



The Cactus Explorer

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

Number 8

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May 2013

1 *Sulcorebutia glomeriseta*

2 *Echinopsis oxygona*

3 Turichipa, Bolivia

4 The Kaibab Plateau

5 Big Bend Ranch Park

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The No.1 source for on-line information about cacti and succulents is <http://www.cactus-mall.com>

Cover Picture: *Sulcorebutia glomeriseta* JC 03-12, recently re-found and photographed by John Carr in Bolivia

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 within 3 months and the copy deadline is just a few days before the publication date which is planned for the 10th of February, May, August and November. 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
May 23rd 2013

INTRODUCTION

Spring at last!

Rather like Spring, this issue of the Cactus Explorer is later than usual! The fact is that I have been really busy with glasshouse jobs postponed by the late arrival of warm weather and my first attendance at the annual Fair of the French Society A.R.I.D.E.S. at Tiercé in the Loire Valley.

The meeting was well attended with about 40 vendors selling a large range of cacti and succulents. Jean Marie Solichon, the director of the Jardin Exotique in Monaco, gave a lecture about the areoles of cacti. I also gave a talk, about the cacti of Brazil. It was certainly a very enjoyable event with good weather and good food!

You will probably already know that this year I have taken over the editorship of the BCSS yearbook, *Bradleya*, from Colin Walker. The articles are of a more scientific nature than those published in *CactusWorld* and often include descriptions of new taxa. There are more articles about cacti this time and I am grateful to authors for choosing *Bradleya* to publish their work.

This year's edition includes two important

Bradleya 31: 2013

15 articles about cacti and succulents, well illustrated with photographs, maps and explanatory diagrams.

Publication date planned for July 2013.

Articles include:

- New species of cacti and succulents.
- A new genus of mesemb.
- Studies of *Aloe* and *Agave*.
- Two accounts of *Ferocactus*.
- Gymnocalycium*.
- High altitude *Lobivias*.
- Orbea*.
- A naturally occurring cactus hybrid.

Pre-order your copy by contacting
bcss@cactus-mall.com

descriptions of new cacti. First there is a new and really different *Matucana* species discovered last year by Chris Pugh and Rob Underwood. It has an actinomorphic flower much like a *Rebutia*, and is probably pollinated by bees rather than the usual humming bird adapted flowers of the genus.

The other new cactus is a *Borzicactus* discovered by Paul Hoxey in southern Peru. It, also, is distinguished by its most unusual flower for the genus, being small and very like the flower of *Lobivia maximiliana*. There are also two articles about *Ferocactus*, others about *Lobivia* and *Gymnocalycium* plus the story of a natural cactus hybrid found in habitat.

Succulent enthusiasts are also well catered for with contributions about *Aloe*, *Agave*, *Trichodiadema*, *Orbea*, and a new genus of mesemb. I am really enjoying my job so please help me keep it by pre-ordering *Bradleya* or buying it when it is published, planned to be in July 2013.

I hope you enjoy this edition of the **Cactus Explorer**. It is smaller than recently and more the size I originally planned it would be. However, I am happy to publish everything I am sent so please keep the articles coming. Don't forget that adverts are free so if you have something to sell or are looking for something to buy or exchange, just send me the text and, if possible, an image and I will do the rest.

Enjoy the summer!

Graham Charles

P.S. I am confident that the BCSS Convention in 2014 will be very entertaining, so please help the organisers by booking early. See the details on [page 6](#).

The next issue of the **Cactus Explorer** is planned for August 2013. If you have not already told me and would like to be advised when it is available for download, please send me your E-mail address to be added to the distribution list.

Thank you for your interest and support!

NEWS AND EVENTS



British Cactus and Succulent Society Zone 6 SHOW

The Village Hall
Broughton Astley
Leicester LE9 6PT

Saturday 1st June 2013

Open 11.00am till 4pm

Admission £1 Children Free. There will be plant and book sales and refreshments will be available.

Contact Tony Morris +44(0)1455 614410
email: membership@bcss.org.uk

British Cactus and Succulent Society Zone 3 Rally

Carlton Village WMC
WF3 3RW

(between Leeds and Wakefield)

Saturday 26th October 2013

9.30am until 5pm

Talks by Trevor Wray, Dr. Andrew Young
and Graham Charles.

Admission £15 with carvery lunch.
Mini Show. Plant, sundry and book sales.
Refreshments included.

Contact Peter Burton +44(0)1132 773424
email: pburton5@sky.com

John Pilbeam is looking for good habitat photos, preferably with flowers, of island species of cacti and succulents around Baja California, as well as Dudleya (in bloom and not) and blooming Cochemiea on the peninsula itself, with publication in mind. email to: jpilbeam@tiscali.co.uk, or snailmail to 51 Chelsfield Lane, Orpington, Kent, BR5 4HG, United Kingdom.

British Cactus and Succulent Society Oxford Branch Show with the Haworthia Society Show



Langdale Hall
Witney OX28 6AB

Sunday 28th July 2013

Open 10.30am till 3.30pm

Plant sales. Refreshments and Raffle.

LECTURE at 4.30p.m. (entry by ticket only)
by Paul Shirley (Boskoop, Netherlands)
"A - Z of Caudiciforms"

Contact Bill Darbon +44(0)1993 881926
email: william.darbon77@btinternet.com

Doug Rowland †

We are sad to report the death of Mr Doug Rowland of Kempston, Bedfordshire, England who passed away on 13th February 2013.

Doug joined the NCSS many years ago and remained active in the BCSS until fairly recently. He is famous for his long running business selling Cactus & Succulent seeds to customers world-wide.

We extend our sympathy to his widow Vivienne on her sad loss.

Chihuahuan Desert video for sale



A trailer of the full size-full quality blue-ray disk titled Chihuahuan Desert is available from Youtube (<http://youtu.be/KbM72VI6vUg>). The documentary covers several samples of the desert - in the south, from where it merges into Sierra Madre Oriental, Mexico, all the way to the Tularosa Basin in southern New Mexico. It is a portrait of the landscapes and ecology with emphasis on the most diverse plant family, the cactus family.

Duration of the entire video is 57 minutes plus additional 38 minutes of slide show. Subtitles of scientific names and audio with English or Czech languages are available both on the DVD and BD versions of this program.

The disks can be ordered at this e-mail: sharloch@gmail.com for \$15 DVD/\$20 BD plus shipping (ca.\$5.00). TV standard NTSC or PAL and the type of disk needs to be specified when ordering.

Please provide your e-mail and shipping address. Payments are made through PayPal. Upon your order, invoice is generated by Paypal service with your order number. Please allow 5 to 10 working days for delivery once Paypal payment is made.

**The Cactus Explorers Weekend
September 20th-22nd 2013**

Beaumont Hall, Leicester University, UK

Anyone interested is welcome to participate but the number attending is limited so book early.

18 cactus talks by participants and visiting speakers **Zlatko Janeba** and **Philippe Corman**.

Plant and Book sales.

Meet like-minded people at a pleasant venue. The price of £200 includes two nights accommodation in en-suite single rooms, all meals, refreshments and wine with the evening meals.

There is a bar offering real ale.

email Graham Charles or visit the [website](#)



South West Cactus Mart

Saturday June 29th 2013

**Portishead Youth Centre,
1, Harbour Road, Portishead, Bristol BS20 7DD**

Open 10.00-14.30

Free Admission

Contact: Tony Irons,

Phone: 01275 846239

[email: tonyironscacti@talktalk.net](mailto:tonyironscacti@talktalk.net)

**The BCSS International Convention.
11th to the 13th July 2014.**

Stamford Court, University of Leicester, UK.

At the same venue as last time but now completely rebuilt with much improved facilities. The structure of the convention will be similar to 2010 with residential and non-residential packages available. Delegates and traders will be offering sales of plants, books and sundries.

Speakers will be *Woody Minnich* from the USA;
Dr Olwen Grace from RBGK;
Ernst Van Jaarsveld from Kirstenbosch B.G.;
Guillermo Rivera from Argentina;
and *Roger Ferryman* UK

In addition, there will be 5 mini-talks.
Full details and on-line booking are available on the BCSS [website](#).

Please **book your place soon** to help the organisation of the event.

**British Cactus & Succulent Society
Zone 12 OPEN SHOW**

(Judge: David Neville AJCS)

Sat/Sun 6-7 July 2013

Paradise Park, Avis Way, Newhaven,
East Sussex, BN9 0DH

40 classes, refreshments, tombola
Plant Sales

Show Secretary: [Graham Evans](#)

Zone 12 Open Show will be held over the weekend of 6-7 July, with plant sales by David Neville, John Pilbeam, Ralph Northcott and BCSS members. This is a new venture for the Zone.

The venue is a popular tourist attraction set in the lovely countryside of the South Downs, with the show itself taking place within its large garden centre. The idea is to achieve a good crossflow of visitors from the general public, many of whom will probably never have seen a display of cacti and succulents before, and hopefully promote interest in the hobby.

The Zone is therefore hopeful of strong support from cactophiles and, in recognition of its promotional aims, is offering £5 towards a Paradise Park restaurant meal/purchase to exhibitors displaying at least 10 entries over both days.

www.paradisepark.co.uk

**Heidi Hartmann awarded
the Cactus d'Or**



Photo: © W. Hartmann

Dr. Heidrun E.K. Hartmann, famous for her studies of Aizoaceae, has been awarded the prestigious Cactus d'Or by the Principality of Monaco. The prize is presented to people who have made an outstanding contribution to the study of succulents.

Recipients are nominated by the Board of the International Organisation for Succulent Plant Study (IOS) and now Heidi joins an elite group of outstanding students of our favourite plants.

In the picture from left to right:

M. André J. Campana, adjointed to the Mayor of Monaco and responsible for the Environment and the Jardin Exotique.

M. Christian Raimbert, Adjoined to the Mayor of Monaco and Director of the Ecole Supérieure d'Arts Plastiques de la Ville de Monaco, at whose school the competition for a new Cactus d'Or has taken place.

His Excellency M. Michel Roger, Minister d'État (the Prime Minister of Monaco), who presented the prize,

Dr. Jean-Marie Solichon, Director of the Jardin Exotique.

GC

Le Couleurs Cactus Club présente la 6^{ème} édition de

COULEURS CACTUS

Le salon des cactus et plantes succulentes

Découvrir · Apprendre · Collectionner

25 - 26 mai 2013
Egliseneuve Près Billom

ENTREE GRATUITE



Echinopsis oreocera par Jacqueline Baudouin

Egliseneuve-Près-Billom

Venez découvrir en famille la beauté et l'extraordinaire diversité de ces plantes adaptées aux milieux arides

Le Cactus Francophone
www.cactuspro.com



Senecio par Christophe Tarto

Les exposants et les bénévoles de l'association seront heureux de vous faire partager leur passion

- > Exposition de plantes de collections
- > Bourse d'échange et de vente de plantes
- > Conférences
- > Tombola - Animations
- > Buvette sur place



Adromischus par Jacqueline Baudouin

British Cactus & Succulent Society
Zone 19 Symposium

Saturday 6th July 2013

St Thomas More Church Hall, Kirkway,
Alkington, Middleton, Manchester, M24 1PP.

09:00 - 17:00. Tickets £15 from Peter Bint,
+44(0)161 643 8932 or peter@bint.myzen.co.uk

Speakers:

Petr Pavelka: Petr is well known in UK for his expansive talks on succulents from African countries and Madagascar. For Zone 19, he is going to give a presentation about south west Angola. His talk about this region will be his first presentation of this topic on the British mainland and promises to be extremely interesting.

Tomi Kulhanek: This is Tomi's first visit to Britain but his reputation goes before him, being well known to *Gymnocalycium* enthusiasts. His presentation is in 2 parts: the first and major section is *Gymnocalycium* from 'the best habitats in Argentina' and the second, is about other cacti from those same habitats.

Ivor Crook: Ivor is known as an excellent local speaker. His talks are thought provoking and challenging. His first talk will set the scene and the second is a personal view of the genus *Rebutia* with images of all accepted species plus some surprising findings.

A tribute to Graham Hole from Brian Bates

Graham Ernest Hole
(21 II 1946 – 17 I 2013)

I first met Graham about 30 years ago when we were both studying *Sulcorebutia*, he also specialised in *Gymnocalycium* and visited Eugendorf in Austria every year for the Gymno weekend. A few years later he lost his job and due to his diminished financial status he started working more on hardy cactus and became an expert on the Opuntioideae of South America, especially from Argentina. In November 1998, he made his first visit to habitat in the company of Walter Rausch and Franz Kühhas. This trip included Walter's 70th birthday.

A couple of years ago he visited Patagonia on a trip organised by Guillermo Rivera. On his return to U.K. he visited the doctor because of an ear problem and was diagnosed with throat cancer. Part of his jaw was removed and he had chemotherapy and other treatments. He had a period of remission but alas the cancer returned and he chose not to have further surgery. He finally succumbed on 17th January 2013.

My memories are of a straight shooting friend who told it how it was. Now the pain has stopped and he is in a better place. I am honoured to have called him friend.

Brian Bates

Kaktus 2013
Eugendorf

**Ausstellung
mit Verkauf**

**50.000
Kakteen
aus aller
Welt**

**Sa. 25. So. 26.
MAI 2013**

**von 9.00 -
18.00 Uhr**

**Sportzentrum Eugendorf
bei Salzburg**
Hammermühlstraße 7
5301 Eugendorf

British Cactus & Succulent Society
CAMBRIDGE BRANCH SHOW

Sunday 2nd June 2013

Great Shelford Memorial Hall
Woollards Lane, Great Shelford
Cambridge CB22 5LZ
10.30 a.m. to 4.00 p.m.

Plant Sales by
Cambridge branch members &
Plantlife Nursery (Stuart Riley)

Schedule and details from
the Show Manager: [Paul Hoxey](mailto:Paul.Hoxey@cambsuccsociety.org)

**Foire Internationale
aux Cactus et Succulentes**

The annual meeting of the French society ARIDES was held in the pleasant town of Tiercé over the weekend of May 4th & 5th.

