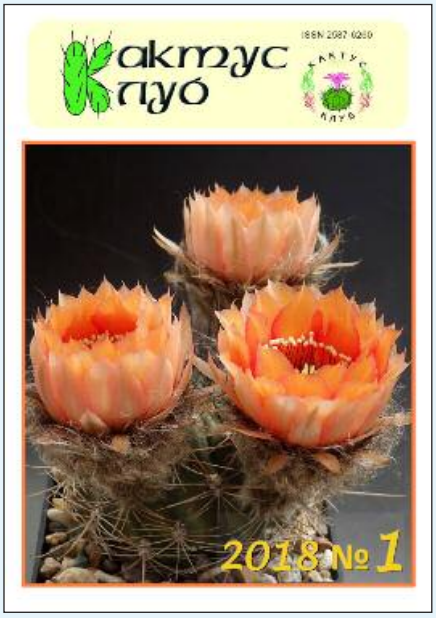
***Cacti & Succulents of Baja California* and *Mammillaria* – Now & Again**

Unfortunately, due to a misunderstanding, the following photographs were not attributed to ***Guillermo Rivera*** as they should have been: Figures 204, 209, 212, 213, 216–219 in the first mentioned book, and the top photo on page 78 in the latter.

John Pilbeam

Kaktus Klub

A new online version of the Russian journal *Kaktus Klub* is now available as a free download.



This is a very well produced journal with excellent pictures. The text is mainly in Russian but there are summaries in English
You can download all the issues from
http://www.kaktusklub.com/htmls/e-journal.html

Zone 3 Rally

Saturday 27th October 2018
from 9.30 am.
Carlton Village W.M.C. WF3 3RW

Plant Sales, Raffle, optional Carvery Lunch.

Smaller South American Opuntias
Tony Roberts

Succulents —Fun for Summer and Winter
Robert Maijer (Netherlands)

Matucana in Habitat and Culture
Graham Charles

Tickets **£10** or **£15** inc. carvery from
Mrs. D.M. Minors, 79, Osborne Road,
Sheffield S11 9BA

Tephrocactus Study Group

All issues of this journal are now available as free PDF downloads at
the Cactus Explorers website

Books , Prints, Catalogues and Separates for sale

Albert Hofman still has some of his library for sale.

You can download the updated lists:

List of Books, Catalogues and Separates

List of Plates

Exeter Branch Convention

7th October 2018
Woodbury Village Hall,
Flower Street, Woodbury,
Exeter, EX5 1LX
9:00–15:30

Speakers:
David Minnion "Texas"
Dr Jonathan Clark
"Lithops and other Mesembs"

Tickets **£15**, including lunch.
Details from Ian Woolnough:
01392 422147 or
ianneilwoolnough@gmail.com

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.

Birmingham Branch and Haworthia Society Show

7th October 2018

Birmingham Botanical Gardens,
Westbourne Road, Edgbaston,
Birmingham, B15 3TR

11:00–16:00

Cambridge Branch Autumn Show

10th October 2018
Great Shelford Memorial Hall,
Woollards Lane, Great Shelford,
Cambridge, CB22 5LZ.

19:30–22:00

North West Mesemb Show

13th October 2018
St Thomas More Church Hall,
Kirkway, Alkrington,
Middleton, Manchester, M24 1PP.

10:15–15:45

Speaker: *John Watmough*
"Those you may not have seen" (14:00).

Details and schedules from Peter Bint:
peter@bint.myzen.co.uk

The Naturalist's Travel Page

https://thetravelingnaturalist.org

Our website has free-to-use online talks for your succulent society's meetings - from many locations around the world. We also have illustrated trip reports and summaries of South African succulent-rich guest farms. Also, a short course on field photography. We are available to help in natural history travel and tour planning.

Repertorium Plantarum Succulentarum

Published annually by the IOS, each issue is a compilation of new names, taxa and new combinations, published during the previous year. There is also a list of the most significant articles and books published about succulent plant systematics.

Until 2009, RPS was only available as a paid printed version.

Since 2011 (No.61 of 2010), RPS has been available as a free pdf format download which you find at the CactusPro library:

https://www.cactuspro.com/biblio/fr:rps

Opuntia Web.

This website about the opuntias of the USA has been redone and is better than ever. There are 1,500 photographs of the various species in habitat.

Opuntia and related species (= opuntiads) are unique cacti with unusual shapes and beautiful flowers. Common in parts of the United States and Mexico; they also occur throughout most of the Americas. There are over 50 species of opuntiads in the United States and many more in Mexico. Opuntia Web describes opuntias of the United States.

www.opuntiads.com

In The Glasshouse

Kamiel Neirinck tells us about the lovely Brazilian miniature cereoid *Arrojadoa eriocaulis* which makes a wonderful easy-flowering addition to our collections.

Translation by Ronald Fonteyne. Photographs by the author except where shown.

Arrojadoa eriocaulis

Synonym: *Arrojadoa dinae* subsp. *eriocaulis*

The genus *Arrojadoa* was described by Britton & Rose in 1920 and named after the then superintendant of the Brazilian railways Dr Miquel Arrojado Losboa. At first only two species were known: *A. rhodantha* and *A. penicillata*. In 1995 P.J. Braun and E. Esteves divided the genus into two subgenera: subgenus *Arrojadoa* and subgenus *Albertbuiningia*. The reason for this division was the discovery by Buining of plants with small, thin, soft stems and a swollen root system that can be up to 12cm thick, and which are flowering with bicoloured flowers: pink and violet. Arrojadoas are not often found in collections, and if so they belong mostly to the subgenus *Arrojadoa*. These are more rigid, thicker and larger stems with a root system that is less susceptible to cold and humidity than those from the subgenus *Albertbuiningia*.

Arrojadoa eriocaulis belongs to the latter subgenus which comprises four species: *A. dinae* Buining & Brederoo, *A. eriocaulis* Buining & Brederoo, *A. beatae* P.J.Braun & Esteves and *A. multiflora* F.Ritter. Also the supposed hybrid *A. albiflora* Buining & Brederoo belongs to this subgenus.

Arrojadoa eriocaulis has two subspecies: subsp. *eriocaulis* (inc. *var. rosenbergeriana*) and subsp. *albicoronata*. Some authors consider the two subspecies as varieties of *A. eriocaulis*. They have small, tender stems with a tuberous root system. In culture this root system is sensitive to rot which results in the plant dying back. To avoid this it is necessary to graft these tender cacti. They should not be kept at a temperature lower than 12°C. A warm, draught free place in the greenhouse is recommended. As is clear from the photographs they flower abundantly with numerous small flowers. In Brazil some small populations (max 50 specimens) occur in the Serra do Espinhaço, Minas Gerais, between Monte Claros and Mato Verde, in quartz sand, between or under bushes, at altitudes between 700 and 1100m. Also a more southerly situated population was discovered in Grão Mogol.

The plants are visited by hummingbirds. The soft green small stems do not branch,a and from a single rootstock can grow 3 to a maximum of 10 new shoots. The areoles have fine white hairs and 10 to 12 red brown spines, 4 to 7mm long. In nature, the plants have a height of up to 60cm. From the cephalium at the end of the stem comes bicoloured violet-pink flowers. In habitat *A. eriocaulis* flowers nearly the whole year round. After flowering, a new shoot grows through the cephalium and on this shoot a new cephalium will appear. The plants do not hybridize. The red-brown berry contains dull black helmet shaped seeds. *Harrisia jusbertii* or *Echinopsis* are good stocks for grafting and yield freely flowering plants. Several times a year one can enjoy a rich blooming. Especially plants grafted on *Echinopsis* are hard to distinguish from plants on their own roots. *Arrojadoa eriocaulis* is threatened with extinction and appears on the IUCN Red List of Threatened Species. *A. eriocaulis* can easily be propagated from seeds and when grafted can already flower after only two years. They flower for several days.

Arrojadoa hoevenii nom. nud. was found by Leo Van der Hoeven north of Grão Mogol. According to Marlon Machado this is a local form of *A. eriocaulis*. As can be seen in the photographs (Figs.8 & 10), *A. hoevenii* is densely covered with white woolly hairs and a gem to have in your collection.

Kamiel Neirinck

Figure 1. *Arrojadoa eriocaulis* ssp. *albicoronata*

Figure 3. *Arrojadoa eriocaulis* ssp. *eriocaulis*

Figure 4. *Arrojadoa eriocaulis* ssp. *eriocaulis*

Figure 2. *Arrojadoa eriocaulis* ssp. *albicoronata*

Figure 5. *Arrojadoa eriocaulis* ssp. *eriocaulis* GC1034.01, in habitat east of Mato Verde showing the underground stem tuber.
Photograph: Graham Charles

Figure 6. *Arrojadoa rosenbergeriana*

Figure 7. *Arrojadoa rosenbergeriana*

Figure 8. *Arrojadoa hoevenii* nom. nud.
Photograph: Leo Van der Hoeven

Figure 9. *Arrojadoa rosenbergeriana*

Figure 10. *Arrojadoa hoevenii* nom. nud. Photograph: Leo Van der Hoeven

On-line Journals

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 23 of *Xerophilia* appeared in February 2018. It is published in English as well as the language of the original article. The quality contents are impressive and varied. There is lots to read in its 102 pages.

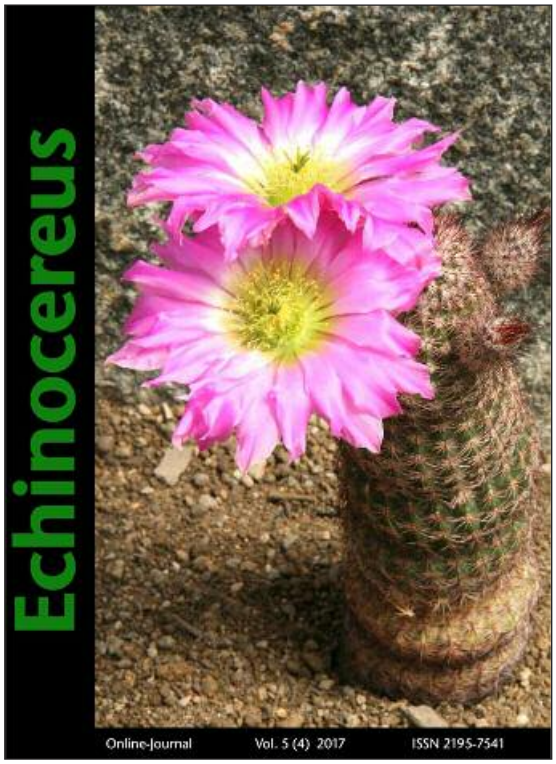
Contents include: · Editorial;· Xerophilia 23's Favourite Quote ; Peyote: Worship and Constraint; Enemy Plants; New records of interesting non-native succulents from Alicante; *Mammillaria orcuttii* Bödecker, not rare but beautiful; Notes on some species of the genus *Ariocarpus*; Succulents from the southwestern deciduous forests of Romania; First record of *Aeonium simsii* in New Zealand; Over-fertilization, a determining factor of aberrant growth.

