

The Cactus Explorer

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

1 *Echinocactus grusonii*

2 *Parodia* (*Eriocactus*)

3 *Austrocactus hibernus*

4 Travels in Arizona

5 Succulents of Tenerife

Number 7

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

Cover Picture *Echinocactus grusonii* at the recently discovered new locality near San Juan Capistrano in Zacatecas, Mexico.

Photograph by Zlatko Janeba

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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The Editorial Team:

Organiser: Graham Charles graham.charles@btinternet.com

Scientific Adviser: Roy Mottram roy@whitestn.demon.co.uk

Paul Hoxey paul@hoxey.com

Zlatko Janeba desert-flora@seznam.cz

Martin Lowry m.lowry@hull.ac.uk

Opinions expressed in the articles are those of the authors, and not necessarily those of the editorial team.

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This issue published on
February 10th 2013

There is a **stat. nov.** on
page 40 of this issue

INTRODUCTION

Longer days at last!

As you read this, the weather in northern Europe will still be cold, perhaps very cold, but at least the days will be getting longer and encouraging us to think of warm sunshine to come.

By the time the plants are ready to start into growth, I am always keen to spend time in the glasshouse and get the growing season started. Some of my friends do their repotting in the winter but I have never been tempted to undertake such work in the cold. One of the best things about a glasshouse is the climate within it when the sun is out, not only warmer but dryer than outside.

Among the first and most pleasing jobs in the season is seed sowing. I am surprised how many enthusiasts do not grow plants from seed. Some lack confidence in their ability to raise plants successfully, while others think it will take too long. The majority of cacti are straightforward to grow from seed although there are some which are sensitive or very slow growing, so requiring special treatment.

The reward is that you can see the natural variation in the seedlings. They often vary not just in appearance but also in vitality. You can choose to keep the best-looking or the fastest growing. Many species are much easier to find on seed lists than as plants, especially if you want more specialist species.

Seed collected in habitat with location data or a field number is particularly valuable if the



plants are to be used for study. Wild seed is also the most likely to exhibit a wide range of diversity as can be seen in the tray of *Copiapoa columna-alba* pictured above.

There is a real sense of achievement when you succeed in growing a plant from seed to flowering for the first time. It is also pleasing to keep a few plants of the same batch from which you can ultimately save your own true seed, a valuable practical conservation activity.

You can find links to many commercial seed producers on pages 65-69 of this journal. Some of the national and specialist societies publish extensive lists of reasonably-priced seeds for their members. It is worth joining just for this benefit.

I am delighted that we are now attracting more advertisements from dealers. These are published for your benefit, the reader, since you may not know of many really good suppliers of seeds, plants and books if they don't advertise in your local journal.

Best wishes for 2013!

Graham Charles

Graham Hole †

After a long struggle with cancer, Graham Hole passed away on the afternoon of 17th January 2013. He will be remembered for his interest in South American cacti, particularly *Gymnocalycium*. Graham was an active member of the Chileans group and made trips to South America with Walter Rausch. He was a true cactus enthusiast and will be missed by his many friends.

The next issue of the **Cactus Explorer** is planned for May 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

Fauna & Flora International



The latest issue of Fauna & Flora carries an interesting article by Stuart Paterson about efforts to protect the cacti of Cuba, an island said to have a remarkable 33 endemic species, 17 of which are threatened. Studies and conservation activities have been supported by the British Cactus & Succulent Society.

Fauna & Flora International is a partner in the Conservation Leadership Programme (CLP), a collaboration which builds the capacity of early to mid-careers conservationists around the world by providing project funding, training and mentoring.

Luisro and his team have been supported by the CLP since 2004. In 2012 they were awarded a Conservation Leadership Award to fund the Cuban Plant Conservation Initiative's national communications campaign and to train local plant conservationists, among other activities. To learn more about this project see

<http://www.conservationleadershipprogramme.org/ViewProject.asp?ProjectID=0282312> GC

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.

BCSS Oxford Branch Plant Auction

This is a really fun event held only every two years. It is a chance to sell your spare plants and acquire specimens you rarely get the opportunity to buy. We all have plants that have outgrown their space so here is a chance to convert them to cash!



Sunday 14th April 2013
 Recreation Hall, Witney Road,
 Long Hanborough, (near Witney) OX29 8BJ
 Viewing and table sales from 12 noon.
 Auction starts at 1p.m.



Contact: **John Watmough**,
 139 Church Cowley Road, Oxford OX4 3JS
 Telephone 01865 772709 or
 email jwatmough1@btinternet.com
 to submit lots or ask for an Auction Catalogue.

North West Cactus Mart

27th April 2013

10.30am - 2.30pm Admission free
 St. Thomas More Church Hall, Kirkway,
 Middleton, Manchester. M24 1PP UK

BCSS Zone 6 Convention

Saturday 20 April 2013
 Wilstone Village Hall, nr.Tring,
 Hertfordshire HP23 4PE England



Speakers

Jakub Jilemicky: The Western Cape:
 Haworthias and other succulents

Peter Berresford: Texas/New Mexico: From
 the Plains to the Mountains

Jakub Jilemicky: Succulents of the Eastern
 Cape

Trade Stands

Toobees, David Neville & **Keith's Plant Books**

Tickets at £15 (includes tea/coffee/biscuits
 on arrival, buffet lunch and afternoon tea)
 are available from David Wilson:

Tel: +44(0)1494581020

E-mail: secretary@berkhamsted.bcsc.org.uk

Full details can be found at

http://www.zone6.bcsc.org.uk/Zone_6_Conventions.htm

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 already booked are *Woody Minnich* from the USA; *Dr Olwen Grace* from RBGK; *Ernst Van Jaarsveld* from Kirstenbosch B.G. South Africa; *Guillermo Rivera* from Argentina; and *Roger Ferryman* UK

In addition, there will be mini-talks.

Full details and on-line booking will appear in *CactusWorld* and on the [website](#) in March 2013.



The 10th IOS Inter-Congress Meeting 10-12 May 2013 at the Botanical Garden and Botanical Museum, Berlin

The programme will include lectures and a tour of the Botanic Garden glasshouses.

Details of participation available from the secretary: David Hunt secretary@iosweb.org

Spalding Cactus Mart

Saturday 20 April 2013

10.00am to 4.00pm

Holbeach Community Centre,
Fishpond Lane,
Holbeach, Lincs. PE12 7DE England

The event will give you the chance to buy plants from Britain's leading nurseries and have a chat with your friends.

FREE parking and FREE admission!

Refreshments available.

Contact: Gerry Blacoe on 01778 393226
or email: gerald@blacoe.gb.plus.com

The BCSS Annual General Meeting

Saturday 13 April 2013

Winstanley High School and Community
Centre, Braunstone, Leicester LE3 3BD

You may not think that an AGM would be much fun to attend but, as well as BCSS business, there are plants for sale and the chance to enjoy the Hampshire/Dunn Memorial Lecture. The speaker will now be Tony Roberts who will tell us about his adventures looking for succulents in South Africa.

This is now the only BCSS business meeting to which all the members are invited so do yourself and the Society a favour by planning to attend.

Mammillaria Society AGM

Sunday 12th May 2013

Hillside Centre, RHS Garden Wisley,
Woking, Surrey GU23 6QB

There will be a talk and a plant display. Participants will have the chance to enjoy the spectacular RHS garden.

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

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 to 55 so book early.
(Previous attendees are guaranteed a place)

18 cactus talks by participants and visiting speakers.

Plant and Book sales.

Meet like-minded people in a pleasant environment. 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](#)



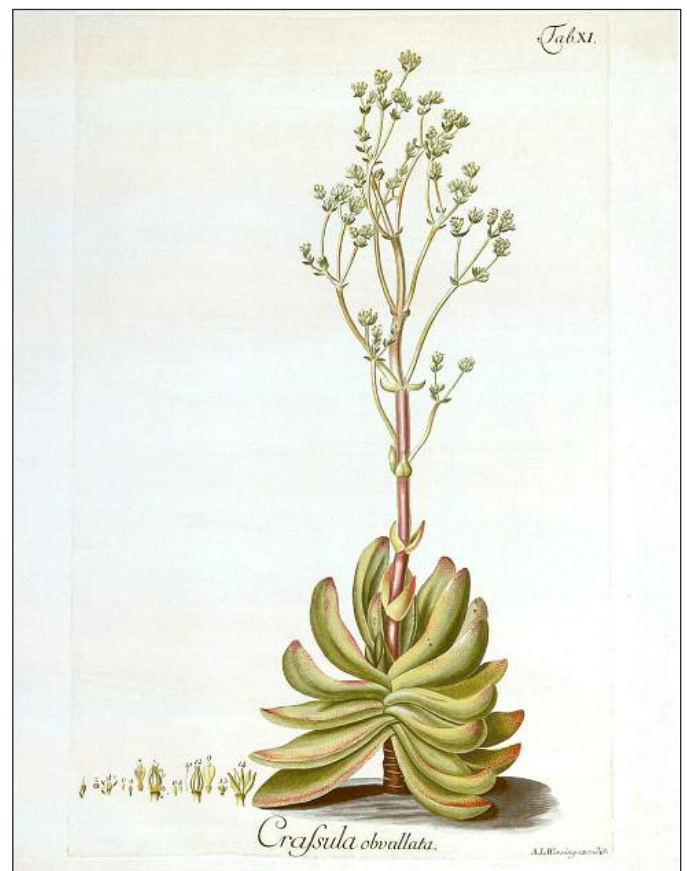
Crassulacea

Another on-line journal has just appeared, this one for the succulent lovers who like Crassula. The new journal Crassulacea can be found at this [web address](#). It publishes miscellaneous notes and observations by the International Crassulaceae Network. Two issues have appeared. The first concerns *Crassula obvallata* and the second *Crassula ovata* Tolkien Group, both written by Roy Mottram.

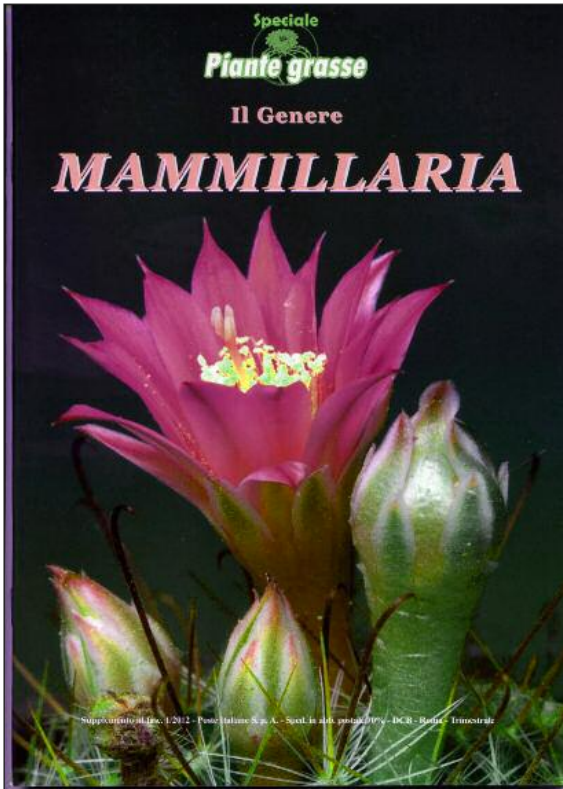
Margrit Bischofberger is the founder of the International Crassulaceae Network [ICNet] and now the first editor of its journal, registered in Switzerland. ICNet has a website consisting of a page for each taxon or cultivar and attempts to describe and illustrate those with as much accuracy as possible.

It has already gained a very high reputation for its informative reference pages. The journal will complement this and aims to maintain a high standard of reporting news and views at all levels of interest, perhaps even encouraging some growers to diversify into Crassulaceae if they haven't yet discovered its joys already.

Roy Mottram



The splendid plate by Trew, from *Plantae rariores* 2: t.11 (1779) included in Issue 1.1 of Crassulacea



**Piante Grasse Special
Mammillaria**

Subscribers to *Piante Grasse* will receive this special issue as part of their membership. It comprises 88 pages plus a soft cover, 240 x 165mm. 29 of the most popular species are discussed (in Italian) and illustrated with large good quality pictures of plants in habitat and culture. There are further notes on history, various classifications, distribution and cultivation.

It looks like a useful introduction to the genus for growers although I cannot say for certain since I don't understand the Italian text well enough! I don't know if this publication will be available separately but you can check at the *Piante Grasse* [website](#). GC

**V Congreso Latinoamericano y del Caribe de
Cactáceas y otras Plantas Suculentas**

The fifth Congress of Latin American and Caribbean cacti and other succulents will be held from 24 to 28 November 2013 at Sucre, Bolivia, organized by the Latin American Society and Caribbean cacti and other succulents (SLCCS) and the Herbarium of southern Bolivia (HSB), University of Mayor Real y Pontificia de San Francisco Xavier de Chuquisaca.

**A late contribution to the article
about *Matucana hoxeyi* on [page 40](#).**

Paul hoxey provides more information about the seeds of the plants discussed.

M. hoxeyi has seeds with a more bulbous base and a distinctly shaped top, perhaps hat-shaped is an appropriate term. This shape isn't present in *M. paucicostata*. Interestingly *M. pujapatii* has a seed quite like *M. hoxeyi* and both are cold sensitive.

I wonder if the nearest relative of *M. hoxeyi* is *M. pujapatii* and somehow it managed to move back upstream to colonise the Rio Rupac. Or perhaps *M. hoxeyi* is the ancestral form and *M. pujapatii* moved down stream!



Paul Hoxey's pictures of seeds are photographed on a 2mm grid background.

M. hoxeyi
PH643.01



M. paucicostata
PH389.01



M. pujapatii
PH193.01

[Paul Hoxey](#)

RECENT NEW DESCRIPTIONS

Daide Donati has kindly allowed the **Cactus Explorer** to reproduce parts of his article describing *Neolloydia inexpectata*, a new species recently published in *Piante Grasse XXXII (3):2-9 (2012)*.
Photos by the author



Fig.1 An adult plant of *N. inexpectata* in habitat showing its similarity to a young *Coryphantha*.

The areas close to the southern-most part of the boundary between the Mexican States of Nuevo Leon and Tamaulipas are characterized by mountain ranges with variable heights, starting with low hills, going right up to high mountain ranges and culminating with Peña Nevada.

Despite the rather dry climate, this area supports a great biodiversity, and is generally covered, at low-medium altitudes, by fairly dense xerophilous vegetation. During the exploration of very low gravelly hills, I found a very peculiar form of *Neolloydia*, comparable with *N. matehualensis*.

Simple morphological observations would lead one to think of an extreme form of the widespread *N. conoidea*, but finding a small

colony of this plant sharing its habitat with the typical *N. conoidea*, showing two quite distinct taxa living as close as a few dozen centimetres from each other, has compelled me to perform further research on this peculiar taxon.

The adult specimens of this taxon show a rather peculiar morphology, with a globular, globular/depressed stem, elongated in very old specimens and plants growing in partial shade, with wide and short tubercles, short and robust spination; so that this plant could be easily mistaken for an immature specimen of *Coryphantha*.

The immature specimens of this taxon frequently show a depressed stem, sometimes flattened on the ground during the dry season, whilst the hypogeal portion of the stem is



Fig.2 An adult plant of *N. inexpectata* in habitat.

rather developed, resulting from subterranean contractions during the early growing phases and basal thickening, frequently forming a short thickened taproot which has bundled

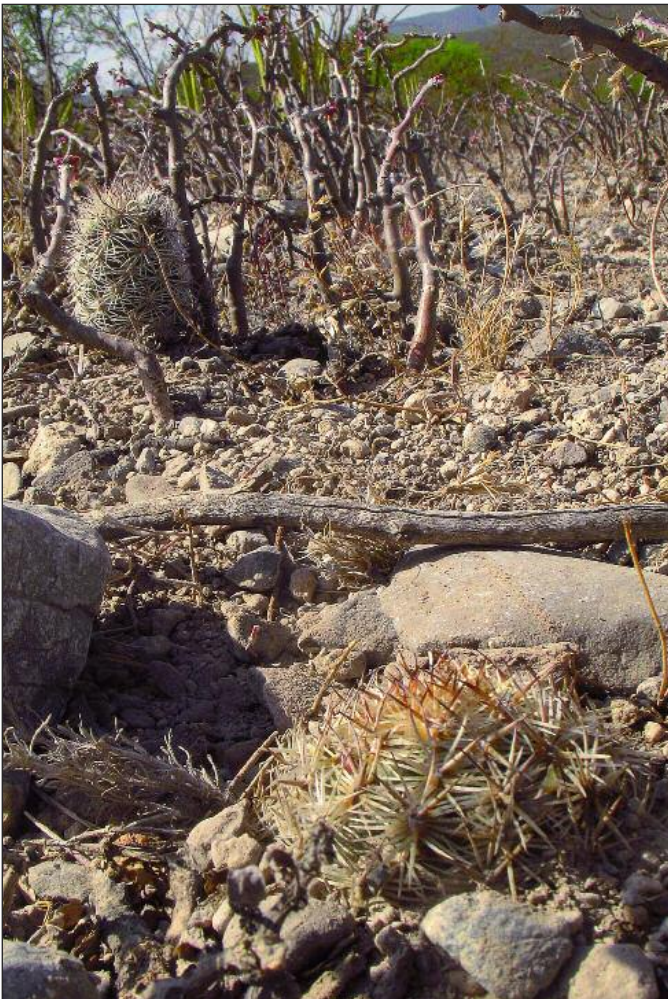


Fig.3 *N. inexpectata* in front and *N. conoidea* in the background, separated by a few dozen centimetres.

roots.

This plant occupies a rather small and well defined, albeit fragmented, distribution range, with the total number of individuals not very large, although there are some spots with a relatively high number of plants.

A small colony of this *Neolloydia* grows together with typical *Neolloydia conoidea* and it is very easy to distinguish the two plants, without finding any morphologically doubtful specimens. The two plants flower at the same time.

