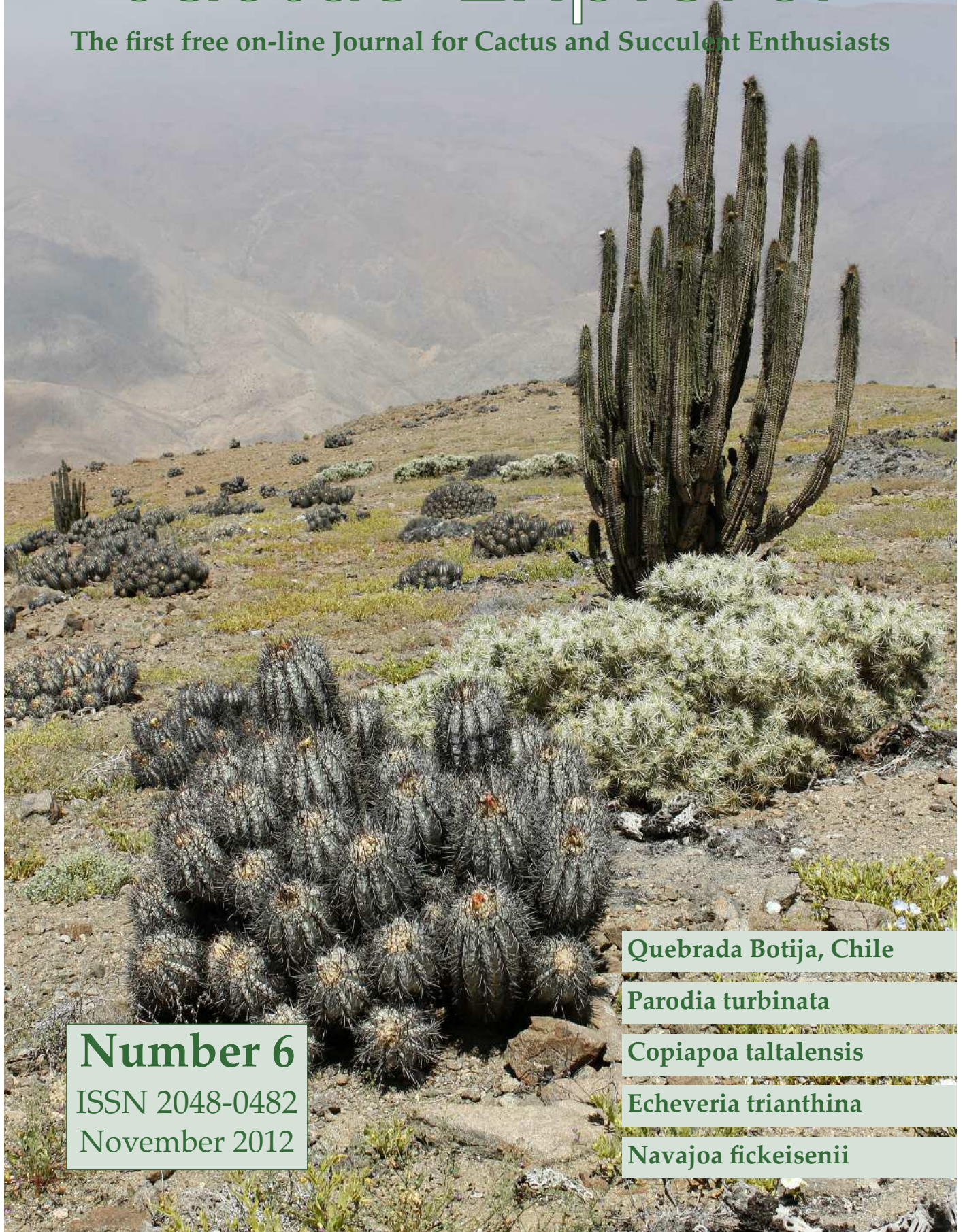


The Cactus Explorer

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



Quebrada Botija, Chile

Parodia turbinata

Copiapoa taltalensis

Echeveria trianthina

Navajoa fickeisenii

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

Cover Picture

Copiapoa atacamensis and *Eulychnia iquiquensis* at the top of Pico Botija. Photo: Philippe Corman

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
November 10th 2012

There is one new
combination on [page 33](#)

INTRODUCTION

Another year nearly over!