There was good turnout of enthusiasts who attended the plant sale, where a wide range of species was offered by 40 professional and amateur growers.



You can find out more about this active group of French enthusiasts at their website:

<http://www.arides.info>

G.C.

IN THE GLASSHOUSE

Matucana tuberculata, one of the best for cultivation.

Graham Charles tells us why it is worth searching out *M. tuberculata* which is not often found on nursery lists. It is an example of a plant which rewards the grower with a succession of exotic flowers through the summer.

Photographs by the Author



Fig.1 *Matucana tuberculata* ISI 1103, the type collection made by Hutchison, Wright and Straw (No.6218) on August 8th 1964 at 2100m above El Chagual, 18km from Aricapampa, La Libertad, Peru.

Although discovered about 50 years ago, here is a plant which is rarely seen in culture. A situation which is even more surprising when you see its potential to produce its remarkable flowers repeatedly throughout the summer.

My first clone was obtained from the ISI back in 1979. This fine-spined form was collected at 2100m on the west side of the river Marañon and is recognizably different from any other I have subsequently grown. The plant clustered freely to make a clump of stems filling a 15cm pan and has flowered regularly and spectacularly [Fig1]. I keep the plants at a minimum temperature of 10°C since



Fig.2 Flowers of *Matucana tuberculata* with taller stems GC555A.05, from near El Chagual by the Marañon.



Fig.3 The form of *Matucana tuberculata* with taller stems GC555A.05, from near El Chagual by the Marañon.



Fig.4 *Matucana tuberculata* GC553.04 from most southerly habitat known, just east of the Marañon crossing on the road from Sihuas to Huacrachuco, Ancash. their habitat is warm, particularly near the river. All my clones have proved easy to grow in the usual acidic compost I use for most South American cacti.



Fig.5 *Matucana tuberculata* GC555.04 from 1985m on the east side of the Marañon near El Chagual, on the road to Parcoy where it makes big flat clusters of stems.

I made my first visit to El Chagual, the type locality of *M. tuberculata*, in 2002. We approached the crossing from the east, having stayed at Tayobamba the night before. We had crossed the high pass and dropped down the steep road through the gold mining town of Parcoy in rain. As we descended into the valley of the Marañon, the weather improved and cacti started to appear in quantity. A forest of *Espostoa mirabilis primigena*, *Armatocereus balsasensis* and *Browningia pilleifera* encouraged us to make our first stop at habitat GC555 at 1985m.

After some searching, Chris Pugh found some large flat clusters of stems of *Matucana tuberculata*, the seeds from which I grew as GC555.04 [Fig.5]. Lower down the road, near the village and the river, GC555A, we saw clusters of stems which were much more elongated. I recognised them as the plants I had grown under the name *Matucana sp.* El Chagual obtained from Karel Knize [Figs.2&3].



Fig.6 View of the village of El Chagual from the west side of the Marañón river. The right turn over the bridge leads through the village then climbs out of the valley to the gold mining town of Parcoyo.

We failed to find a place to stay overnight in El Chagual so continued on to Aricapampa where we were offered a room. It was not until 2009 that I had the chance to go to El Chagual again. This time we approached from the west and had the chance to stop a few times on the descent into the valley.

I did not realise at the time that I should have stopped at 2100m to look for the type location of *M. tuberculata* so we did not stop until habitat GC1080 at 1680m. The *M. tuberculata* were in flower and fruit and looked rather different from the type form [Fig.7]. Further down, we found many more *M. tuberculata* growing on steep banks of what looked like dried mud, often in the company of the small-growing form of *Matucana formosa* which Ritter had named var. *minor*.

This time we were able to stay at a small new hostel in El Chagual so we had time to look around just north of the bridge on the east side of the valley. Here, at habitat GC1082, we saw many large clumps of *M. tuberculata*



Fig.7 *Matucana tuberculata* GC1080.04 in flower and fruit at 1680m, west of the Marañón river, El Chagual.



Fig.8 A large clump of *Matucana tuberculata* GC1082.05 growing near the Marañon river at 1280m, just north of the bridge at El Chagual.

[Fig.8] growing with *M. formosa* var. *minor* and *Melocactus onychacanthus*, among the large trees of *Espostoa mirabilis primigena*, *Browningia pilleifera* and *Armatocereus balsasensis*. It was beginning to get dark as butterflies were still visiting the *Melocactus* flowers. One day, I would really like to explore further along this

road which climbs out of the valley and goes to the Bosque de Chigualén Park.

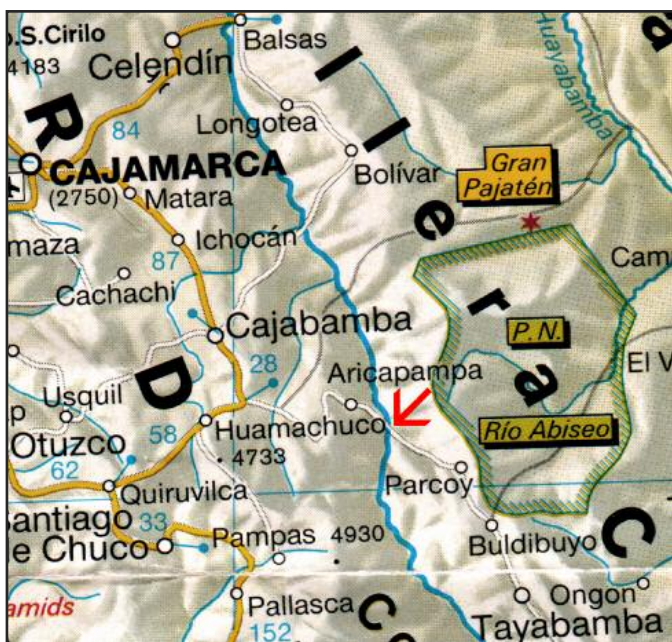
Matucana tuberculata had been found by Ritter in 1960 who gave it the provisional name *M. tuberculosa* but the species was first validly published by John Donald in 1979 as *Borzicactus tuberculatus* and later transferred to *Matucana* by Bregman in 1987. It appears to be most closely related to *Matucana krahnii* which occurs further north, down river, near Balsas. Difficulty of access to the river prevents us from seeing if the two intergrade.

G.C.

References

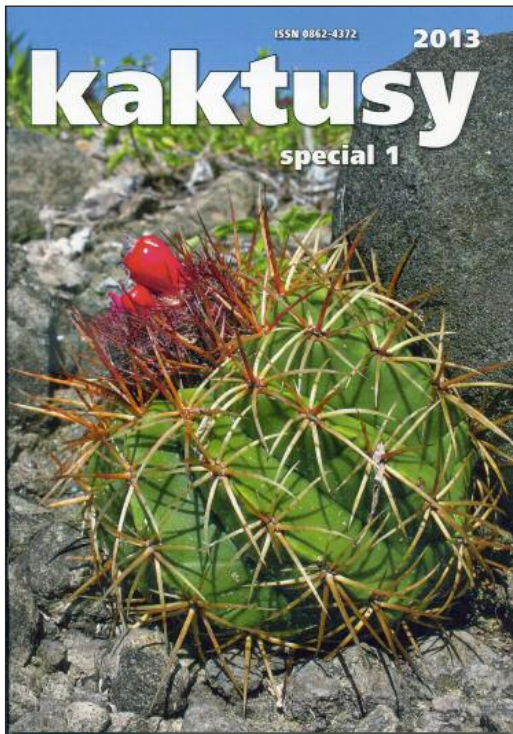
Donald, J. D. (1979) New Species from the Rio Marañon. *Cactus & Succulent Journal* (U.S.) 51(2):51-56

Bregman, R. (1996) *The Genus Matucana*. A.A.Balkema, Rotterdam.



Map.1 Showing El Chagual on the River Marañon with a red arrow

JOURNAL ROUNDUP



Melocactus of Cuba

The unique flora of Cuba has recently been a popular subject for writers, not least the *Melocactus* species which occur there.

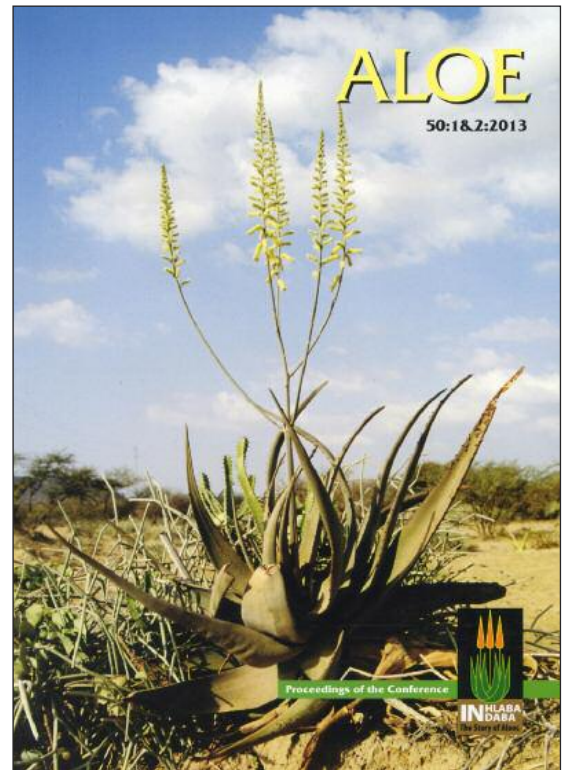
The first special edition for 2013 of the Czech language journal *Kaktusy* is a well-illustrated account of the Cuban *Melocactus* names. The Czech text is a problem for me but it appears that the author, Libor Kunte, was able to find all the named species in habitat and provides 2 maps to show approximately where they are located.

There is a new combination for *Melocactus harlowii* subsp. *borhidii* (Mészáros) Kunte on page 27. Authors who take a broader view of species do not accept all the published names, but there are probably four good species of *Melocactus* on the island.

Subscription to *Kaktusy* can be found at

http://www.cactus.cz/english/kaktusy/kaktusy_2012

GC



Aloe

'Aloe' is the journal of the Succulent Society of South Africa. 2013 is the 50th Anniversary of the Society during which time this publication has earned a reputation for high quality content which surely makes it a must for all succulent enthusiasts.

Volume 50 starts with combined Nos. 1 & 2, a tribute to John Lavranos. The large format of this 88 page quality publication facilitates the presentation of large spectacular photographs. The issue starts with a tribute to John, surely one of the greatest succulent explorers of our age. Then there are another 16 articles about the genus *Aloe* and some of the succulent plants that grow with them. Altogether, a real treat for the *Aloe* enthusiast and anyone who enjoys the history and habitats of succulents.

Please consider subscribing to this valuable and prestigious publication.

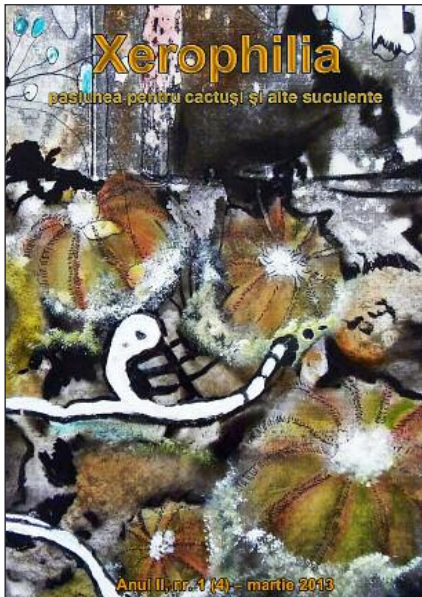
<https://www.succulentsociety.co.za>

GC

ON-LINE JOURNALS

On-line Journals for you to download

Publishing journals on the web is becoming more popular and the number is increasing. Here are the links for you to download and enjoy.



Xerophilia

The fourth issue of Xerophilia appeared in March 2013. It is published in Romania but much of the content is in English as well as Romanian. It is intended to focus on cultivation with articles about growing and propagating our plants.

The impressive fourth edition has 102 pages and includes articles about cacti in art; *Neolloydia*; *Lobivia*; *Obregonia* and *Mammillaria theresae* in habitat; trifids- a disease of cacti; *Frailea* in Uruguay; *Mammillaria hernandezii*; Crassulaceae of Tamaulipas; growing *Ariocarpus*; *Escobaria abdita*. The next issue is due in June 2013.

The magazine may be downloaded as a pdf from

<http://xerophilia.ro>

Contact: xerophilia@xerophilia.ro

ECHINOCEREUS Online-Journal

The new German language on-line journal for Echinocereus lovers.

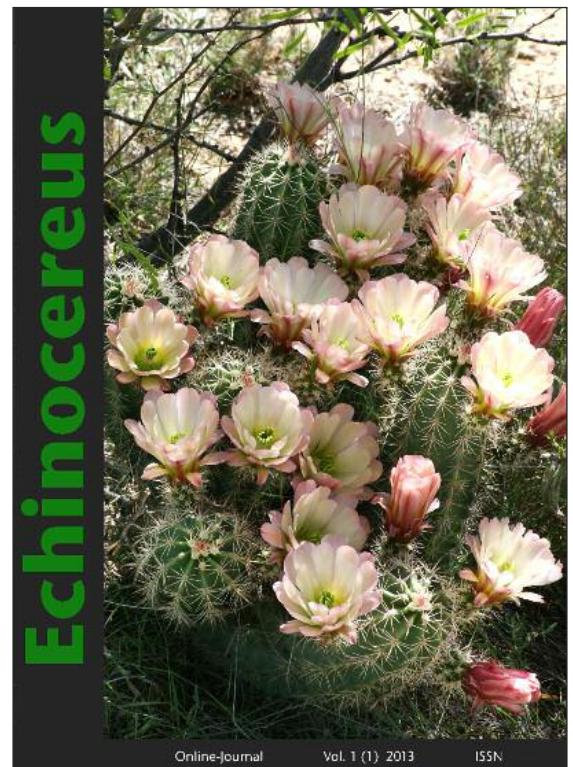
The goals of this new journal are to study the genus Echinocereus, to publish articles about the continuous research on these plants (classification, morphology, evolution) as well as to protect the genus Echinocereus by reproduction from seeds and distribution of the seedlings.