Based on the currently available data, I believe that this *Neolloydia* should be described as a new species. The finding of this new and unexpected *Neolloydia* has, in my opinion, a significant impact on the *Neolloydia* genus itself (as it is considered today), since its existence raises the following question:

Is *Neolloydia conoidea* really an extremely polymorphic species, or conversely, a number of distinct species that have been neglected and included in a single species for lack of in-depth studies? Detailed studies in situ and in the laboratory will be necessary to answer this important, albeit underestimated, question.

Davide Donati

IN THE GLASSHOUSE

Tephrocactus bonnieae “buckyballs”

We are always being told to look at our plants more closely. Tony Roberts shows us that we probably should have taken more notice in our school maths lessons to interpret what we see!

Photos: Tony Roberts (except where stated)



Photo: Mike Partridge

Fig.1 *Tephrocactus bonnieae* in habitat west of Fiambala, Catamarca, Argentina

Some “Cactus Explorers” (like me!) don’t get out into habitat as often as they would like, so much of the exploration is done in the greenhouse. So how closely do you look at your own plants? I’m sure many of you are aware of the Fibonacci series (0, 1, 1, 2, 3, 5, 8, 13, 21, ...) which you can see in nature, for example, in the arrangement of the tubercles of many *Mammillarias* or the number of ribs in *Lophophora* (never mind the seeds of a sunflower or the florets of a cauliflower!). Look more closely and you can see other mathematical patterns and arrangements in your plants too – here is one which I have been studying, and which I don’t believe has been described before.

Tephrocactus bonnieae which was originally described as a *Puna* (Ferguson and Kiesling, 1997) but now correctly classified as a *Tephrocactus* (Stuppy, 2001) is a plant well worthy of growing, being rightly considered as one of the gems of the small *Opuntiads*. These plants occur as tiny specimens in their natural habitat near Loro Huasi in the Argentinean province of Catamarca [Fig.1]

but you more often see them in culture as multi-headed clumps, often grafted onto *Austrocylindropuntia subulata*. This produces attractive, if somewhat unnatural, plants which certainly in my hands have a propensity to flower well [Fig.2]. The challenge is growing them successfully on their own roots, although the individual segments will root down quite readily if you almost bury them in



Fig.2 *Tephrocactus bonnieae* in flower in cultivation.

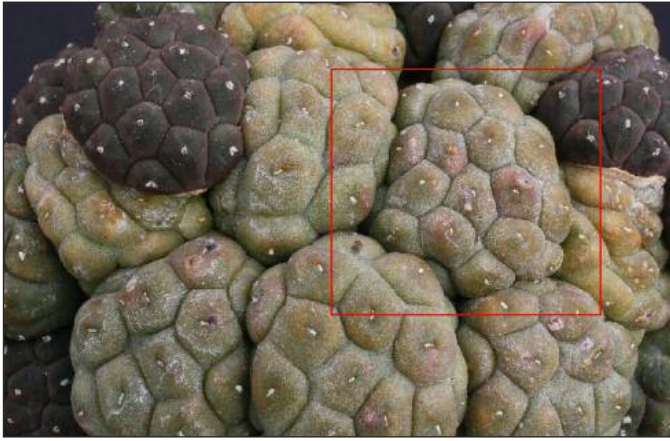


Fig.3 *Tephrocactus bonnieae* (spineless form).

very well-drained compost and then have patience. It was while doing just this that I had reason to examine the segments much more closely.

The more common form of *T. bonnieae* has many tiny spines (as seen in Fig.2) but there is another form which is spineless [Fig.3] and I'll use this to illustrate my observations. Each segment is made up of a number of sections. Look at one in particular (the red shaded one in Fig.4a) and you will see it is a pentagon, each side of which is adjacent to a hexagonal section (yellow numbers 1 to 5). Now take one of these hexagonal sections (the yellow shaded one in Fig.4b) and you will see that this is adjacent to alternating pentagons (red numbers 1 to 3) and hexagons (yellow numbers 1 to 3). If you were to continue this process over the whole segment, what you will observe is the shape depicted in Fig.5 – a truncated icosahedron, which consists of 12 pentagons and 20 hexagons.

This is nature's way of making a nearly "perfect sphere" which I'm sure you will recognise as the design used by many manufacturers of footballs (Fig.6a). The advantage of this shape is that the football can be under-inflated or over-inflated and it will still keep its shape and not (usually) burst. The same is true of *T. bonnieae* – in times of drought the plant segment shrinks evenly and neatly, whilst after a sudden and perhaps rare watering it swells quickly, but does not split as the geometric shape

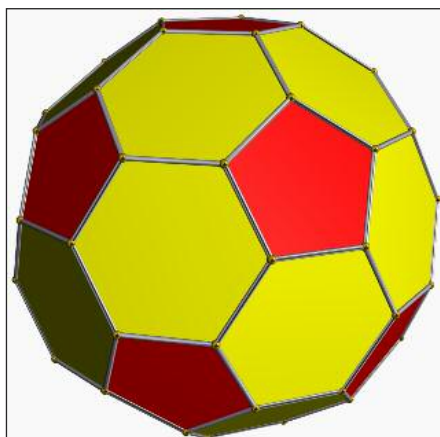


Fig.5 A truncated icosahedron.



Figs.4a and 4b. A segment of *T. bonnieae* showing the pentagons and hexagons.

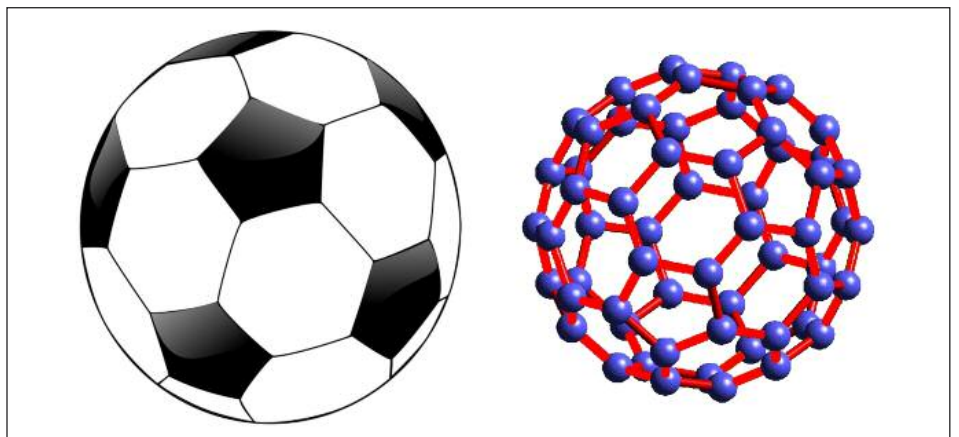
allows it to expand quite evenly (cf. strongly ribbed plants which can often split when given too much water too quickly, particularly at the beginning of the season). [I ought to add that not all segments show this perfect symmetry, but when grown to maturity, particularly on a plant "above ground", they do!]

So does this geometric shape occur elsewhere in nature? Why yes – famously just once! A new allotrope of carbon that consists of 60 carbon atoms in the shape of a truncated icosahedron (the 32-sided shape has 60 vertices, Fig.6b) was discovered in the eighties (Kroto *et al.*, 1985); this molecule was named Buckminsterfullerene and given the nickname "buckyball", hence the title of my article. Kroto, Curl and Smalley were awarded the Nobel Prize in Chemistry in 1996 for this discovery – I'm still waiting for mine!

References

- Ferguson, D. J. & Kiesling, R. (1997)** *Puna bonnieae* (Cactaceae), a new species from Argentina, *Cact. Succ. J. Am.*, 69:287
- Kroto, H. W. et al. (1985)** C_{60} : Buckminsterfullerene, *Nature*, 318:162; see also: http://www.nobelprize.org/nobel_prizes/chemistry/laureates/1996/
- Stuppy, W. (2001)** A New Combination in *Tephrocactus* Lem. (Cactaceae), *Kew Bulletin*, 56:1003

tony@robertscacti.co.uk



Figs.6a and 6b. A football and a C_{60} "buckyball"

Flowering *Echinocereus hancockii* in the glasshouse

Paul Hoxey tells us about his success at flowering an *Echinocereus* from Baja California which rarely blooms in cultivation in the UK.

Photographs by the author (except where stated)



Fig.1 *Echinocereus hancockii* PH317.01 at San Hipólito, Baja California Sur, Mexico. 30-70m

Echinocereus is one of the most popular genera of cacti to grow and has a large fan base and a specialist society, based in Germany, devoted to the study of the plants. The genus has a diverse range of species from the diminutive *Echinocereus pulchellus* through to the large growing species such as *Echinocereus enneacanthus* that can make clumps 2 metres or more in diameter.

It is undoubtedly the flowers that give the grower the greatest joy. They are usually large, brightly coloured and produced relatively easily on many species. Invariably, there are exceptions to every rule and this short article introduces a species that is rarely seen in collections and perhaps the most shy flowering of all the *Echinocerei*.

Echinocereus hancockii was described in the American periodical *Desert Plant Life* in 1949 by Elmer Yale Dawson. The type location is on the north side of Bahía San Hipólito on the west coast of Baja California, Mexico. The plants grow on arid and fairly barren slopes within sight of the sea where they make clumps of chunky fiercely spined stems [Fig.1]. *Echinocereus hancockii* is clearly related to *Echinocereus maritimus*, a much more common and widespread plant that grows further to the north on the Baja peninsula.

Echinocereus hancockii has stronger spination and more robust stems but otherwise is quite similar. Nigel Taylor (1985) reduced *Echinocereus hancockii* to a variety of *E.*



Fig.2 *Echinocereus maritimus*



Fig.3 *Echinocereus hancockii*

maritimus. Later, Blum et al. (1998) considered it a subspecies of *E. maritimus* but more recently Hunt et al. (2006) declined to accept the name at any rank but with the caveat "Field studies are needed to determine the status of this giant form". You can take your pick whether to call it a species, subspecies, variety or ignore the name altogether!

Personally I am unsure if *E. hancockii* is worthy of a botanical rank. Perhaps it is best just considered a giant form of *E. maritimus* growing at the extreme southern end of the distribution. Nevertheless, having a handle to give to this plant helps the grower distinguish it from the more typical forms of *E. maritimus* so the name 'hancockii' at whatever rank serves a useful purpose.

In 2002 I raised a number of seedlings of both *E. hancockii* and *E. maritimus* and kept about 5 of each for growing on in my own collection. Over the last 10 years they have



Fig.4 *Echinocereus hancockii* bud

grown quite slowly in typical greenhouse conditions on an unshaded bench, so the spination has been good and the heads have stayed compact.

During a long overdue repot in 2011, I moved all the seedling from 9cm into 14cm pots which accelerated growth in the spring and summer of 2012. *E. maritimus* produces smaller but more numerous heads and with spination that is not quite as strong as *E. hancockii* [Figs.2 & 3]. This matches character traits from habitat and indicates that the morphological differences are genetic and not just due to environment conditions.

It was with some surprise but excitement that I noticed two small buds appearing from the upper side of the areoles of one *E. hancockii* in early September 2012 [Figs.4 & 5]. Most *Echinocereus* buds burst through the epidermis of the plant but *E. hancockii*, in common with a few other Baja species, do not do this.

I wondered if the reddish brown buds, lacking any spines at the time, would continue to develop into the autumn. My fears were



Fig.6 *Echinocereus hancockii* flower



Fig.5 *Echinocereus hancockii* in bud

unfounded and over the next 3 weeks they continued to grow and developed a few weak spines. On the 29th September the first flower opened to reveal the yellow petals. Sometimes flowers are reported to have a reddish throat but my plant had pure yellow petals [Fig 6 & 8]. Observant *Echinocereus* enthusiasts will also notice the colour of the stigma lobes [Fig. 7]. The vast majority of *Echinocereus* species are described as having green stigma lobes and this feature is often quoted as a distinguishing character of the genus. The pale yellow stigma with barely a hint of green is very unusual in the genus. This feature of yellow, or sometimes very light green stigmas, is shared with a few other Baja California species such as *E. brandegeei*, *E. ferreirianus* and *E. pensilis* although I am unsure how consistent the character is in all these species. The flowers on my *E. hancockii* seedling lasted well into October perhaps due to the cooler conditions prevailing at that time of year.

Echinocereus hancockii is notorious for being shy to flower, so to produce flowers on such a young plant was a great surprise. Is there a



Fig.7 *Echinocereus hancockii* showing the yellow stigma



Fig.8 *Echinocereus hancockii* in flower

reason why this occurred? The summer of 2012 was one of the wettest on record with less sun and cooler conditions than usual in the UK. Perhaps these climatic conditions suit this species because in its natural habitat on the west side of the Baja Peninsula temperatures are not excessive. Cooling winds blow in off the sea and bring with them clouds and mist and result in temperatures a few degrees lower than in similar habitats on the eastern side of the peninsula.

Another shy flowering cactus from Baja California is *Mammillaria halei*. This also grows on the western side of the peninsula. I have been told this plant can be persuaded to flower if moved to a shady spot in the greenhouse. I have not been able to verify this theory but it would be interesting to hear from anyone who has flowered this plant or *Echinocereus hancockii* to know if this tip really works.

Paul Hoxey
paul@hoxey.com

References

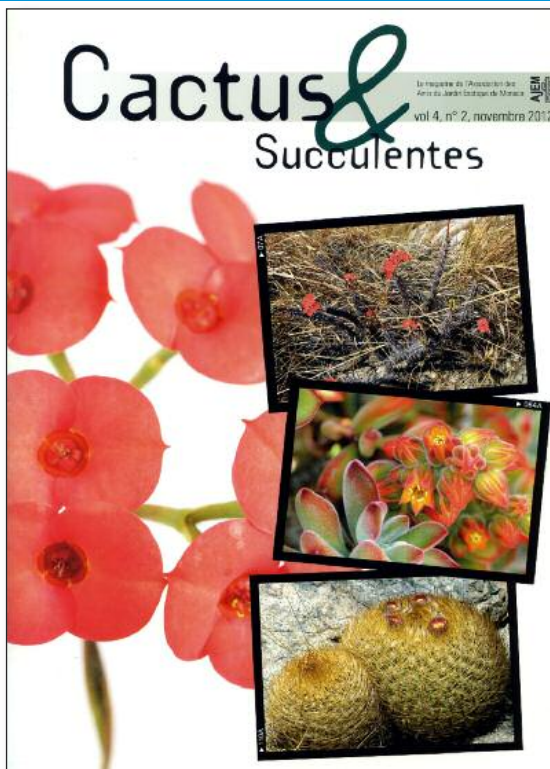
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Fig.9 *Echinocereus maritimus* NCT31 for comparison

Photo: Graham Charles

JOURNAL ROUNDUP



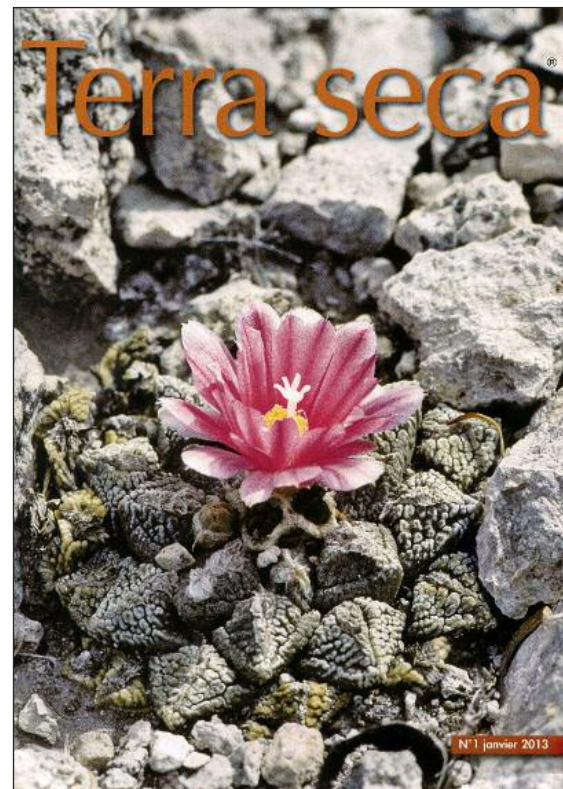
Journal of the Friends of the Jardin Exotique de Monaco

Now completing four years of publication, this large-format French language journal maintains its content of well-illustrated articles by renowned authors. The production is high quality with good pictures and a pleasing layout.

The latest issue, Vol.4 (2) has articles about *Echinocactus parryi*; A new species of *Euphorbia* from Madagascar, *E. beuginii*; *Kalanchoe rebmannii*; *Eriosyce aurata*; *Echeverias* and *Euphorbia millii*.

There are two issues a year and you can subscribe for about 23€ by contacting ajem@amisjem.com More details about the contents of previous issue can be found on the [website](#) of AJEM.

GC



Terra Seca

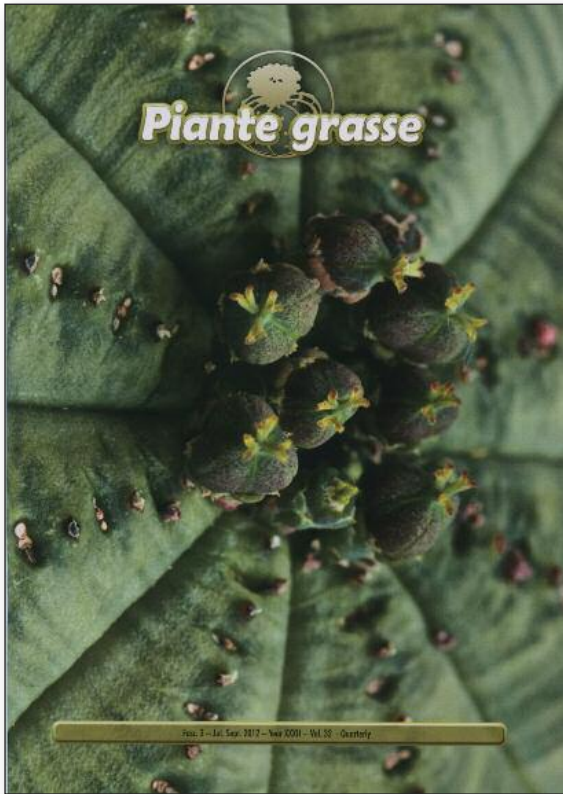
Another French language journal which continues to deliver well-illustrated articles about interesting subjects.