At the beginning of the growing season, I always think I shall have plenty of time to do some long-overdue jobs. So, here we are, at the end of the season and did I get the jobs done? Well, I made a start!

September was as busy as usual but very enjoyable. I was one of the speakers at ELK in Belgium and my talk was attended by a large audience. Giving talks is something I really enjoy and now that digital projection is the usual method of presentation, I can include text with the images. This enables plant names to be communicated more reliably, overcoming the different pronunciations used around Europe.

It was 50 years ago that my father took me to my first cactus meeting in Birmingham, the second city of England, where I lived as a boy. In those days, the local branch of the National Cactus and Succulent Society regularly attracted around 100 people to its meetings. How numbers have changed since then!

Membership of Societies continues to decline and attendance at some local branch meetings is reaching such low numbers that the viability of holding such meetings is in question. One gets a vibrant impression of the health of the British Society when one attends events like the National Show. You can read more about this great day out on [page 4](#).

The Cactus Explorers Club weekend was again a great success, much enjoyed by the participants. The talks were really excellent, covering a wide range of locations across cactus country. We always try to include more unusual plants and places. Examples this year included talks about 'Corynopuntia' from Davide Donati, 'the history of botanical trees' from Roy Mottram and 'Patagonia' from Ralf Hillmann. A full report written by Roland Tebbenham appears on [page 7](#).

Readers of CactusWorld, the quarterly

journal of the BCSS, will have seen the announcement that I will be the Bradleya editor starting with Issue 31 of 2013. I am taking over from Colin Walker who has been editor for the last 12 issues, during which time he has presented us with a wealth of learned articles.

I assure you that this new post will not affect my work on the **Cactus Explorer** and I hope that if you have a more technical article available for publication, that you will offer it to me for Bradleya. I also hope that you support this valuable journal which is a vital legacy to future generations of students of succulents.

Early editions of Bradleya are out of print so can only be bought [second hand](#). Those issues still in print can be purchased new from the [BCSS shop](#). Out of print issues Vols. 1-7 are available as pdfs from the BCSS eLibrarian, Pete Arthurs.

One of my favourite winter activities is looking through the seed lists and trying to decide what to sow next spring. You can find links to the vast range of cacti and succulents in our feature on [page 65](#). Many of the specialist societies have seed distributions for their members which often include unusual species. These alone can often justify the membership fee since the seeds are usually cheaper than commercial suppliers.

So, all of us at the Cactus Explorer wish those of you living in the northern hemisphere a mild winter just as energy prices rise again.

More explorations in February.

Happy New Year!

Graham Charles

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



The National Show was a Great Success

It was one of the hottest days of the year when hundreds of enthusiasts went to Wood Green Animal Shelter for the National Show on the 18th August. The event was expertly organised by the Shows Committee of the BCSS and surely enjoyed by everyone who attended.

There were many amazing plants exhibited in the 134 competitive classes, posing a real test for the team of judges. Some outstanding specimens left the show without prize cards, some of them so large as to present a transport challenge to their owners. At least the owner of the huge plant of *Maihueniopsis clavarioides* (pictured here) should be pleased with his Diploma for the Best Cactus in the show.

I am particularly fond of Copiapoa and their current popularity was reflected by the well-supported classes for the genus. Working with Derek Bowdery, I was fortunate to be a judge of these classes. We chose a perfectly grown specimen of *C. columna-alba* with two heads as the best in the unrestricted pot size class, but it was a close competition and many outstanding plants failed to win a prize.





As well as the competitive classes, there was a large plant sale with a wide range of choice plants available to buy. Nurseries came from Holland, Germany and the Czech Republic as well as many from Britain. I wonder how many plants changed hands to be taken to already crowded glasshouses to bring pleasure to their new owners?

So, congratulations go to the organisers, the exhibitors and everyone who contributed to a wonderful day. In four years we shall again gather to view the best of the best at the National Show 2016. It sounds like a long time to wait but I bet the years pass quickly!

GC

ELK is a weekend of entertainment

Enthusiasts from around Europe again congregated in Blankenberge during the first weekend in September for ELK to meet friends, to buy or sell plants and drink beer. The weather was sunny, ideal conditions for relaxing and enjoying the occasion.