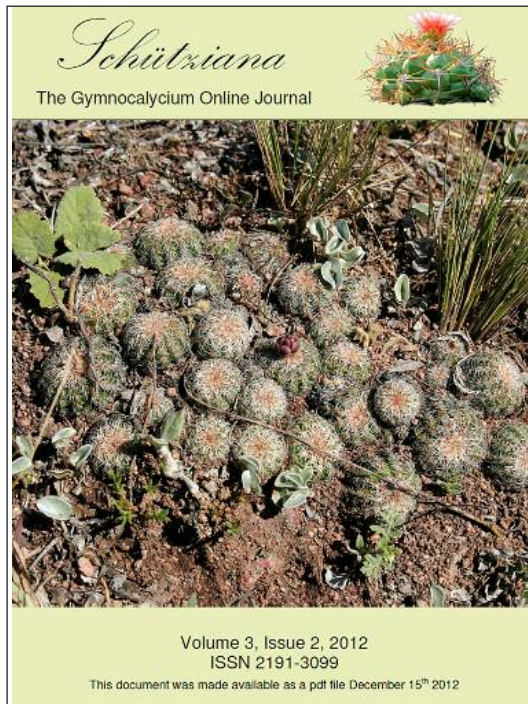
In this first issue there are well-illustrated articles about *E. pulchellus*, *E. triglochidiatus*, *E. x lloydii*, and *E. koehresianus*. Text in German with English summaries. There are many large pictures of good quality making this a very attractive publication.

The downloaded pdf file does not allow printing, so if you want a printable version, you have to ask for it. The page numbering is also unconventional with odd numbers on the left of spreads.

See website: www.echinocereus.eu

GC





Schütziana

The latest issue of Schütziana, the specialist on-line journal for Gymnocalycium enthusiasts, deals exclusively with *G. bruchii*. The first part of a detailed article by Wolfgang Papsch describes and illustrates the variations to be found in the many populations of *G. bruchii*. The recent proliferation of superfluous population names is also questioned.

The text of this valuable publication is in English and the pictures and distribution maps give a clear insight into the plants found in habitat and culture.

You can download free any of the six issues from:

www.schuetziana.org

GC

Avonia-News

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

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,
geschaefsstelle@fgas.sukkulenten.de



Succulentopi@

The latest issue of this new free online journal has recently appeared. This is the first online journal published in French and it is called **Succulentopi@**

The quality is excellent as you would expect from Yann Cochard and his very active team. It is available as a free download from:

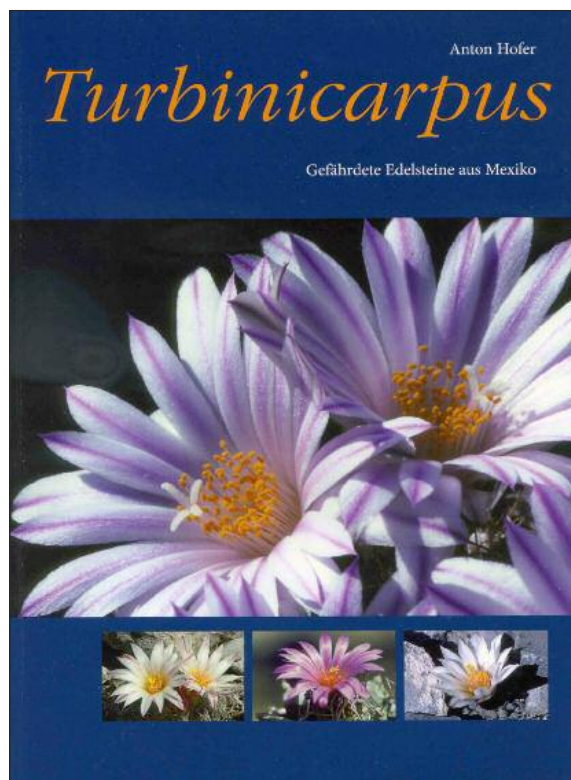
<http://www.cactuspro.com/succulentopia>

Succulentopi@ is a magazine in PDF format published by 'Le Cactus Francophone' and its team. Their goal is to publish it every three months, and to include articles, information, photos, etc. on the theme of cacti and other succulents.

THE LOVE OF BOOKS

News of Recent Publications. A Reminder of Old Favourites.

Many cactophiles enjoy reading about their plants, particularly in the winter when our collections are less demanding. This feature aims to provide you with inspiration.



Turbinicarpus by Anton Hofer

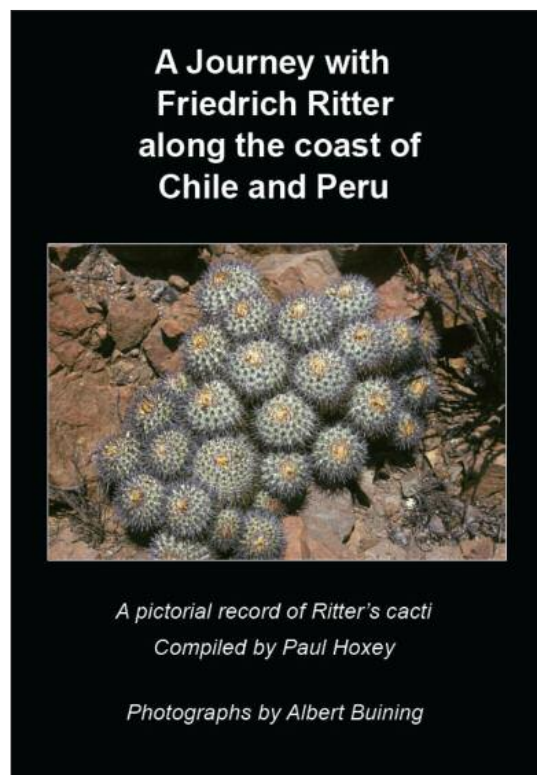
The latest offering from the German Cactus Society (DKG) which has recently published a number of attractive and reasonably-priced books for its members.

Anton Hofer is well known for his extensive travels in Mexico and his interest in the genus *Turbinicarpus*. He has lectured on the subject around Europe, including a number of visits to Britain.

This softbound book is 170 x 239mm, with 144 pages. It is well-illustrated with 204 colour pictures of plants and habitats as well as a map. The picture quality is generally good, but some of the images are rather dark.

After some introductory chapters, the description, distribution, habitat, and flowering time are given for each species.

Available only to DKG members for 10€ in Germany and 12€ elsewhere in Europe.



A Journey with Friedrich Ritter

This is a most unusual book featuring the pictures taken by Albert Buining when he travelled with Ritter in Chile and Peru during 1968-69. When the transparencies came to light, it was obvious that they were a valuable pictorial record of the plants represented by Ritter's FR field numbers. Most of the images have been attributed to an FR number and are a valuable supplement to those published, in black and white, in Ritter's 'Kakteen in Südamerika'.

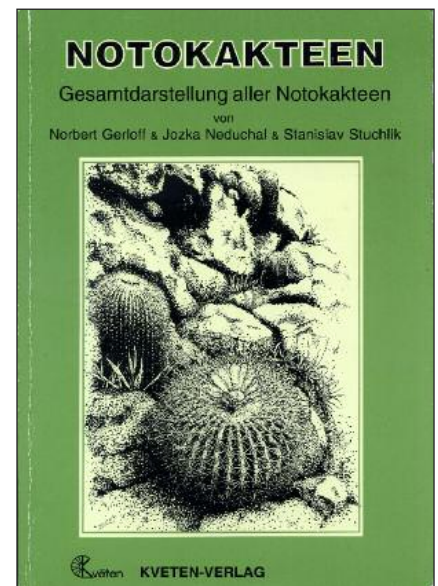
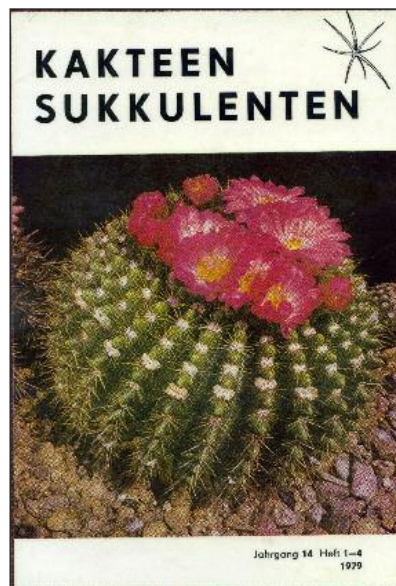
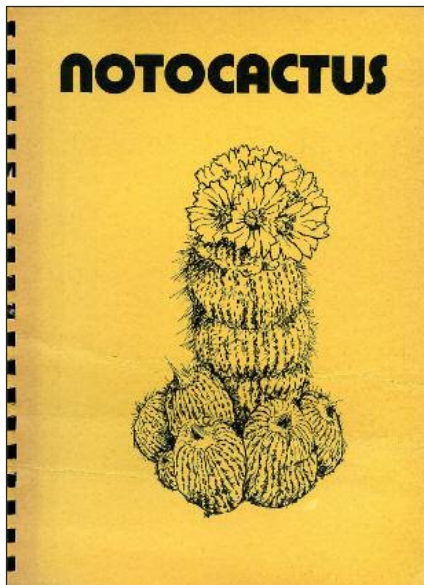
The book is A4 with 96 pages, perfect bound with soft covers. There are 345 original pictures which, because of their age, are variable in quality, depending on how good the transparencies were.

Available from [Keiths Plant Books](http://www.keithsplantbooks.com) for £19 plus carriage.

GC

Specialist Reference Books

All the popular genera of cacti have their enthusiastic followers, some even with specialist societies that publish journals. The genus *Notocactus*, now usually included in *Parodia*, is the subject of study for the German journal 'Internoto'. But, you can also find information in books about the genus, although these are few in number. Here, I present the ones I know. GC



Notocactus was my favourite genus in the early years of my interest in cacti. In the late 1960's and the early 1970's, the genus was greatly expanded by new discoveries by Ritter and Horst-Uebelmann, many of which were truly very different from previously-known species and introduced new flower colours.

The publication in 1975 of a review of the known species was welcome indeed. It was written by Tony Mace, an enthusiast for *Notocactus* and part of the active Sussex Zone of the NCSS in England.

Simply-produced as comb bound A4 and illustrated with line drawings by Maureen Holt and some black & white photographs, it was a useful compilation of descriptions in English along with some brief notes about the plants. There was an introduction covering history, distribution, cultivation and morphology.

A second edition and supplement appeared in 1978. Second hand copies occasionally come up for sale. Remarkably, it remains the only review of *Notocactus* in English, probably because the genus has not been fashionable for some time.

The next book was a special edition of the East German publication *Kakteen-Sukkulenten* published in 1980. The contents, in German, were similar to the Mace book, but with a

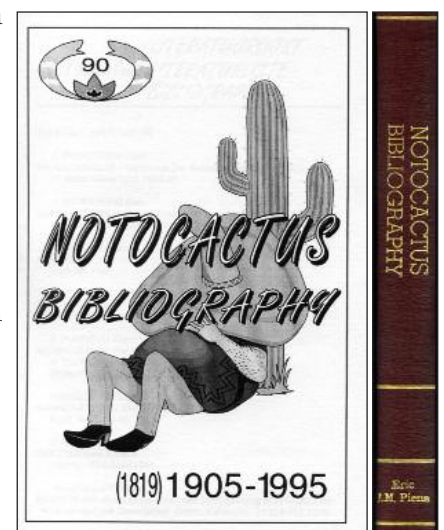
smaller page size (±A5), perfect bound with soft covers and pictures in colour as well as black & white.

Finally, Norbert Gerloff et al. published their review of the genus in 1995. Again, with a similar content but this time with all species illustrated in black & white or colour. This tends to be the first place I look as a reference to the genus but, of course, all these books take a splitter's view and many of the names are really just synonyms.

I also have a nicely bound volume called 'Notocactus Bibliography' by Eric J.M. Piens which I got when a library was sold. It looks like a privately-published book so I don't know how many copies were produced or if it was available on open sale.

It comprises an extensive list of references in the literature which relate to *Notocactus*. It must have taken a lot of time to compile!

GC



CACTUS PEOPLE HISTORIES

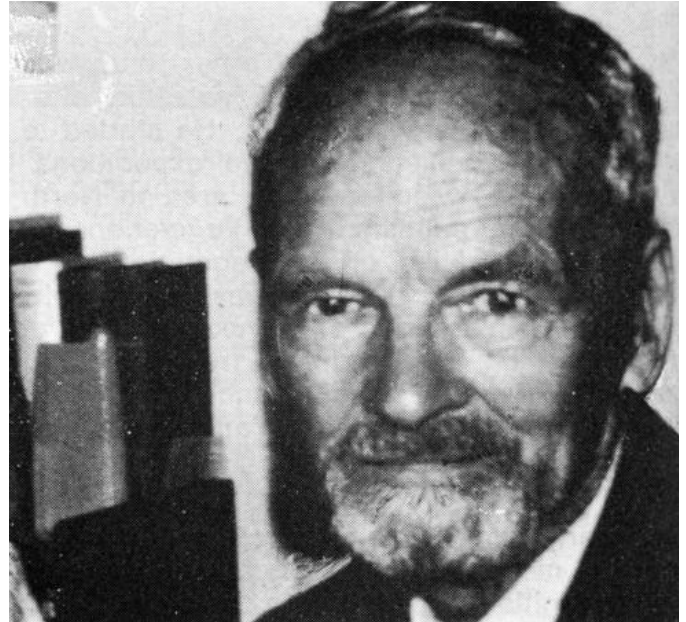
Chuck Staples continues his series about people who have made significant contributions to the study of cactus and succulent plants. His subject this time is Friedrich Ritter.



F. Ritter on the Cerro San Ramon near Santiago (Chile) from the Winter catalogue of 1956. Photo: Lembke.

The following brief biography touches mainly on the aspects of the life and career of Friedrich Ritter that relates to his contributions to the cactus and succulent plant world. This person made wider contributions than have been included here, but I hope that for interested succulentists, this will provide a sufficient introduction to the achievements of the individual.