The magazine may be downloaded free as a pdf from

http://xerophilia.ro

Contact: xerophilia@xerophilia.ro

ECHINOCEREUS Online-Journal

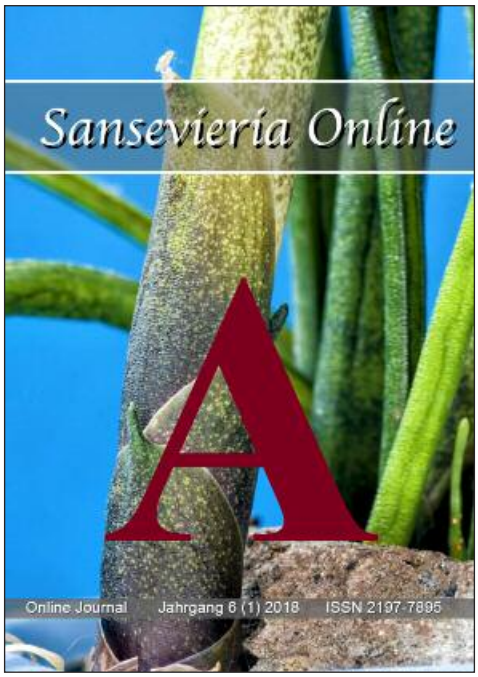


The German language on-line journal for Echinocereus lovers. The goals of this journal are to study the genus *Echinocereus*, to publish articles about the continuous research on these plants (classification, morphology, evolution) as well as to protect the genus *Echinocereus* by reproduction from seeds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

This issue, published in October 2017 includes: A whim of nature? Blooming surprise in September 2016; 40 year obsession with cacti; Observations in the greenhouse; Memories ... *Echinocereus ortegae* near San Miguel, Sinaloa.

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: Species protection for Sansevierias? Protection of Sansevieria in Kenya ; From historical writings; Two days in Kew Gardens looking at Sansevierias ; Sansevierias in front of the camera Part 3; Cherished Sansevierias presented.

There is a cumulative index published for 2013–17.

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

Schütziana

The latest issue of Schütziana, the specialist on-line journal for *Gymnocalycium* enthusiasts, was published in August 2018 and features 2 articles:

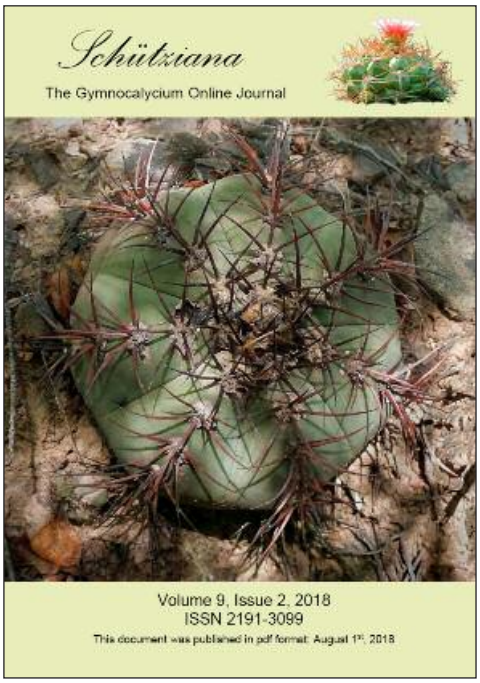
1. A sensational discovery from the utmost northwest of Paraguay – *Gymnocalycium cabreraense* spec. nov.

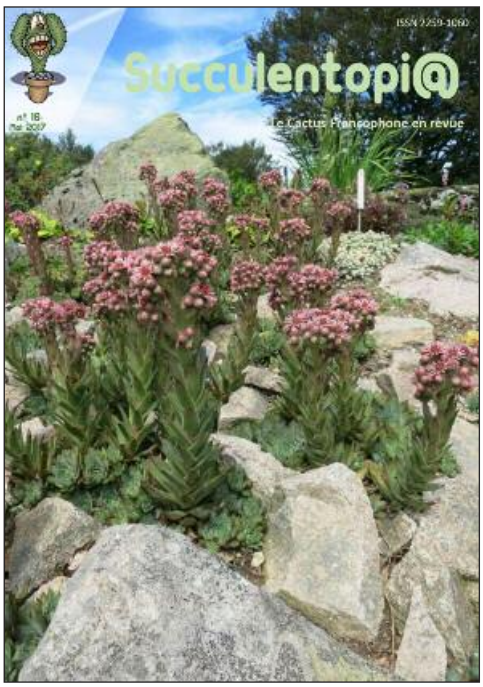
2. *Gymnocalycium leptanthum* and *G. parvulum*.

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





Succulentopi@

More than a year has passed since the last Succulentopi@ was published, No.16 appeared in May 2017.

This was the first online journal published in French. The quality is excellent as you would expect from Yann Cochard and his enthusiastic team.

It is available as a free PDF download from:

http://www.cactuspro.com/succulentopia

This issue includes experience with *Toumeya papyracantha*; The genus *Acanthocalycium*; Photo Gallery; 4 pachypodiums from Madagascar; Substrates and their composition; Philately and the CactusPro Library.

I hope we see more issues soon!

Sukkulenten (formerly Avonia News)

Free German language on-line newsletter of "Avonia", the quarterly journal of the German Society for other Succulents.

From 2015, the monthly on-line newsletter has been called "Sukkulenten"

This issue, No. 3 of 2018, discusses The genus *Huernia* and other succulents in Angola, part 4; *Crassula muscosa* – The Wolf claw Crassula and *Sempervivum ciliosum*.

It is very well produced with excellent pictures.

See website: www.fgas-sukkulenten.de

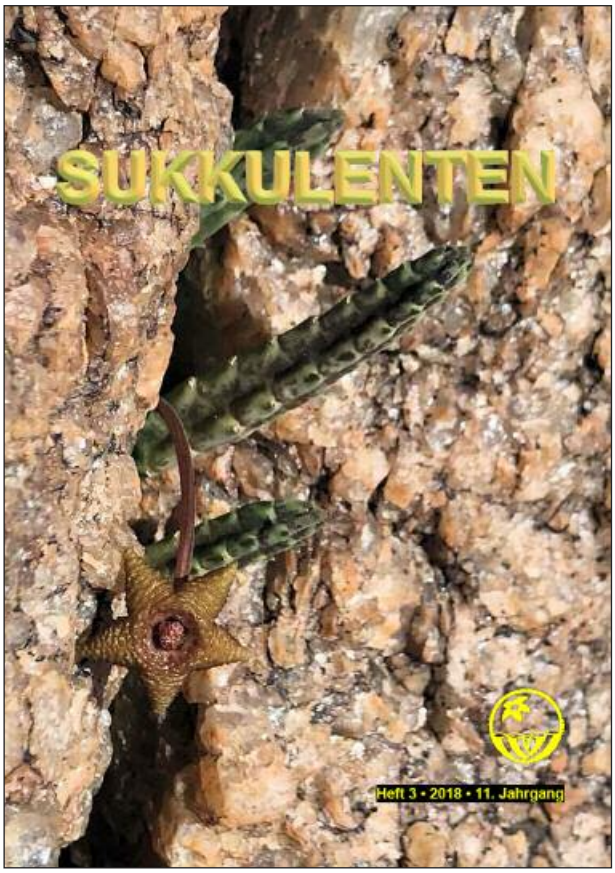
Annual seed list for members and much more.

Special interest groups for *Aloe* (incl. *Haworthia* etc.), Ascleps, *Euphorbia*, *Mesembs* and *Yucca*/winter-hardy Succulents.

For membership and further information contact:

Dr. Jörg Ettelt: Morgenstr. 72, D-59423 Unna, praesident@fgas.sukkulenten.de or

Wilfried Burwitz: Postfach 100206, D-03002 Cottbus, geschaeftsstelle@fgas.sukkulenten.de



Essex
SucculentReview

Written by growers for other growers

The Essex Succulent Review is a high quality quarterly on-line UK newsletter featuring non-technical articles on all aspects of cacti and succulents.

Issue 18, published September 2018, features 30 pages of: Czeching it out, visiting two Czech nurseries; *Adenia* Part 2 – types, shapes and forms; What I'm interested in today ...; Legends of the Saguaro; Two interesting Euphorbias, No.3 Zimbabwe and Madagascar; Western Flower Thrips control; *Ferocactus lindsayi*; and A visit to Le Jardin Exotique.

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

Further details and back issues are available on the website:

http://www.essexsucculentreview.org.uk

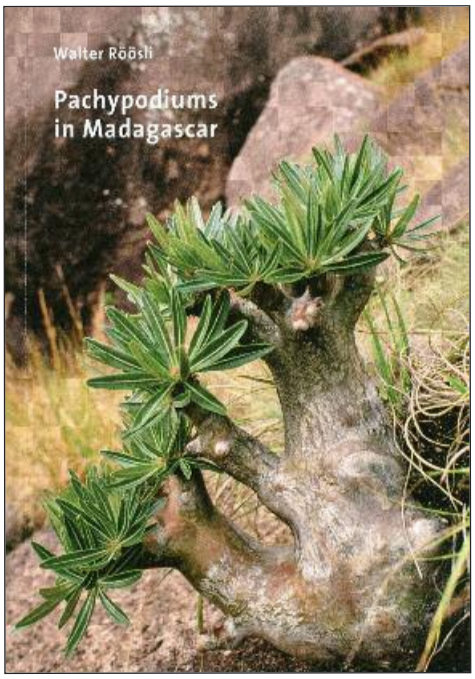
or email: sheila@essexsucculentreview.org.uk

You don't have to live in Essex to read it!

The Love of Books

News of two Recent Publications from the world of Cacti and Succulents.

Pachypodiums in Madagascar



Walter Röösli

First published in 2015 with German text, this new edition gives English speakers the chance to enjoy a comprehensive review of the remakable pachypodiums that grow on Madagascar.

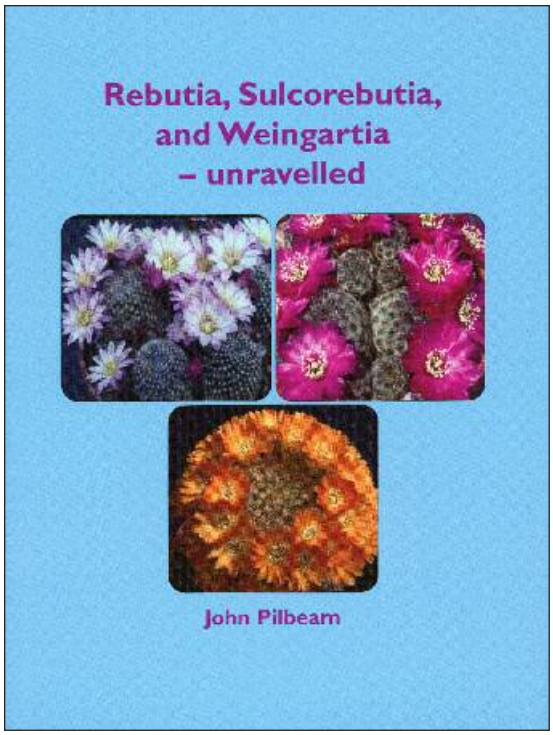
The book is very well illustrated with good quality colour pictures of plants in habitat together with detailed botanical drawings. An English language version of this book has been available as print-on-demand but that version had only black and white pictures, very much inferior to this all-colour edition which is arguably even better than the original German one.