It is a great place to meet people and to buy those plants you have been unable to find elsewhere. There are mature plants as well as young propagations for those looking to add to their collections. It is also a good place to look for books and journals, both new and second-hand.

The lectures added to the entertainment this year and included speakers from Argentina and Chile. Next year, it will again be the first weekend of September, the 6th to 8th 2013, so why not plan to be there? If you cannot get a room at the venue, there is plenty of good accommodation nearby in Blankenberge.

GC



An interesting web resource

The conservation of cacti in their native habitats has a much higher profile than in the past, but I suspect that plants are still stolen from the wild by unscrupulous collectors. For some species, this is the main reason for the decline of their populations.

An organisation calling itself the Cactus Conservation Institute has a website with information about the status of *Lophophora williamsii* and *Astrophytum asterias*.

Their [library](#) has a number of interesting articles on the subject and you can read about their activities at:

<http://www.cactusconservation.org>

GC

What goes on in the garden

John Cox brought to my attention a remarkable short video on youtube:

<http://www.youtube-nocookie.com/embed/xHkq1edcbk4?rel=0>

The slow motion sequences of humming birds and the pollination of cactus flowers by bats are well worth seeing.

GC

Taxonomy of Echinopsis

The publication of more molecular studies is slowly revealing a picture of relationships where the morphological characters traditionally used to define genera are not necessarily reliable indicators of a common ancestry. It is clear that characters associated with the floral syndrome, like flower structure, have evolved multiple times in clades which may only be distantly related.

As the molecular results for each group of plants is published, a similar pattern emerges. Traditional genera are often shown to be polyphyletic, that is, they include species from more than one evolutionary line. There is a debate about whether this matters, some botanists preferring to have genera which can easily be recognised by prominent characters, rather than monophyletic ones where common characters are difficult to define.

If one takes the view that genera should be monophyletic, the approach which appears to have been preferred for the Cactaceae recently, then the taxonomic consequence is to have more, smaller genera, so-called 'splitting'. *Echinopsis*, one of the largest cactus genera as defined by the 'New Cactus Lexicon', is the most recent candidate for a breakup following the publication of [Boris Schlumberger's paper](#). The trees clearly show the pollination syndrome of each taxon, illustrating how these have each evolved multiple times.

Boris has published the taxonomic consequences of his work in 'Cactaceae Systematics Initiatives' 28 (October 2012). It sees the resurrection of many old genera, some having not been in common use for years: *Acanthocalycium*, *Chamaecereus*, *Leucostele*, *Reicheocactus* and *Soehrensia*.

The paper provides answers to a number of taxonomic issues. It was a pre-publication sight of Boris's work which, with his guidance, encouraged me to recognise *Borzicactus* as a separate genus from *Cleistocactus*. There is also a suggestion in his work that *Loxanthocereus* does not belong within *Borzicactus*, so it is to be hoped that a detailed study of his 'Oreocereus clade' may be undertaken in the future to resolve this.

Among the many interesting findings, I will select a couple which I think are particularly interesting. The Denmoza clade comprises *Acanthocalycium*, *Denmoza*, *Setiechinopsis* and *Echinopsis leucantha*. Mainly because of its flower structure, it has long been thought that *E. leucantha* is really different from other *Echinopsis* species exhibiting long flower tubes. We can understand its individuality much better now.

Vatricania guentheri is shown to be in the 'Cleistocactus clade', so not an *Espositoa*. This clade would also repay a detailed study to see if there is any justification for more than one genus within it.

I recommend reading the whole paper which can be downloaded from http://www.umsl.edu/~renners/Schlumberger_Echinopsis_AJB2012.pdf

GC

The Cactus Explorers Weekend 2012

Written by Roland Tebbenham

Photo: R. Tebbenham



Fig.1 Dessert not Desert

A returning explorer enjoys the eighth intensive club weekend designed to share new details and ideas about cacti from interesting places. This event was organised by Graham Charles with his quiet efficiency and was supported by fifty-four enthusiasts, including guest speakers and delegates from Italy, Sweden, Switzerland and many parts of the UK. The usual array of choice plants, books and literature sales coupled with the promise of two barrels of Old Speckled Hen for delegates stimulated an air of eager expectation on a sunny Friday afternoon. Sixteen presentations were planned, spanning habitats from the USA to Patagonia. I here attempt to regale you with my understanding of the essential elements comprising an explorer's life.