The January 2013 issue contains articles about historic paintings of succulents; the first part of an article about *Ariocarpus* in habitat illustrated with excellent pictures by Anton Hofer; a thought-provoking article about succulent orchids; and the first part of a series of articles about the genus *Gymnocalycium* by an acknowledged expert Detlev Metzger.

You can find out about how to subscribe to the journal by visiting:

<http://www.terraseca.org>

GC



Pianta grasse in English

The third issue available in English has just been published and it is great to have more interesting material to read with ease. The layout is very attractive and represents a significant improvement over recent years. The pictures are very good and are reproduced at a good size.

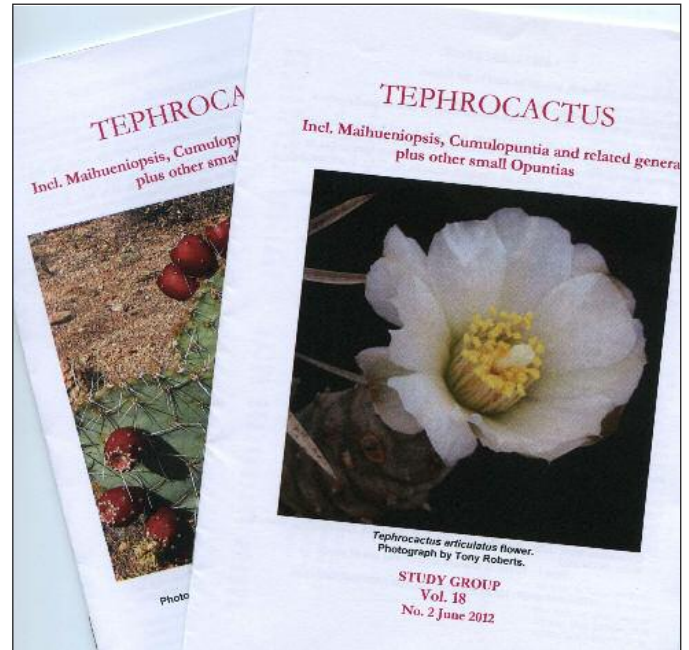
I was sorry to read that, having revitalised *Pianta grasse*, Davide Donati has been forced to step down as editor because of ill health following an accident in Mexico. We wish him and the journal well in the future.

This issue includes the description of a new species *Neolloydia inexpectata*; A day in the Quebrada San Ramon looking for *Copiapoa krainziana*; The genus *Euphorbia*; *Echeveria laui* is in care; *Sempervivum grandiflorum*; and some advice on photography.

It is a brave venture to produce a special English language version of the journal at this time, so please consider subscribing to it:

<http://www.piantegrassejournal.it/eng/index.html>

GC



Tephrocactus Study Group

After a delay in publication, Issues 2 and 3 for 2012 have just arrived with a promise that No.4 is on the way.

No.2 has articles about *Tephrocactus articulatus*; Flowering *Tephrocactus geometricus*; A profile of John Betteley; and comments about *Cumulopuntia iturbicola*, *Maihueniopsis minuta* and *M. mandragora*.

No.3 includes an article about large-growing North American *Opuntias*, extending the remit of the group to these fascinating plants. Tony Roberts encourages us to grow *Corynopuntia* - An underrated genus in culture.

There is an interesting article about *Micropuntia* by Elton Roberts, well-known for his cultivation skills, and Ivor Crook tells us about the origins of *Opuntia ficus-indica*, one of the most written-about of all cacti.

Joe Shaw gives an introduction to his website for *Opuntia* enthusiasts. It is well illustrated and certainly worth visiting:

<http://www.opuntiads.com/O>

Information on subscribing to the *Tephrocactus* Study Group can be found on their website:

<http://www.cactus-mall.com/tsg/index.html>

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 third issue of Xerophilia appeared early in December 2012. 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 third edition has 88 pages and includes articles about *Aeonium 'Rangitoto'*; Locations of *Strombocactus disciformis*; The genus *Thelocactus*; x *Carpophyma mutabilis*; *Thelocactus rinconensis* complex; *Thelocactus macdowellii*; an interview with John Pilbeam; and more about Alfriston Botanic Gardens. The next issue is due by the 30th March 2013.

The magazine may be downloaded as a pdf from

<http://xerophilia.ro>

Contact: xerophilia@xerophilia.ro

NEW!

ECHINOCEREUS Online-Journal

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

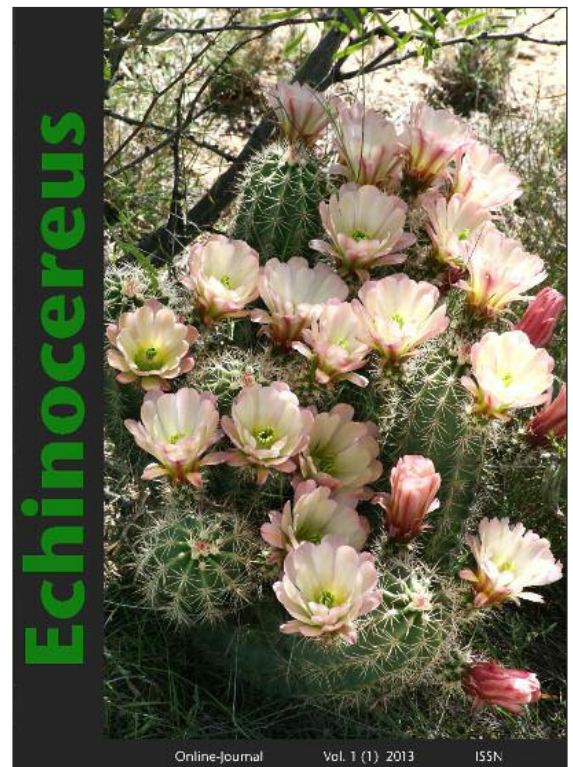
The goals of this new journal are to study the genus *Echinocereus*, to publish articles about the continuous research on these plants (classification, morphology, evolution) as well as to protect the genus *Echinocereus* by reproduction from seeds and distribution of the seedlings.

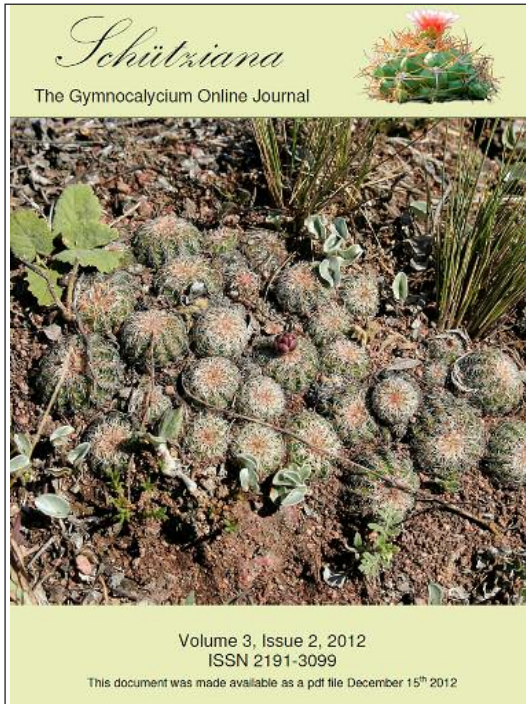
In this first issue there are well-illustrated articles about *E. pulchellus*, *E. triglochidiatus*, *E. x lloydii*, and *E. koehresianus*. Text in German with English summaries. There are many large pictures of good quality making this a very attractive publication.

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

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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

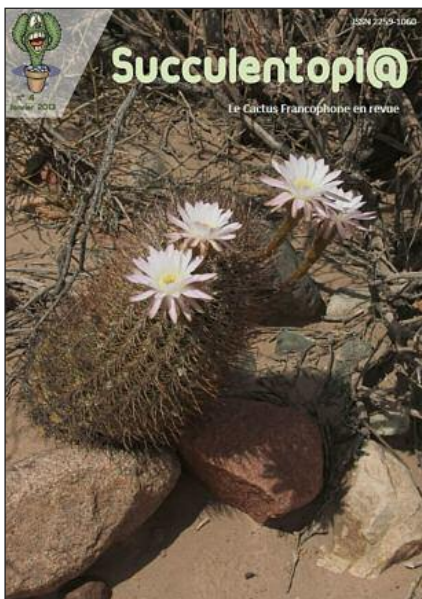
Annual seed list for members and much more.

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,
geschaeftsstelle@fgas.sukkulenten.de



Succulentopi@

The fourth 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:

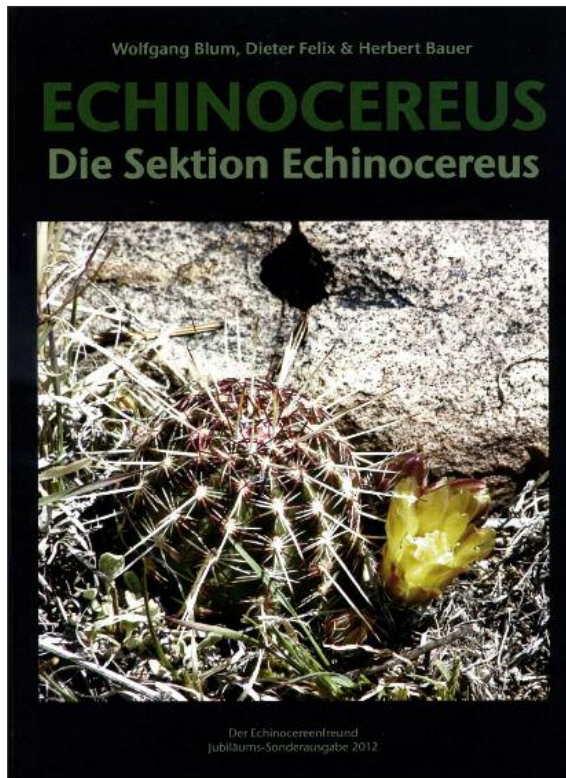
<http://www.cactuspro.com/succulentopia>

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.



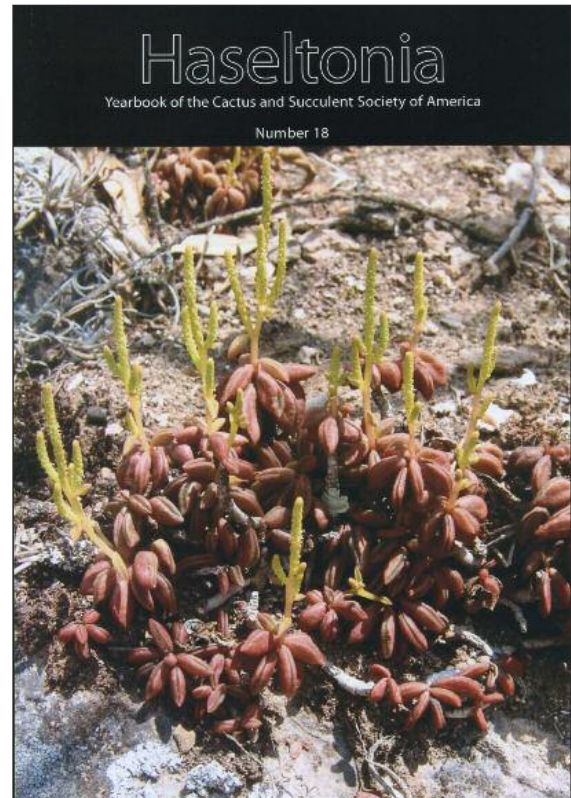
Echinocereus section Echinocereus Blum, W., Felix, D. & Bauer, H.

The latest in a useful series of books from the German Echinocereenfreund study group. This volume deals with the relatives of *E. viridiflorus*, *E. chloranthus* etc. It also includes the first description of a doubtfully - distinct new species named as *E. blumii*. The detailed text is in German with a small amount also in English.

As with the other books in the series, the colour illustrations are good quality and the production is excellent. 336 pages, 230 x 165mm, hardbound with picture cover, 298 colour pictures, 3 maps, 49 seed SEMs, and 25 images of herbarium sheets.

Available for 39€ plus carriage from the Echinocereenfreund [website](#).

GC



Haseltonia 18 - Yearbook of the CSSA

The latest bumper issue of Haseltonia contains fourteen articles covering a wide range of topics with something for everyone. A remarkable 22 new species are described.

Subjects include *Peperomia*; *Cleretum*; *Gibbaeum*; *Sedum*; *Echeveria*; the succulent flora of Mona Island; *Opuntia* chromosome numbers; *Opuntia ventanensis*; seeds of *Harrisia fragrans*; *Harrisia*; *Gymnocalycium esperanzae*; *Trichocereus* of Chile; and *Crassulaceae* of Veracruz, Mexico.

This will be the last issue edited by Martin Terry who tells us that he wants to work on a new book about *Lophophora*. He promises the results of molecular studies so perhaps this will help to decide how many species there really are!

You can buy your copy of this and previous Haseltonia issues from the CSSA web shop:

<http://shop.cssainc.org/haseltonia.html>

Mesembs The Titanopsis Group



Steven A Hammer

Mesems The Titanopsis Group

The Little Sphaeroid Press has joined forces with Steven Hammer to produce a series of eight new books that describe and illustrate every compact collectable member of the Living Stones from the unique perspective of this well-known and widely travelled mesemb expert.

Everyone knows Steven Hammer's hundreds of articles, dozens of new species descriptions, 32 trips to South Africa, and three major books on Conophytum and Lithops.

This is the first volume in the series to be published. It is a complete treatment of the 34 compact and collectable species in the genera *Aloinopsis*, *Nananthus*, *Titanopsis*, *Deilanthus*, *Didymaotus*, *Ihlenfeldtia*, *Vanheerdea*, *Prepodesma*, & *Tanquana*, by the world's foremost authority on mesemb cultivation, hybridisation and exploration. It includes two new species descriptions and one new combination.

Comprising 208 pages 254 x 220mm; hardcover quarter bound in cloth and paper with French-fold dust jacket featuring original wood engravings; 237 photographs of wild and cultivated plants; 12 watercolours; 13 line drawings; 6 distribution maps. Produced to a high standard on quality paper and thread



The splendid drawing of *Aloinopsis luckhoffii* at Brakfontein by Janet Synman

sown binding.

This is truly a beautiful book with a pleasing layout and featuring numerous high-quality photographs, many whole page, and excellent botanical drawings. There is a foreword by the prominent South African botanist Ernst van Jaarsveld, followed by a general introduction about history, taxonomy, hybridisation, cultivation and habitats, topics which are later covered in detail for each genus..

The nine genera are then treated in detail with a splendid botanical drawing to introduce each chapter. Appendix 1 provides notes on the cultivation of *Mesembryanthema*, originally written by Arthur Tischer. Further appendices offer historical notes and a full list of accepted taxa. A bibliography and index complete this impressive work.

You can find out about buying the book direct from the publisher, which is priced at \$59.95 plus carriage, at

<http://www.littlesphaeroid.com>

It is also available from [Keith Plant Books](#) at the attractive price of £36, or £39 including carriage within UK.

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CACTUS PEOPLE HISTORIES

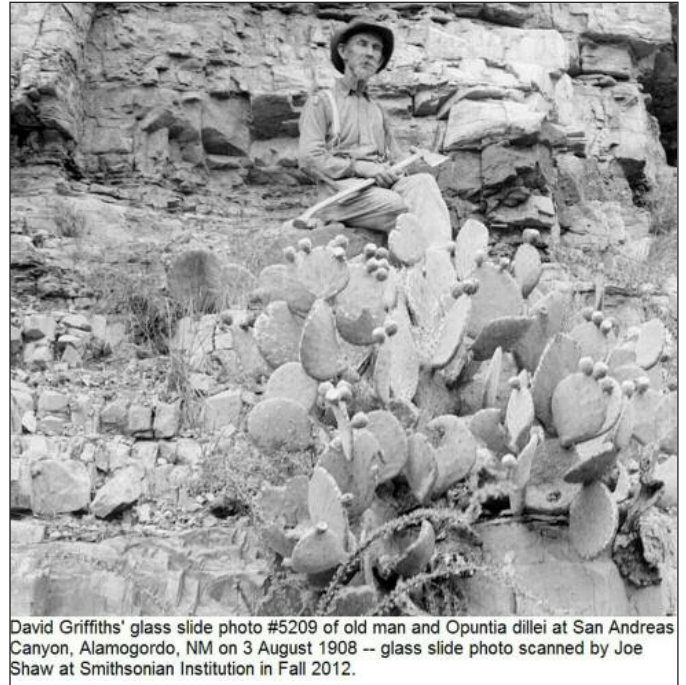
Chuck Staples continues his series about people who have made significant contributions to the study of cactus and succulent plants. This time his subject is David Griffiths



Permission to reprint this 1893 photo of David Griffiths (1867-1935) in non-profit publications granted by South Dakota State University in November 2012.

The following brief biography touches mainly on the aspects of the life and career of David Griffiths as 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.

David Griffiths (1867–1935) became interested in *Opuntia* (prickly pear cactus) family of plants as emergency livestock feed for cattle in times of drought. Born in Aberystwyth, Wales on 16 August 1867 he immigrated to the United States of America with his parents when he was only three years old. Growing up on a farm in South Dakota he attended the local schools in Groton and Aberdeen, both in Brown County in northeast South Dakota. His higher education was at South Dakota Agricultural College (now South Dakota State University) in Brookings with a



David Griffiths' glass slide photo #5209 of old man and *Opuntia dillei* at San Andreas Canyon, Alamogordo, NM on 3 August 1908 -- glass slide photo scanned by Joe Shaw at Smithsonian Institution in Fall 2012.