This softback volume has 172 pages, 210 × 148mm with 211 colour pictures, 24 clear distribution maps and 21 pages of botanical drawings.

Only available from Keith Larkin and excellent value at £18 plus carriage.

GC

Rebutia, Sulcorebutia, and Weingartia — unravelled



John Pilbeam

The latest picture book from the UK's most prolific author illustrates some of the most floriferous easily-grown plants available for us for culture. It is a pictorial index of what the bodies and flowers of variously named plants, many subsumed by 'lumpers', actually look like, useful when perusing nursery lists.

The part dealing with *Rebutia* revisits plants John wrote about in his excellent *Cactus File Handbook 2* (1997). It is curious that *Rebutia* species have never been as popular as Sulcorebutias, of which there is an increasing number of new forms. Some of these novelties are very usefully illustrated with pictures from Johan de Vries, a specialist in the genus.

This hardbound book has 130 pages, 280 × 215mm, with 240 good-sized pictures. It is available from the author for £40 (UK), £45 (EU) and £50 (RoW) including postage.

Succulents on a Plate

Graham Charles describes the splendid *Plantarum succulentarum historia*, a lavish set of stipple engravings based on the painting of Redouté with text by Augustin Pyramus de Candolle.

Plate 112 from the small paper edition of *Plantarum succulentarum historia* depicting the plant we now know as *Melocactus communis*. One of 14 illustrations of cacti in the work.

Plantarum succulentarum historia, ou Histoire naturelle des plantes grasses.

The work comprises around 180 unnumbered stipple engravings, colour printed and finished by hand from paintings by Pierre-Joseph Redouté (1759-1840) with text by Augustin Pyramus de Candolle (1778-1841).

It was originally planned to produce a work of 50 fascicles The first 29 fascicles containing 159 folio plates were published by Pierre Didot L'Aine, Paris, between 1799 and 1805 when an argument between de Candolle and the publisher halted publication. It is said that only 100 copies were produced. A small folio edition was also produced with the same sized engravings but printed on smaller paper. The number of copies printed for the quarto and for other later editions is not known. The work was resumed through the interest of the

botanist J.-B.-.A. Guillemin (1796-1862) when another three fascicles were published in 1829-31. Fascicle 32 is only known from a few loose plates but there is no known text, never being officially published.

It was Redoute's first significant work as an illustrator and was the first major botanical work to rely on colour-printed plates using the technique of stipple-engraving, an art refined by Redouté which he had learned from Francesco Bartolozzi while visiting England with French botanist C.-L. l'Hriter de Brutelle (1746-1800). It has been claimed that Redouté introduced the art to France. Certainly the technique had not been applied to flowers before and it allowed for the first time the artist to reproduce the delicacy of a flower's form and colour that had so far eluded the printer's art.

Plantes Grasses, as it is better known, was also the first collaboration between the then young Swiss botanist and Redouté. Whilst Redouté began work on the drawings on vellum, R.-L. Desfontaines found a young Swiss botanist, Augustin Pyramus de Candolle, then a student at the garden, ready to undertake the task of writing the descriptions of each species. Desfontaines also found a publisher. Out of this collaboration. developed the now famous *Plantarum historia succulentum*.

Literature

ROWLEY, G.D. (1956–57). Pierre-Joseph Redouté — "Raphael of the Succulents". *Cactus & Succulent Journal* (GB) **18**(4): 91–93, **19**(1): 6–8, **19**(2): 30–32, **19**(3): 54–57, **19**(4): 8–93.

Plate 75 from the large paper edition of *Plantarum succulentarum historia* depicting *Aloe plicatilis.*

Plate 141 from the large paper edition of *Plantarum succulentarum historia* depicting the plant we now know as *Aeonium canariense.*

The problematic Horridocactus kunzei

Grzegorz Matuszewski has a great interest in the cacti of Chile and has explored there on a number of occasions. Like others before him, he is fascinated by the application of the name *Echinocactus kunzei* C. F. Först. and here tells us the story.

In 1845, in his *Handbuch der Cacteenkunde*, Carl Friedrich Förster described and named *Echinocactus kunzei* in honour of the director of the botanical garden in Leipzig, prof. Gustav Kunze. The described plants came from a parcel, delivered by Dr. Eduard Pöppig from the city of Copiapo in Chile. As the typical location the author of the description pointed to Chile, on the highest ridges of the mountains, where plants are often covered with a thin layer of snow in the winter. Unfortunately, there was neither a picture nor a drawing.

Description: spherical body, a bit flattened, green, the top slightly concave with almost no spines. 16 ribs, of which 4 divided at the top, so 20, a bit spiral at the bottom, vertical at the top, tight-knit, blunt, thickened at the areole, forming mounds. Tubercles very smoothly connected, underneath the younger areoles they protrude sharply. Furrows are sharp, then relatively flat. Areoles close together (13–18mm), very long and narrow, (2.2mm wide and 9–13mm long), no spines at the top, first with a small amount of dirty white wool, then bare. Spines almost all bent upwards, protruding, yellowish when young, horn-coloured at the top, ash-grey at the end. Radial spines 10 to 12, up to 4cm long, shorter below, relatively straight at the bottom and turned downwards. Central spines 2–4, slightly longer (up to 5cm) and more firm. Flowers and fruits were described.

In 1853 Labouret described *Echinocactus neumannianus* in his *Monografie des Cactées*, adding that it is synonym of *Echinocactus kunzei* and stating the place of origin to be the Copiapo area. It is difficult to determine whether Labouret saw these plants in nature, or whether he made the description based on ones brought to Europe. It is obvious, however, that the name given to the same plant at a later date is invalid, unless the original has been described with an infringement of the nomenclature rules in operation at the time.

In 1886, Theodor Rümpler in *Handbuch der Cacteenkunde*, not only copied the original description of *Echinocactus kunzei*, but published an engraving showing a descendant of originally imported plants (reproduced below). He also referred to the location around Copiapo published by Labouret. However, the question remains as to how close the presented image captures the described plant, whether it is a hybrid, and if Förster used other plants for the description that were also brought from around Copiapo and then averaged the data.

Ritter explored Chile in 1955/56, and his observations were published in 1980 in a four-volume work *Kakteen in Südamerica*. Volume 3 refers to Chile. Ritter also wanted to find the mysterious *Echinocactus kunzei*, looking for it in the Copiapo valley. His desire was so great

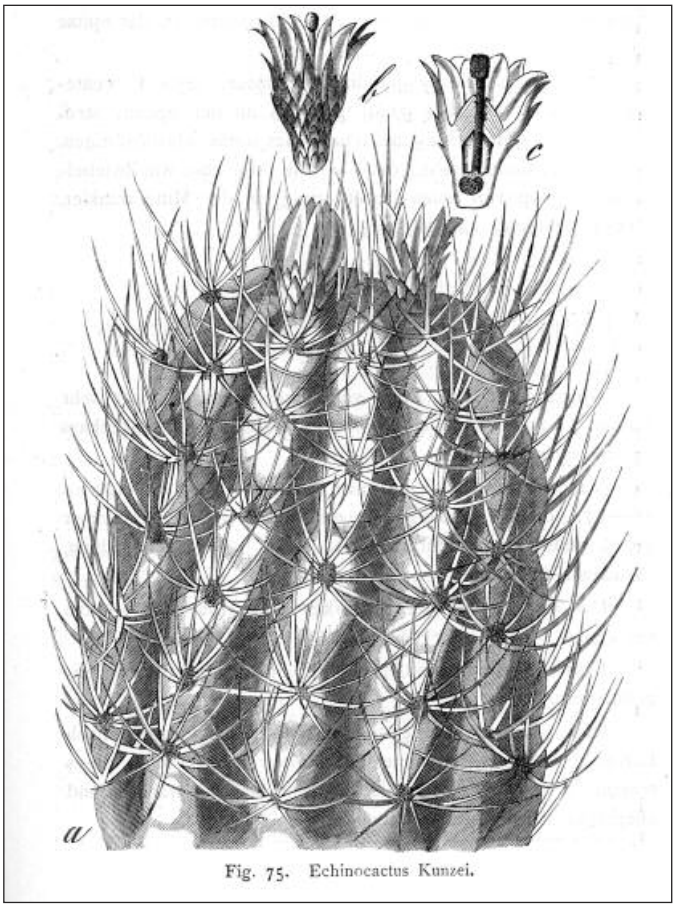


Illustration of *Echinocactus kunzei* from *Handbuch der Cacteenkunde*, by Theodor Rümpler (1886).

Horridocactus confinis, Sierra Hornillos

Horridocactus confinis, Sierra Hornillos

Eriosyce spinibarbis, El Maray

Eriosyce spinibarbis, El Maray

Horridocactus eriosycoides, Balala

that he described the plants found in Sierra Hornillos as the true *E. kunzei*, initially under the generic name *Horridocactus*, and later *Pyrrhocactus*.

Because the Sierra Hornillos location is easy to identify, I decided to go there to learn what *Echinocactus kunzei* really looks like. To my surprise the place I found was filled with numerous plants, yet all of those that had 16 ribs were already known to me under the name *Horridocactus confinis* F. Ritter. It seems that Ritter, blinded by the desire to find the species, did not recognize the plants he had already described earlier.

From my experience, and others also confirm, in the Valley of Copiapo one can only find (excluding *Copiapoa*, *Cumulopuntia* and *Maihueniopsis*) *Eriosyce aurata* var. *spinibarbis* (F.Ritter) Kattermann and *Horridocactus confinis*. I found the latter to appear not only

Horridocactus confinis, PuntaSalada

Horridocactus confinis, Playa Rodillo

Horridocactus transitensis, Pinta-Conay

Horridocactus transitensis, Pinta-Conay

Horridocactus eriosycoides, Balala

Horridocactus eriosycoides, Balala

Horridocactus domeykoensis, Punta Del Viento

Horridocactus kunzei, Hurtado

Horridocactus kunzei, Romeral

Horridocactus kunzei, TresCruces

Horridocactus atroviridis, Chacritas

Horridocactus atroviridis, Sauce Perez

Horridocactus crispus, Freirina

near the coast, but also closer to Copiapo city. Unfortunately, they do not grow on the mountain tops and are never covered in snow. The only ones that happen to be covered in snow near Copiapo area are *Eriosyce aurata* var. *spinibarbis*. Albeit they also have narrow areoles, they do not fit the description since the ribs are more numerous and there are more spines in areoles.