Plans, Pleasures, Perils, Pitfalls and Prizes

After the first pleasures of conversations in the sales room and bar we enjoyed an excellent dinner of Paté, Hake, Strawberry dessert [Fig.1] and cheese, all well lubricated by Chilean wines. Then we settled down to hear Paul Hoxey start proceedings in Peru, where there were many pleasures to enjoy. There was discussion of *Cumulopuntia corotilla* (an older name for Backeberg's *Tephrocactus mistiense*), large plants covered with fruits [Fig.2].

The *Islaya islayensis* plant in Fig.3 faced a potential peril voiced by a delegate sotto voce "It needs watering" followed quickly by a riposte: "No, you'll kill it." The good-humoured atmosphere had developed quickly amongst the assembled company! Paul showed pictures taken



Fig.2 *Cumulopuntia corotilla* PH918.01 east of Arequipa, 3290m

in successive years showing the effects of severe drought; a peril for the plants as well as for explorers looking for them. He mentioned "my sad hobby of trying to identify the dead cactus". The *Neoraimondia arequipensis* areoles made another arresting image. Paul had planned part of his trip by researching Dr Franz Meyen's travels in the Department of Arequipa during the 1830s where he described cereoid plants and an *Echeveria*. Paul showed us the dry valley travelled by Meyen with *Browningia* and *Cumulopuntia* plants. He also found nice plants of *Echeveria peruviana*, declared an honorary cactus for the weekend that brought appreciative comments from John Pilbeam. We saw examples of the specialized (non-succulent) flora up to 4860m altitude, before a pleasure for me to see an unusual hemi-parasite on



Fig.3 *Islaya islayensis* needing water? PH920.02 Near Matarani on coast road to Mollendo, Peru 120m

Photo: P. Hoxey

Photo: P. Hoxey

Photo: P. Hoxey



Fig.4 *Neoraimondia arequipensis* PH963.01 on coast south east of Punta de Bombón, Arequipa, Peru 140m

Photo: B. Burke



Fig.5 *Sulcorebutia gerosenilis (hertusii)*.

Weberbauerocereus. Ligaria cuneifolia is a member of the 'Showy Mistletoe' (Loranthaceae) family. The genus has two species and they are used in folk medicine in Argentina. All-in-all this was a great start to a busy weekend.

Saturday featured nine presentations. There were classification ideas, the story of the phylogenetic tree-makers, and two Bolivian journeys to enjoy, all scheduled before lunch. Ivor Crook introduced us to his thoughts on the group of plants in the NCL termed *Rebutia fiebrigii*. (The NCL says: 'A very variable species, especially in its spination, and here treated in a wide sense.') He had spent ten years trying to relate the paleogeography, climate fluctuations and recent DNA analysis findings with the plants' appearance and locations at present. Ivor started the story at

Photo: B. Burke



Fig.6 Yet another pit stop!

60 million years before present and explained the forces causing speciation and radiation around the Andes mountain region resulting in the present distribution as we understand it. Doubtless there is yet more to discover.

Ivor's talk was complemented by Roy Mottram with an historical perspective 'Cactus Cladogenesis'. The term phylogeny was introduced by the German biologist Haeckel (1834-1919). Darwin's 'Origin of Species' appeared in 1859 followed seven years later by Haeckel's own book on evolutionary theory, which also carries the earliest phylogenetic trees. Later the study of evolutionary diversification became known as cladogenesis after the term 'clade' was introduced by Julian Huxley in 1958, and phylogenetic diagrams, usually drawn with their timescale horizontal, are now known as cladograms. There is a well-known aphorism 'God created, Linnaeus ordered' that enumerates our desire to classify as a means of understanding what is around us.

Roy explained the results of another group of explorers seeking the means to codify the family Cactaceae; starting from the analysis of the superficial morphology through more detailed studies of embryos, seeds and pollen to the application of statistical techniques and finally molecular systematics and DNA. There are pitfalls in this quest, from insufficient data, premature assumptions, or even new discoveries from detailed work in habitat; all of which can modify earlier conclusions. Maybe there are prizes here for amateur explorers whereby they can inform professional taxonomists with new habitat records and new species?