Bachelor of Science degree in 1892 and a Master of Science degree in 1893 — majoring in botany.

With his Master's degree behind him he taught biology, physics and chemistry in Aberdeen High School until 1898. Moving on — specializing in botany and zoology at Columbia University in New York City — he received a PhD degree in 1900.

Upon receiving his PhD he was appointed professor of botany at the Experiment Station of the University of Arizona, Tucson for one year where he began studies on grasses and other range plants. His next step was to join the Bureau of Plant Industry of the United States Department of Agriculture (USDA) and became an agrostologist in the Office of Grass and Forage Plant Investigations. For the next 15 years he collected native grasses, salt bushes and cacti in the United States and in northern Mexico. He became especially interested in prickly pear cacti and other xerophytic plants as emergency livestock feed in times of drought.

This interest involved travel and collection



David Griffiths and his camera from the Smithsonian glass slides.

of cacti from northern United States south into northern Mexico. Specimens were given to three botanical gardens: Plant Introduction Gardens in Chico, California; San Antonio Gardens, Texas; and Southern Texas Gardens in Brownsville, Texas. The purpose was to grow them in different geographical areas that would allow him to identify truly unique species. At one time there were some 3,500 separate *Opuntia* plants at the Chico location which included about 100 different species, many of which he himself collected.

Griffiths took extensive glass slide photos of his plants, most of which are now stored at the Smithsonian Institution. The glass slides stayed in storage until 1956 when most of them were sent on loan to Lyman Benson (1909–1993) at Pomona College for his studies in the Cactaceae. These photos remained at Pomona College for about 30 years before being returned to the Smithsonian Institution. Amazingly, most of the glass slide negatives remain unbroken and are still in good shape when scanned.

During his time with prickly pear cactus he wrote numerous small books, pamphlets and articles that had mostly to do with feed stock. *Sedum griffithsii* was named in his honor by Joseph Nelson Rose (1862-1928) in 1905.



Packing and shipping Chico cuttings to five growers in June, 1930. Represented in the photo are Wm. Hertrich, Mrs. John D. Wright, E. O. Orpet, and Ralph Hoffman.

This distribution of Dr. David Griffiths' *Opuntia* collection was made after his experiment of *Opuntia* species as cattle feed was completed in about 1916 at Chico, California. The originals of some 100 species of *Opuntias* were mostly collected by David Griffith (1867-1935) on various expeditions into US & Mexico in early 1900s.

Griffiths described at least four plants that were discovered by him: *Nopalea inaperta*, *Opuntia aciculata*, *O. atrispina* and *O. fuliginosa*.

After his experimentation with spineless prickly pear cactus, Griffiths spent the remainder of his years in the study of bulbous plants. David Griffiths died on 19 March 1935 at an Emergency Hospital in Washington DC.

Reference

Griffiths D. 1953. David Griffiths' *Opuntia* Collection – Memo from him 15 Oct 1930. *Cact Succ J (US)* 25: 120.

Chuck Staples, Des Moines, Iowa USA,
charlesjstaples@msn.com

COPIAPOA ANGUSTIFLORA

Graham Charles reminds us about a small growing plant that has often been seen in habitat but is rarely cultivated.

Photos by the author.



Fig.1 *Copiapoa angustiflora* GC728.04 in habitat in the Guanillos Valley, near Esmeralda, Chile

It was during my first trip to Chile in 1994 that I went to Esmeralda with the hope of seeing *Copiapoa laui*. We first went to Pan de Azucar National Park, a wonderful place to explore and look for cacti. We paid our entry fee at the Park Headquarters and asked if one of the rangers would accompany us the following day to Esmeralda, an abandoned mine just north of the Park. We were able to make the arrangement and agreed to collect the ranger the following morning so that he could guide us through the maze of tracks to Esmeralda.

We pitched our tents at the campsite on the beach and enjoyed a meal looking out to sea as the sun set alongside the island where tourists go to see penguins. Surrounding us was a 'forest' of *Copiapoa columna-alba* with a few plants of *C. cinerascens*. What an amazing place to spend the night, looking forward to the promise of adventure the following day.

The 3rd November dawned misty as it often does in this part of the world, the dampness on the ground giving the clue to how the plants survive this largely rainless desert. It was still and quiet with just the sound of the sea. It did not take long for a simple breakfast and to pack our tents before making our way back to the Park Headquarters.

The ranger did not know the plants we were looking for but was very interested to see what we might find. We set out on the tracks leading to the north. It would have been a series of guesses as to which to take without the help of the ranger. As we travelled, the sun was starting to break through the mist and, as the ground warmed, a breeze off the sea started to blow. Soon the sky was clear and a cool wind kept the temperature at a very pleasant level. To add to the magic of the day, we witnessed a partial eclipse of the sun as we approached the valley of Esmeralda.



Fig.2 *Copiapoa laui* GC728.02 in habitat in the Guanillos Valley, near Esmeralda, Chile

The first wonderful location for cacti was an extensive population of *Copiapoa columna-alba*. The plants grow in translucent sand and while running my hand over the surface hoping to find *Thelocephala*, I felt spines just under the surface.

Scraping away some sand revealed a large number of tiny seedlings of the Copiapoa. It appeared that the seeds had germinated underground and developed into small plants while protected by a layer of the sand through which light could diffuse. It is not until they are large enough to survive the full sun that they appear above the surface. This is very similar to the reproductive process for *Uebelmannia gummifera* growing in the quartz sand of Brazil

Having enjoyed this famous and much-photographed location, we took a track which cut through low hills into the next valley north. This is the Guanillos Valley and there is a good track which leads down to the sea passing through excellent cactus country. Most

prominent are the large and beautiful clusters of *Copiapoa longistaminea*. You can also see *C. grandiflora*, *Thelocephala esmeraldana*, *Eriocyce taltalenis* and *Eulychnia iquiquensis*.

The question was where we should look for *Copiapoa laui*. It was really by chance that a few kilometres from the sea at about 100m altitude, we saw a patch of ground which looked different, comprising small pieces of a pinkish granite-like crystalline material. It was a thrill to find that the place was densely packed with mats of *Copiapoa laui*. When Lau first found the plant, he thought he had found a *Thelocephala* similar to *T. malleolata* and I could see why. It certainly was not obviously a species of Copiapoa.

Growing with the *C. laui* was another Copiapoa with small pinkish bodies. It also only grew in the specific material found at that place. At the time, I had no idea what it was, but when, in 1996, Schulz and Kapitany published their book 'Copiapoa in their Environment', I saw that they had identified it

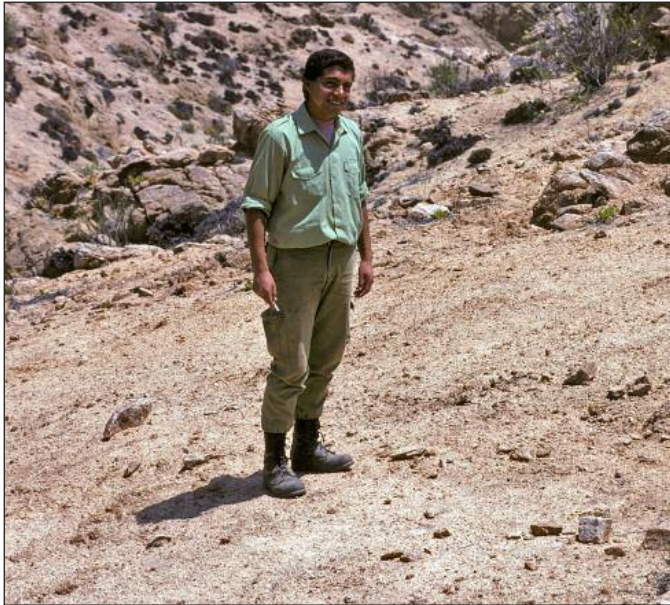


Fig.3 The Park ranger standing on the habitat of *C. laui*, the first time he had seen the plant

as *Copiapoa esmeraldana* Ritter. They stated that it was related to *C. humilis* and I accepted their identification when I wrote my own book 'Copiapoa' in 1998. I used the combination *C. humilis* var. *esmeraldana* which had been made by Adriana Hoffman in her book 'Cactáceas. En la flor silvestre de Chile' (1989).

Unfortunately, this identification and suggested relationship was wrong. The true *C. esmeraldana* has a much larger flower and grows at higher altitude at Las Lomitas. It is most probably related to *C. grandiflora*, and exhibits a similarly shaped flower leading to Doweld calling it *C. grandiflora* ssp. *ritteri*.

So, our plant remained nameless but its flower shape suggested that it is not related to *C. humilis*, but together with its body, is reminiscent of *C. mollicula* which is found



Fig.5 *Copiapoa angustiflora* GC303.01 in cultivation, from the Guanillos Valley, near Esmeralda, Chile.



Fig.4 *Copiapoa angustiflora* GC129.01 in habitat in the Guanillos Valley, near Esmeralda, Chile

some way to the south near Chañaral. When Schulz published his second Copiapoa book in 2006, he also accepted that the plant had no name so he referred to it as 'species Guanillos'.

The plant was finally named by Walter, Mächler and me in CactusWorld (2006) as *Copiapoa angustiflora*. The article deals in detail with this taxon and its relatives. It is a thorough review of what we know and is recommended reading.

C. angustiflora has remained uncommon in cultivation although it is no more difficult to grow than other Copiapoas. The only problem I had with one of my plants was a split in the body near the ground caused by sudden body expansion following the first watering of spring. Perhaps it would be best to start the year with sprays rather than a soaking.

GC

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- Walter, H. & Mächler, W. (2006)** *An old acquaintance from the Guanillos Valley is finally validated*. CactusWorld 24(4):185-192

OBSERVATIONS CONCERNING PARODIA (ERIOCACTUS)

Giovanna Anceschi & Alberto Magli share their observations of the misunderstood populations of *Parodia claviceps* (F. Ritter) F. H. Brandt living in the Province of Misiones (Argentina)

Photographs by the authors

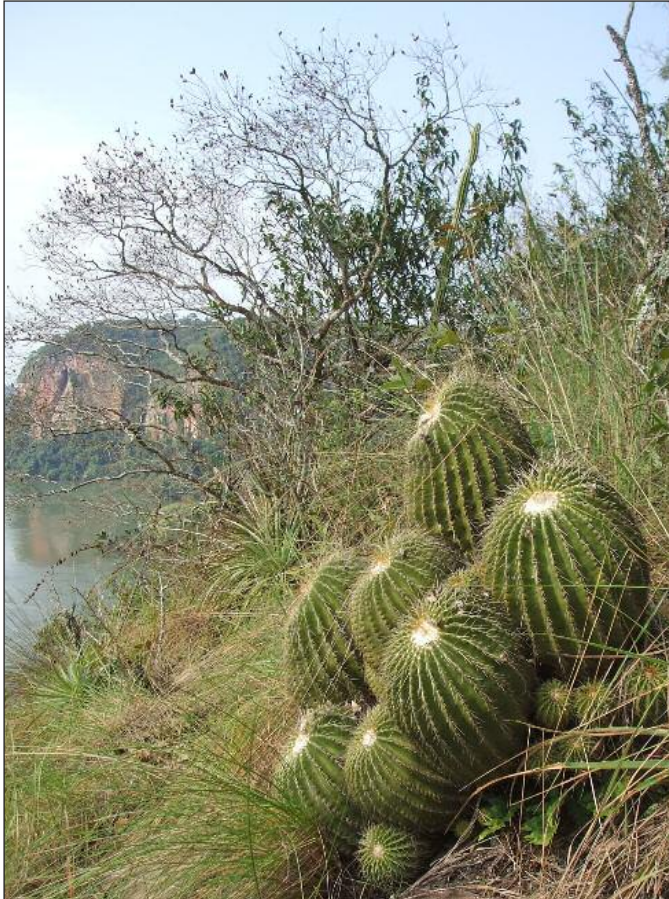


Fig.1 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 22 Jul 2007, A&M 246 (cactusinhabitat.org 2010)

When Graham Charles suggested in an email that it might be interesting if we wrote about our experience with *Eriocactus* Backeberg (Anceschi & Magli 2010, 24-26) for the Cactus Explorer readers, we welcomed the idea.

Among all the segregates of *Parodia* Spegazzini, *Eriocactus* is our favourite, and perhaps the only one that deserves separate recognition at generic level. In fact, in 2010, when we first published cactusinhabitat.org, we seriously wondered about the possibility of a genus *Eriocactus*, being separated from *Parodia*. But the results of the molecular data (Nyffeler 1999; Nyffeler & Eggli 2010) convinced us that, if on one hand our idea



Fig.2 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 22 Jul 2007, A&M 246

about a possible classification of *Eriocactus* being separate from *Parodia* (for its most basal position within the group) was confirmed, on the other hand this separation should also include *Brasilicactus* Backeberg and *Brasiliparodia* F. Ritter, which instead we consider in every respect part of *Parodia* sensu lato, despite the different morphology of the flower in *Brasilicactus*.

We know in fact, through the latest molecular studies, that the characters of the flowers and of the different pollination syndromes (Nyffeler & Eggli 2010.15; Schlumpberger & Renner, 2012, 1347-1348) are not indicators of the proximity or remoteness of two evolutionary lines. At a morphological level it would seem that the forms of growth

(for example globular vs. columnar) are less subject to phenomena of evolutionary convergence (Schlumpberger & Renner 2012, 1347-1348), and therefore of higher taxonomical value. For these reasons, despite the holomorphological characters of *Eriocactus* being distinct from those of the other members of the group, for consistency we prefer to keep it as a segregate of *Parodia*. There is another reason why we feel connected with this group, a sentimental reason, which is that an *Eriocactus* was the first taxon we found and started to document in its own habitat. Not only was it our first cactus in habitat, our A&M 1, but fatalistically this meeting also gave rise to our first "case": an episode in which our observations, related deductions and assumptions contrasted strongly with the known data. It is this case of *Eriocactus*, which from now on we will call *Parodia*, and its close relatives that we shall examine in this article.

In early October 2005 we were in Buenos Aires, and we were making the final arrangements for our first long trip around South America. During the visit to the Botanical Garden, a gardener put us in touch with the Darwinian Institute and with Roberto Kiesling. We were excited about this meeting having heard about Kiesling and his knowledge of the Argentinian cacti. We made an appointment to meet him and to get information on some of the taxa that marked the steps of our journey. Among the cactus of Argentina, in the province of Misiones, there was *Parodia schumanniana* (K. Schumann) F. H. Brandt. Kiesling was very friendly and answered all our questions. With regards to *P. schumanniana* he told us that we could find the taxon in the Parque Provincial Teyú Cuaré, where from the viewpoint near the rangers' cottage it was possible to observe the plants on the rocky walls overlooking the Río Paraná.

We later found out that it was not in the 78 hectares of the P. P. Teyú Cuaré we had to look, but in the neighbouring Reserva Natural Osununú, owned by the Fundación Temaiken. Due to aggressive human intervention, the two protected areas have a difficult task in protecting this surviving area of the Mata Atlántica. At Osununú ("who thunders" in Guaraní language), we found the viewpoint



Fig.3 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 13 Oct 2005, A&M 1

we were looking for, and the spectacle that greeted us was magnificent and unforgettable. Groups of *Parodia*, club-shaped, bright green, with golden spines, were perched on the rock walls, almost vertical above the big river. All framed by the intense green of the subtropical forest [Fig.3].

That first time we stayed in San Ignacio from 12th to 18th October we did various surveys of the Reserva and the Park but without ever being able to get close to the plants, which seemed to live only on the rocky walls far from our reach. So we recorded our first A&M based on what little documentation we were able to obtain, noting that *P. schumanniana* lived there, and promising ourselves that we would get better organized and come back and get a closer look at the plants.

The following year, in December 2006, we were in Agudo, the unique German community in the Quarta Colonia of Rio Grande do Sul, in the south of Brazil. In fact, we are referring to the Italian fourth colony of immigration in that State, consisting of the towns of Agudo, Dona Francisca, Faxinal do Soturno, Nova Palma and Pinhal Grande. We went there to study the population of *Parodia horstii* (F. Ritter) N. P. Taylor, which lives on the Morro overlooking the town. We wanted also to start the surveys on populations of *Parodia claviceps* (F. Ritter) F. H. Brandt, living on the rocky walls in the Rio Jacuí basin. We cannot thank the municipality of Agudo enough for their help. It was also thanks to



Fig.4 *Parodia claviceps* Brazil, Rio Grande do Sul, Agudo, Morro Finkenberg, 8 Dec 2006, A&M 93

them, together with the forestry engineer of the municipality Janete Dumke, that we adventurously reached our first population of *P. claviceps* on Morro Finkenberg. The forest beside the Finkenberg's house ends suddenly, on the brink of a precipice, and on the rocks below, fearless of the abyss, the plants are living [Fig. 4]. For us it was a little complicated, but clinging to the trees and moving into the limited space available, we were able to reach them and we documented some of them [Fig. 5].

The second survey of the species in the Jacuí basin started in a curious way. We were in Agudo and we stumbled upon a brochure that advertised the beauty of the Quarta Colonia. In one of the photos we saw a large group of *Parodia*, on the rocks above a big water surface. It was the dam of Itauba, built to contain the Jacuí river in the area of Pinhal Grande. Also in this case the Municipality of Agudo did its utmost to help us, putting us in touch with colleagues.

On December 9th 2006 we arrived at Pinhal Grande. The following day, on board a small motor boat, we began to sail along the banks of the Represa Itauba. The valley, now a lake, is surrounded by steep rock walls [Fig. 6]. It seemed to show no trace of cacti, but fortunately the boatman suggested a place where he thought there might be some, and sure enough we found them. The display was impressive, and not just for cactus enthusiasts. Hundreds of plants looked out over the water from the walls [Fig. 7]. Many specimens were



Fig.5 *Parodia claviceps* Brazil, Rio Grande do Sul, Agudo, Morro Finkenberg, 8 Dec 2006, A&M 93

located a few metres from the water's surface [Figs.8 & 9], allowing for accurate documentation. The day was made complete by seeing a plant of astonishing size: metres of *P. claviceps* and an infinite number of stems in a single individual, perched on a rock, almost in the water [Figs.10-12]. Of course, it raises a question about the future survival of the population, which is now living in a beautiful setting, but completely alien and artificial, which will undergo inevitable climate change. We can also imagine the consequences of any rises in water level.