Friedrich Ritter (1898–1989) is world renowned for his work on South American Cactaceae. Born in the small village of Quentel in the Hesse State of Germany on 9 May 1898, Friedrich studied biology, geology and paleontology at the University of Marburg, German. His interest in the Cactaceae family began when he and his parents with seven brothers and sisters moved from Germany to Mexico in 1920 (before he had a chance to graduate at the university). He began a career in mining in 1921 near Pezuapan, Guerrero, Mexico—starting his own mining company at Cacalotepec, Oaxaca, Mexico by 1924. By the time he was 29 years old and had moved to Saltillo in the Mexican state of Coahuila he gave up the mining venture for exploration and collection of cacti.



F. Ritter while he was living in the Canary Islands from the British Cactus and Succulent Journal, June 1983. Photo: Broogh.

After exploring in a number of Mexican regions in 1928 and 1929 in search of plants and seeds to sell to nurseries and collectors in Germany, he spent the year 1930 collecting in Peru on the eastern side of the Andes in the lowland tropical forest—then collecting in parts of Bolivia, Argentina and Chile during the first half of 1931. Back in Mexico he continued collecting in the states of Sonora and Baja California before making his way back to Germany in 1937. During this time several experts in Germany were working on identifying Ritter's specimens—among them were Friedrich Boedeker (1867–1937), Wilhelm Weingart (1856–1936) and Alwin Berger (1871–1931), all three specialists in Cactaceae.

Ritter emigrated to South America in 1952 to begin another odyssey of plant collecting through Argentina, Bolivia, Chile and Peru, sending plants and seeds back to Germany again. He settled in Arica, Chile and bought himself a 1931 Ford for collecting trips into central and northern Chile in 1956. It wasn't long before he made further collecting trips into Peru, Bolivia, southern Chile, northwest Argentina and southeast Brazil, constantly on the move from one place to another. During the 1960s many new plant species were



Friedrich Ritter watering his plants in his garden in Granizo, near Olmué, Chile. Photo: Albert Buining. © [Succulenta](#) Photograph from the new book 'A Journey with Friedrich Ritter along the coast of Chile and Peru' [see page 16](#).

published by Ritter in the German Cactus Society journal.

By the early 1960s he moved his base to the Chilean village of Granizo. From there his collecting journeys took him into the states of Bahia and Minas Gerais, Brazil and to Paraguay. In 1964 he was recognized with an honorary membership by the German Cactus Society. In 1968 Ritter spent a couple of months touring through Chile and Peru with Albert Frederik Hendrik Buining (1901–1976) and his spouse Dina—shipping cactus plant specimens back to their home country of the Netherlands. [see the new book of Buining's pictures from this journey on [page 16](#)]

By 1971 Ritter had given up hunting for cacti, spending the next 8 years in Paraguay due to the upheaval with a new president in Chile. Back in Germany he published four volumes on the Cactaceae of South America (Kakteen in Südamerika) and, upon its completion in 1981, he moved to the Canary Islands where he passed away on 9 April 1989. Friedrich Ritter never married and was a vegetarian, at least during the later part of his life. He became an IOS member in 1961 and received the CSSA Fellow award in 1985.

The genus *Ritterocereus* was dedicated to him by Curt Backeberg (1894–1966) in 1942, now a subgenus of the genus *Stenocereus*. Ritter described a number of genera of which the following are still widely accepted: *Calymmanthium*, *Cipocereus*,

Miqueliopuntia, *Lasiocereus* and *Yungasocereus*. *Gymnocalycium ritterianum* was named in his honor by Walter Rausch (1928–) in 1972. Ritter described many species of cactus plants, including a number of species of *Copiapoa*, *Gymnocalycium* and *Matucana*. He discovered a number of plants species that were named in his honour by other plant people including: *Aztekium ritteri*, *Cleistocactus ritteri*, *Espostoa ritteri*, *Eulychnia ritteri*, *Rebutia ritteri*, *Matucana ritteri*, and *Parodia ritteri*.

Friedrich Ritter was an extraordinary German traveller, geologist, adventurer, amateur botanist and cactus collector. His personal herbarium was deposited in the Museo de Historia Natural in Santiago de Chile in 1972. His work on South American Cactaceae has done much for the enlightenment of students of cacti and the enrichment of the hobbyist. During his field work, he accumulated some 5,500 pages of notes and data that filled 74 volumes.

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THE SULCOREBUTIA OF AYOPAYA PROVINCE

John Carr describes important research into an interesting group of *Sulcorebutia* species and presents the rediscovery of *S. glomeriseta* in habitat.

Photos by the author (except where stated)



Fig.1 *Sulcorebutia glomeriseta* JC 03-12

The province of Ayopaya is the most northern area in which *Sulcorebutia* have been found and all the forms in this area have yellow or near yellow flowers. The region is part of the Cotacajes river system and the plants grow on the slopes feeding the rivers Santa Rosa and Ayopaya and on into the Rio Cotacajes itself. The region is also the only large area in Bolivia with alkaline soils (Schultz et al 2004).

There are six names attributed to the area, and these are *S. arenacea*, *S. candiae* & its ssp. *kamiensis*, *S. glomeriseta*, *S. menesesii* and *S. muschii*. The plants can be found at different altitudes from 1300m to around 4000m. The habitats are usually small with numbers varying from a few dozen to a few hundred individuals at

any one locality. An interesting factor is that often different forms can be found in the same area but at different altitudes, separated only by the climatic conditions that occur between the localities.

There is not a common separation factor at the different locations as climatic conditions change as the rivers pass through the valleys. Starting in the north-east at the lowest point of known locations, *S. menesesii* grows close to the river on rocky outcrops surrounded by dry forest but in very small numbers at each location. At this altitude the climate is subtropical with minimum temperatures around 15°C. The higher reaches of the forest are subject to regular cloud cover before and probably after the rainy season starts, so experience more moisture over a longer period than the lower area



Fig.2 *Sulcorebutia arenacea* JC 07-07



Fig.3 *Sulcorebutia arenacea* JC 07-07



Fig.4 *Sulcorebutia arenacea* JC 07-07

where it is cooler.

On the top edge of the forest, *S. glomeriseta* can be found. This grows above some of the cloud where its adaptation of finer and more numerous spines probably allow it to pick up moisture from any cloud cover. Its location on the slopes rather than the tops and its fibrous root system in combination with fine spination and different seed



Fig.5 *Sulcorebutia candiae* VZ 608

Photo: Johan de Vries



Fig.6 *Sulcorebutia candiae* VZ 608

Photo: Johan de Vries



Fig.7 *Sulcorebutia candiae* VZ608

Photo: Johan de Vries



Fig.8 *Sulcorebutia candiae* VZ 608 in culture

Photo: Johan de Vries



Fig.9 *Sulcorebutia glomeriseta* JC 03-12 Showing spine colour range

form make it the most distinctive plant in the group. Its habitat and physical appearance are very like those of *Aylostera fiebrigii* which grows further south, but the flowers are typical of *Sulcorebutia*. The location makes it the most northern *Sulcorebutia* species of all (so far!). The photographs show the plants in habitat for the first time ever, since no photographs were taken when it was first discovered in 1949 (named in 1951).

Further south and west near Tirquirpaya, two more populations are to be found. At lower

altitudes, around 1600m alongside the Rio Santa Rosa, *S. arenacea* is found. In separate locations some variation in spination can be seen, but all sites are recognisable as the same species. Higher on the same river slopes *S. candiae* can be found. This is a smaller growing plant, with spines usually yellow in colour. Isolation at this site is effected by a very dry cactus and Acacia forest some 1000m in depth.

S. candiae seems to be suffering in habitat perhaps due to a lack of rain in the area in recent times, but also in part due to road building and



Fig.10 *Sulcorebutia glomeriseta* JC 03 12 Showing spine differences



Fig.11 *Sulcorebutia glomeriseta* JC 03 12 Showing spine differences



Fig.12 *Sulcorebutia glomeriseta* JC 03-12 Showing vertical habitat plant collecting.

Further south and west grow plants of *S. candiae* ssp. *kamiensis* at the highest altitudes, up to 4000m. *S. muschii* is also named from this area, but it has been reduced to a synonym by most authors. Several populations of *S. candiae* ssp. *kamiensis* are known and vary in numbers and appearance. Plants from two populations are shown in the pictures. One population contained several hundred plants, while the other had only a few. The higher reaches of this area (above 4000m) experience frost for around 200 nights each year, so this should be the hardiest of the plants discussed. At present no low altitude species are known in this area but included in the photographs is a plant found by Chris Sherrah at 2700m which is at river level this far west. This finding means more work is needed to establish the full distribution of this group of plants.

These plants are treated differently by different authors. The new Cactus Lexicon (Hunt 2006) recognises only two species: *S. arenacea* and *S. glomeriseta*, and places all the others in synonymy with *S. glomeriseta*. It also subsumes the yellow flowered *S. krahnii* in with this, but it is clearly a *S. steinbachii* ssp. *tiraquensis* form in that taxonomy.



Fig.13 *Sulcorebutia glomeriseta* JC 03-12



Fig.14 *Sulcorebutia glomeriseta* Card. 4399 In culture



Fig.15 *Sulcorebutia candiae* ssp. *kamiensis* JC 05-12 orange flowered plant



Fig.16 *Sulcorebutia candiae* ssp. *kamiensis* JC 05-12 pectinate spines at this site



Fig.17 *Sulcorebutia candiae* ssp. *kamiensis* JC 06-12 longer spines at this site



Fig.18 *Sulcorebutia kamiensis* JC 06-12



Fig.19 *Sulcorebutia candiae* ssp. *kamiensis* JC 06-12

Pilbeam & Hunt (2004) also speculate on the significance of the yellow flowering of some *Sulcorebutias* and suggests that they are on average lower altitude plants and may have different pollinators. However, the published altitudes are in some cases in error by as much as 1000m. My own observations suggest that all *Sulcorebutia* are pollinated by large solitary or bumble bees at all altitudes. As *Sulcorebutia* are amongst the first plants to flower each spring, they must form an important food source for these insects of the region at the start of their breeding season. One can only speculate on the damage that would be done to the ecosystem should their first food source of the year be eradicated.

My thoughts on flower colour are based on soil acidity but more work is needed for a conclusive answer.

Gertel & Latin (2010) also use the same two basic species but include *S. candiae*, *S. candiae* ssp. *kamiensis* and *S. menesesii* as varieties of *S. arenacea*, a better solution I believe as the distinct differences listed above between the two makes this a better approach. They also place *S. muschii* in the synonymy of *S. candiae* ssp. *kamiensis*. With the inclusion of *S. muschii* under this name *S. candiae* ssp. *kamiensis* is without doubt the most variable of this group with a wide range of spination and body differences and a larger number of known sites than all the other names.

Horáček (2008) listed all the populations as species with the exception of *S. kamiensis*, which he retains as a ssp. of *S. candiae* (more accurate due to locality and altitude). He is the only author to retain *S. muschii* as a species as he finds it quite distinct although it grows in the same area as *S. candiae* ssp. *kamiensis*. He also suggests that the



Photo: Martin Lowry

Fig.20 *Sulcorebutia menesesii* JC 05-11

species with yellow flowers to the south of Cordillera Real, (*S. cardenasiana* / *langeri*) are closely related. However, there are now other new, recently named yellow flowered plants in the south-east that mean a separate grouping (or two) might be needed.

Brederoo, A.J. and Donald, J.D. (1986) described *S. kamiensis* as a ssp. of *S. menesesii* but later authors have moved it as a ssp. under both *S. candiae* and *S. arenacea* with Hunt reducing it to synonymy under *S. glomerista*! In 1989, Donald proposed that all these plants were in a separate group under *S. steinbachii* but did not make any new combinations. He also placed *S. cardenasiana* and *S. langeri* in a separate subgroup under *S. steinbachii*.

This group of Sulcorebutias has a clearly defined separation from the rest of the genus with a large mountain range running from west to east, with altitudes well in excess of 4000m even at the passes. So it has had a separate evolution for millennia and has become an island grouping. Each site has also become an island isolated within the larger island, separated by climatic conditions for many generations. Whether this makes them



Photo: Martin Lowry

Fig.21 *Sulcorebutia menesesii* JC 05-11

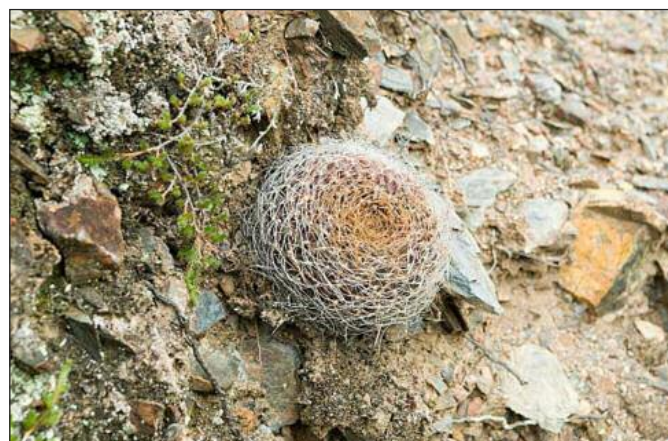


Photo: Martin Lowry

Fig.22 *Sulcorebutia menesesii* JC 05-11



Fig.23 species Chris Sherrah at 700m lower than any recorded finding near Kami

separate species is for others to judge. However, it does make for an interesting discussion! Yet how do you discuss them if you don't have a name? The use of subspecies for island populations is common in other branches of botany so why not in the Cactaceae?

The conservation status of the group as a whole is not critical as over 30 sites are known (although some may not still exist). One I visited was heavily forested with no plants and another now bare rock. This situation changes when you treat each name as a separate species as then all become vulnerable or critically endangered. All populations are small, probably none more than 300 plants and some less than 20, so extinction is very possible.