Brendan Burke outlined both pleasures and perils for explorers in his Bolivian trip made with

Photo: B. Burke



Fig.7 'A lunchtime view'

John Carr, Chris Pugh, Paul Klaassen and Wieba Bosma; it became 'The 2011 Pit Stop Tour'. Bulbs, aroids, epiphytes, and bromeliads complemented some beautiful cacti like *Sulcorebutia gerosenilis (hertusii)* [see Fig.5]: all adding to the pleasures. However the perils included Bolivian Wasps that "sound like a 747 landing", seventeen punctures in fourteen days that gave the talk its name [Fig.6] and checkpoints where cash was needed to continue travelling along the dirt roads.

Brendan clearly enjoyed seeing and recording *Cleistocactus*, *Echinopsis*, *Lobivia* and *Sulcorebutia* plants in their habitats. By contrast, the wide views over distant mountains were also a distinct pleasure [Fig.7] and Brendan commented that he was awed by the solitude and stillness.

Brendan was followed by Ralf Hillmann [Fig.8], one of our overseas speakers from Switzerland, who had been exploring the Cordillera Mandinga in SE Bolivia between 1000m and 4500m altitude. The habitat pictures were breathtaking and included a wide variety of plants including the vividly flowered *Sulcorebutia crispata* amongst others from the same genus. The east of the country is rich in rain forest habitats with many bromeliads and epiphytes, whereas the west is higher, rockier and drier so more xerophytic plants grow there. This cordillera is poorly explored with few roads and the perils for the intrepid plant hunter who wants to investigate the cliff-dwelling species [Fig.9] were clear; you must trust your colleagues. But the cacti were worth the effort: *Cleistocactus*, *Echinopsis*, *Lobivia*, *Parodia* and *Sulcorebutia* all featured together with *Zephyranthes* bulbs and many Tillandsias. Ralf suggested there might be many interesting finds amongst the unexplored hills.



Fig.8 Ralf Hillmann

Photo: T. Wray



Fig.9 Working by the Abysss.

Photo: R. Hillmann

We enjoyed an intensive morning of presentations and had earned our lunch and the chance to wander in the gardens exchanging views and ideas of what we had seen and heard. The next presentation was the antithesis of the traditional post convention-lunch 'graveyard' session: 'A Ballade for Corynopuntia' by Davide Donati [Fig.10], our second invited overseas speaker from Italy and the Editor of *Piante Grasse*. He kept everyone wide awake with an explorers' special – a talk on *Opuntias*.

We enjoyed a circular tour from San Luis Potosí, via Nuevo León, Tamaulipas and Coahuila into the SW states of USA, then to Baja California, crossing the Sea of Cortez to Sonora seeing plants from contrasting limestone and granite habitats. We were able to reflect on the extreme perils of their glochids, spines and sheaths (the last are absent in *Grusonia*) from a prudent distance! Two particularly beautiful, but well-armed and very



Photo: T. Wray

Fig.10 Davide Donati



Photo: P. Hoxey

Fig.13 *Arequipa hempeliana* 'australis' PH945B.01 on road to Tignamar, Arica and Parinacota, Chile, 3160m



Photo: D. Donati

Fig.11 *Corynopuntia invicta*

Opuntia fruits into your pockets; this proved to be a very bad idea! His cultural advice was to keep these plants cool, dry and pruned like bonsai; then they will grow into nice compact, attractive specimens. Davide proved popular with the audience owing to his practical knowledge coupled with a richly ironic sense of humour – the latter an essential attribute for explorers.

Davide was followed by visits to Oklahoma, Northern Chile and Mexican Adventures care of Peter Berresford, Paul Hoxey and Aldo & Daina Delladdio respectively. Peter reminded us of the perils of tornados in his search for *Echinocereus* in the temperate grasslands of the Great Plains. Fortunately for us he avoided tornados and showed us terrific plants from various sites across the state. Notable were the subspecies of *Echinocereus reichenbachii* together with many local wildflowers, some familiar in UK gardens like *Oenothera*, *Coreopsis* and *Salvia*. We also enjoyed seeing *Coryphantha echinus* and *Echinocactus texensis*. Peter had gleaned important data relating to the distribution, regeneration and threats to some of his favourite plants; all prizes for careful research, planning and exploration.