Seven months later, near the end of that second South American tour, exhausted after the last months spent between bus transfers and long walks in the Andean regions (of Argentina, Chile, Peru and Bolivia), from Santa Cruz de la Sierra (Bolivia), we allowed ourselves a flight to Asunción, the Paraguayan capital. The idea was to get back on the Trans-Chaco, almost to the north-west border with Bolivia (P. N. Tnte. Enciso), to study some populations of *Gymnocalycium*, and then going from Asunción, down to the Rio Paraná, the natural border between Paraguay and Argentina. The remaining steps of the journey included some species of the genus *Parodia*. In Paraguay we were looking for *Parodia nigripina* (K. Schumann) F. H. Brandt, a taxon closely related to *P. schumanniana* which lives in the Dpt. Cordillera (to which we will return later) and for *P. schumanniana* itself, living a little further south, in the Dpts. of Paraguari and Guairá. And finally, in Argentina, looking



Fig.6 Habitat of *Parodia claviceps*. Barragem Itaúba, Brazil, Rio Grande do Sul, Pinhal Grande, 10 Dec 2006



Fig.7 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)



Fig.8 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)



Fig.9 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94.

for the population of *P. schumanniana* of Misiones, left open in 2005.

We made camp in Carapeguá for the research on the populations of *P. schumanniana* in the Dpt. of Paraguari. There we met Gabriel Lezcano, a mathematics teacher and now a dear friend, who was the guide in those first excursions in search of *P. schumanniana*, and also in the subsequent years.

We include the taxa *P. grossei* (K. Schumann) F. H. Brandt, and *P. ampliostata* (K. Schumann) F. H. Brandt, for us properly considered as synonyms of *P. schumanniana*.

The first visit to the Monumento Natural Macizo Acahay, 16th July 2007, was really exciting. After climbing up to the top on the north-east side, between the granite rocks, in a lovely setting, we saw up close our first large population of *P. schumanniana* [Fig. 13], (excluding those Argentinian of Misiones). From the first comparison in habitat, then confirmed by the later ones, the differences between *P. schumanniana* and *P. claviceps* were clear. The holomorphology of the two taxa are quite distinct [see also Table 1 on page 33].



Fig.10 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)

Starting from the kind of growth; generally simple (first globular and then columnar) < 180 x 30cm (h x Ø) for the first taxon, vs. simple or in groups (first globose and then clavate) < 70 x 25 (h x Ø) for the second [Figs.13-14], then passing through all the other elements of distinction (ribs, areoles, spines, etc.) [Figs.16-17], we arrive at the clearly different topology of the habitats occupied by the two taxa. *P. claviceps* lives on the almost vertical rock walls of Basalt of the Serra Geral formation (a slope that is almost 90 degrees) in the river basin of the Jacuí and the Jaguarí rivers, Rio Grande do Sul, Brazil. These rocky walls develop the conditions for a microclimate, strongly differentiated from the humid subtropical general area around them, essentially consisting of forest formations of the Mata Atlantica Biome.



Fig.11 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)



Fig.12 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)

The steep slope which prevents even intense rain from permanently moistening the rock, and the strong and direct sunlight, transforms some of these walls into a genuinely xerophyte habitat, allowing for the formation of flora, otherwise unthinkable in these areas (Larocca 1998 ,12).



Fig.13 *Parodia schumanniana* Paraguay, Paraguari, Carapeguá, M. N. Macizo Acahay, 16 Jul 2007, A&M 243 (cactusinhabitat.org 2010)

The populations of *P. schumanniana* live in south-western Paraguay, on the sandstone outcrops of the Silurian, i.e. sandstone of Caacupé (Cordillera de los Altos, Cerro Santo Tomás and Cerro Verá [Figs.18-19]), and on the granitic rocks of the Silurian (Macizo Acahay) [Fig. 13], in the Dept. of Paraguari. They also live on the sandstone outcrops of the Permian, i.e. Passa Dois series, including in the Independencia-Villa Rica area (Cerro Acatí, Cerro Pelado) in the Dept. of Guairá



Fig.14 *Parodia schumanniana* Paraguay, Paraguari, Carapeguá, M. N. Macizo Acahay, 16 Jul 2007, A&M 243

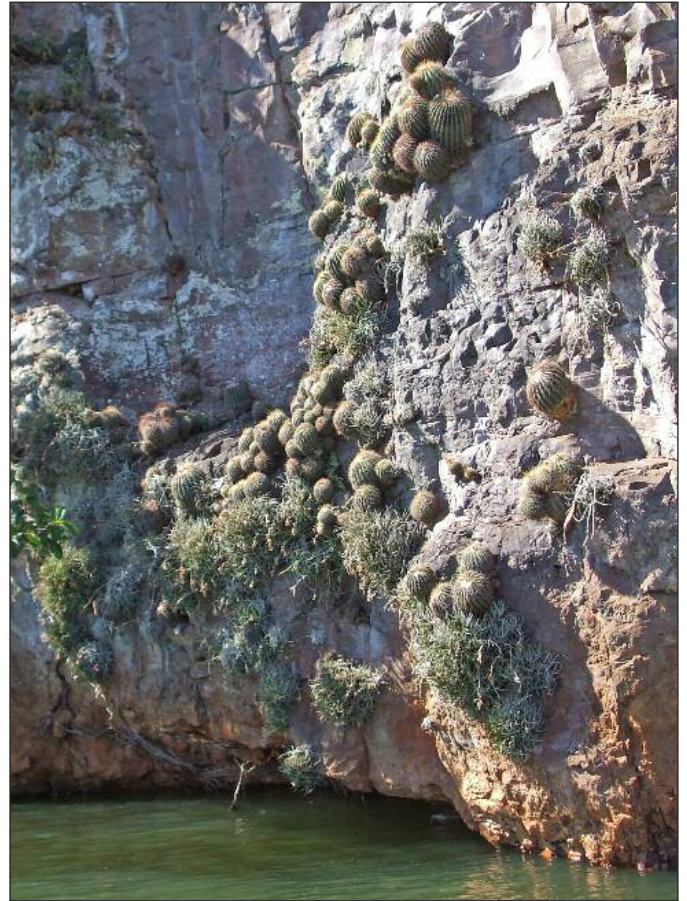


Fig.15 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94



Fig.16 *Parodia schumanniana* Paraguay, Paraguari, Carapeguá, M. N. Macizo Acahay, 16 Jul 2007, A&M 243.

(Esser 1982, 38:13). All the surveys carried out have highlighted that these populations live far from watercourses, unlike the surveys for *P. claviceps*.

At the end of July 2007, after the stop-off between Caacupé and Carapeguá, we arrived in Encarnación and from there we went through Argentina to get to San Ignacio once



Fig.17 *Parodia claviceps* Brazil, Rio Grande do Sul, Pinhal Grande, Barragem Itaúba, 10 Dec 2006, A&M 94. (cactusinhabitat.org 2010)

more, with the intention of organizing visits to Osununú-Teyú Cuaré to get at the populations of *P. schumanniana* that we missed in 2005.

We asked a resident of the area who seemed to remember seeing the plants, and he offered to accompany us. He knew the protected area, which consists of an amphitheatre rock formation, covered with a wet subtropical forest overlooking the Rio Paraná. He told us

	Parodia claviceps	Parodia schumanniana
habit	simple or clustering	usually simple
stem	globose to clavate < 70 x 25cm (h x Ø)	globose then cylindric < 180 x 30cm (h x Ø)
ribs	23 - 38	21 - 48
areoles	> 3-4mm < 3-4 mm on oldest plants	7-15mm apart
spines	awl like, curved, wavy or twisted central: 0 - 3 (- 5), < 30mm radial: 0 - 6 (- 8)	slender, acicular, straight or slightly curved central: 0 - 1, < 10 - 30mm radial: 5 - 7, the lowest < 65mm
pericarpel and floral tube	c. 32mm	c. 20 - 25mm
habitat	Basaltic rock walls of Serra Geral, gradient close to 90°, on the Jacuí and Jaguarí rivers (Rio Grande do Sul, BR) nearly vertical rocky slopes on the Paraná river, in the R. N. Osununù -P. P. Teyú Cuaré (Misiones, AR)	Hills with granitic rock outcrops and sandstone reliefs, in the Paraguari Dpt. (PY), sandstone reliefs in the Guairá Dpt. (PY). Far from rivers.

Table 1

about the half moon inlet on the river, circumscribed by the rock formation, also covered by dense forest, where there is a small mountain, Cerro Pelón [Fig. 20], in the centre. He believed that the plants were there.

The following day, after getting past the ridge from the west, we passed through a forest of tall trees where everything looked the same and there was a complete lack of reference points. There was just dense forest, the heat, the birds singing and nothing else. That day our guide was not too well, and it took time to get to the base of the small mountain, which we then had to climb. The humidity had made the ground slippery and the vegetation was quite tangled. Finally, we reached the summit on the west side, we went round the hill, and on the river side, we began to see the first samples of *Parodia* ... Big and wonderful! [Figs.1 & 2]



Fig.18 *Parodia schumanniana* Paraguay, Paraguari, La Colmena, Cerro Verà, 20 Sept 2011, A&M 753.

But the first impression was one of amazement, it was not *P. schumanniana*, as reported in the literature (Nicolai 1893; Kiesling 1995, Anderson 2001, Hunt et al., 2006), and the plants were not those we had seen a few days before in Paraguay: instead they were identical to those encountered in the south of Brazil: same growth, same form, same size, same ribs, areoles, spines, etc. [Figs.21-23] They also shared the same environmental conditions: almost vertical rock walls above the river, immersed in the same subtropical forest (Mata Atlantica Biome) as the *Parodia* of Rio Jacuí.

That day we stayed for a long time to study and document that population of cacti. From the top of the cerro we could see the eastern extremities of the reserve, the rocks of Osununù, where in 2005 we had seen the plants for the first time, as promised by



Fig.19 *Parodia schumanniana* Paraguay, Paraguari, La Colmena, Cerro Verà, 20 Sept 2011, A&M 753.



Fig.20 Habitat of *Parodia claviceps* R. N. Osununú, Argentina, Misiones, San Ignacio, 3 Oct 2011



Fig.22 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 22 Jul 2007, A&M 246.



Fig.21 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 22 Jul 2007, A&M 246. (cactusinhabitat.org 2010)



Fig.23 *Parodia claviceps* Brazil, Rio Grande do Sul, Agudo, Morro Finkenberg, 8 Dec 2006, A&M 93

Kiesling [Fig. 24]. However, we did not know then that it was not *P. schumanniana* but rather *P. claviceps*, here in its most northwestern distribution area; about 250km as the crow flies from its westernmost location in the state of Rio Grande do Sul, Brazil, in the municipality of Jaguarí.

On the way back, the guide lost his sense of direction, and only after wandering in the forest, led by the noise of the river, we finally reached the familiar rocks of Teyú Cuaré. We



Fig.24 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununú, 22 Jul 2007, A&M 246. (cactusinhabitat.org 2010)

were tired, but excited to have new information to bring to all enthusiasts.

From our inferences based on the studies in habitat, and its comparison with the literature, it appears evident that *P. schumanniana* is an endemic taxon of Paraguay, whose populations are detectable, as already mentioned, in the south-west of the country on

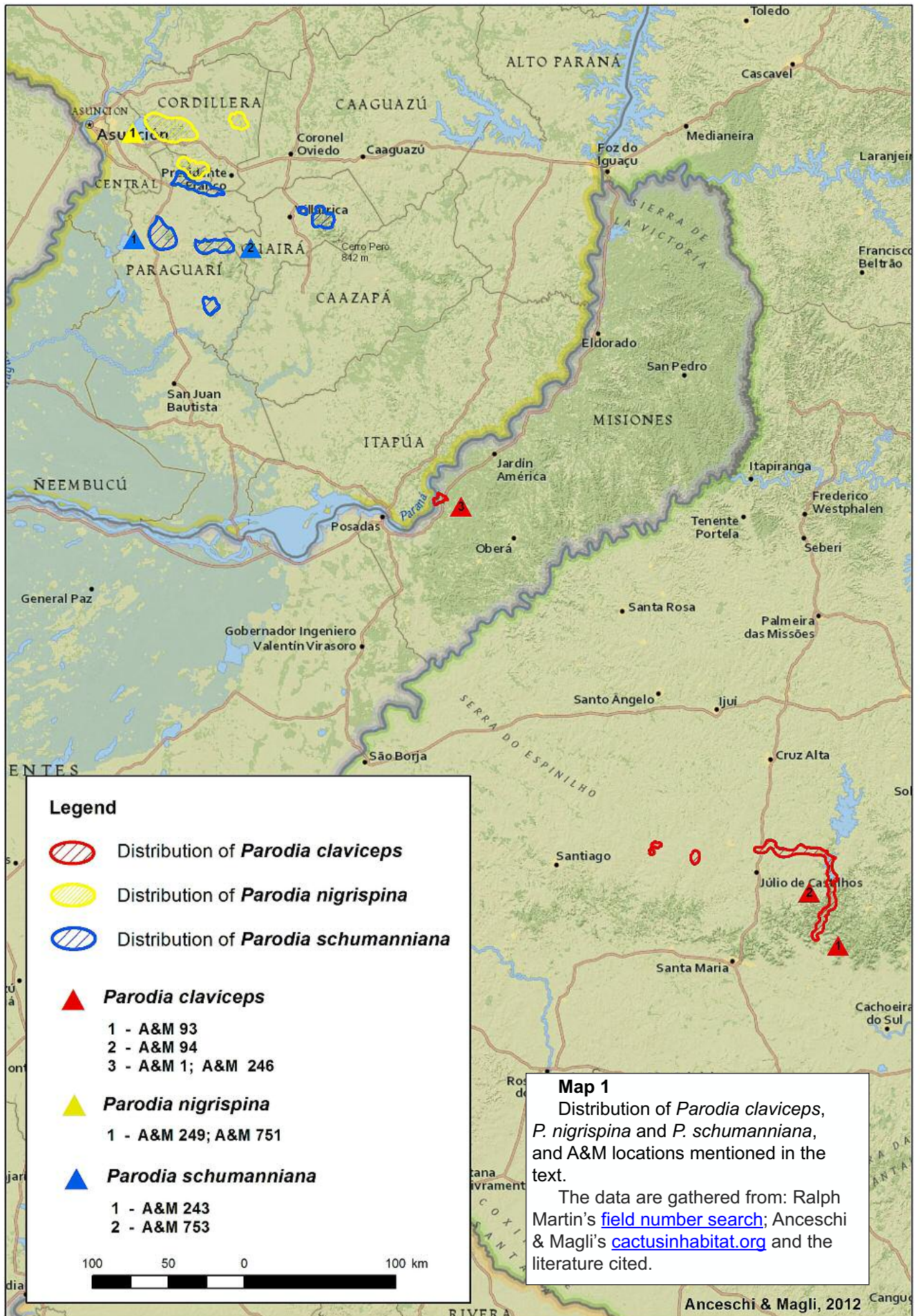




Fig.25 *Parodia nigrispina* Paraguay, Cordillera, Tobatí, Cerro Tobatí, 11 Sep 2011, A&M 249.



Fig.26 *Parodia nigrispina* Paraguay, Cordillera, Tobatí, Cerro Tobatí, 14 Sep 2011, A&M 751.



Fig.27 *Parodia nigrispina* Paraguay, Cordillera, Tobatí, Cerro Tobatí, 11 Sep 2011, A&M 249.



Fig.28 *Parodia schumanniana* Paraguay, Paraguari, La Colmena, Cerro Verà, 20 Sept 2011, A&M 753

sandstone outcrops and granitic rocks.

We believe that the taxon has never crossed the great natural barrier formed by the Río Paraná. We would like to emphasize that the line of the southernmost populations of *P. schumanniana* (Acatí, Capilla Tuya, Verá) is between 170 and 200km away as the crow flies from the river and the Osununú-Teyú Cuare area.

In addition, contrary to the current opinion, which classifies *P. claviceps* as a subspecies of *P. schumanniana* (Anderson 2001, Hunt et al., 2006), as result of the combination proposed by Hofacker (1998, 6:12), we would like to point out that the taxon historically related to *P. schumanniana* (and perhaps not distinct) is not *P. claviceps*, but *P. nigrispina* as Gerloff et al. (1995: 142) have already suggested.

In the first vague description of *Echinocactus*

nigrispinus K. Schumann (1899, 9: 45), the type is reported “between Carepe-guà and Aca-ay”, but in fact no population of *P. nigrispina*, as currently conceived, has ever been found in these parts, where instead only *P. schumanniana* lives.

The current conception of *P. nigrispina* was fixed by Buining (1970, 49 (11): 179). In Schumann’s description, he identified the populations in Dept. Cordillera (PY) above the location of Chololò. Populations which have their centre between the sandstone outcrops of the Silurian, sandstone of Caacupé (Esser 1982, 38:57-59), between Caacupé, Tobatí and the Yhaguy Guazu river [Figs.25-26], as was also reported by Gerloff et al. (1995, 142). The conditions for the survival of the taxon are quite critical, as we have already stressed (Anceschi & Magli (2010, 40). Besides geographical location to the north of the Dpts.