If more research on the role these plants play in the life cycle of the pollinators and the possible effects of their extermination would have on the rest of the ecosystem was properly understood, then maybe the local people could be enlisted to ensure that these populations were protected.

Acknowledgments

Special thanks go to my experienced travel

companion Johan de Vries. I also thank Roy Mottram for details of *S. glomeriseta*.

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- [John Carr](#)

GRANNY'S ECHINOPSIS

Graham Charles discusses *Echinopsis oxygona*, so often one of the cacti given to children, but a beautiful and easy to grow plant which should not be overlooked. Photographs by the author.

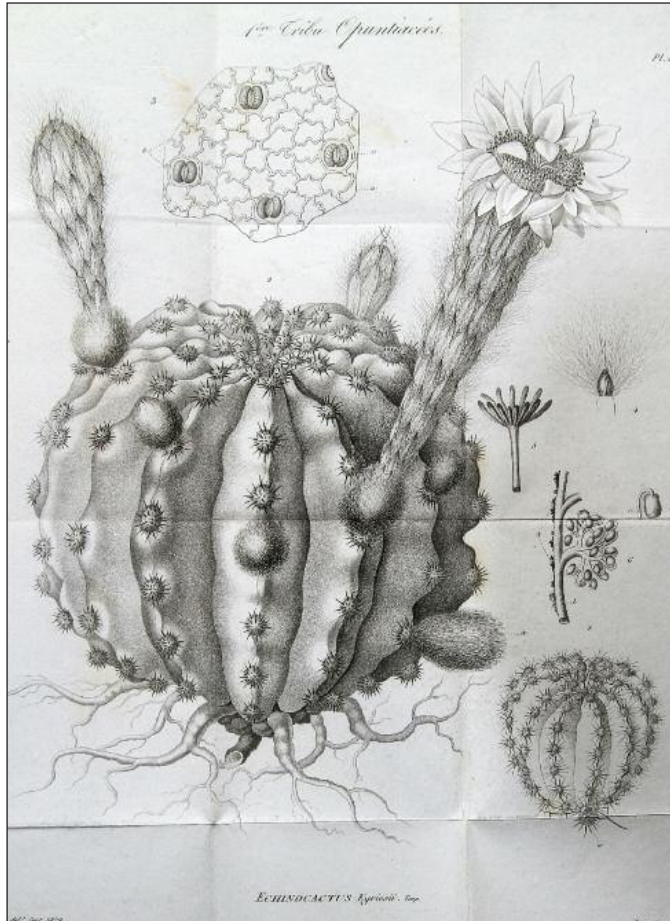


Fig.1 Lectotype image of *Echinocactus Eyriesii* from the first description by Turpin (1830).

Actually, it was a friend of my parents who gave me my first cactus and succulent cuttings. I was 12 years old and my father, who was keen on his garden, encouraged me to take an interest in plants. Sure enough, among the first plants I had was an offset from a large plant of *Echinopsis oxygona*, although it was called *E. eyriesii* at the time.

Examples of this *Echinopsis* were often found on window sills where they produced many offsets but rarely flowered. The offsets, which look rather different from the mature stems, root easily and soon make offsets of their own. It has been suggested that repeated propagation by offsets tends to produce plants which themselves offset more readily. I think it

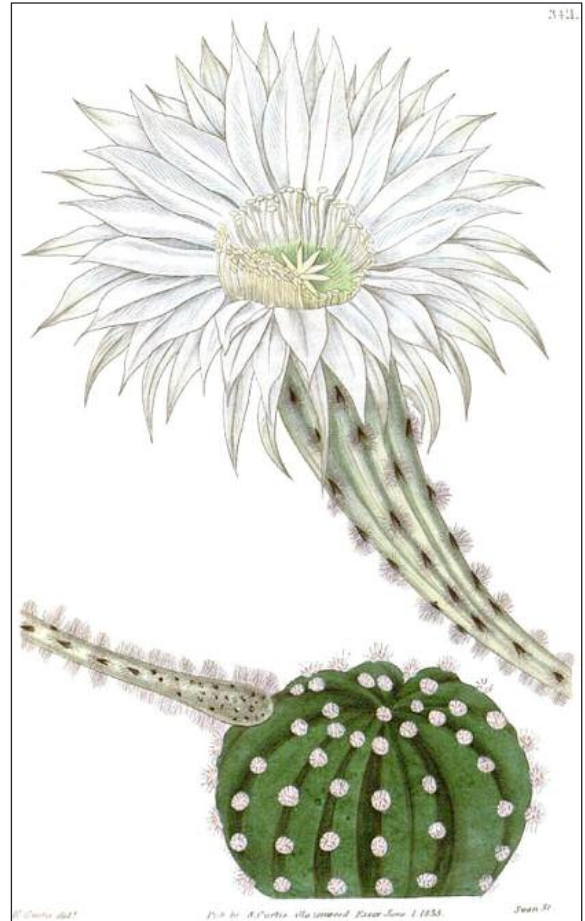


Fig.2 *Echinocactus Eyriesii* illustrated as Plate 3411 in Curtis's Botanical Magazine (1835).

is more likely that some clones are more prolific and these are the ones which tend to get propagated.

I have grown various clones that were collected from habitat in southern Brazil and they offset sparingly and flower freely once they are large enough. The spination of the plants is very variable which has encouraged various names to be created for this species. The flowers vary in size and can be white or a lovely pale pink.

By the laws of botanical nomenclature, the oldest name is the one we should use. The plant has been given a number of names, the prime candidates for being the oldest are *Echinopsis eyriesii*, *E. multiplex*, *E. oxygona* and



Fig 3 *Echinocactus Eyriesii*. Plate 1707 from Edwards's Botanical Register Vol. VII (1835).

E. tubiflora.

Echinocactus Eyriesii Turpin

The first description appeared in 'Annales de l'Institut Horticole de Fromont', and later extracted in 'Observations sur La Famille des Cactées', both published in 1830. The plant was named for Mr. Alexander Eyries of Le Havre. Mr. Eyries said the plant was originally from Buenos Ayres, a French captain brought two plants from there in 1827. Buenos Aires was a major port for the region when the origin of plants was often given as the port of embarkation rather than their actual habitat location. So, *E. Eyriesii* probably originated in Southern Brazil or north east Argentina.

Turpin mentions that he had seen the published description of *Echinocactus oxygonus* which he says is related to his *E. Eyriesii* but differs in a number of aspects including the

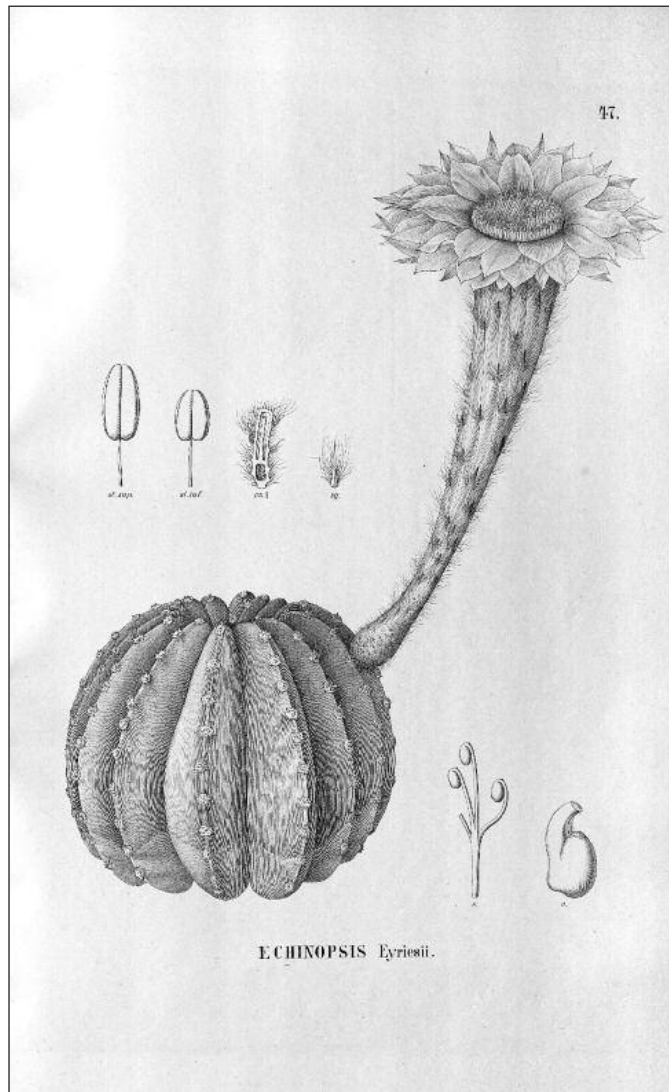


Fig 4 *Echinocactus Eyriesii*. Plate 47 from Flora Brasiliensis Vol. IV Pars II. (1890)

spines which are much longer and the flowers which are pink rather than white. Turpin's illustration [Fig.1] shows the short spines we still associate with this name. This reference means that *E. oxygonus* must have been published earlier.

E. Eyriesii flowered at Kew in January 1835 and was illustrated in Curtis's Botanical Magazine the same year [Fig.2]. The text tells us: 'The drawing of this charming Echinocactus, no less remarkable for the great size of the flower, than for its delicious fragrance, was made by Mr. Henry Curtis, the youngest son of the Conductor of this work, in whose choice collection, at Glazenwood, it flowered in Jan., 1835. This noble flower, like that of *Cereus grandiflorus*, seems to expand only at night. It is a native of Mexico, having been introduced to the Horticultural Society,



Fig 5 *Echinocactus eyriesii* (var. *glauca*) Plate 31 from Edwards's Botanical Register Vol. 24 (1838).

according to Dr. Lindley, some years ago by Sir John Lubock'.

The plant was featured in Edwards's Botanical Register in the same year as Plate 1707 [Fig. 3]. Like the other illustrations, it shows the short-spined plant with white flowers which are still associated with the name *E. eyriesii*. Another fine illustration was published in the same journal in 1838, this time of a variety called *E. eyriesii* var. *glauca* [Fig.5]. It's common name 'Glaucous Sweet-scented Porcupine Cactus' refers to the characteristic perfumed flowers.

In 1890, Schumann published his study of Brazilian cacti in 'Flora Brasiliensis'. As well as a plate of *Echinopsis eyriesii* [Fig.4], Schumann included a key to five *Echinopsis*, all said by him to come from southern Brazil. He keyed out the species by minor differences in



Fig 6 *Echinocactus oxygonus* Link The illustration which accompanied the first description in 1830. Designated as the lectotype of the name.

spination and flowers.

Echinocactus oxygonus Link

The first description of this name appeared in Transactions of the Prussian Horticultural Society: *Verhandlungen des Vereins zur Beförderung des Gartenbaues in den Königlich Preussischen Staaten* 6: 419. (1830) with a good illustration [Fig. 6]. The plant was said to have come from Mr. Sells, from southern Brazil. The name 'oxygona' is derived from the Greek word 'oxys' meaning 'sharp' and 'gonia' for 'corner' or 'margin' which refers to the sharp ribs of the plant.

This and the later plate in Edwards's Botanical Register of 1835 [Fig.7] show that the plant has longer spines than *Echinopsis eyriesii* and a pink, rather than white, flower.

The depiction in 1845 in Pfeiffer's



Fig.7 *Echinocactus oxygonus*. Plate 1717 from Edwards's Botanical Register Vol. VII (1835).

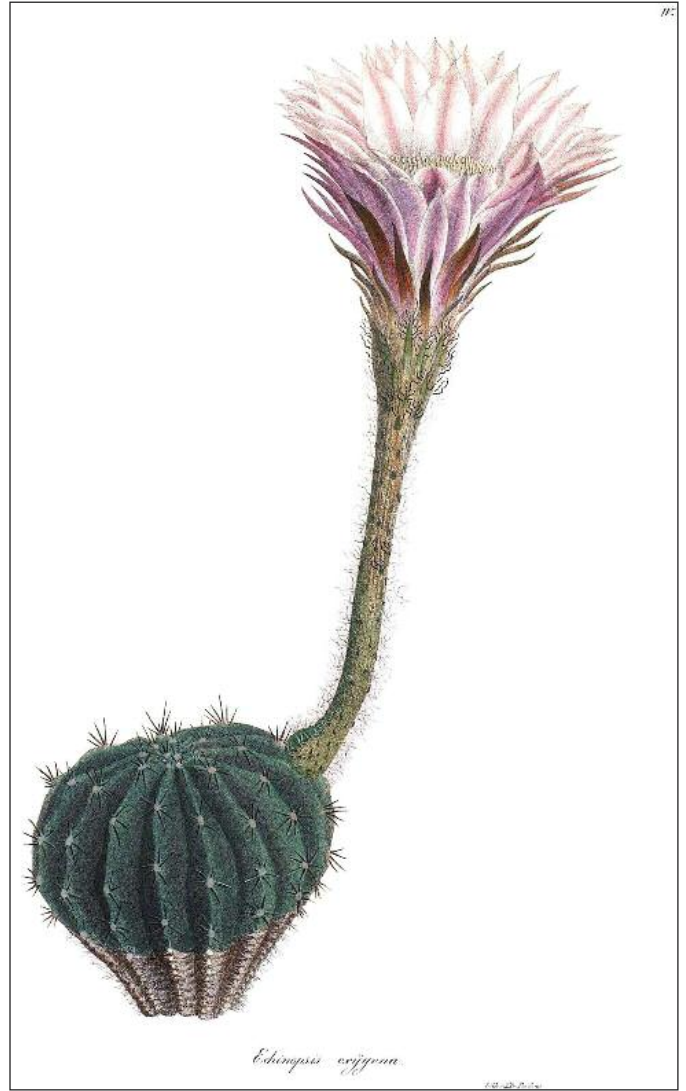


Fig.9 *Echinopsis oxygona*. from Pfeiffer, L. *Abbildung und Beschreibung Blühender Cacteen*, Vol. 2 Plate 4 (1845).



Abbildung und Beschreibung Blühender Cacteen, Vol. 2 Plate 4 [Fig.9] shows a similar plant, as does the dramatic 1845 illustration in Curtis's *Botanical Magazine*, Plate 4162 [Fig.8].