Photo: D. Donati

Fig.12 *Corynopuntia bulbispina*

Paul's second programme featured a natural peril in north Chile; earthquakes. A 7.9 magnitude earthquake at Limaxina destroyed the village in 2005; it has not been rebuilt and people have moved to the larger towns. His planned exploration area was N Chile, in areas where no rain has been recorded – ever. He planned to study steep valleys with some springs and flowing water, betrayed by vegetation. Some *Prosopis tamarugo* trees were planted and still grow quite well. Paul visited the type localities of *Oreocereus leucotrichus* and *Cumulopuntia leucophaea* to verify what is the

dangerous plants are shown in Figs.11 & 12. These prizes were associated with pitfalls of severe sandstorms that blanked out vision and restricted progress; also Davide's exhortation not to put

Photo: P. Hoxey



Fig.14 *Soehrensia uebelmanniana* PH681.01 between Linzor and Toconce, Antofagasta, Chile, 3760m

correct application of those names. He showed *Corryocactus* plants with 20cm long spines, *Haageocereus chilensis*, beautiful humming-bird pollinated flowers of *Arequipa (Oreocereus)* and fine old *Soehrensia* up to 2m tall [Figs.13 & 14]. The geysers near El Tatio and old *Trichocereus atacamensis* with resident humming bird formed a pleasurable finale to Paul's second presentation.

Aldo and Daina Delladdio are now 'regular Explorers' and they showed us some of their 'holiday slides' taken during a long trip around central Mexico in August. So many lovely plants were evident including two of my favourites: *Astrophytum myriostigma* [Fig.15] and *Strombocactus disciformis* in profusion [Fig.16]. I also grow Cycads from seed and was pleased to see *Dioon edule* with cones; my plants share the greenhouse conditions with cacti and other succulents. Perils to explorers included being accused of stealing peyotl and the sign 'Happy Trip, Drive Carefully' on a very doubtful bridge! Plant perils included flooding, goats, and organised habitat destruction for *Agave* and *Aloe vera* plantations. So we saw the good and bad in more than 270 images; a veritable tour de force.

Martin Lowry chaired the evening session, though initially he struggled to silence an audience reinforced by another good four-course dinner with much beer and wine. The anticipation was palpable – Trevor Wray has an enviable reputation for entertainment – so his 'Life and Death in the Desert' programme was bound to include both pleasures and pitfalls. There were snakes, mealy bugs, droughts, survey tags, gunshot damage, GPS malfunctions, collectors, more goats and bad roads [Fig.17] – all contriving to frustrate intrepid explorers in search of the beautiful *Pediocactus* and



Fig.15 *Astrophytum myriostigma*

Photo: A. Delladdio



Fig.16 *Strombocactus disciformis*

Photo: A. Delladdio

Sclerocactus plants.

And yet the modern technology of GPS led Trevor to pleasures and the ubiquitous Swiss Army Knife came to be used for more than scale in photographs. Are there really sunshades for



Fig.17 A hazardous road

Photo: T. Wray

Photo: C. Davies



Fig.18 *Ferocactus pilosus*

Photo: R. Hillmann

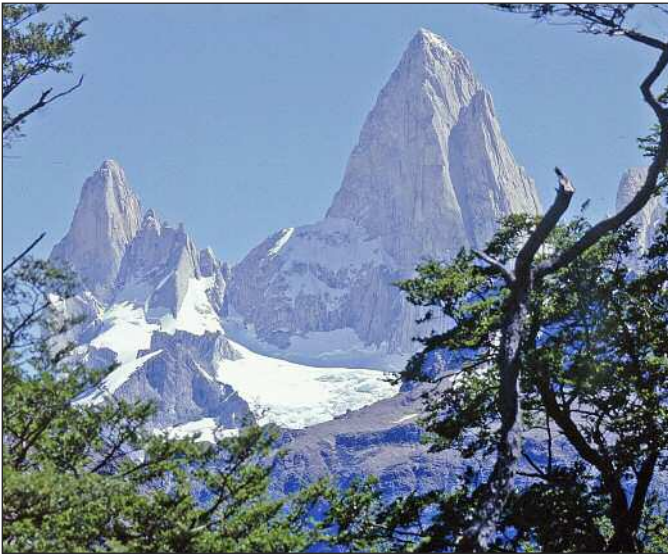


Fig.19 Mount Fitzroy

Photo: R. Hillmann



Fig.20 *Pterocactus hickenii* RH3773a

Pediocactus sileri and chastity belts for *Sclerocactus wetlandicus*? You bet there are! Also if you purchase a rescued plant at a sale in USA the north side is marked so you can replant it correctly

orientated in your patch. Well done Trevor for another memorable exploration report.