It remains only to be surmised that the plants, although sent from Copiapo, must have come from other, more distant regions.

Let's assume that the plants are sometimes covered with snow and grow high in the mountains. As far as I know, it can only be *Eriosyce aurata* (Pfeiffer) Backeb., *E. lapampaensis* F. Ritter, *Horridocactus curvispinus* (Bertero) Backeb., *H. eriosyzoides* F. Ritter, *H. transitensis* F. Ritter, and alpine plants found in the high mountains between Huasco and Domeyko in the north-west down to Hurtado and Romeral south of Vicuña, an area over 200km further away.

Mentioned plants are described by some botanists as *Horridocactus kunzei* (or *Eriosyce kunzei* (C. F. Först.) Katt. [1994] or *Neoporteria kunzei* (C. F. Först.) Backeb. [1936]). Because the area is large in span, the plants differ between locations. First one needs to exclude *E. aurata* and *E. lapampaensis*, because they have many more ribs and spines. Also *H. curvispinus* has more ribs, areoles are shorter and wider, while the radial spines are not turned upwards, which allows to exclude this species. *Horridocactus eriosyzoides* corresponds to the

Horridocactus crispus, Freirina

description quite well, although I counted 21 ribs on adult plants and it is difficult to find a spineless top. Moreover, I counted more both radial and central spines on many of them. Most of these plants have yellow spines, so the ones brought for description would also be yellow. The closest matching description of *Echinocactus kunzei* is in my opinion *Horridocactus transitensis*, which is like in between *Eriosyce eriosyzoides* (F.Ritter) Ferryman and *Eriosyce kunzei* (C. F. Först.) Kattermann. Populations that grow high in the mountains are more like *E. eriosyzoides*, while the lower and closer to the coast they grow, the more similar to *E. kunzei* they become.

Plants from Tres Cruces, east of Vicuña, are characterized by almost black spines, while those from Hurtado and Romeral have the most delicate and thin yellow-brown spines. They also correspond well to Förster's description. Some intermediate features can be observed on plants from the vicinity of Domeyko, known as *H. eriosyzoides* var. *domeykoensis* F. Ritter, or *Neoporteria eriosyzoides* (F. Ritter) Donald & G. D. Rowley var. *domeykoensis* (F. Ritter) Ferryman. I have to admit here that Förster's description, although quite precise, can fit many plants from this group, hence so many alternatives proposed by various

Horridocactus carrizalensis, Quebrada Mala

Horridocactus carrizalensis, Canto Del Agua

Horridocactus huascensis, Huasco

Horridocactus huascensis, Huasco

Horridocactus totoralensis, Caleta Totoral Bajo

Horridocactus totoralensis, Caleta Totoral Bajo

botanists. In fact *Horridocactus atroviridis*, *H. kunzei*, *H. transitensis*, *H. eriosyzoides* and *H. domeykoensis* all seem similar.

As a result, we can choose one of the following:

1. Accept that *Echinocactus kunzei* refers to plants recognized by Kattermann as *Eriosyce kunzei* [1994]. In that case *Horridocactus transitensis* can be considered as a variety of *Eriosyce kunzei* (C. F. Först.) Katt. var. *transitensis* (F. Ritter) Katt. [1994]. Nowadays, the name *Neoporteria kunzei* v. *transitensis* should be used. Instead J. Lode recently treated the *transitensis* variety as a synonym of *N. kunzei*. The name *Neoporteria eriosyzoides* (F. Ritter) Donald & G. D. Rowley [1966] I suggest be kept because these plants differ in a few details from *E. kunzei*. However, only the populations of the Huanta valley, Elqui, should be recognized under this name.
2. Consider *Echinocactus kunzei* as an unreliable description and as such reject it. Then we have to accept that the correct name for plants indicated by Kattermann as *Eriosyce kunzei* [1994], is *H. transitensis* F. Ritter [1959], so the valid names would be *Eriosyce eriosyzoides* (F. Ritter) Ferryman var. *transitensis* (F. Ritter) A. E. Hoffm. & Helmut Walter [2004], *Neoporteria transitensis* (F. Ritter) Ferryman [1966].

There would be an unresolved matter of naming the remaining plants growing south and west of *N. transitensis* which, however, differ a lot. This gap is filled by the description of *Horridocactus vallenarensis* (F. Ritter) Backeb. [1962] from Rivadavia neighbourhood, incorrectly qualified by J. Lode as *Neoporteria vallenarensis*, also described by Ritter, albeit it for a completely different and easily recognizable plant. But with the current inclusion of earlier strict types to a single broad genus *Neoporteria*, there would appear two identical names for two completely different plants. A naming change would then be required. Kattermann recognized the name as a synonym of *E. kunzei*, which would be correct for version 1. Also, the comparison of these plants with the picture published by Rümpler shows great similarity. I would also like to point out that populations growing only 20km further away in Tres Cruces (*H. vallenarensis* = *N. kunzei*) and Huanta – Balala (*N. eriosyzoides*) are very different and should be taxonomically distinguished, although probably some kind of relationship exists. This can only be checked by DNA testing.

Some botanists (for example D. Hunt) decided to fill the gap described by Ritter *H. atroviridis* [1962] that I pointed out, creating the *Eriosyce eriosyzoides* (F. Ritter) Ferryman subsp. *atroviridis* (F. Ritter) Ferryman [2003]. J. Lode now recognizes the name *Neoporteria atroviridis* (F. Ritter) Ferryman [1991] as an independent taxon.

Even more confusion arises when the chain of species is extended by *Horridocactus crispus* F. Ritter, *H. huascensis* F .Ritter, *H. carrizalensis* F. Ritter and *H. totoralensis* F. Ritter in its various configurations depending on the author's point of view.

F. Kattermann [1994] and E. F. Anderson [2001] have expanded the species *Eriosyce crispa* to include subspecies *E. crispa* ssp. *atroviridis* and varieties *E. crispa* var. *totoralensis*, var. *huascensis* and var. *carrizalensis*.

D. Hunt, N. Taylor and G. Charles [1999] have included only *E. crispa* ssp. *atroviridis* in the *E. crispa* family, considering *Horridocactus huascensis* as a synonym of *E. crispa* while *H. carrizalensis* and *H. totoralensis* as synonyms of *E. crispa* ssp. *atroviridis*.

E. & N. Sarnes and W. Mächler in their *Eriosyce* [2016] study recognize only *E. crispa* with subspecies *crispa* and ssp. *totoralensis*, also *E. eriosyzoides* with its subspecies ssp. *eriosyzoides* and ssp. *atroviridis* (*H. carrizalensis* and *H. huascensis* were treated as synonyms of *E. eriosyzoides* ssp. *atroviridis*).

Both options have their pros and cons, but maybe it is best to approach the subject as J. Lode did, leaving all species names as independent, i.e.: *Neoporteria atroviridis*, *N. crispa*, *N. confinis*, *N. eriosyzoides*, *N. huascensis*, *N. kunzei*, and *N. totoralensis*. I just wonder why he showed no consequence with *N. carrizalensis* and *N. transitensis*. After all, none of these has been DNA tested. Until this settlement is done I am in favour of leaving the original species names and not treating them as varieties or subspecies, maybe with exception of the double name *H. vallenarensis*, which I am willing to change into *Neoporteria kunzei*.

Grzegorz Matuszewski

Opuntia cacanapa 'Ellisiana'

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Synonyms of *Opuntia cacanapa*

Opuntia cacanapa Griffiths & Hare — *Bull. Agric. Exp. Sta. New Mex. Coll. Agric. Mech. Arts* **60**: 47. (1906)
Opuntia tricolor Griffiths — *Rep. (Annual) Missouri Bot. Gard.* **20**: 85, pl. 4. (1909) [name given to plants with dark spine base from south Texas]
Opuntia ellisiana Griffiths — *Rep. (Annual) Missouri Bot. Gard.* **21**: 170 (1910) [name given to spineless cultivated plant (originally found in Corpus Christi, TX)
Opuntia lindheimeri var. *tricolor* (Griffiths) L. Benson – *Cact. Succ. J.* **41**:125 (1969)
Opuntia lindheimeri var. *ellisiana* (Griffiths) K.Hammer — *Kulterpflanze* **24**: 268. (1976)

Opuntia cacanapa Griffiths and Hare, 1906 grows in Texas primarily on the Stockton/Edwards Plateau and western South Texas Plains (approximately Cameron to Brewster, Crockett, and Bandera Counties), and southward in Mexico to Hidalgo. It is a large plant from about 3 to 10 feet tall; shrubby to tree-like and usually growing one to few trunks; with glaucous blue-green pads that are usually circular, but varying to obovate or sometimes ovate; mostly 5 to 8 inches in diameter (occasionally to 12 inches). Spines are slender, usually terete, yellow and up to 2 inches long (rarely with a dark base); usually only one (or none) per areole, but occasionally up to two or three. Glochids mostly delicate, usually few and short in a tight cluster in small areoles, but sometimes more, stouter, and longer near pad edges or on old pads (Figure 1). The plant has a distinctive appearance due to its usually bluish colour, usually round pads, and distinct spine arrangement. It can typically be distinguished from other co-occuring species even from a moving vehicle. Some plants have only a few spines or vestigial spines; however, these plants still have a typical accompaniment of glochids. The style is white and the stigma is pale to bright green, and the filaments are pale. The flowers are bright yellow (rarely orange or red in Mexico) but sometimes fade to orange. The fruits are pyriform, glabrous, spineless, and the areoles are typically crowded near apex. Seeds are tiny (approxmately ⅛ inch or a little more). The leaves of *O. cacanapa* are essentially unique

Figure 1: *Opuntia cacanapa* Cladode showing pyriform and spineless fruit, one spine per areole, and enlarged glochids at the edge.

Figure 2: *Opuntia cacanapa* Cladodes, showing recurved leaves, spines, and glaucus pads.

Figure 3: *Opuntia cacanapa* 'Ellisiana' showing recurved leaves, lack of spines, and glaucus pads.

because they are strongly recurved, often almost forming circles (Figure 2), a trait shown by only a few species of *Opuntia*. The species is mostly seen growing on calcareus soils in broken terrain, but the largest plants are often in nearly level areas with relatively deep soils. *O. cacanapa* can be a very large plant that may reach 10 feet or more in height with a massive trunk up to 14 inches thick and a crown spread almost equaling the height. Most large plants have been destroyed by land clearing or livestock, and existing plants in nature are typically only three to four feet tall.

David Griffiths *described O. ellisiana* in 1910. It is a large plant with glaucous blue-green pads that are circular to ovate or obovate. The style is white and the stigma is pale or bright green, and the filaments are pale. The flowers are bright yellow. The fruits are pyriform, glabrous, spineless, and the areoles are typically crowded near apex. Like *O. cacanapa*, the leaves are also strongly recurved (Figure 3; Figure 4). In form, overall shape, flowers, fruit, seeds, and leaves, *O. ellisiana* resembles *O. cacanapa* though it is not known to reach the same height. *O. ellisiana* was described from a plant growing in a garden in Corpus Christi, Texas and has not since been duplicated from Nature.