***Echinocactus multiplex* (Pfeiffer) Pfeiffer & Otto**

First described as *Cereus multiplex* by Pfeiffer in his 'Enumeratio Diagnostica Cactearum Hucusque Cognitarum' (1837), the plant was transferred to *Echinopsis* by him and Otto in their splendid 'Abbildung und Beschreibung Blühender Cacteen' volume 1 (1838). The combination was accompanied by a fine illustration [Fig.10].

The plant was later illustrated in Curtis's *Botanical Magazine* as Plate 3789 in 1840

← Left Fig.8 *Echinocactus oxygonus* from Curtis's *Botanical Magazine* Plate 4162 (1845).



Fig.10 *Echinopsis multiplex*. from Pfeiffer & Otto *Abbildung und Beschreibung Blühender Cacteen*, Vol. 1 Plate 4 (1838).



Fig.12 Plate IV from Volume 3 of *The Cactaceae*, Britton & Rose (1922) with *Echinopsis multiplex* on the right and *E. turbinata* on the left.

The illustration published in *The Cactaceae* (1922) by Britton and Rose [Fig.12] is again similar and the authors comment that *Echinopsis multiplex* may not be distinct from *E. oxygona*. Their key differentiates these various names by flower colour and spination.

Other Similar Plants

There are other names published later that have similar characteristics and, where stated, originate from the same region of South America:



Fig.11 *Cereus multiplex* Plate 3789 from Curtis's *Botanical Magazine*(1840)

[Fig.11] using its original genus name *Cereus*. The drawing was made by Mrs. Stannard from a flowering plant in the collection of Messrs. Mackie of Norwich.



Fig.13 *Echinocactus tubiflorus* Plate 3627 from Curtis's *Botanical Magazine*(1838) designated as the Neotype of the name.

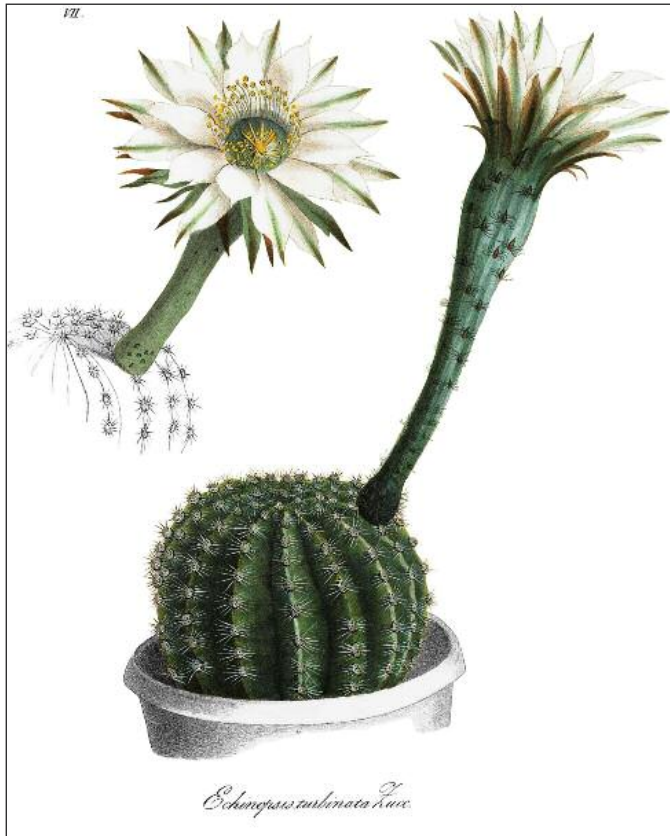


Fig.14 *Echinopsis turbinata*. from Pfeiffer Abbildung und Beschreibung Blühender Cacteen, Vol. 2 Plate 7 (1846).

Echinopsis gemmata (Zuccarini ex. Pfeiffer) Schumann. First described in 1837.

Echinopsis tubiflora (Pfeiffer) Dietrich. First described in 1837.

Echinopsis turbinata (Pfeiffer) Pfeiffer & Otto. First described in 1835

Discussion

It is generally accepted that all the plants discussed are synonyms so what is the evidence and what is the earliest name? Both *E. eyriesii* and *E. oxygona* were described in the same year, 1830, before any other name, so one of these is the correct one to use.

The fact that Turpin, when describing *E. eyriesii*, mentions that he had seen the description of *E. oxygona* strongly suggests that he was not the first to describe this plant. Further evidence is given by Taylor in CSI (2005) where he tells us that Hooker had annotated his copy of the *E. oxygona* publication with VI, indicating that it had been received in, or before, June 1830, a month before the publication of *E. eyriesii*.



Fig.15 *Echinopsis oxygona* GC754.01 in woodland near Gruta do Segredo, Rio Grande do Sul, Brazil at 150m.



Fig.16 *Echinopsis oxygona* at the same locality as the plant in Fig.15. GC754.01 near Gruta do Segredo, Rio Grande do Sul, Brazil at 150m. The short spined form described as *E. eyriesii*.

So, the correct name to use is *Echinopsis oxygona*, which can be applied to all the forms of this variable species, including pink and white flowers, as well as a range of spination. It is understandable that so many names were created for this plant. It must have caused a sensation when it first flowered in cultivation in Europe. Its beautiful large and perfumed flowers, produced on relatively small globular plants, were bound to impress the people who saw it. Its impact on horticulture is reflected in the number of illustrations which were published in the 19th century.

My own experience of seeing *E. oxygona* in the wild was in Rio Grande do Sul, Brazil in 2005. I saw the plants at a number of locations and at each place they exhibited diverse spination including the very short-spined form we know as *E. eyriesii* [Figs. 16 & 19]. I did not see the flower colour but a short-spined plant of GC754.01 has flowered pink [Fig.20].



Fig.17 *Echinopsis oxygona* at habitat GC777, north-east of Dom Pedrito, Rio Grande do Sul, Brazil at 245m. It is growing with *Notocactus arnostianus*. Note the short-spined plant to the left of the pictures which corresponds to the description of *E. eyriesii*. All the other plants are long spined, more like the description of *E. oxygona*.



Fig.18 *Echinopsis oxygona* GC777.02, NE of Dom Pedrito, Rio Grande do Sul, Brazil at 245m. A form with very short spines. The same place as Fig.17.



Fig.19 *Echinopsis oxygona* GC777.02, NE of Dom Pedrito, Rio Grande do Sul, Brazil. The short spined form described as *E. eyriesii*. Same place as Fig.17.

Echinopsis oxygona has a wide distribution in Paraguay, Argentina, Brazil and Uruguay. The plants from Paraguay were named by Moser as *Echinopsis adolfriedrichii* in 1982. He compared it to *E. chacoana*, another species found in Paraguay, but this is now known to be related to *E. rhodacantha*, a different lineage from *E. oxygona*. All the plants of *E. oxygona* I have grown from seed collected in north-eastern Argentina have darker bodies and produce white flowers.

Cultivation

It is well known that these plants are amongst the easiest of all cacti to grow. They are often used as grafting stocks for seedlings. It is also easy to propagate them from offsets which root easily and grow quickly if given sufficient space and water.

They will flower throughout the summer if kept watered, and produce a spectacular display. Why are they not more popular?



Fig.20 *Echinopsis oxygona* GC754.01 Gruta do Segredo, Rio Grande do Sul, Brazil at 150m.



Fig.22 *Echinopsis oxygona* AH68 South of Caçapava do Sul, Rio Grande do Sul, Brazil.



Fig.21 *Echinopsis oxygona* (adolpfriedrichii) LB85 North of Caapucu, Paraguari, Paraguay.



Fig.23 *Echinopsis oxygona* LB251 Paso de los Libres to Mercedes, Corrientes, Argentina.

Reference

Moser, G. (1982) A new Species of *Echinopsis* from Paraguay. *National Cactus and Succulent journal* 37(2):39

GC

TRAVEL WITH THE CACTUS EXPERT (7)

Zlatko Janeba continues his account of cactus hunting in the USA. It is clear that you cannot always find what you are looking for and the negative impact of human activity has sometimes threatened the existence of the plants you seek. Photos: Zlatko Janeba



Fig.1 View of the House Rock Valley and the Vermilion Cliffs while descending from the Kaibab Plateau, Arizona.

On the morning of the third of May, after a quick continental breakfast, we filled the tank of my Subaru and headed south on Hwy. 89A towards the Kaibab Plateau. This plateau, which is a part of the larger Colorado Plateau, is bordered in the south by the so popular Grand Canyon, and reaches an elevation of some 2800m above sea level. It is heavily forested with aspen, spruce-fir, ponderosa-pine, and pinyon-juniper woodlands and thus, stands in a sharp contrast to the arid lowlands around it.

We passed Fredonia (Arizona) and when the road started to climb up the Kaibab Plateau, we made our first stop (milestone 592, elevation of 1900m). In the pinyon-juniper woodland (a forest type characteristic of many parts of the SW of the USA) on the northern slope of the plateau we

encountered our first cacti of the day, namely *Coryphantha vivipara*, *Echinocereus triglochidiatus* ssp. *mojavensis*, *Opuntia phaeacantha* and *O. whipplei*, as well as the quite common *Yucca baccata* (*Agavaceae*).

A little bit higher we stopped to shoot a couple of pictures from the scenic viewpoint and then we passed Jacob Lake (AZ), the “Gateway to the Grand Canyon” (the beginning of Route 67, that is the only paved road leading to the North Rim of the Grand Canyon), but we continued along Hwy. 89A towards Marble Canyon (AZ).

On the Kaibab Plateau we made two stops to look for the most typical cactus of this beautiful area, *Pediocactus paradinei*. The first stop was random, we just chose a place which seemed to be good for pediocacti, with some open sunny spaces



Fig.2 Habitat of *Pediocactus paradinei* at the Kaibab Plateau (2000m), Arizona.



Fig.3 Large specimen of *Pediocactus paradinei* (9cm in diameter) loaded with flower buds, Kaibab Plateau (2000m), Arizona.

at elevation of some 2000m [Fig.2]. There, in the pine and juniper forest, we actually encountered *P. paradinei* with flower buds. Some of the plants were the largest I had ever seen in the field with bodies up to 9cm in diameter [Fig.3]. There were also *Echinocereus triglochidiatus* ssp. *mojavensis* with about 1cm long buds, *Opuntia phaeacantha*, *Yucca baccata*, and *Castilleja* sp. (Indian



Fig.4 Juvenile *Pediocactus paradinei* with a freshly open flower, Kaibab Plateau (2030m), Arizona.



Fig.5 Fruiting and dehydrated *Escobaria marstonii* in House Rock Valley, Arizona.

paintbrush) with red flowers.

The second stop was near the milestone 572, at an elevation of some 2030m. It is a place Josef had already visited back in 1980 and later I used to visit quite regularly (in all possible seasons of the year) when living in the United States. During our visit, the *P. paradinei* were just about to flower [Fig.4], but certainly, the population did not seem as numerous and prosperous as it used to be before. Could it be that this spot has become so notoriously popular and so often visited by travellers that the cactus population can hardly withstand the enormous impact caused by the cactus enthusiasts? Or is there a natural decline (life cycle) within the populations?

Further to the east the road (Hwy. 89A) starts to meander down, the forest retreats and gorgeous views of the House Rock Valley and Vermilion Cliffs to attract the travelers attention [Fig.1]. The typical vegetation of the eastern slopes is dominated by low growing pines, juniper trees, *Yucca baccata* and *Opuntia phaeacantha*.

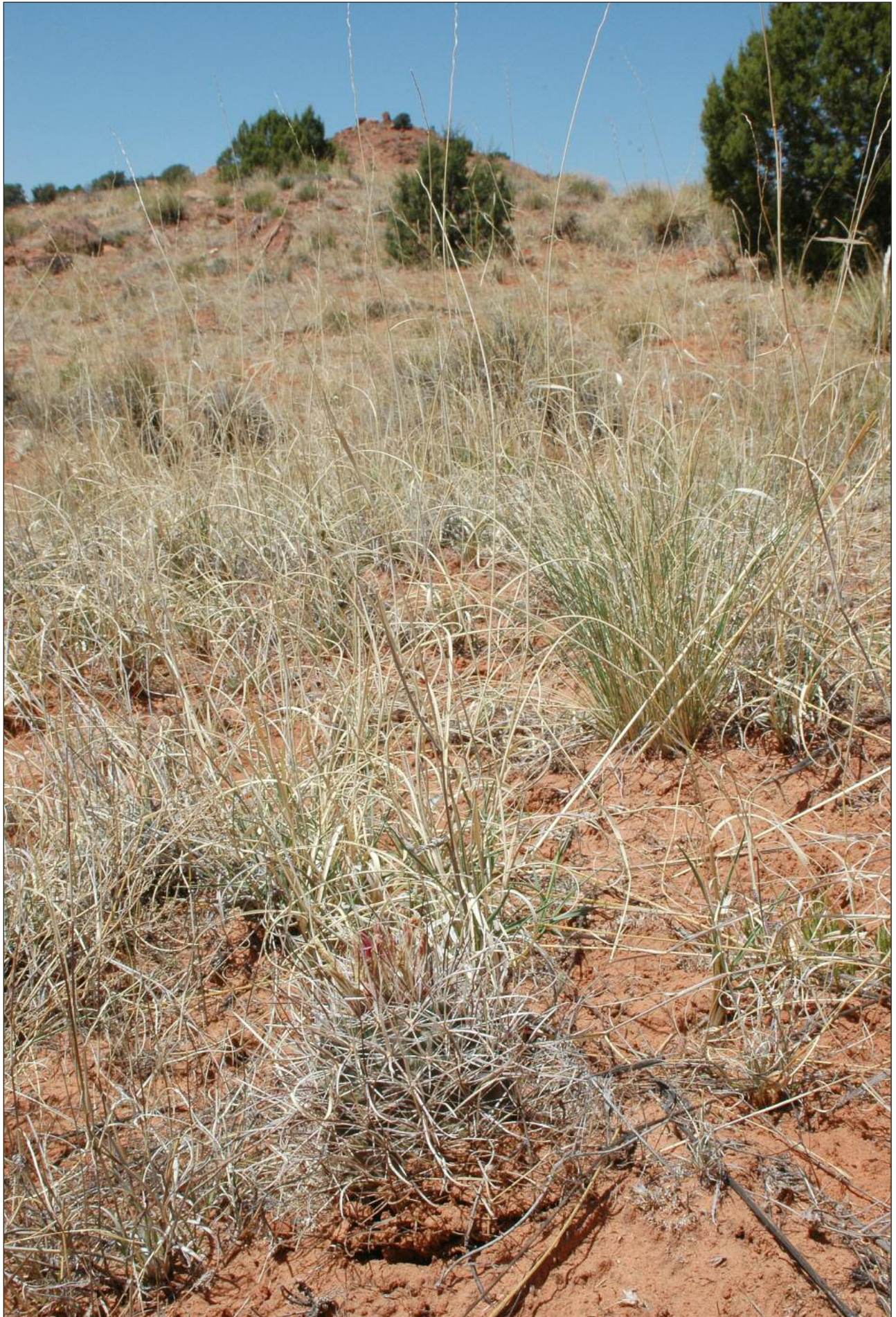


Fig. 6 Habitat of *Sclerocactus sileri* in House Rock Valley. The spiny *Sclerocactus* plants can be well camouflaged in dry grass.