Fig.29 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununu, 3 Oct 2011, A&M 1

Paraguarí and Guairá, there are various distinctions that Buining listed to separate his *Notocactus nigrispinus* (K. Schumann) Buining from *Notocactus schumannianus* (Nicolai) A. Berger: The first show a tendency to form groups compared to the second which has usually simple growth; the first have shorter stems (< 40cm compared with < 180cm the second); the first also has stronger and less bristly spines, from dark grey to yellow compared with the second's bristly, thin spines, brown to yellowish (when young), then brown. Based on our studies in habitat the distinctions proposed by Buining are usually verifiable (even if it is now difficult with adult individuals to form groups). We have to add that, despite its name, *P. nigrispina* often highlights pale grey-coloured spines and not dark grey [Fig. 27]. In spite of this, the two taxa are very similar [Fig.28].

The real reason that we still distinguish *P. nigrispina* is the distinct distribution areas. The



Fig.30 *Parodia claviceps* Argentina, Misiones, San Ignacio, R. N. Osununu, 3 Oct 2011, A&M 1

two species are parapatric: we have not yet found any area where the two intergrade. So, although this would be a case in which the subspecies category may have a possible meaning, we think that a natural species is composed of populations, in their turn composed of individuals, and not by variety or subspecies; or in agreement with Hennig, of semaphoronts. "(The characters bearer)... The individual in a certain, theoretically infinitely small, time span of its life, during which it can be considered unchangeable" (Hennig 1996, 65). The infra-populational (var.) and intra-populational (ssp.) differences, within a species, are part of the biological concept of species, a species considered as a process, not as a static unit, so from our point of view they do not deserve taxonomic recognition (see Anceschi & Magli 2010, 12-14). This is the reason we prefer to keep *P. nigrispina* at the species level.

Having clarified the links between the taxa

	Gerloff et al. (1995)	Anderson (2001)	Hunt (1999)	Anceschi & Magli (2010)
Parodia claviceps	BR (Rio Grande do Sul)	BR (Rio Grande do Sul)	BR	AR (Misiones), BR (Rio Grande do Sul)
	Gerloff et al. (1995)	Anderson (2001)	Hunt et al. (2006)	Anceschi & Magli (2010)
Parodia schumanniana	PY (Paraguarí, Guairá, Misiones?) Including <i>Notocactus ampliocostatus</i> and <i>Notocactus grossei</i>	AR (north-eastern), PY	AR (Misiones), BR (Rio Grande do Sul)*, PY	PY (Paraguarí, Guairá)

Table 2 Revised distribution of *Parodia claviceps* and *Parodia schumanniana* from the previous sources.

* According to Hofacker (2000, 10:12) there are no populations of *P. schumanniana* in Brazil.

in question, we can ask ourselves why a population of *P. claviceps* is located 250km from the rest of its range. The assumptions are two-fold. The first is that between the two locations, Osununú-Teyú Cuaré in Argentina and the Municipality of Jaguari in Rio Grande do Sul, Brazil, as pointed out by Larocca (1998, 64), there could be little-explored areas such as the Serra do Pirapó and the Ijuí and Icamaquã river valleys, where *Parodia* populations could be hidden, still unknown. The hypothesis that the most likely candidate to populate it might be *P. claviceps* is suggested by the most westerly extension of the taxon, compared to the other *Eriocactus*, living in southern Brazil.

The second is that in the 16.0-14.8 Ma, as reported by Arakaki et al. (2011, 8380), from the probable beginning of the diversification for the clade *Notocactae*, extinction in *P. claviceps* may have intervened interrupting the spatial continuity, generally observed between the different populations which constitute a natural species.

Regarding instead the different attribution made by the previous researchers to the Osununú-Teyú Cuaré populations, we believe that probably none of them have ever personally visited all the taxa concerned in their respective habitats. It is clear for example that if you do not know the populations of *P. claviceps* of southern Brazil, the populations of Argentina may look similar to *P. schumanniana*, but as we have shown, the real relationship between these taxa is different.

During our last visit to Osununú and Teyú Cuaré, in October 2011, the rangers informed us that, both for safety reasons, due the rising level of the Rio Paraná, caused by the construction of the Yacyretá Dam, and for preservation reasons, it is no longer possible to get access to the internal forest where the Cerro Pelón and the cacti are. However, we have had the opportunity to go for a long walk in that park that we love so much, and to look again at *P. claviceps* on the rocks of Osununú, as we did for the first time six years earlier [Figs.29 & 30].

Implications of this article for the genus *Parodia* Spegazzini:

The revised distribution of *Parodia claviceps* and *Parodia schumanniana* compared to the previous sources is shown in Table 2 on page 37.

Update of the risk assesment of the conservation status of *Parodia nigrispina* compared to the previous sources (see also Anceschi & Magli 2010, 40).

Metzing, D. (1994) Endangered, EN

Hunt et al. (2006) Vulnerable, VU D2

Anceschi & Magli (2010)* Critically Endangered, CR B1ab(iii,v)+2ab(iii,v);C2a(i)

* In September 2011, we once again visited the distribution area of *P. nigrispina* in the zones comprised between Piribebuy, Caacupé, Tobatí and Atyrá. While in Piribebuy (Esser 1982, 60) the taxon is extinct, in Tobatí, in the same zone we monitored between 2007 and 2008, we recorded small but encouraging improvement. The population has increased from 7 to 15 plants. The difficult to access population, near the Cerro Tobatí also shows a slight increase compared to the 2008 survey (from approx. 20 to 25 individuals). At the market in Asunción we saw specimens of *P. nigrispina* and *Discocactus hartmannii* (K. Schumann) Britton & Rose on sale piled in a basket. The two taxa are almost extinct in Paraguay (Anceschi & Magli 2010: 39-40).

Giovanna Anceschi & Alberto Magli

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MATUCANA HOXEYI

Graham Charles proposes to raise the rank of *Matucana hoxeyi* to a distinct species in line with the treatment of other *Matucana* species from the Marañon drainage system. Its isolated habitat and numerous morphological differences support the argument. Unlike the related *M. paucicostata*, it is also very cold-sensitive in culture. Pictures by Paul Hoxey and the author.



Photo: Paul Hoxey

Fig.1 *Matucana hoxeyi* PH643.01 Rio Rupac, east of Sihuas, Ancash 2230m

In the first issue of the **Cactus Explorer**, I told readers about a new *Matucana* discovered by Paul Hoxey in the valley of the Rio Rupac in Peru. I had described it in Quepo 24 (2010), the journal of the Peruvian Cactus Society, as *Matucana paucicostata* ssp. *hoxeyi*.

I speculated then that perhaps it was distinct enough to be a species in its own right and now, after more observation, I am convinced that it is worthy of separate species status. There are very many morphological differences and its habitat is isolated from the nearest *M. paucicostata* locality.

***Matucana hoxeyi* (G.Charles) G.Charles stat. et comb. nov.** Basionym *Matucana paucicostata* subsp. *hoxeyi* subsp. nov. G.Charles Quepo 24:67 (2010)

	<i>M. hoxeyi</i>	<i>M. paucicostata</i>
Body colour	Pale yellow-green, sometimes glaucous	Dark grey-green, never glaucous
Body size	< 30cm tall < 12cm Ø	8-14cm tall 4-7cm Ø
Offsetting	Often solitary, sometimes clustering	Strongly offsetting forming mats
Central spines	1, < 40mm golden fading to grey	0-1, < 30mm red-brown fading to grey
Radial spines	<10, < 30mm golden fading to grey	4-8, 5-30mm red-brown fading to grey
Flower	< 65mm, perianth very zygomorphic	60mm, perianth not very zygomorphic
Seed (see note on page.8)	2.2 x 2.0mm dark brown	1.0-1.4mm x 0.7-1.2mm, dull black

Photo: Paul Hoxey

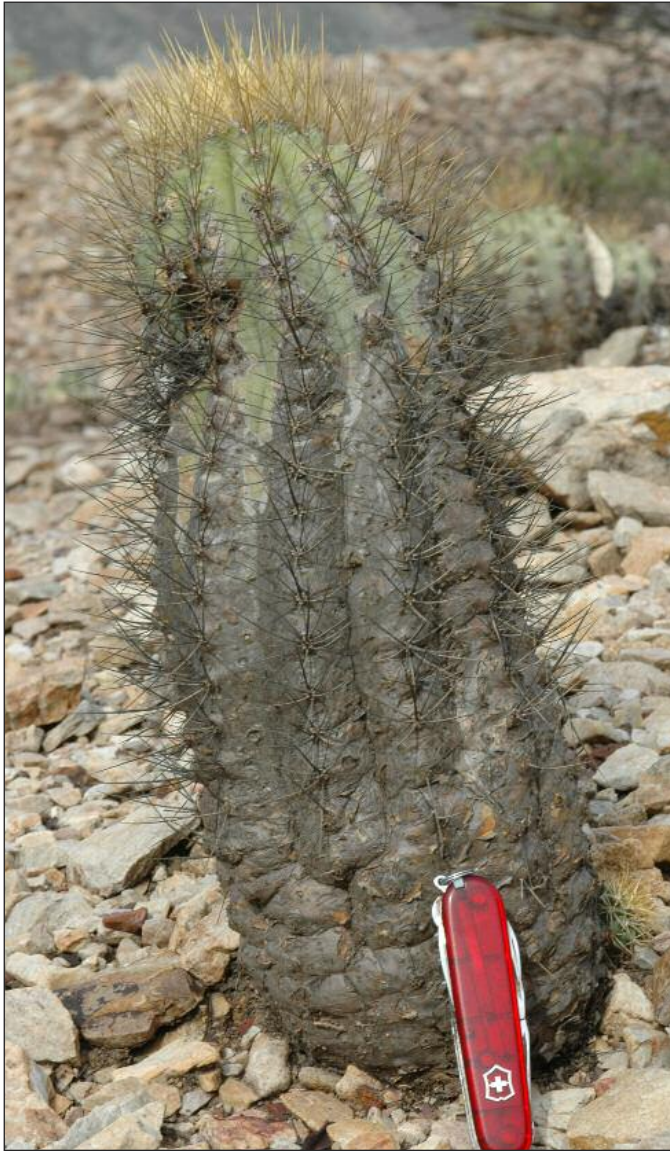


Fig.2 *Matucana hoxeyi* PH643.01 Rio Rupac, east of Sihuas, Ancash 2230m

Photo: Graham Charles



Fig.4 *Matucana paucicostata* GC245.03 Palca, Rauhapampa Valley, Ancash, 2420m

Photo: Paul Hoxey



Fig.3 *Matucana hoxeyi* PH640.01 Rio Rupac, east of Sihuas, Ancash 2340m

Photo: Graham Charles



Fig.5 *Matucana hoxeyi* GC551.01 Rio Rupac, east of Sihuas, Ancash 2330m (Type locality)

TRAVEL WITH THE CACTUS EXPERT (6)

Zlatko Janeba continues his account of cactus hunting in the USA. He conveys the excitement of finding plants in flower among spectacular scenery.

Photos: Zlatko Janeba



Fig.1 Zlatko Janeba at the location of *Pediocactus peeblesianus* ssp. *fickeiseniorum*, just above the campground of Gerhard Häslinger and his companions, Navajo Trail Road, Arizona. The red flowers belong to the Indian paintbrush (*Castilleja* sp.).

We woke the next morning on 2nd May 2006, and surprisingly I had only a slight headache. As I had got up earlier than Josef, I had some time to explore the nearest hill. At the top of it, at an elevation of some 1550m, I found *Coryphantha vivipara* (including one crested plant, but it was too ugly to photograph), *Echinocereus engelmannii*, *Escobaria marstonii*, *Opuntia phaeacantha*, *Yucca baccata*, and *Oenothera* aff. *deltoides* (*Onagraceae*) with large white flowers, often called evening primrose. It was a nice warm morning (8°C at 8 a.m.).

After a quick breakfast, we headed out in anticipation. Only half a mile more to the north (N36°29.468', W113°21.495', 1545m), we stopped as I had spotted yellowish flowers

while driving. Several *Escobaria marstonii* were growing on the SE slopes at the bottom of low hills, with the majority of plants just opening flowers or with numerous buds. Interestingly, most of the cacti were invaded by a certain caterpillar, feeding ravenously on both buds and flowers and having a rich breakfast [Fig.2]. I doubt whether such an invasion can have a negative impact on such a population of *Escobarias*. We saw *C. vivipara* and *Echinocereus engelmannii* there as well.

After another 3 miles we observed exactly the same situation, hungry hairy caterpillars destroying the reproductive parts of *Escobaria marstonii*. We also encountered *Opuntia whipplei* and a small *Yucca* species with narrow



Fig.2 *Escobaria marstonii* with hungry caterpillars having their breakfast, Mount Trumbull Loop, Arizona. leaves.

Driving further north we reached the junction between Mount Trumbull Loop and Navajo Trail Road. We had data from Jurgen Menzel (El Cajon, California) suggesting that just south of the junction is a rich population of *Pediocactus peeblesianus* ssp. *fickeiseniorum*. (For simplicity, I refer to these miniature cacti as Navajoa here). So we spent some time roaming in that area, without success at first. On the top of the hills I encountered *Coryphantha vivipara*, *Echinocereus triglochidiatus* ssp. *mojavensis* in flower, *Opuntia phaeacantha* and *O. whipplei*, *Yucca baccata*, but no Navajoas.

I also enjoyed some time taking pictures of a large specimen of a non-venomous colubrid snake, probably the bullsnake (*Pituophis catenifer* ssp. *sayi*), which I suddenly surprised under a huge old juniper tree [Fig. 3]. Gopher snakes (including bullsnakes, genus *Pituophis*) are harmless colubrid species found in North America. Six subspecies are currently recognized, including the subspecies *Pituophis catenifer* ssp. *catenifer*, which should be found more to the west.

From the top of the hill I had a nice view of the whole area and noticed a slightly different character of the terrain on the lower part of the western slopes. It appeared to be drier with much less vegetation. With a strong sense of anticipation, I ran down to the area and found the first Navajoas within a couple of minutes [Figs.4 & 5]. They really were numerous, growing along with *Escobaria marstonii*. Both species were loaded with buds, many just



Fig.3 Probably a light coloured variety of the bullsnake (*Pituophis catenifer* ssp. *sayi*), Mount Trumbull Loop, Arizona.

about to open. Many of the buds and flowers of both species were being eaten by the caterpillars again [Fig.6].

Similar to many other Navajoa locations, the spination of these attractive cacti was extremely variable. Our cameras were kept busy for probably half an hour there and we were really satisfied. Although I found one Navajoa plant only some 10m away from the dirt road, the tiny cacti were much more common further from the road, especially at the base of the hills where the slopes start to slowly ascend.

Exactly at the above mentioned junction (N36°41.160', W113°27.908', 1530m), just north of the Navajo Trail Road, I found another three Navajoa plants with partially eaten buds. We stayed there only for about 15 minutes then headed eastward along the Navajo Trail Road.



Fig.4 Short-spined *Pediocactus peeblesianus* ssp. *fickeiseniorum*, Mount Trumbull Loop, Arizona.



Fig.5 Flowering specimen of *Pediocactus peeblesianus* ssp. *fickeiseniorum* with longer central spines, Mount Trumbull Loop, Arizona.



Fig.6 Some damage was done by hungry caterpillars on the flower of this Navajoa specimen, Mount Trumbull Loop, Arizona.



Fig.7 Flowering *Escobaria marstonii*, Navajo Trail Road (1450m), Arizona.

After about 4 miles we stopped in a beautiful rocky area (1450 m) where we observed numerous *E. marstonii* in flower [Fig.7], as well as *C. vivipara*, *E. engelmannii*, *O. whipplei*, and *O. phaeacantha*, but no Navajoas. This place seemed to be a biotope of another character, probably too rocky for Navajoas.

Since we had already learned how Navajoas usually grow and what habitat they prefer, I decided to make another two stops within the next 10 miles, carefully evaluating the landscape around us and we always succeeded in finding Navajoa plants [Fig. 8], growing again together with flowering *Escobaria marstonii*. The first stop was at an altitude of 1400m (also with *C. vivipara*, *E. engelmannii*, *O. chlorotica*, *O. phaeacantha*, *O. whipplei*, and *Yucca baccata*) and the second stop at 1350m where we also saw several Navajoa seedlings.

Some 12 miles from the above mentioned junction we stopped just before the dirt road started to climb up the hill. There we again encountered numerous *E. marstonii* in flower, *Opuntia polyacantha (hystricina)* with buds, and a very spiny *Echinocereus* specimen, which I thought was a form of *E. triglochidiatus* (there were no flowers).

About a mile further and higher (1550m) we were shooting pictures of *Echinocereus toroweapensis* in flower [Figs.9 & 10]. The Echinocerei there were quite variable, both in spination and in flower colour. The hilly landscape was beautiful [Fig.11] with many *Echinocereus* plants bearing numerous flowers. It was pretty windy on the top of the hills, where we also observed *Opuntia whipplei* and *Yucca baccata*.

Note: Although I use the name *E. toroweapensis* in my series, the more correct name for this *Echinocereus* species from north-western Arizona should probably be *E. canyonensis*, as it very probably describes identical plants and is the older name (1941). Moreover, there is a lot confusion in the *E. triglochidiatus* complex. *E. triglochidiatus* var. *toroweapensis* was described only quite recently (in 1991) and only two years later, the status of this taxon was elevated to specific level as *E. toroweapensis*. More recently this name became only a synonym under *E. coccineus*. But there seems to be no reliable diagnostic characters to separate the two species, *E. coccineus* and *E. triglochidiatus*. A different number of ribs or the



Fig.8 Josef Busek in action over plants of *Pediocactus peeblesianus* ssp. *fickeiseniorum*, Navajo Trail Road, Arizona. Notice the typical habitat of this cactus species, preferring to grow on low hills with open gravel spots among the grasses.

shape and number of spines are not really satisfactory features, especially when various forms can often be seen growing together. Neither is the number of chromosomes useful in this case, since there are diploids and tetraploids assigned to the both “species” and thus, all the above mentioned names form one complex taxon. In this I completely agree with Nigel Taylor’s view (The genus *Echinocereus*, 1985, Collingridge).