Sunday dawned fine, cool, with a slight mist; ideal for a pleasant stroll around the Harold Martin Botanic Garden before breakfast. Then to some serious science: Pete Arthurs introduced Martin Lowry, who challenged us with an analysis of the effect of climate on cactus distribution. He had plotted temperature, rainfall and altitude data along an east/west transect of Bolivia; also plotting the mean temperature of the wettest quarter and the rainfall amount of the coolest quarter. Following some neat charts to summarise the data he showed us *Rebutia* and *Lobivia* from the various climatic regions, localities and particular areas such as in rain shadows. His message was simple: 'check the habitats and apply science to your plants in the greenhouse for best results, some are very tolerant, others quite limited to specific conditions'. Martin's analysis overlapped in part with Ivor's thoughts on the distribution influences of climate and geography we enjoyed the previous morning and led to some spirited discussion. He commented that the reverse is also true: analyse the geology, soil and aspect to aid the explorer in searching for new plants.

Pete introduced Chris Davies and his 'Northeast Mexican Ramblings' with subtitle 'Featuring plants other than *Mammillarias*'. Chris visited a number of Mexican States during April and showed us many choice plants including *Turbincarpus ysabelae*, *Acharagma aguirreana*, *Ariocarpus agavoides*, *Geohintonia mexicana*, *Pelecyphora aselliformis*; and many lovely *Thelocactus* to enthuse Martin Doorbar and, of course, quite a few nice *Mammillarias*. He had been assisted in his quest by John Miller, who provided GPS data of particularly interesting locations. However, my favourite plant image was a gorgeous stand of *Ferocactus pilosus* glowing in the sunlight amongst spiny shrubs [Fig.18]. These were pleasures indeed, with comparatively few perils, bar a Mexican Army squad along a track at one location. On enquiry they retorted that Chris and his companions were "Quite safe because we are here" ... hmm. Chris also met some Mexican Wildlife Officials, who inspected some of the parties' luggage for contraband plants in an effort to protect their natural flora. Fortunately, no-one was carrying contraband so all was well.

During the morning coffee break there was a rare sighting of a group of explorers armed with maps planning a trip to South America; they never miss an opportunity eh?

The pre-lunch session was an interesting

Photo: D. Donati



Fig.21 *Neolloydia conoidea*

juxtaposition of ‘*Theलोcephala*’ by Justin Gilbert and ‘Patagonia’ by Ralf Hillmann. First Justin sought to contrast *Theलोcephala* with plants known by other names including *Erioseyca*, *Horridocactus*, *Islaya*, *Neochilenia*, *Neoporteria* and *Pyrrhocactus*. He showed us excellent pictures of well grown *Theलोcephala esmeraldana*, *T. napina* (with its subspecies) and *T. odieri* plants from his own collection, including many of documented origin. Graham Charles reminded us that two or more plants grown from seed from the same locality are particularly valuable for pollination to preserve the original source material. Explorers’ prizes can contribute to effective ex-situ conservation by controlled cross-pollination and distribution to other enthusiasts. ‘The best way to keep a plant is ... to give it away’ – a good maxim.

Ralf described an exploration of Patagonia in 140 images that emphasised the space, jagged mountains (including Mount Fitzroy 3359m/11020ft in Fig.19), glaciers and lakes juxtaposed with bare open spaces and the highly adapted, low-growing plants including just ten cactus taxa. Many growers do not include *Austrocactus*, *Pterocactus* and *Maihuenia* among their interests; but the plants did look really good in habitat [Fig.20]. We saw four *Austrocactus*, three *Pterocactus*, two *Maihuenia* and one *Gymnocalycium*. Needless to add Graham cheered when *Gymnocalycium gibbosum* was shown growing strongly and flowering well near its southerly range limit.