Fig.7 Detail of *Sclerocactus sileri* with pure white flowers, House Rock Valley, Arizona.



Fig.8 Detail of *Sclerocactus sileri* with pinkish flowers, House Rock Valley, Arizona.



Fig.9 Josef Busek at the habitat of *Sclerocactus sileri*, House Rock Valley, Arizona. Notice the forested Kaibab Plateau in the background.

House Rock Valley is a long and relatively narrow valley stretched in a South-North direction, bordered by the Kaibab Plateau in the west and by Vermilion Cliffs in the east. There is a good quality dirt road going through the valley, the House Rock Valley Road or BLM 1065.



Fig.10 A beautiful specimen of *Sclerocactus sileri* near the Vermilion Cliffs. Notice the reddish soil the *Sclerocactus* plants are growing in. The flowers are pollinated by small bees.

House Rock Valley is home to a special plant, *Sclerocactus sileri* (L. D. Benson) K. D. Heil & J. M. Porter. This cactus was described by L. D. Benson in 1969 as *Sclerocactus pubispinus* var. *sileri*, then in 1994 it was elevated to the rank of species by K. D. Heil and J. M. Porter. In 1995, a new combination was created by F. Hochstätter, *Sclerocactus whipplei* ssp. *busekii*, in honour of Josef Busek. It is a very interesting taxon, certainly a close relative of *S. whipplei*, but still somewhat different. Interestingly, this taxon was treated in the New Cactus Lexicon (Hunt 2006) as not well-understood and enigmatic.

Between 2002-2004 I used to monitor three micropopulations of *Sclerocactus sileri* in House Rock Valley which were located just next to the dirt road. These were spots visited originally by Josef Busek back in 1976 and 1980 (he mentioned the plants were quite rare there that time). The populations always seemed to be thriving during my visits with numerous plants of all possible sizes from tiny seedlings to huge old examples of the *Sclerocactus*. During my last visit in spring 2004, the *Sclerocactus* plants were loaded with fruits, not fully riped yet.

As we had been discussing this topic with Gerhard Häslinger the day before, Gerhard suggested that we spent more time in House Rock Valley and walk farther away from the road towards the Vermilion Cliffs. And that was exactly what we did.

During the walk we discovered several *Escobaria marstonii* plants with red fruits [Fig.5]. I guess that without seeing the fruits we had no



Fig.11 *Coryphantha vivipara* near Vermilion Cliffs, Arizona.

chance of noticing them. The Escobarias were very dehydrated, almost pulled under the soil and thus very well camouflaged. There were also plants of *Coryphantha vivipara*, *Echinocereus engelmannii* ssp. *decumbens* (the type of this subspecies comes from nearby Marble Canyon, these plants are also often called var. or ssp. *variegatus*), and *Opuntia phaeacantha*.

We tried to look for Navajoa but without any success. Finally, almost at the bottom of the Vermilion Cliffs, we encountered what we were after, *Sclerocactus sileri* [Figs.6-10]. We saw some 25-30 plants, mostly large adults (up to 15cm in diameter) with numerous flowers, but also small seedlings (about 1cm across). The majority of the *Sclerocactus* flowers were white, but some were pinkish or yellowish. The flowers were being pollinated by small bees, as well as by introduced honey bees. Many flowers were damaged, probably by some kind of insect. The *Sclerocactus* plants were exposed to the full sun, growing in reddish sediments among sparsely distributed juniper trees, accompanied by *Coryphantha vivipara* [Fig.11], *Echinocereus engelmannii*, flowering *E. triglochidiatus* ssp. *mojavensis* [Fig.12,13], *Opuntia phaeacantha*, and *O. polyacantha*.

Then we decided to visit one of the populations just next to the dirt road, but we (especially me) experienced a terrible disappointment. The habitat was completely destroyed and we could only find a few miserable plants. More exactly we found 1 tiny seedling, 1 juvenile plant, and 2 dead plants. The area was evidently damaged by off-road vehicles, with copious beer cans scattered around and many juniper trees damaged as well. Moreover, there seemed to be efforts to make the dirt road improved



Fig.12 Flowering *Echinocereus triglochidiatus* ssp. *mojavensis* near Vermilion Cliffs, House Rock Valley, Arizona.



Fig.13 Detail of *Echinocereus triglochidiatus* ssp. *mojavensis* flowers, House Rock Valley, Arizona.

and wider. It was a really sorry sight after what I used to see there before.

Although there most certainly are thousands and thousands of seeds in the soil to support the future *Sclerocactus* generations, there is not much hope if the habitat has been destroyed. Here are GPS data (N36. 47.934, W112. 04.579 1750m) so anybody can check the place and let me know how it looks nowadays.

We continued along the House Rock Valley Road further north and some 10 miles from the Hwy. 89A we stopped. There was a spot where I had seen many *Pediocactus paradinei* together with Jiri Kroulik several years before, but again, we could not find any with Josef (we found 3 plants in total). Josef mentioned that in 1980 and 1982 there were hundreds of *Pediocactus* and the vegetation (consisting mostly of sagebrush) did not seem to be so dense as in 2006. Josef remembered a lot of gramma grass and open space. The landscape here is changing quite drastically, probably thanks to the pastoral farming. Moreover, we saw *C. vivipara* and



Fig.14 Vermilion Cliffs in the late afternoon sun, Arizona.

E. engelmannii plants damaged by some animals (cattle?). What about *P. paradinei* with even more softer bodies?

We also took one dirt road eastwards leading up to the Vermilion Cliffs, but there at an elevation of some 1800m we saw only various *Opuntia* and numerous *Yucca* with long narrow leaves.

It was getting late so we returned back to the Hwy. 89A [Fig.14] and drove some 5 miles eastwards and then we took a dirt road on the right side of the Hwy. 89A, going to the south.



Fig.15 Rattlesnake, House Rock Valley, Arizona.

Somewhere there was a place where Josef discovered Navajoa many years ago, so we tried to look for them. Unfortunately, the habitat seemed to be too dry, the sun was rapidly going down, and moreover, Josef was not sure after such a long time, where the right place would be. We only discovered one lonely rattlesnake there [Fig.15].

Slightly disappointed with not seeing any Navajoa, we got some beers and ended up in a motel in Lee's Ferry (~ US\$80 per room).

[Zlatko Janeba](#)

TWO TO TURICHIPA

Martin Lowry & Mats Winberg describe the excitement of finding plants in Bolivia which have recently been described and remain largely unknown in cultivation.

Photos by the authors



Photo: Mats Winberg

Fig.1 Mats Winberg enjoying a view of the Turuchipa valley

Sucre, 25th November 2012: We woke at around 6am planning to make an early start on the long drive to [Turichipa](#). It had rained heavily three days before with more light rainfall overnight and the skies were still overcast. As it was now the end of the dry season in Bolivia, we hoped this wasn't an omen since we had a long way to go, about 180km, half of it over high ground on dirt roads.

Martin had been keen to travel this road ever since he visited Johan de Vries in 2000 and saw plants of two different *Lobivias* Johan had collected along the route in 1998 with Tim Marshall. The two *Lobivias* were forms of *L. cinnabarina* (VZ072) and *L. versicolor* (VZ072A) quite unlike those in cultivation at the time. Since then, several new species from the region of Turichipa have been described, most notably *Parodia hegeri* Diers, Krahn & Beckert

in 2005 (KuaS 56:127) and *Lobivia krahn-juckeri* Diers in 2009 (KuaS 60:216), placing the area very high on the list of places to visit. Martin had travelled a short distance along the road in 2011 with John Carr and Moises Mendoza but, being short of time, they had to curtail their trip long before reaching Turichipa. For Mats, who primarily had travelled in Argentina looking for *Lobivia* and *Rebutia*, this was also an interesting area to visit.

We left Sucre at 7:36am and made good progress along Ruta Nacional 5 in the direction of Potosi. By the time we reached the low point on the road, 2225m, at the crossing of the Rio Pilcomayo about an hour later, the sun had risen sufficiently to drive off the clouds and the temperature had risen to a very comfortable 18°C or so. We made a brief stop so that we could photograph one of Bolivia's many ornate 16th century bridges, Puente Mendez [Fig.2],

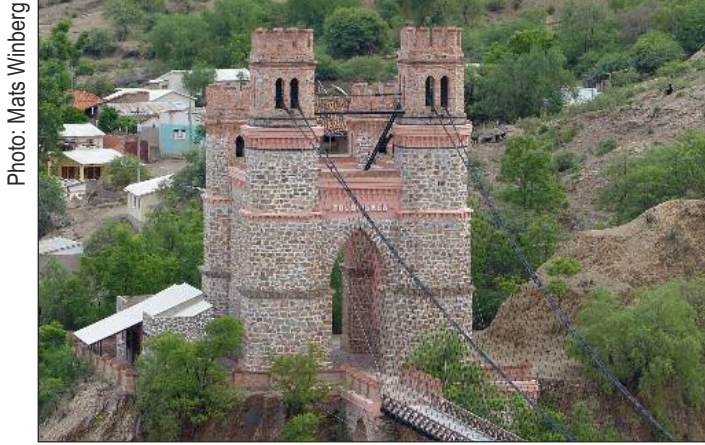


Photo: Mats Winberg

Fig.2 The Northern tower of the recently repaired Puente Mendez, a major tourist attraction on the route from Sucre to Potosi



Photo: Mats Winberg

Fig.5 *Echinopsis bridgesii* ssp. *vallegrandensis*. A very spiny specimen that in the past would probably have been identified as *E. sucrensis* Cardenas.



Photo: Mats Winberg

Fig.3 *Blossfeldia liliputana* growing in its preferred niche, soft loam between layers of shale



Photo: Mats Winberg

Fig.6 *Lobivia tarijensis* ssp. *bertramianus* displaying the typical pale flowers of this subspecies.



Photo: Martin Lowry

Fig.4 Mats Winberg collecting a fruit of *Lobivia tarijensis* ssp. *bertramianus*; it became MN464. Notice the dense forest of *Polylepis tomentella* in the background.

then moved on to Millares where we made a quick pit stop to re-inflate a failing tyre. We then we took a short detour to visit a well-known habitat for *Blossfeldia liliputana* (BLMT914) alongside the Rio Mataka. There, growing between layers of shale and mudstone, we found many hundreds of the tiny plants [Fig.3]. Also there were several

plants of *Weingartia neocumingii* ssp. *lanata*, *Gymnocalycium pflanzii* and *Echinopsis bridgesii* ssp. *vallegrandensis* [Fig.5].

Now feeling an urgent need to move on, we drove the next four hours without making a stop. We first had to climb out of the valley of the Rio Pilcamayo, then cross the high plain at 3260m to Sicllani, where we turned east onto Chimpa Pata Pampa, heading for the small village of Esquire in order to cross the Rio Mataka. The descent to and ascent from the river were very steep with many tortuous hairpin bends, but eventually we emerged from the valley onto a plateau at around 3700m altitude. Now, with about five hours of light remaining and only 60km from Turichipa we could slow down and enjoy the wonderful scenery and interesting plants [Fig.1].

The first plants we noticed were not cacti but trees! At 3700m, trees are normally quite rare, but these trees were special. The hillsides



Photo: Mats Winberg

Fig.7 Our picnic spot at BLMT916 about halfway between Esquire and Turichipa

Photo: Mats Winberg



Fig.8 *Lobivia rossii*, or is it just a spiny *L. cinnabarina*?

were clothed in many thousands of specimens of *Polylepis tomentella*, a high- altitude member of the rose family much prized for its dense, slow-burning wood; the presence of so many trees indicated that the area was comparatively untouched by human activity. Scattered widely amongst the trees were the tall, white columns of *Lobivia tarijensis* ssp. *betramianus* [Figs.4 & 6].

Soon our stomachs made known their displeasure at our inattention to their needs and we pulled over alongside a small mountain stream at 3750m [BLMT916, Fig.7]. We'd already spotted a few red flowers nearby so knew there were cacti here too. After



Photo: Martin Lowry

Fig.9 *Lobivia cinnabarina*, or is it just a flat *L. rossii*? Notice the *Rebutia* flowers just visible on the right edge.



Photo: Martin Lowry

Fig.10 *Parodia hegeri*, one of the several new species described from this area



Fig.11 *Lobivia rossii*, a more typical looking specimen



Fig.12 *Lobivia rossii* with a flower colour more usually associated with *Lobivia pentlandii*!

refreshments, we discovered that the red flowers belonged to possibly four different species, *Lobivia cinnabarina*, *L. rossii*, *Rebutia ritteri* and *R. steinmannii*. It is quite common to find the two Rebutias growing together, yet we have never observed any obvious hybrids. For the Lobivias, the situation here was very confusing. We had also seen these two species growing together before, but usually it is quite easy to tell them apart since *L. cinnabarina* grows applanate and has red flowers, whereas *L. rossii* is more spherical and has yellow/orange flowers. At this place they both had red flowers [Figs.8 & 9]!