Unusually, *O. ellisiana* is entirely without spines and essentially without glochids. Pads may be handled with impunity. Like *O.*

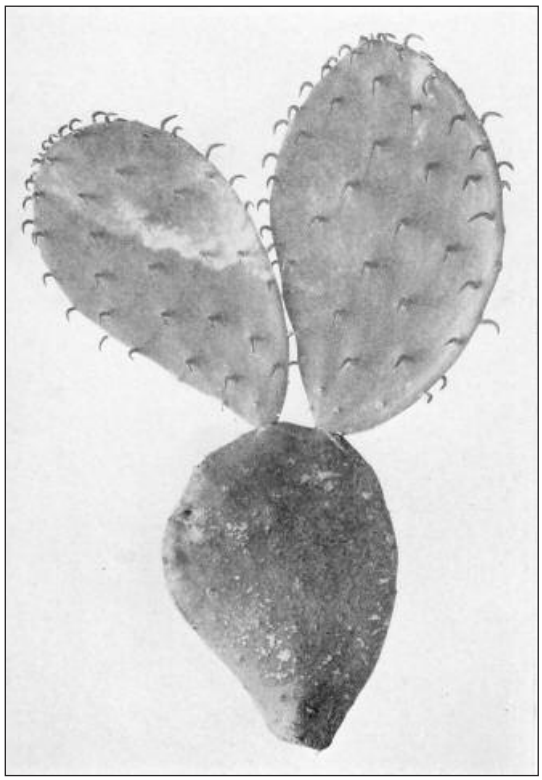

Figure 4: *Opuntia cacanapa* 'Ellisiana' *Annual Report of the Missouri Botanical Garden* (1910) **21**, plate 25.

cacanapa, *O. ellisiana* is relatively cold hardy (Griffiths, 1915 and personal observation).

Because it is not found in nature, and because of its similarities with *O. cacanapa*, we consider *O. ellisiana* to be a garden form of O. cacanapa. It is not known where it was originally found in nature (the most similar wild plants known, with normal spines and glochids, occur on the Stockton Plateau in Texas). Thus, *O. ellisiana* is actually *O. cacanapa* cultivar 'Ellisiana'.

This plant is often confused with, and mislabeled as, "Burbank's Spineless" pricklypear, which are actually multiple selections of *O. ficus-indica*, a much bulkier plant with larger pads, and different areoles, fruits, flowers, seeds, and spines (if present). *O. ficus-indica* is also much less cold tolerant than *O. cacanapa* and has glochids (Griffiths, 1909).

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What is Lobivia krahn-juckeri?

Martin Lowry describes his encounters with the recently described *Lobivia krahn-juckeri* and transfers it to *Echinopsis* together with its subspecies. Both appear to be well suited to culture.

Observations in habitat

In our article in issue 8 of this journal, Mats Winberg and I wrote about a visit we made to the small Bolivian town of Turichipa in 2012. As we descended into the village we had found a small population of the then recently described *Lobivia krahn-juckeri*. Lothar Diers had described this species in August 2009 from material collected independently by both Wolfgang Krahn and Hansjörg Jucker with information from Ewald Heger.

Diers' description compared it with *Lobivia lateritia* Gürke. This comparison is perhaps understandable since that species grows close by – only 120km further south. There are, however, other Lobivias much closer, as discovered by me and Mats when we found *L. rossii* Boed. only 10km to the northwest of where we first saw *L. krahn-juckeri*. More likely the comparison with *L. lateritia* is based on the uncanny similarity of Gurke's splendid illustration in Schumann's *Blühende Kakteen* (Fig. 1).

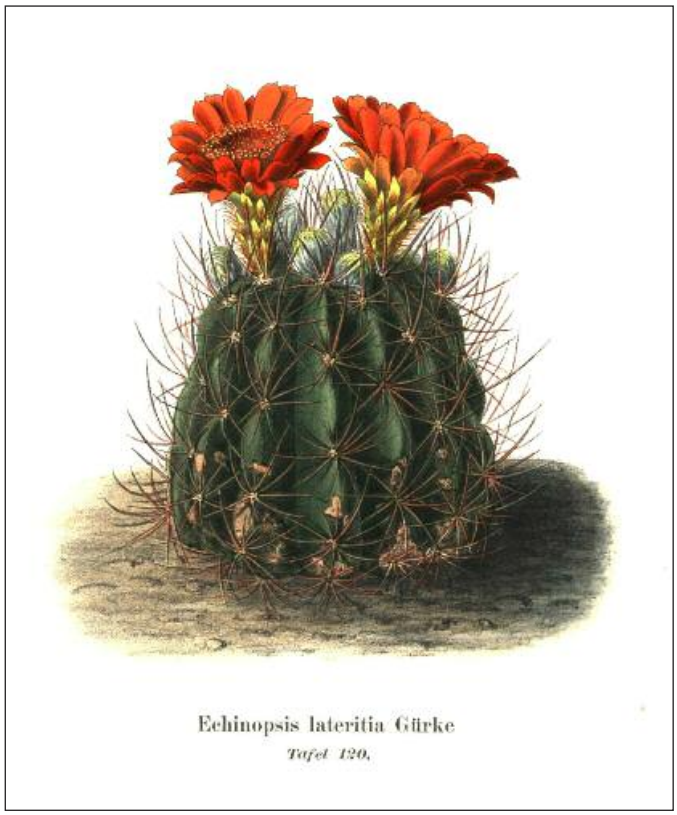

Figure 1. Plate 120 of *Echinopsis lateritia* Gürke from *Blühende Kakteen* (*Iconographia Cactacearum*) (1910)

Eventually *L. lateritia* grows tall and thin and has many more spines and is easily distinguished from Diers' species. The images of flowering plants in the protologue were also surprising since they showed plants with flowers ranging in colour from white with pink stripes, through yellow, orange and red, even to magenta. The commentary also mentions plants with short and long flower tubes and for one specimen quotes the nectar chamber as 16mm long, very unusual for a *Lobivia*. The plants Mats and I saw (see images in our article) reminded me very much of *Echinopsis bridgesii* ssp. *vallegrandensis* (Cardenas) Lowry, especially as they were not in flower and I couldn't tell from the floral remains we saw whether the tubes were long or short. All the indicators pointed to something strange about this plant and I had already begun to have suspicions about the parentage of this species, maybe it was a stabilised hybrid between an *Echinopsis* and a *Lobivia*, both of which it was now replacing.

In fact I had seen *L. krahn-juckeri* twice before when travelling with John Carr. In November 2009 a road blockade at Padcoyo had forced us to attempt to reach Sucre by an alternative route. We were given directions that took us on a long detour east to Palacio Tambo then north to Buena Vista (yes, yet another one) before we should cross the Rio Turichipa at Uruchini and then head north and west towards Betanzos. We made good time and just after lunch, on the descent from Buena Vista to the river, we made a stop (LM0631).

Much to my delight, and John's disgust, there, in an almost bare rocky field, were several specimens of what I immediately recognized as the species Diers had described

Figure 2. (LM0631.03). One of the first plants seen in 2009.

Figure 3. (LM0631.07). A small specimen flowering.

Figure 4. (LM0631.02). A large plant with many fruits.

Figure 5. View from LM0761 overlooking the Rio Turichipa. *Echinopsis krahn-juckeri* grows on the lower slopes of the hills on the far bank.

Figure 6. Mature plants of *Echinopsis krahn-juckeri* (LM0761.04), again on almost bare rock.

Figure 9. *Echinopsis torrefluminensis* (LM0769.02). A single-headed specimen with dark spines.

Figure 10. *Echinopsis torrefluminensis* (LM0769.02). A clumping specimen with pale spines.

Figure 7. *Cleistocactus tominensis* (LM0761.03) showing its typical golden spination.

Figure 8. *Gymnocalycium pflanzii* (LM0761.08). A large spiny specimen with tiny buds.

Figure 11. Immature buds of *Echinopsis torrefluminensis* sectioned to show the petal colour.

only three months earlier (Fig. 2). It was growing there at nearly 3340m altitude with strange partners: *Weingartia westii* (Hutchison) Donald (Fig. 3) and *Corryocactus melanotrichus* (Schumann) Br. & R. (Fig. 4). To complete the story I'm sorry to say we never made it to Sucre as we got bogged down in soft, wet sand whilst trying to cross the river. It took four hours to release the car and we had to return to Padcoyo and the blockade by the same route. In May 2011 John and I returned to the same location with Moises Mendoza to collect herbarium specimens of the *Corryocactus* at what we then thought to be its southern-most location.

Returning to my trip in 2012 with Mats, after sleeping in the school at Turichipa overnight we continued our journey. We made a short trip east of town to the bridge over the Rio Turichipa where we again found *L. krahn-juckeri* (LM0761.04, Figs. 5 & 6). This time it was growing at a much lower altitude, 2380m, alongside *Cleistocactus tominensis* (Weingart) Backeberg (Fig. 7.) and *Gymnocalycium pflanzii* (Vaupel) Werd. (Fig. 8). The plants here were much larger than those of the previous day and one or two buds were just beginning to extend, but none were in flower. Over the remainder of the day we made our way back west and south, arriving in the pleasant town of San Lucas by late afternoon.

The next day we set out early and, after several stops, by 1:30pm we had reached the sleepy town of Pulquina on the western side of the Rio Pilcomayo. The drive south from there was very interesting with several species we recognized but hadn't seen before and some that were obviously new discoveries. One of these was a very neat many-ribbed, densely spined, almost spherical, offsetting plant (LM0769.02, Fig. 9). Several specimens were producing small woolly buds which allowed us to guess it was either an *Echinopsis* or a *Lobivia* (Fig. 10), but unfortunately none of the plants was actually in flower so I had to make sections of a couple of nearly mature buds to discover the flower colour (Fig. 11). It was red, suggesting that the plant was more likely to be a *Lobivia* than an *Echinopsis*. They reminded us very much of some forms of *Lobivia aurea* Br. & R., a species from over 1000km further south in Argentina. It has taken several years, but we now know from its recent description by Diers & Jucker that this plant had been first found in 2006 by Hansjörg Jucker in two tributary valleys of the Rio Pilcomayo slightly further to the north. They burdened the plants with the rather unwieldy name *Lobivia krahn-juckeri* subsp. *echinopsoides*.

Observations in cultivation

At each of the places where I saw *Lobivia krahn-juckeri* and its subspecies *echinopsoides* I was able to find a few offsets small enough to bring home. These all rooted easily and have now grown into mature flowering plants. Just as indicated in the first description, the specimens of *L. krahn-juckeri* have produced a range of flower colours (Figs. 12–19). It is curious though, that of five plants from the population near Buena Vista, only one has a brightly coloured flower, orange, whilst the remaining four are primarily white. The three specimens from around Turichipa all have different flower colours: one pale yellow, one magenta and one bright pink. None of the plants have produced flowers with long tubes.