Then something unbelievable happened. We knew that Gerhard Häslinger, an Austrian

enthusiast specializing on the cactus flora of the SW of USA and especially on the genus *Sclerocactus*, and an old friend of Josef, was cactus hunting somewhere in the USA at the



Fig.9 Flowering *Echinocereus toroweapensis*, Navajo Trail Road, Arizona.



Fig.10 A form of *Echinocereus toroweapensis* with shorter spination, loaded with flowers, Navajo Trail Road, Arizona.



Fig.11 A gorgeous landscape along the Navajo Trail Road, Northern Arizona, with flowering *Echinocereus toroweapensis* in the foreground.

same time as ourselves. So, whenever we met a passing car, I teased Josef with the words: " ... Oh, that must have been Häslinger!" Then, some 26 miles from the above mentioned junction, we passed a man standing next to a car, waiting for something or somebody. And only a second later Josef shouted to me that the man was Gerhard. I thought he was just mocking my previous jokes, a sweet revenge, but Josef continued: " ... Stop. Stop. It really was him!". It was around 7pm.

The world suddenly seemed to be really small at that moment, but we had been really lucky, since Gerhard was waiting at the beginning of another minor dirt road for the second car of their expedition. He had only been waiting there just for some 10 to 15 minutes ... So we were very happy to have had an opportunity to meet Gerhard and his three friends, who were setting up their camp-ground there, hidden from the sight of the



Fig.12 *Pediocactus peeblesianus* ssp. *fickeiseniorum* with a flower bud, on the hilltop just above the Häslinger's campground, Navajo Trail Road, Arizona. main dirt road by a hill.

Also, we were told there were Navajoas on the top of that hill (some 1500m elevation). We quickly discovered three Navajoas, although the sun was already setting on the horizon and the light was not the best for taking pictures (Figs. 1 & 12). Next to the Navajoa plants were aluminium labels as this apparently was someone's study site.

It was a very pleasant time at a very nice camping spot, and although our colleagues wanted us to stay there overnight with them, Josef preferred to move on, as we had scheduled. It was a shame, but we drove to Kanab where we stayed in a hotel. However, we agreed to meet up again later during our trip, on the Nevada-Utah border, to study *Sclerocactus pubispinus* together ... (to be continued).

ZJ

LET US VISIT ONE OF THE MACARONESIAN ISLANDS « TENERIFE »

Albert Leroy has explored extensively on Tenerife and here he gives us an introduction to the remarkable diversity of succulents on the island.

Photographs by the author



The 3718m high volcano Mount Teide, the highest peak of Tenerife

It is now more than 20 years since I got an official licence from the "Medio Ambiente" to study plants in the field. I met the "Consejero General del Medio Ambiente - Don Wladimiro Rodrigues" at an exhibition of farm products because of the intervention of Miss A.M. Luykx, a woman from Belgian origins but working for many years on the development of tourism for the City of Arona (South Tenerife).

Let me first of all introduce to you the Macaronesian region.

The name (which is occasionally misspelled "Macronesia" in analogy with Micronesia) is derived from the Greek words for "islands of the fortunate" μακάρων νῆσοι *makárōn nêsoi*, a term used by Ancient Greek geographers for islands to the west of the Strait of Gibraltar. It is divided in three sectors namely:

1) **Central Macaronesia** comprising the Canary Islands and Madeira, Desertas Islands, Porto Santo Island, and the Selvagens Islands

2) **Lauri Macaronesia** comprising Central Macaronesia and the Azores Islands

3) **Macaronesia** or also named "**The Large Macaronesia**" contains the above and the Cap Verde Islands, a small part of Portugal (the cape just below Lisbon and part of the Atlantic coast of Morocco starting just below Rabat until the extreme point of the so called Western Sahara (Morocco) with the City of Nouâdhibou.

Let us have a look at Tenerife.

As you can see here we are nearly in a tropical climate with summer temperatures reaching max the 35/38°C daytime and 15/19°C night-time. Winter temperatures are very mild with temperatures during the coolest period in daytime not below 17/19°C and night temperatures about 11/14°C. These temperatures are the estimated temperatures for the South of the Island of Tenerife, Main Island of the western province. For the



Fig.1 *Euphorbia canariensis* - *Aeonium lindleyi*

northern part of the Island you have to reduce them by about 5°C in summer (day and night) and by 3°C in winter (day and night).

Exceptions have to be made for the mountains. Indeed, here we have mountains up to 3718m high (the volcano Mount Teide). Once you are near 350 metres you already enter into a fresher zone and once in the high mountains (over 2000m) you enter into a

alpine/sub-alpine region with freezing night temperatures and in winter a lot of snow!!! Yes, snow near the tropics!!

For the plant lovers this is PARADISE on earth. On Tenerife we have about 1300 different species of plants: 50 Pteridophyta, 13 Gymnospermae, 223 Monocotyledoneae and 1011 Dicotyledoneae. These are approximate numbers as nearly every year new discoveries



Fig.2 *Euphorbia canariensis*



Fig.3 *Euphorbia paralias*



Fig.3a *Euphorbia paralias*

have to be added. This shows us also that Tenerife is the island with the highest number of different species but, unfortunately, also the island with the highest number of non-Canarian plants imported and escaped from gardens.

On Tenerife we have also the highest number of local- (± 140), Canarian- (± 173) and Macaronesian (± 83) endemics. In all these results we didn't calculate the natural hybrids as this would take us too far.

I started, as a cactus collector, to study the succulent plants of which a large number can be found here: *Aeonium*, *Aichryson*, *Greenovia*, *Euphorbia*, *Monanthes*, *Mesembryanthemum*, *Sedum*, *Ceropegia* and more succulents or sub-succulents. But quickly my interest turned to a wider view of the local flora and so, after more than 20 years, 4 months a year (April, May, half of June and half of September until the end October) I came to the conclusion that I still haven't seen all of them and every year I have other surprises. At this moment I have in my possession a collection of over 40,000 slides and digital photos! This collection allows me to give talks all over Europe (interested? you can contact me)

As you can imagine most of those endemics have a name "canariensis" and I suppose the best known will certainly be the *Euphorbia canariensis*, the stems of this very tall plant can reach over 8 metres of which only 3- 3½ metres are standing up. The rest are lying on the ground due to the heavy weight of those branches. The flowers are in a group, each time



Fig.4 *Euphorbia atropurpurea* - flowers



Fig.5 *Euphorbia atropurpurea* X *lamarckii* v. *broussonetii*



Fig.6 *Aeonium tabuliforme*

two female flowers with, in the middle, one male flower [Figs.1 & 2]. The fruit is a typical *Euphorbia* fruit with three compartments each one containing one seed of a brown colour.

In the genus *Euphorbia* we have some other representatives, such as *E. balsamifera* ssp. *balsamifera* with separate female and male plants, *E. aphylla*, the splendid *E. atropurpurea*

Fig.7 *Aeonium canariense* in flowerFig.10 *Aeonium tabuliforme* X *lindleyi*Fig.8 *Aeonium sedifolium* on a rooftopFig.9 *Aeonium smithii*

with the very close *E. atropurpurea* fa. *lutea*, the *E. bourgaeana* (very rare), *E. lamarckii* var. *lamarckii* and the very close *E. lamarckii* var. *broussonetii*, *E. mellifera* (very rare) and the very special *E. paralias* [Figs.3 & 3a]. In those Euphorbias I could find a very nice hybrid between *E. atropurpurea* and the *E. lamarckii* var. *lamarckii* and also with *E. lamarckii* var. *broussonetii*. [Figs.4 & 5]

Another succulent genus is *Aeonium*, of which we have 14 representatives on Tenerife. The most remarkable is certainly *Aeonium tabuliforme* [Fig.6] with its flat rosette measuring up to 40cm across. The most impressive is *A. canariense* [Fig.7] and *A. cuneatum*. Both can reach about one metre in diameter (in good growing conditions). Further we have the very nice *A. sedifolium* [Fig.8], *A. spathulatum*, *A. urbicum* with the very close *A. pseudourbicum*, the splendid *A. holochrysum*, the smaller *A. haworthii*, *A. mascaense* (rare) and *A. decorum* fa. *tenerifae*, *A. ciliatum*, *A. lindleyi* and the rare and hairy *A. smithii* [Fig.9]. As in so many members of the family Crassulaceae, we can find several hybrids for example *A.lindleyi* X *A.tabuliforme* [Fig.10] and even inter-generic hybrids with species of the genus *Greenovia*. (Example *Greenovia dodrantalis* X *Aeonium spathulatum* [Fig.11], and *Greenovia aurea* X *Aeonium spathulatum* [Fig.12].

After the Aeoniums we have the genus *Greenovia* with the species *Greenovia aurea*, *G. dodrantalis* and *G. aizoon* and the known natural hybrids X *Greenonium* and *Greenovia* X *aureozoon*.

As we are in the Family Crassulaceae, we continue with the genus *Monanthes*. This is (for me) the most important genus. The highest number and for collectors the most interesting group as they are so small. On Tenerife we can find about 14 different species of this genus. Last year, we finally found the annual *Monanthes icterica*, a very small and nice plant [Fig.13]. This genus has provoked disputes



Fig.11 *Greenovia dodrantalis* X *Aeonium spathulatum*



Fig.12 *Greenovia aurea* x *Aeonium spathulatum*

about whether this is a species, a form or a variety. In a following article I will go further in this discussion. Apart from *M. icterica* we have *M. wildpretii*, *M. minima*, *M. adenosceps*, *M. laxiflora*, *M. anagensis*, *M. praegeri*, *M. niphophila*, *M. brachycaulon*, *M. pallens*, *M. silensis*, *M. polyphylla* and *M. subcrassicaulis*. I have some hybrids from which I still have to make descriptions. In my collection I have some other species which I am studying and they could prove to be new species. I will keep you informed about this situation.

On Tenerife we have also a member of the genus *Sedum* with *S. rubens*, a fantastic small biennial plant. We must not forget the annual *Crassula tillaea*, but unfortunately it is without any interest for collectors.

Apart from the above, we have another genus *Aichryson*. The most important of this genus is *A. laxum* [Fig.14], a bi- or tri-ennial plant. Then there is *A. pachycaulon*, *A. parlatorei*, *A. porphyrogennetos* and *A. punctatum*.

Very interesting are the two members of the genus *Mesembryanthemum*, namely *M. cristalinum* [Fig.16] and *M. nodiflorum*.

Other small genera on Tenerife are *Umbilicus*, with *U. heylandianus*, *U. horizontalis* and *U. rupestris*. The genus *Senecio* is represented by only one species *Senecio kleinia* (syn. *Kleinia nerifolia*) [Fig.17] and the genus *Zygophyllum* by *Z. fontanesii* [Fig.18].

A very important genus is certainly *Ceropegia* about which a lot of disagreements are running. Later I will come back to this



Fig.13 *Monanthes icterica*



Fig.14 *Aichryson laxum*

genus. Here we have *Ceropegia fusca* [Fig.15], *C. dichotoma* and the rare *Ceropegia chrysantha*.

And, last but not least, the famous *Dracaena draco*. A tree-like succulent of the family Agavaceae. (now Asparagaceae, Nolinoideae) On Tenerife there is only one species but on the Island of Gran Canaria, at the end of the last century, a group under Prof. Marrero



Fig.15 *Ceropogia fusca* var. *fusca* - Malpais de Guaza - 12 (The small grey stick-like plants in front of the Euphorbia)

discovered *Dracaena tamaranae*.

So after all this, what are we finally doing on the island? Every year we are there during the months of April, May, mid September and October. Every two days (consider our age) we are exploring the mountain sides. The best places to discover new plants are those famous barrancos (dry valleys) but there is a big inconvenience on those places, it can be very hot in those cavities. Temperatures up to 45/50°C are not exceptional. It is normal as the

bottom is made of black lava rocks, mostly opposite to the wind direction, so no fresh air is coming in and the sun, due to the proximity of the equator, is standing nearly at the zenith. But nevertheless it is always a pleasure to be in those untouched landscapes. Once you have a look to the sea then two minutes later completely enclosed by mountains. Here no snakes, the only creeping reptile is the *Gallotia gallotii*, a lizard 45cm long at most and not dangerous at all. Apart from the named succulents we have the very impressive *Echium*



Fig.16 *Mesembryanthemum crystallinum*



Fig.17 *Senecio kleinia*



Fig.18 *Zygophyllum fontanesii*

wildpretii [Fig.19] which can easily reach three metres high with his flower stalk and the other species *Echium simplex* [Fig.20] which could even be a little taller.

In the next article I will take you with me exploring some interesting sites on Tenerife to show you what untouched nature means. Every year we discover new surprises, and every year I'm looking for amateurs who would like to join me on my trips! I have



Fig.19 *Echium wildpretii*

apartments in the South of the island at cheap prices. So if you are interested in joining us on such a holiday, you can contact me by email tenerifesucculents@hotmail.com.

Albert Leroy – Belgium/Tenerife



Fig.20 *Echium simplex*

A VISIT TO THE HABITAT OF *AUSTROCACTUS HIBERNUS* IN ARGENTINA

Elisabeth and Norbert Sarnes describe their adventure to look for habitats of *Austrocactus hibernus* surrounded by spectacular scenery. Photographs by the authors



Fig.1 A colourful welcome to the Valle de Las Leñas.

At the very beginning of 2013, in January, we had the great luck to go on a joint cactus explorer trip from Mendoza to Northern Patagonia with Roberto Kiesling, supposedly Argentina's best known cactus expert. One intention of this tour had been to solve some questions like for example: How large is the distribution of *Austrocactus hibernus* in the area of Las Leñas?

Being limited in our time, we could only spare one day of the trip for this question. To make the most of it we started early after breakfast from Malargüe, driving directly to the ski resort of Las Leñas. Although this was not our first visit to this place, we were again deeply impressed by the magnificent scenery of the colourful Andes mountains beneath a cloudless blue sky. Reaching Las Leñas we were struck how much the ski resort had

expanded in only one year's time. Buildings are now standing at the location where we had found our first *Austrocactus hibernus* several years ago. Luckily, the distribution area is not too small.

As usual, we followed the beautiful pink flowers of *Rhodophiala rhodolirion* [Fig.3] to find the plants of *Austrocactus hibernus* [Fig.4] that grow well hidden under shrubs of *Junellia* spec. What a pity! The flowering season was just over and fruits of the Austrocacti were not ripe yet. With some luck we found only a few late open flowers [Fig.5].

In January 2012 we had followed the road leading from here to Valle Hermoso. At a place resembling the location at Las Leñas we had discovered another habitat of *Austrocactus hibernus*. Thus, we decided to drive all the way



Fig.2 View into the magic Valle Hermoso, west of Las Leñas.

to Valle Hermoso this time trying to find additional locations that might be suitable for *A. hibernus*. We were successful - at an altitude of a little less than 2500m we discovered another population of the species.

After this our attention was completely caught by the breathtaking scenery of the high Andes [Fig.2]. Going up higher and higher, the vegetation changed distinctly and only when reaching the valley we found two locations that seemed promising for cacti. However, although we searched intensely for a long time we could not find any cactus. Yet, we were rewarded by lots of lovely *Viola vulcanica* [Fig.6]. Many of these were still flowering and

we almost went into raptures, nearly forgetting about the time.

It was already late afternoon and we had to leave this wonderful valley. But we are sure to return to this magical place and spend more time there because we are convinced that there must be another location of *A. hibernus* somewhere in this area.

Already on our way to Las Leñas, Roberto had told us about a habitat of *Austrocacti* between Los Molles and Las Leñas that he had visited many years before. Thus, we decided to take a closer look there on our way back to Malargüe. We were really keen to see these



Fig.3 *Rhodophiala rhodolirion*, a beautiful companion of *Austrocactus hibernus* in this location



Fig.4 A wonderful, healthy cluster of *Austrocactus hibernus*



Fig.5 One of the season's last flowers on *Austrocactus hibernus*



Fig.6 One of the charming, little *Viola vulcanica*.



Fig.7 Fruit of *Austrocactus* spec. SAR 6842 "Los Molles"

plants; a few months earlier, as a preparation for our trip, we had made another 'cactus explorer trip' to the herbarium of the Städtische Sukkulentsammlung Zürich. There, we had seen the herbarium specimen of an *Austrocactus* spec. No. 17611 collected by



Fig.8 Roberto Kiesling and Elisabeth Sarnes examining an *Austrocactus* spec. SAR 6842 "Los Molles"

Eggli & Nyffeler in 1995 that we could not identify for sure as *Austrocactus hibernus*.

Reaching the place Roberto remembered, we soon found quite a lot of *Austrocacti* [Fig.8]. It was a lucky circumstance that we could find some ripe fruits. It is important to mention that one main characteristic of *A. hibernus* is its green, mucilaginous fruit which resembles a ripe gooseberry (even in taste!)

Well, the fruits we found here, west of Los Molles, had no similarity at all with those of *A. hibernus* [Fig.7]. They were dry inside like those of all other *Austrocacti*. We can now be sure that they are not *Austrocactus hibernus* but we cannot identify them at the moment as we have not seen the flowers up to now. At least, one more reason for us to come back to the 'Valley of the Yellow Wood' - the meaning of the valley's complete name: 'Valle de Las Leñas Amarillas'.

[Elisabeth](#) and [Norbert](#) Sarnes

Further Reading

Sarnes, E. & N. (2012) Cactus de Patagonia.

Sarnes, E. & N. (2012) Die Gattung *Austrocactus*. - *Kakteen und andere Sukkulente* 63(5): 113-126

IN PRAISE OF *ECHINOCACTUS GRUSONII* AND THE JOY OF A NEW LOCATION.