About 5km further on we stopped again when we spotted bright yellow flowers by the roadside (BLMT917). Investigation revealed a sizeable population of the new *Parodia hegeri*, with many plants in flower [Fig.10]. Ritter's claim that *P. suprema* grows at the highest altitude, 3500m, for any *Parodia* is thus well surpassed by the new species, since we were still above 3700m and would see it again in a



Fig.13 A precocious juvenile *Lobivia krahn-juckeri* (MN465) providing evidence of its, perhaps, hybrid origin.

few days at over 4000m! It is a striking plant with about 15 ribs and many short, stiff white spines at each areole. The flowers are quite small but produced in abundance [Fig.10]. Growing with the Parodias were more of the confusing Lobivias, displaying both yellow [Fig.11] and pink [Fig.12] flowers, and some *Rebutia steinmannii*.

The Parodias, Lobivias, and Rebutias appeared frequently along the route for many kilometres, but we didn't stop again until we'd started the descent towards Turichipa and had passed out of the zone of the Polylepis forest. By about 3300m the trees had been replaced by low scrub with many bushes of *Dodonaea viscosa*, an invader of disturbed ground that generally indicates extensive overgrazing in the past. Amongst these bushes and surrounding a dilapidated home, we spotted some tall specimens of *Trichocereus tacaquirensis* so decided to take a look round (BLMT918). It was well that we did for there we discovered what at first sight could be taken for *Echinopsis bridgesii*. However, being this close to Turichipa, we realized it was, in fact, the recently described *Lobivia krahn-juckeri*. We found many mature plants, some with buds, and one seedling with a nearly open flower [Fig.13]. This is a very strange Lobivia since mature plants [Figs.14 & 15] are almost indistinguishable from *Echinopsis bridgesii* ssp. *vallegrandensis* [see Fig.5], yet the protologue describes it as having short or long flower tubes and white, magenta, red or yellow flowers!



Photo: Mats Winberg

Fig.14 *Lobivia krahn-juckeri*, mature plants with spent flowers which, unlike the seedling, appeared to have short tubes.

When describing it, Prof. Diers allied it with *Lobivia caineana* but to us it seems possible that it is a stabilised hybrid between *Echinopsis bridgesii* ssp. *vallegrandensis* and a local *Lobivia*, perhaps the one with variable flower colours we had seen earlier in the day, both of which it has displaced. Other plants growing here were *Weingartia fidana*, *Echinopsis tacaquirensis* and *Echinopsis pamparuizii*.

After a further descent of 800m, we reached Turichipa at around 5pm. It is typical of most small South American villages, with all activity centred around the village square. This one was quite plain, no raised flower beds or paved walkways, just bare earth and a couple of trees. Along one side was a row of small *tiendas* (shops), on another the village school, the third held the church and the remainder a few homes. There cannot have been more than 50 houses in the whole village.

Characteristically of these remote places, the arrival of a couple of *gringos* created quite a spectacle and we were soon being watched from every doorway. It must have been obvious we planned to stay overnight since we set about preparing our evening meal and leisurely shared a bottle of wine. Eventually one of the women approached us to let us



Photo: Mats Winberg

Fig.15 Another strong, pale-spined specimen of *Lobivia krahn-juckeri*

know there was no *alojamiento* in the village, but if we wished she would find somewhere for us to stay. After clearing away our dinner, we got into a discussion with some of the locals over a few beers. They asked what we were doing in Turichipa and didn't seem surprised on being told we were searching for cacti. Apparently we weren't the first. Well, we knew that. They told us of the strange European who'd walked across the Rio Pilcomayo and travelled around the area on foot for several days. Yes, they knew [Hansjörg Jucker](#) too!

[Martin Lowry](#) & [Mats Winberg](#)

BIG BEND RANCH STATE PARK, TEXAS, USA

Rick Fend tells us about Big Bend Ranch which is a state park located west from the Big Bend National Park in Texas, USA. The park was established in 1988, and covers an area of about 1000 square kilometers. Photos by the author



Fig.1 Solitario Dome in the park.

The climate of the park is characterized by temperature extremes of the Chihuahuan desert. The summer daily maxima regularly exceed 38 degrees Celsius. The hottest month is July, when temperatures during the day stay around 40°. On the other hand, the coldest month is January, when temperatures drop below freezing point. Summer rains are the main source of moisture. They come with the seasonal monsoon from the Gulf of Mexico in

July, August and September. The winter period is relatively dry and precipitation stays below 110 millimeters.

Among the most interesting geologic formations of the park is a structural dome Solitario [Fig. 1]. It was developed in Paleozoic and Cretaceous rocks above an Eocene granite intrusion. Viewed from above, it suggests an impact crater, though it is actually the eroded remains of a laccolith. Solitario is the type



Fig.2 *Echinocereus viridiflorus* var. *canus*



Fig.3 *Mammillaria pottsii*



Fig.4 *Mammillaria meiacantha*



Fig.5 *Echinocereus stramineus*



Fig.6 *Agave lechuguilla*



Fig 7 *Fouquieria splendens*



Fig.8 *Dasyliirion wheeleri*



Fig.9 *Yucca torreyi*

locality for very beautiful cactus, *Echinocereus viridiflorus* var. *canus* [Fig.2]. The plants prefer siliceous rocks like the Caballos novaculite or Maravillas chert which are easily recognized by their light whitish color. *Echinocereus viridiflorus* var. *canus* grows here together with *Mammillaria pottsii* [Fig.3], *Mammillaria meiacantha* [Fig.4], *Echinocereus stramineus* [Fig.5] and some other succulent plants such as *Agave lechuguilla* [Fig.6], *Fouquieria splendens* [Fig.7], *Dasyllirion wheeleri* [Fig.8] and *Yucca torreyi* [Fig.9].

Of the other interesting geologic features are cryptobiotic soil crusts [Fig. 10]. These soils are important members of desert ecosystems and



Fig.10 Cryptobiotic soil crusts

contribute to the well-being of other plants by stabilizing sand and dirt, promoting moisture retention, and fixing atmospheric nitrogen.

Epithelantha bokei is common throughout the park, and is even more common than its closest relative, *Epithelantha micromeris*. Its distribution range extends south all the way to the Mexican city of Saltillo. Flowers appear in May and June [Fig.11].

Ariocarpus fissuratus is the only species of the genus *Ariocarpus* which grows in the United States. The other species of this genus are found in the Mexican states of Coahuila, San Luis Potosí, Nuevo León and Querétaro. It prefers soils developed on limestone rock, and



Fig.11 *Epithelantha bokei*



Fig.12 *Ariocarpus fissuratus*

unlike most of the other cacti, blooms in the autumn months of September and October [Fig.12].

Escobaria dasyacantha is endemic to western Texas, where it is only thinly distributed. The species is closely related to *Escobaria chaffei* from the Chisos Mountains of Big Bend National Park [Fig.13].

Yucca thompsoniana has fine leaves of bluish colour and grows up to 2.5 meters in height. The inflorescence appears in April and May [Fig.14]. Some other non-succulent plants are equally thriving under these arid climatic conditions. Lupins of the Fabaceae family can be found in dry arroyos, where water runs only after heavy rains. Another one is the desert tobacco of the Solanaceae family. All parts of this plant are toxic, containing the alkaloids of nicotine and anabasine. Although it may seem unusual, spikemosses and ferns have also adapted to these arid conditions in big numbers [Fig.15].

In the entire park one can find 65 species of cacti. This high number is a result of a combination of geology, climate and geography both of which vary with altitude. In addition, the park's biota is influenced by the adjacent ecoregions, the Sierra Madre Oriental, the Rocky Mountains and the Tamaulipan Mezquital and Tamaulipan Matorral.

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Fig.13 *Escobaria dasyacantha*



Fig.14 *Yucca thompsoniana*



Fig.15 Fern

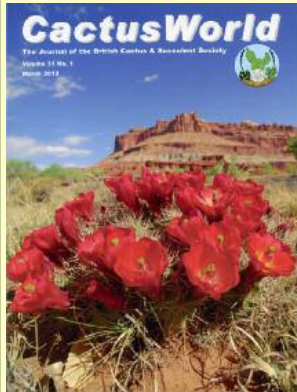
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Berresford, P. (2011) The search for the Graybeard Cactus - encounters with *Echinocereus viridiflorus* var. *canus*. CactusWorld 29(3):133-140

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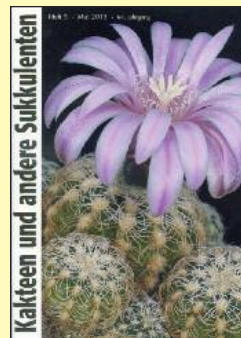
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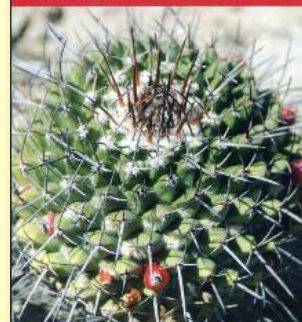
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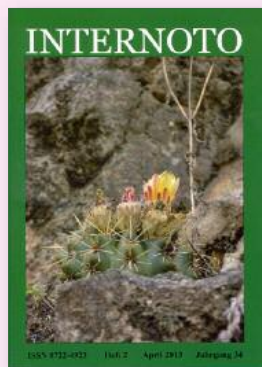


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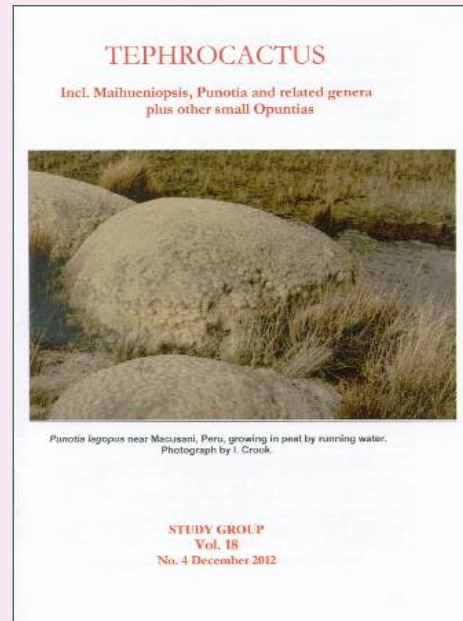
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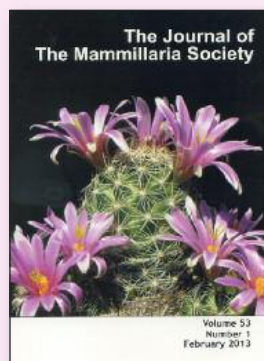
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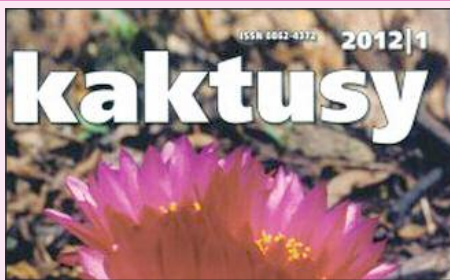
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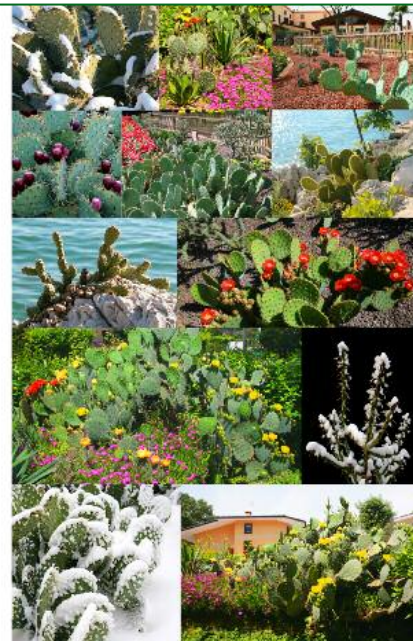


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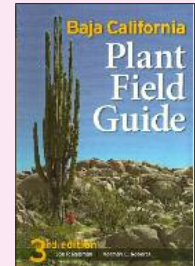
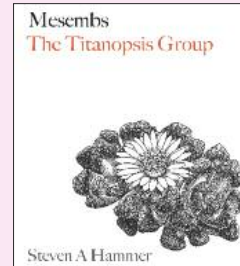
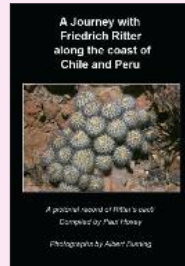
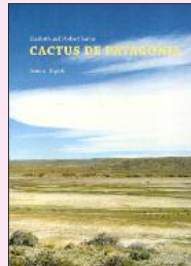
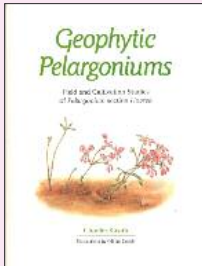
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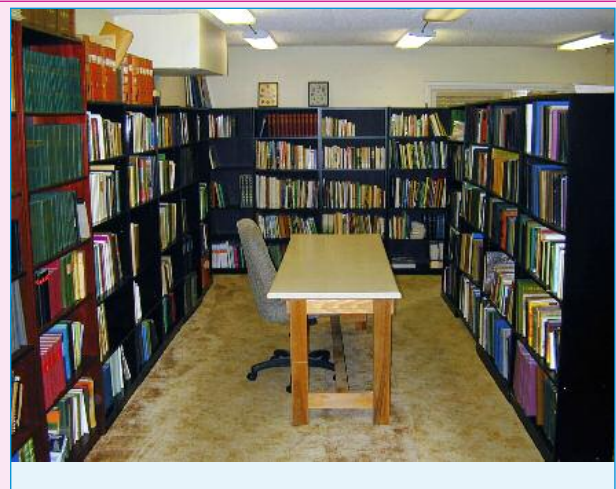
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