Of the four specimens of subspecies *echinopsoides,* two have red flowers, one has orange flowers and the last flowers yellow (Figs. 17–20). There are major differences between the two forms, especially noticeable in epidermis colour and rib count, that make them impossible to confuse. Plants of *L. krahn-juckeri* are a bright pale green whilst those of subsp. *echinopsoides* are a very dark green. Also, whereas even large plants (>10cm diameter) of the first have only 9–12 ribs, much smaller plants (<7cm diameter) of the subspecies generally have 12 or 13 ribs. There are less noticeable differences in spine number, length and disposition and also in rib shape.

New names

In light of the major differences between these two plants and the high probability that the type subspecies arose from a natural hybridization event, I consider that they should be recognized as distinct species,

Figure 12. *Echinopsis krahn-juckeri* (LM0631.03, accession 7005) flowering in cultivation.

Figure 13. *Echinopsis krahn-juckeri* (LM0631.03, accession 7006) flowering in cultivation.

Figure 14. *Echinopsis krahn-juckeri* (LM0631.03, accession 7182) flowering in cultivation.

Figure 15. *Echinopsis krahn-juckeri* (LM0631.03, accession 7183) flowering in cultivation.

Figure 16. *Echinopsis krahn-juckeri* (LM0631.03, accession 7184) flowering in cultivation.

Figure 17. *Echinopsis krahn-juckeri* (LM0760.01, accession 7352) flowering in cultivation.

Figure 18. *Echinopsis krahn-juckeri* (LM0760.01, accession 7353) flowering in cultivation.

Figure 19. *Echinopsis krahn-juckeri* (LM0761.04, accession 7356) flowering in cultivation.

Figure 20. *Echinopsis torrefluminensis* (LM0769.02, accession 7376) flowering in cultivation.

Figure 21. *Echinopsis torrefluminensis* (LM0769.02, accession 7377) flowering in cultivation.

Figure 22. *Echinopsis torrefluminensis* (LM0769.02, accession 7378) flowering in cultivation.

Figure 23. *Echinopsis torrefluminensis* (LM0769.02, accession 7379) flowering in cultivation.

preferably in a genus that is currently accepted in the *New Cactus Lexicon*, i.e. *Echinopsis* Zuccarini. The choice of name for the current type subspecies is relatively clear – even though I'm not a fan of the practice of naming plants after people. Hence we have:

Echinopsis krahn-juckeri (Diers) M. Lowry **comb. nov. Basionym**: *Lobivia krahn-juckeri* Diers in *Kakt. u. and. Sukk*. **60**: 215–223 (validated on page 216) (2009). **Type**: Bolivia, Dept. Potosi, Prov. Linares, middle and lower reaches of the Rio Turichipa around its confluence with the Rio Pilcomayo, 2500–3000m, WK 1000 [LPB].

For the non-type subspecies, the same principle would give us the tautological *Echinopsis echinopsoides* – clearly nonsensical so a new epithet is required. It might have been appropriate to use an epithet referencing the administrative region of the stated type locality, but Diers and Jucker seem unsure of this since their diagnosis says the plants were found "on the western side of the Rio Torre Mayu" and places this in "province Nor Cinti, Dept. Chuquisaca". The Rio Torre Mayu, however, forms the boundary between departments Chuquisaca and Potosi so the "western side" would be in province Linares, Dept. Potosi. Their map confounds the confusion since the red line representing the area of the type locality is drawn on the *eastern* side of the river! I have therefore chosen an epithet that refers to the river itself:

Echinopsis torrefluminensis M. Lowry **nom. nov. Replaced synonym**: *Lobivia krahn-juckeri* subsp. *echinopsoides* Diers & Jucker in *Succulenta* (NL) **96**: 111-121 (validated on page 112) (2017). **Type**: Bolivia, Dept. Chuquisaca, Prov. Nor Cinti, "steep rocky slopes on the western [?] side of the Rio Torre Mayu, about 9–10km south of the place where the river flows into the Rio Pilcomayo", 2700m, HJ 1208 [LPB].

Postscript

Over the last few years I have produced several batches of seed from crosses between several pairs of my specimens of each species. It will be interesting to see how the variation in flower colour propagates into the next generation. Mats already has some of this seed and I will send him more when this year's fruits have ripened.

Acknowledgements

It is a pleasure to thank John Carr and Mats Winberg for making my trips to Bolivia so enjoyable. I must also thank Roy Mottram for his help and advice on matters both nomenclatural and Latin.

Relevant literature

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Martin Lowry

Travel with the cactus expert (21)

Zlatko Janeba continues his popular series of articles about exploring the American South West, this time searching for *Sclerocactus nyensis*.

Photographs by the author.

It was a great night. Absolutely quiet. One could only notice a light desert breeze and some birds chirping in the distance. Camping in the middle of nowhere. Well, more precisely, in the midlle of the Great Basin Desert. Also the morning (17th May 2006) was very pleasant and quiet. Again, we started to regret we did not camp more often during our cactus-hunting adventures. The campsite was gorgeous too, placed among low rolling hills and dark brown lava rocks (Fig. 1). And actually, soon after we got up, I realized we were not alone there. When I was packing my small tent, I discovered another night companion hiding under the bush about a meter away. It was a nice Great Basin Rattlesnake (*Crotalus viridis lutosus*) with almost perfect camouflage colouration (Fig. 2).

We tried to search for cacti in that area for a couple of hours then drove a little bit farther along the dirt road, up to an elevation of some 1850m and about 5 miles away from US 6. We made several stops. It would be nice to have discovered sclerocactus there, but we were not that lucky. I remember seeing only *Escobaria vivipara*, *Cylindropuntia echinocarpa* (Fig. 3) and *Opuntia hystricina* there. The cacti were accompanied by sagebrush, as well as with quite rare juniperus and pine trees. On the way back, about a mile from US 6, in a flat area, we observed the relatively common *Opuntia* (*Grusonia*) *pulchella* with numerous flower buds (Fig. 4). The plants growing in the Warm Springs area, which form clusters of numerous, slen-

Figure 1. Our campsite in the Great Basin Desert, North of Warm Springs, Nevada.

Figure 2. Great Basin Rattlesnake (*Crotalus viridis lutosus*), our night companion, north of Warm Springs, Nevada.

der (pencil-like) joints, had been named *Micropuntia pygmaea* (although *M. gracilicylindrica* looks also very similar, but is supposed to have much longer joints (up to 20cm); anyway, they are probably identical).

We were really excited about our next stop. If lucky enough, we were about to see *Sclerocactus nyensis* along the road NV 375. We parked our car some 10 miles east of Warm Springs and walked to the nearby low hills. The habitat there evidently suffered from extreme drought. It seemed to be much drier than the habitat at our campsite that morning, not too far away. It was 11am and the air temperature had already reached 28°C (the soil was 44°C at the surface and 27°C about 8cm below the surface). We could not find any scleros at first, but later we discovered our first *S. nyensis*. It was at an elevation of 1580m and the cactus was quite well camouflaged and was bearing a green fruit (Fig. 5). It was clear that without flowers it would be very difficult to find more plants. Furthermore, we were aware of the fact that *S. nyensis* near Warm Springs was supposed to be quite a rare plant. Nevertheless, we were relatively successful as we saw 4 living specimens of *S. nyensis* and 1 mummy (a small pile of white spines, Fig. 6). Some plants were bearing unripe fruits or there were a few seeds from the previous season hiding amongst the spines. The last plant we observed still had an open flower (Fig. 7). This one was very easy to spot even

Figure 3. View of the landscape north of Warm Springs, Nevada, with *Cylindropuntia echinocarpa* in foreground.

Figure 4. *Opuntia* (*Grusonia*) *pulchella* (or *Micropuntia pygmaea*) with numerous flower buds, north of Warm Springs, Nevada.

Figure 5. A well camouflaged specimen of *Sclerocactus nyensis* with a fruit, east of Warm Springs, Nevada.

Figure 6. A mummy of *Sclerocactus nyensis,* east of Warm Springs, Nevada.

Figure 7. A flowering specimen of *Sclerocactus nyensis,* east of Warm Springs,

from a distance. We also found several *Escobaria vivipara* specimens (Fig. 8) and quite common was *Opuntia* (*Grusonia*) *pulchella* again. I also took many photos of the Desert Horned Lizard (*Phrynosoma platyrhinos*) with very attractive colouration (a combination of brown, orange and white, Fig. 9).

Sclerocactus nyensis is absolutely frost hardy in the central Europe (probably not winter hardy since the winters can get very-humid here). But even in its habitat, it can often be covered with snow. I remember Gerhard Häslinger saying that he once saw 20cm of snow at the habitat of *S. nyensis* near Warm Springs in the second half of May (I am not sure what year was that). Josef Busek experienced about 5cm of snow at the same locality on 5th May 1989. So, this sclero seems to be tolerant of the vagaries of weather. Unfortunately, in cultivation it is extremely difficult to keep *S. nyensis* prospering for a longer period of time. For that reason, it is usually grown grafted on a winter hardy stock.

We made one more short stop on the way back, about 7 miles east of Warm Springs. There was a bland dirt road towards the south and *S. nyensis* was also reported from there. But we did not see any. I only took several shots of the landscape and on the way back to the car I discovered another Desert Horned Lizard (*P. platyrhinos*). This one was much better camouflaged and its colouration perfectly matched the soil colour around (Fig. 10). If it had not been moving I would probably not have even noticed it.

Later we stopped in Warm Springs, a place located at the intersection of US 6 and NV 375, some 50 miles from Tonopah. There was a small stone house with a couple of green trees, and just behind it we took pictures of warm springs (Fig. 11). It looked like

Figure 8. *Escobaria vivipara* east of Warm Springs, Nevada.

Figure 9. A nicely coloured Desert Horned Lizard (*Phrynosoma platyrhinos*), east of Warm Springs, Nevada.

an oasis in the desert to me. The spring was really warm (the temperature was between 60 and 70°C) and anything that had fallen in the spring died and got covered with a whitish crust of minerals. We saw various twigs and plant leaves like that, but also a dead snake.

Warm Springs was originally a stopping place for travellers and stages going from Eureka to Elko. The tired travellers used to stop there and enjoy the rejuvenating hot waters of Warm Springs. Nobody lives there today but the old buidings from the early days remain to remind us of their glorious past.

Next, we wanted to check a location of *Sclerocactus polyancistrus* we got from Gerhard Häslinger. It was some 20 miles east of Tonopah at an elevation of 1940m. We easily found about 10 specimens of *S. polyancistrus*. Many plants were really of huge size and they were decorated with rings of reddish flower buds (Fig. 12). At that elevation, we were there too early to see flowers. We found scleros growing both on the rocky outrops, at the bases of the hills and also in the washes among the hills. We encountered several sclero mummies too and from other cactus species we saw *Escobaria vivipara* and *Echinocereus engelmannii*. Indian paintbrush (*Castilleja chromosa*, f. *Orobanchaceae*) was in full flower all over the place.