One of the most common species in cultivation, *E. grusonii* is rare at its type locality but now a new distant locality is known where the plants are subtly different

Photos and text: Graham Charles & Zlatko Janeba

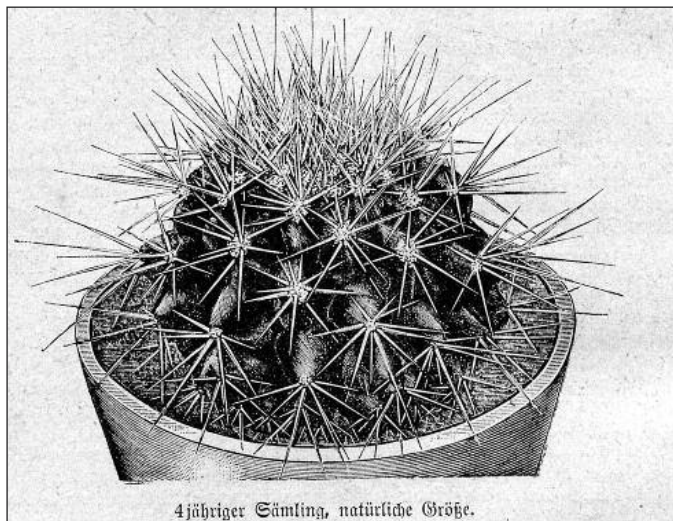


Fig.1 The illustration of a 4 year old seedling which accompanied the first description of *Echinocactus grusonii* by Hildemann in MfK 1891.

Just because a plant is commonly seen in cultivation, it doesn't mean that we should ignore it or not appreciate its beauty. I have fond memories of The 'Golden Barrel' cactus, *Echinocactus grusonii*, from the early days of my interest in cacti.

One of the pictures in the 'Observer's book of Cacti and other Succulents' illustrates rows of large barrels growing outside in a nursery, probably in California. I was a school boy when I first saw this and was enthusiastically spending my pocket money on cacti which

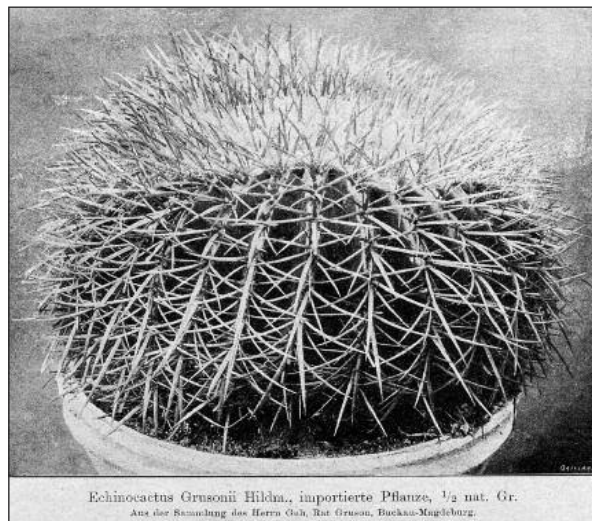


Fig.2 The illustration of a mature imported specimen which accompanied the first description of *Echinocactus grusonii* in MfK 1891.

were rapidly filling up my father's greenhouse. I just had to find a plant of *E. grusonii* to buy.

My parents were encouraging my interest in cacti and agreed to take me to an open day at Worfield Gardens, the nursey owned by Sir Oliver Leese, that was quite near where I lived. At the time, it was one of the best places to see large cacti and a good chance to buy plants which were rarely seen in shops.

My visit to Worfield Gardens was the first time I had seen really large 'Golden Barrels', a sight which further increased my desire to

Photo: Graham Charles



Fig.3 *E. grusonii* growing in the author's collection, including the two original plants mentioned in the text.



Fig.4 The recently introduced *E. grusonii* c.v. 'Curvispinus' in the author's collection.

Photo: Graham Charles

Photo: Graham Charles



Fig.5 *Echinocactus grusonii* in cultivation at the Jardin Exotique in Monaco. This is the type form which has been in cultivation for years

own one. So, imagine my disappointment when I was told that there were none available for sale that day! I cannot remember where I eventually found a plant to buy but it could have been at 'Woolworths', famous at the time for selling cacti, or perhaps the seed merchants and garden shop 'Proffit and Westwood' which had a number of branches in the Midlands.

Some years later, an elderly member of the Cactus Society decided to sell his collection and I was able to buy two 30cm specimens for £15. They are still flourishing in my planted bed [Fig.3], along with others obtained over the years. Sadly, I have not yet succeeded in

flowering one, perhaps because my glasshouse is slightly shaded by trees.

There are a number of cultivated forms of *E. grusonii* seen in collections. There is one with short spines, often described as the 'spineless' form and a white-spined version which is said to have originated in Italy. It is curious that abnormal forms of plants are often sought-after, even if they are less attractive than the original, which I personally think is the case with these two. [see Giusti 2001 for good pictures of these]

However, I do like the most recent form to appear under the name fa. *curvoispinus*. It is very neat and when I first saw it, I thought it was made of plastic! It has been extensively propagated and can be obtained quite easily now.

It has been widely reported that the number of plants of *E. grusonii* at its type locality in the Sierra Madre Oriental, Querétaro, Mexico, is small and continues to decline. The construction of a hydro-electric dam near Zimapán in 1990-91 flooded 23km² and reduced the size of the habitat. During this construction, many large plants were removed and replanted in a Mexican botanic garden, as illustrated in Anderson (2001).

Photo: Graham Charles



Fig.6 *Echinocactus grusonii* VZD1153 seedlings from the new locality El Tulillo, Zacatecas, in cultivation.

Photo: Zlatko Janeba



Fig.7 *Echinocactus grusonii* at the new locality.

The article written by Arturo Anaya (2005) gives a clear impression of the type locality and is illustrated by spectacular pictures. He reports on the discovery of a population nearby which has many plants although regeneration is not much in evidence.

The latest milestone in the history of this famous plant happened when a group of Germans found a new population a distant 550km away from the type locality north of a village called San Juan Capistrano in Zacatecas, Mexico. They published an article about their find in *Kaktusblüte* (2005).

Explorations by Fitz Maurice et al (2005-6) in the area later revealed a number of localities

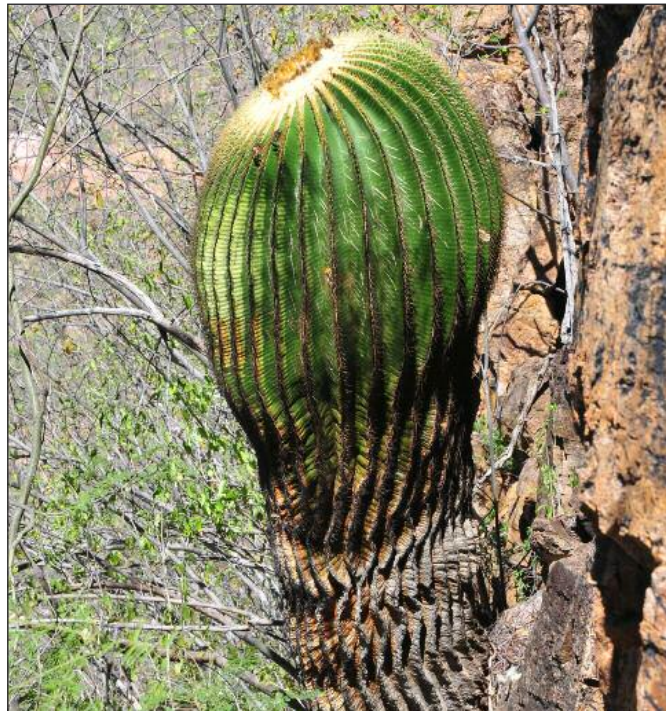


Photo: Zlatko Janeba

Fig.8 *Echinocactus grusonii* at the new locality.

for the plant, always on steep volcanic cliffs. They speculate that there could be tens of thousands of individuals in an area of some 240km². The plants differ from those found at the original locality in a number of details. They have smaller, darker brown seeds. The mature plants are more columnar and the young plants have finer spines, pinkish when



Photo: Zlatko Janeba

Fig.9 *Mammillaria wagneriana* at the new locality.



Fig.10 *Astrophytum ornatum*, Presa Zimapán, Hidalgo (28 May, 2003)



Fig.11 *Ferocactus glaucescens*, growing fully exposed on a barren limestone rock, Presa Zimapán, Hidalgo (28 May, 2003)

young [Fig.6].

Seedlings of plants from the new locality have been offered recently, for instance, at the ELK meeting in Belgium. Although clearly the same species, they are easily distinguished from the commonly cultivated form originally from the type locality. The one plant I kept from a batch I grew from seed collected at the type locality is indistinguishable from the plants we have seen in commerce over the years .

The Golden Barrel is remarkably easy to grow, although it needs to be large and kept in a sunny place to flower. It is certainly the easiest and quickest barrel to get to a large size, leading some to speculate that it could be a natural hybrid with the sympatric *Ferocactus glaucescens* as one of its parents. Finding a second locality of such similar plants makes this theory less likely.

Genetic studies suggest that *E. grusonii* may be more closely related to some *Ferocactus* species, especially *F. glaucescens*, than to other

Echinocactus species.

GC

Zlatko Janeba has been to both the localities and wrote the following about his experiences:

Echinocactus grusonii is a very common cactus in cultivation but was some time ago considered to be (almost) extinct in nature. The major reason for the disappearance of *E. grusonii* from its type (and at that time the only known) locality was the construction of the Presa Zimapán (Zimapán Dam, opened in 1993). Meanwhile an attempt to remove the remaining plants from the habitat and thus rescue them (!) is considered to be a minor factor.

Nevertheless, during the last 10-15 years there were numerous attempts to discover this species in the vicinity of the dam and the good news was that several of them were successful (e.g. reports by Anaya 2005, Dráb 2005, Záruba 2007). I also had the opportunity to see this beautiful cactus in the field near the Presa Zimapán, although it was only a single plant [Fig. 12]. When travelling in Mexico in 2003 with my companions Richard Kalas and Olda Fencl, we decided to try our luck. We spent several hours out there and we also tried to get some help from the locals, but on hearing that we were looking for a golden barrel cactus, they usually answered that there were plenty of them. What we realized later was that they might consider other cacti growing there also as barrel cacti with golden spines, especially *Ferocactus glaucescens* [Fig. 11] and *Astrophytum ornatum* [Fig. 10], which are both very common in the field.

My next encounter with *E. grusonii* was some 7 years later at the more recently discovered population of this species near San Juan Capistrano, when traveling with Jaroslav Šnicer and again with Richard Kalas. That time we saw some 13-15 plants in the field. Unfortunately, we did not observe any flowers, fruits, or seeds, but I have to say that it is a very enjoyable place to visit with many photogenic plants.

The character of both biotopes is quite similar. *E. grusonii* at both localities grows on



Photo: Zlatko Janeba

Fig.12 Echinocactus grusonii, Presa Zimapán, Hidalgo (28 May, 2003)

very steep slopes above the river, creating a relatively humid environment. But, at Presa Zimapán they grow on a greyish limestone, while near San Juan Capistrano you find them on reddish volcanic rocks.

Taking into account the large distance apart of the localities (more than 500km), as well as the different type of the substrate, the accompanying flora clearly must be different too. From the Zimapán flora can be mentioned especially cacti like *Astrophytum ornatum*, *Coryphantha clavata*, *C. octacantha*, *Echinocereus pentalophus*, *Ferocactus glaucescens*, *F. hystrix*, *Mammillaria cadereytensis*, *M. elongata*, *M. scheinvariana*, and *Stenocactus sulphureus*, while from the vicinity of San Juan Capistrano e.g. *Echinocereus spinigemmatum*, *Mammillaria wagneriana* [Fig.9] and from nearby also very popular species like *Mammillaria roemerii*, *Coryphantha tripugionacantha*, and *Echinocereus pamanesiorum*.

The two forms of *E. grusonii* can easily be distinguished from each other at first glance. The ones from San Juan Capistrano, sometimes called „capistranoensis“, have generally a greener appearance as a whole plant, shorter and sparser spination, and areoles seem to be further apart. ZJ

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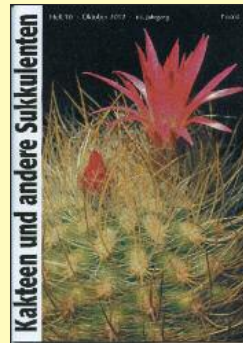
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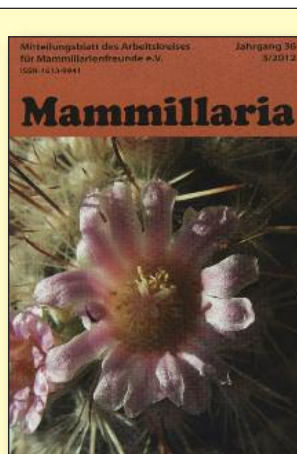
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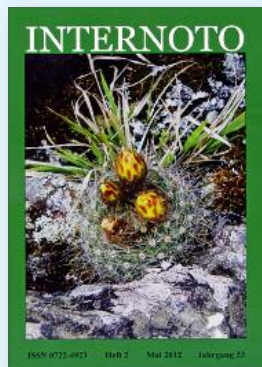


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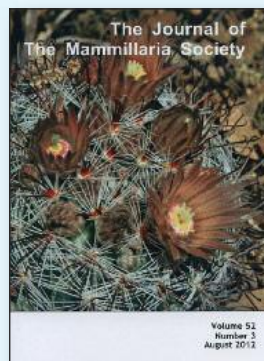
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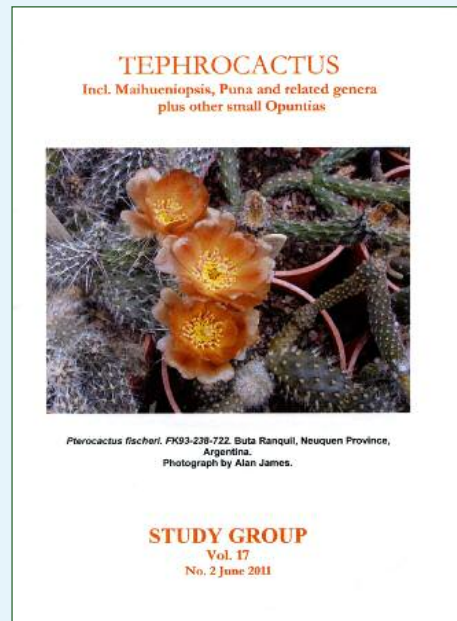
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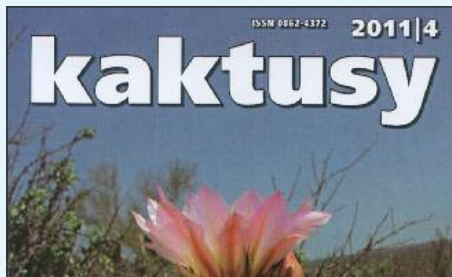
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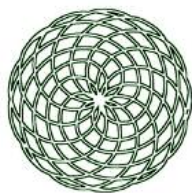
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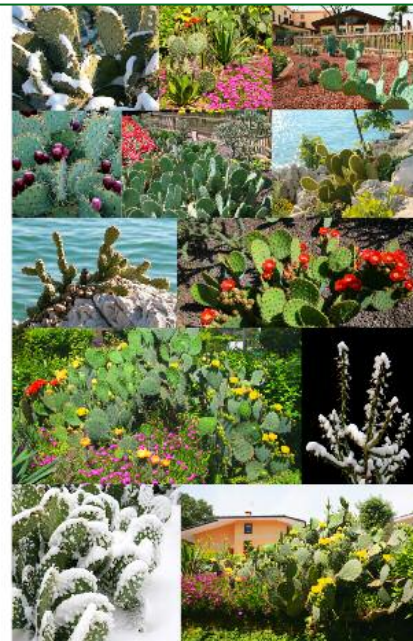


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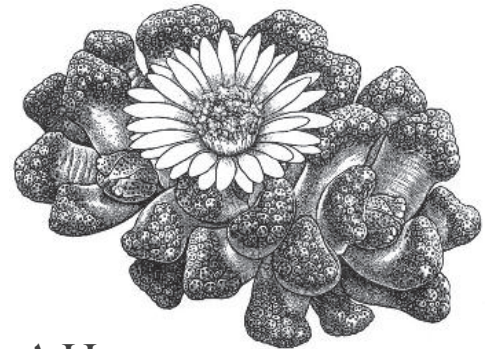
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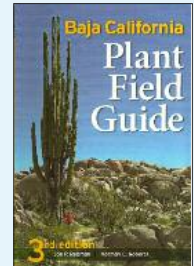
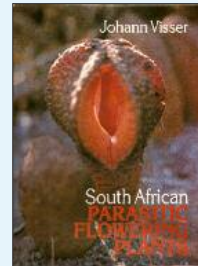
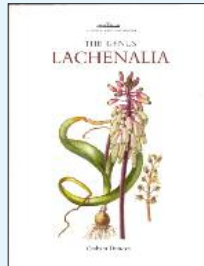
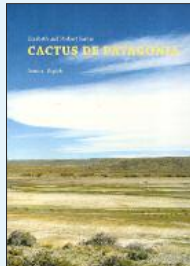
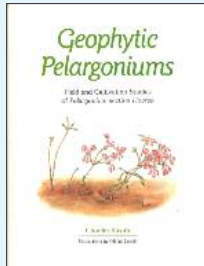
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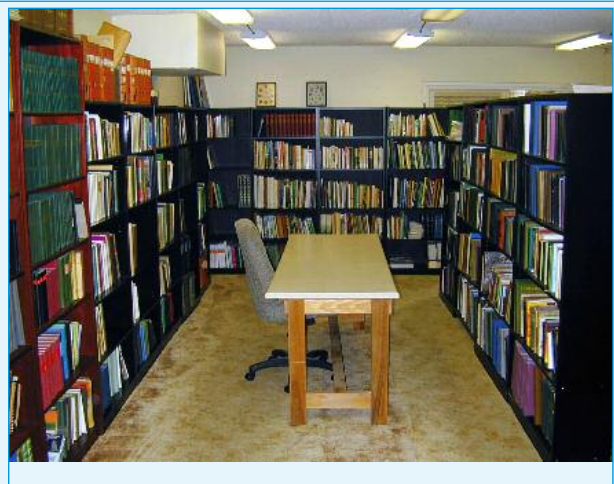
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