Later we passed Tonopah. I must say Tonopah is one of my favourite places. I slept in a hotel in Tonopah or outdoors behind the town many many times. I used to feel there like I was at home. Our goal was the habitat of *Sclerocactus nyensis* located several miles south of Tonopah at an elevation of about 1760m. The landscape there is quite colourful. It consists of reddish or whitish low hills of volcanic tuff (Fig. 13). *Sclerocactus nyensis* grows there in the coarse gravel in direct sun, unless buried in the gravel. And we had our lucky day. Almost all scleros were in flower (Figs. 14 & 15), so it was very easy to search for them. We saw at least 30 specimens of *S. nyensis*. Often, the body of the cactus was completely buried in the gravel of volcanic tuff and only the flowers were exposed above the surface (Fig. 16). It was such an unbelievable experience. We also observed *Escobaria vivipara*, *Echinocereus engelmannii*, *Opuntia hystricina* and a *Cylindropuntia* sp. there.

Along to the US 95, which goes southwards from Tonopah to Goldfield, lies a parallel old paved route. We drove along the old route and we made a stop about every mile or so. We made five such short stops and we kept looking for *S. nyensis*. We easily found scleros during every stop (except one) since they all were in flower (Fig. 17). We observed the scleros at the elevation from 1750 to 1840m. Only during one of the stops we did not see any scleros during some 10 min of searching, but we were awarded by another interesting discovery. I encountered another rattlesnake (or pitviper if you prefer), but as I was informed later by a friend of mine, it was a very important find. The snake was

Figure 10. Another colourful variation of Desert Horned Lizard (*Phrynosoma platyrhinos*), east of Warm Springs, Nevada.

probably Panamint Rattlesnake (*Crotalus stephensi* or also as *Crotalus mitchellii stephensi*), which is found in southern and central Nevada (Fig. 18). I was told that our finding had extended the known natural range of this beautiful snake a little bit to the north. The specific name (*stephensi*) was created in honour of Frank Stephens (1849–1937), the curator emeritus of the San Diego Society of Natural History. This species is quite a robust snake and can reach some 130cm in length.

Interestingly, we discovered the largest plants of *Sclerocactus nyensis* at the highest elevation we looked for cacti (~1840m) and closest to the town. The biggest one was some 12cm in diameter. During our search for scleros along the old paved route south of Tonopah we also observed some other cacti growing as companions to *S. nyensis*, namely *Echinocereus engelmannii*, *Escobaria vivipara*, *Opuntia polyacantha* and cylindropuntias.

Finally, we made our last stop of the day, looking for scleros along the new US 95. Again, after a while we did find several large *S. nyensis* plants. It was already late afternoon and the flowers were almost closed. I have to admit I did not expect *Sclerocactus nyensis* to be such a common species in the Tonopah area. We saw scleros at almost every stop we made. (And actually, some years later I studied populations of *S. nyensis* in the Silver Peak area and there this cactus is even more common. But more about that some other time).

Figure 11. Hot spings at Warm Springs, Nye County, Nevada.

Figure 12. A large specimen of *Sclerocactus polyancistrus* about 20 miles east of Tonopah (1940m), Nevada.

What also really surprised me was that during the afternoon there were several short showers and it was actually quite hot and humid weather.

We got a room with two beds at Motel 9 for only US$ 33. Not the best motel in

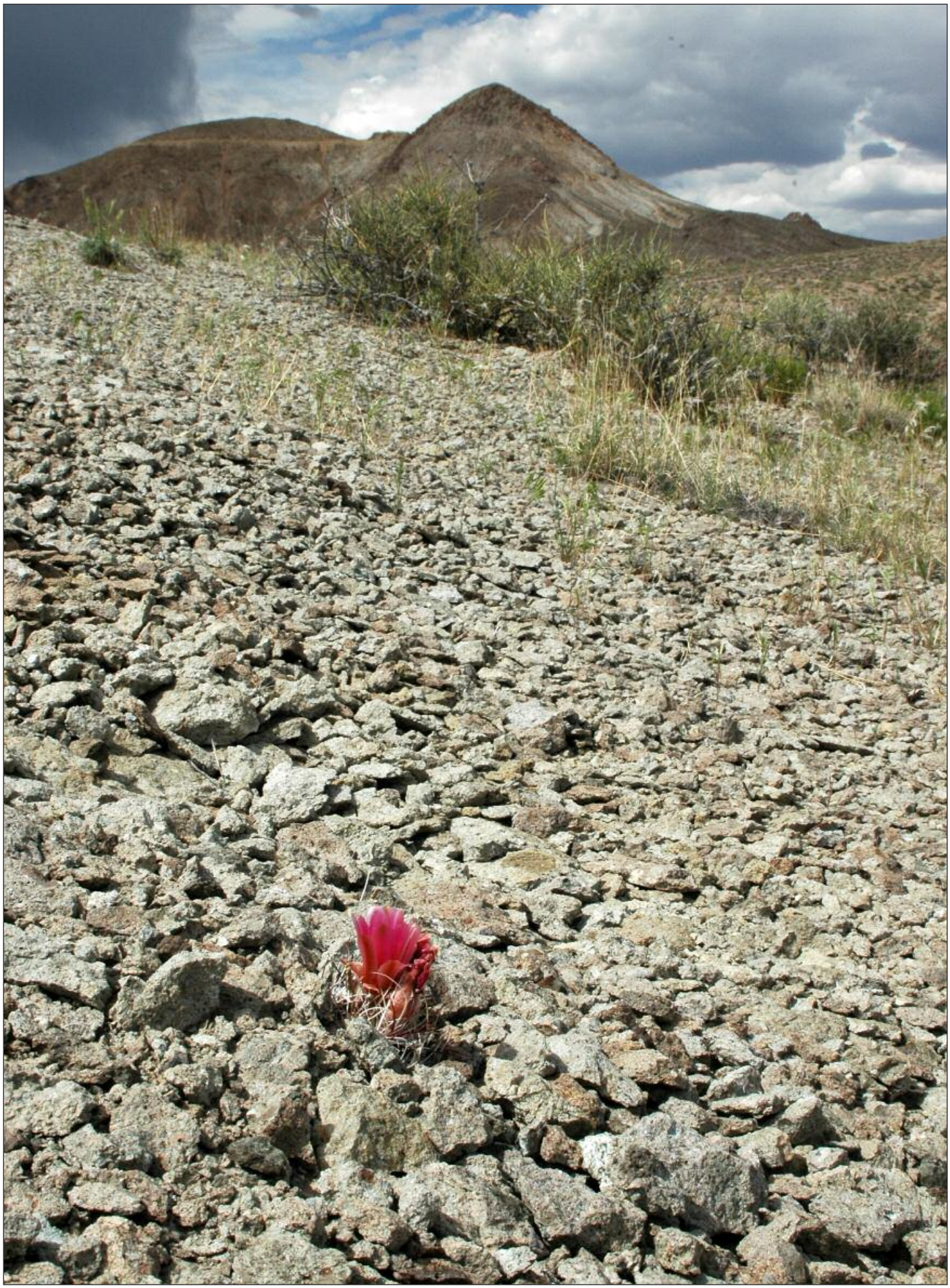

Figure 13. The habitat of *Sclerocactus nyensis* south of Tonopah, Nye County, Nevada.

Figure 14. *Sclerocactus nyensis* south of Tonopah (1760m), Nevada. Notice the coarse gravel of volcanic tuff the plants grow in.

Figure 15. A specimen of *Sclerocactus nyensis* with several flowers at various stages of development, south of Tonopah, Nevada.

Figure 16. This plant of *Sclerocactus nyensis* is completely hidden below the gravel, only the flowers are above the ground, south of Tonopah, Nevada.

Figure 17. The author admiring flowering *Sclerocactus nyensis* south of Tonopah, Nye County, Nevada.

Tonopah, of course, but a great price. We were recommended to go for dinner at a Mexican restaurant nearby. Unfortunately, it was completely full. That meant it was really a good place to eat, but we were not in the mood to wait. So instead, we ate in the Bang Club. It was almost empty and the food was truly terrible (Josef even labelled it as disgusting and he did not finish his meal). It was certainly the worst meal of out trip. Well, we learnt a lesson — it is always better to be patient. Luckily, several bottles of cold beer from the local liquor store saved the evening.

Zlatko Janeba, desert-flora@seznam.cz

Figure 18. Quite a rare snake, Panamint Rattlesnake (*Crotalus stephensi*), just south of Tonopah, Nevada.

'Cow's Tongue' Opuntia, a Garden Form

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Griffiths treated this taxon as a discrete species (*Opuntia linguiformis* Griffiths, *Annual Report of the Missouri Botanical Garden* **19**: 270. 1908). *The Flora of North America* online treats it at the varietal rank (*O. engelmannii* Salm-Dyck ex Engelmann var. *linguiformis* (Griffiths) B.D. Parfitt & Pinkava, *Madroño* **35**: 347. 1989 [1988 publ. 1989]). In 1969, Lyman Benson treated it as a variety of *Opuntia lindheimeri* (*Opuntia lindheimeri* Engelm. var. *linguiformis* (Griffiths) L.D. Benson, 1969, *Cactus & Succulent Journal* (*Los Angeles*) **41**: 125).

These different publications are referring to a large Opuntia with elongate, tongue-shaped pads. The plant is known in gardens as the 'Cow's Tongue' or 'Lengua de Vaca'. Large pads may be 3 to 8 inches wide near the base, and to as much 30 inches long (sometimes more), and taper to a rounded point (Figures 1 & 2). The sprawling plants may reach 3 to 5 feet tall (exceptionally to as much as 10 feet) and have attractive yellow flowers with green stigmas. The plants have the characteristic shiny yellow spines of regular *O. lindheimeri* that may have a tinge of red at their base. Depending upon your choice of taxonomic treatment, it may have derived from *O. lindheimeri* or *O. engelmannii* var *lindheimeri*.

Griffiths described the plant as "ascending or half prostrate" with young growth blue glaucous green. He described the flowers as yellow or old gold in colour and about 3 inches wide, a very garden worthy plant. However, 'Cow's Tongue' cactus belongs in a large garden because it can easily spread 5 feet or more across.

In actuality, the 'Cow's Tongue' cactus is a sport of *O. lindheimeri* that likely derived originally from a single plant. It was found near San Antonio in Bexar County, Texas from where it was taken and cultivated in gardens. It is a form or cultivar derived from a single wild plant and is not a species, subspecies, or variety. The tongue-shaped pads are formed because the apical meristem is indeterminate and does not limit the growth of the pad. Some pads may be up to 3 feet in length or more. Perhaps they could be even longer but eventually they do stop growing—perhaps

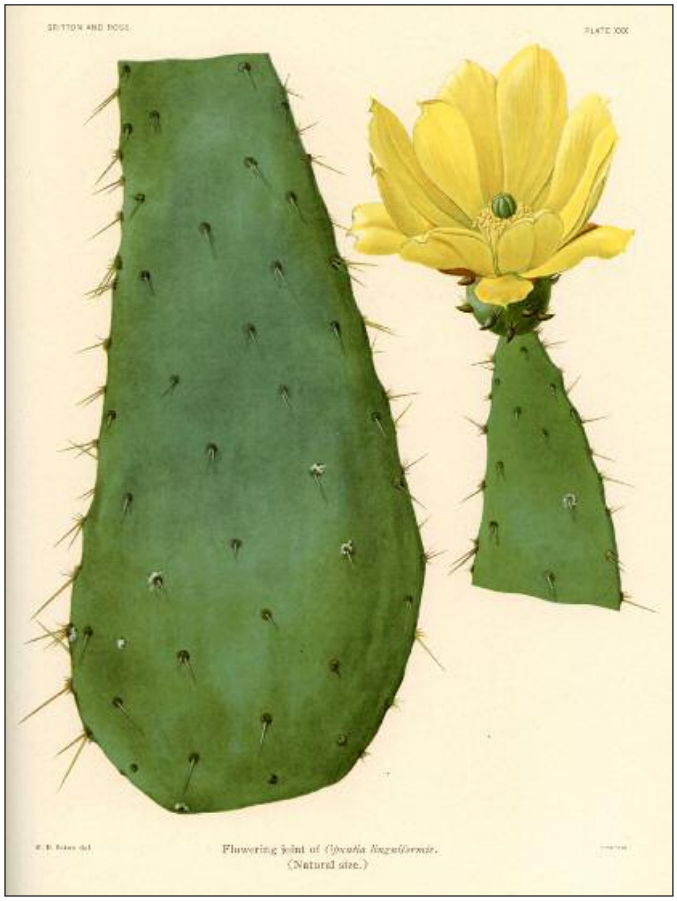

Figure 1. Pad of 'Cow's Tongue' Cactus

Plate XXX from N.L. Britton and J.N. Rose, *The Cactaceae: Descriptions and Illustrations of Plants of the Cactus Family*, Carnegie

limited by the end of the growing season or some other factor. Though unusual, the "Cow's Tongue" aberration has been found in other *Opuntia* species, and perhaps the same genes are responsible for all such occurrences.

'Cow's Tongue' plants routinely revert, at least in part, producing some regular-appearing *O. lindheimeri* pads or even entire branches (Figure 3). Cuttings made from these pads typically grow into entirely normal *O. lindheimeri* plants.

Interestingly, even though these plants sometimes revert to normal growth, the mutation is heritable, and offspring grown from seed commonly (but not always) show the same condition, whether they are pure *O. lindheimeri* or hybridized with other species. This means that all 'Cow's Tongue' plants in gardens are not now necessarily clones of the single original parent.

The 'Cow's Tongue' cactus has spread far and wide from its original parental plant and is often associated with dwellings, even abandoned ones. However, occasional plants or even whole stands can be found in wild places even far outside the range of *O. lindheimeri*. How they came to be there is anyone's guess, but it seems likely that they mark the spot of long-gone habitations, dumping of landscape debris, or even spread by birds or water. The plant is widespread in eclectic locations from Texas, to southern Oklahoma and California. It is as cold-hardy as regular *O. lindheimeri*, surviving into USDA hardiness zone 7, but the pads may suffer cold damage in upper USDA zone 7, even while the plant remains intact. A mature plant can regrow from cold that freezes it nearly to the ground.

Joseph Shaw

Figure 2. 'Cow's Tongue' Cactus, in Tucson, Arizona

Figure 3. 'Cow's Tongue' Cactus in Albuquerque, New Mexico. Branch reverting to normal *Opuntia lindheimeri* shape.

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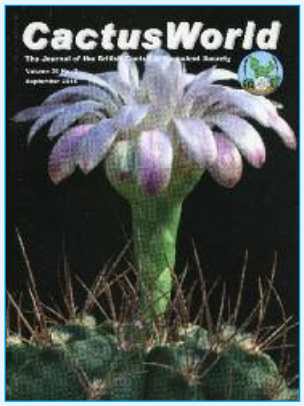

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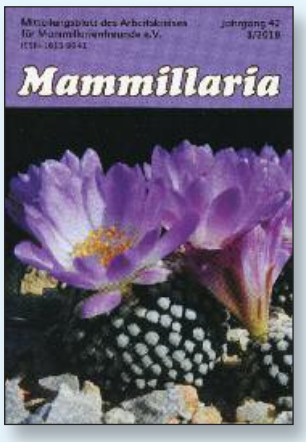

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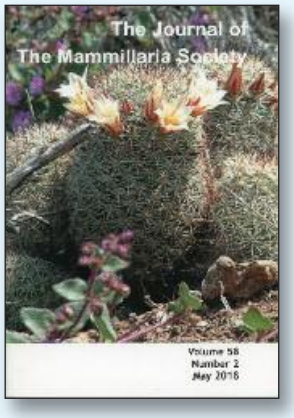

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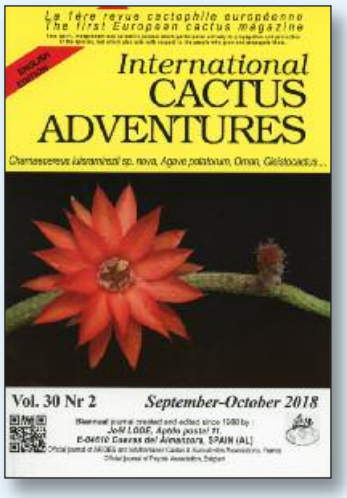

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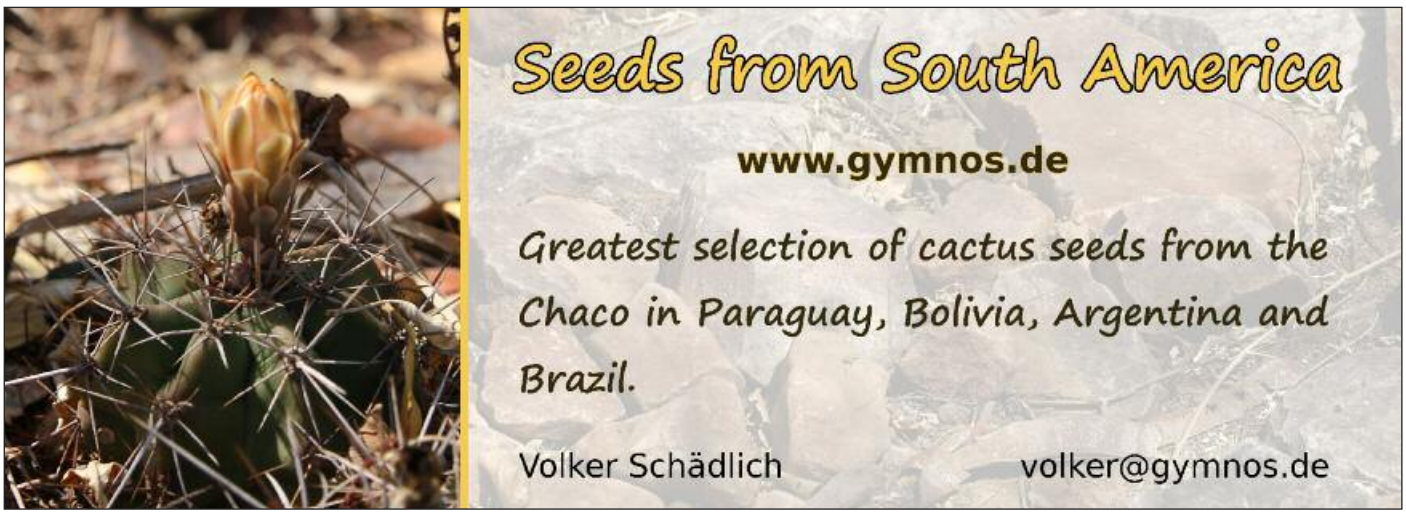

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Plants offer: http://www.cact.cz/nabidka-rostlin-jaro-2014-a16

Bercht Seed List

Already familiar to many of you, for others a voyage of discovery. Many seeds you are looking for can be found in this seed list. A large number of the seeds is provided with well known and reliable habitat information or with a field number.

The list specialises in South American cacti such as *Acanthocalycium, Echinopsis, Frailea, Lobivia, Mediolobivia, Notocactus, Rebutia, Sulcorebutia, Weingartia* and *Wigginsia*, but above all an almost complete selection of ***Gymnocalycium***. Furthermore, you can also find many seeds of North American cacti in this list.

www.bercht-cactus.nl

Mesa Garden

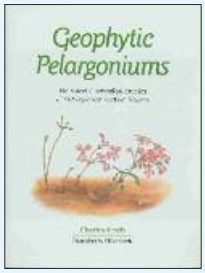
P.O. Box 72, Belen, New Mexico, USA

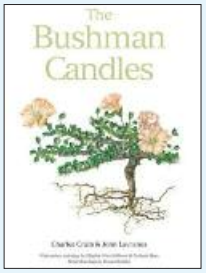
Large list of Cactus and Succulent seeds, particularly strong on Mexican and U.S.
Now under the new management of Aaron and Tarah Morerod.
Note the new emil address

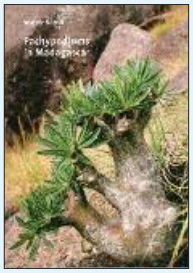
http://www.mesagarden.com
email: mesagarden@swcp.com

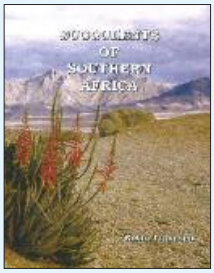
Books for Sale

Keith's Cactus Books







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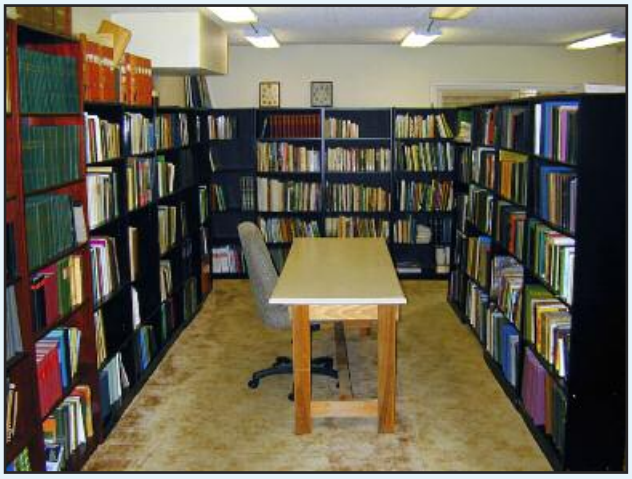

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