Photo: D. Donati

Fig.22 *Echinocereus rayonesensis*

Despite few cactus taxa, in a little over fifty minutes Ralf delivered a superb exposition of a rarely visited habitat for those of us privileged to enjoy it. He included images of penguins, pangolins, guanacos, crickets, lizards, birds, fungi and many wildflowers. The variety of natural organisms emphasised the richness and the drama of cool, dry, sweeping southern plains coupled with distant snow-capped mountains, still lakes and the South Atlantic Ocean coast.

The final Sunday afternoon session came round too quickly and was chaired by Graham Charles, who despite heckling introduced his own subject: ‘*Borzicactus icosagonus*’. Graham had spent time with Chuck Hanson looking at Ecuadorean plants and seeking to unravel the mystery of the two names *B. humboldtii* and *B. icosagonus*. Before the end of the 1920s these two ‘names’ had been in five genera! Graham has clarified that the pink-flowered, hairy-tubed plants from the Rio Leon valley in southern Ecuador are distinct from the orange-flowered, naked-tubed plants from the Rio Huancabamba valley in northern Peru. Also related to these two is ‘*Akersia roseiflora*’ from the Rio Catamayo valley in southern Ecuador. Graham believes that these three plants have sufficient in common to be one species, but are three geographically separated populations each with distinct defining characters. We also learned the meaning of the ‘Explorers’ Password’ – ‘TLD’; it stands for: ‘that looks different’. The illustrated details of Graham’s investigations and conclusions have been published in the BCSS yearbook for 2012 Bradleya Vol.30. Make sure you have ordered your copy!

So we came to a rip-roaring finale by Davide Donati, who summed up all five elements of my

theme in his presentation 'The Crazy Adventures of a Botanist'. This was a compendium of pitfalls and perils, but delivered with panache and a fine English sense of irony. This apparent irrationality was caused by an intense desire to find *Turbinicarpus*. I am certain many readers will understand that sentiment well; the search for *Turbinicarpus* can be addictive, even obsessive. Davide needed to search for his prizes in Mexico; and so the company of explorers laughed until they cried – well some of us did anyway. First he was so entranced by some *Echinocactus horizontalonius* plants in San Luis Potosí, Mexico that for two hours he forgot his wife was in the car. He only had some bad tap water to drink, which

Photo: D. Donati

Fig.23 *Epithelantha micromeris* in Profusion

Photo: R. Tebbenham



Fig.24 QR code or a shed?

subsequently caused a high fever and more distressing symptoms! Later he was fleeing from angry hornets and fell onto his 'good' camera causing two broken ribs. This was all in his quest for *Turbinicarpus*. Then on a bad dirt road a misjudgement of the water depth of a ford after a thunderstorm stopped his car. It was unclear whether the refried beans were a pleasure or merely an energy boost to get things going again.

Wild dogs and snakes came into the story; fortunately one snake was so calm on a cool morning that Davide could reposition it with a couple of sticks for a photograph! Crazy indeed; but overcoming all these perils Davide found many plants including pristine *Neolloydia conoidea* and *Echinocereus rayonesensis* [Figs.21 & 22] and lots of his target *Turbinicarpus*. We gasped at a profuse clump of *Epithelantha micromeris* [Fig.23] which will probably feature in Davide's next researches and publications. Finally he signed off with a six-minute video featuring landscapes and plant images with Aldo ably translating the Italian subtitles. They both enjoyed well-deserved applause.

Graham thanked all the speakers and bade us farewell: the sixteen presentations had featured tales of intrepid travel, scholarship, science and acute observation. They exemplified the need for Planning, the Perils and Pitfalls of being in wild places, and the Pleasures and Prizes that make the life of an explorer both vivid and rewarding. That last sentiment was evident in all the speakers' programmes. We were invited to re-assemble on the third weekend of September 2013 for more convivial debate: maybe new prizes will be found by unlocking the QR code in the grounds outside [Fig.24]?

I here acknowledge the presenters who agreed the use of selected images from their presentations to illustrate this meeting report. Their photography was excellent and the latest projection technology and wide screen deployed during the weekend enhanced the delegates' appreciation of some two thousand images of many tiny plants contrasted with breathtaking wide habitat views. Thanks to you all.

[Roland Tebbenham](#)

The 2013 meeting of the Cactus Explorers Club will be held September 20th-22nd at the same venue in Leicester UK.

RECENT NEW DESCRIPTIONS

Holger Witner has just described *Browningia utcubambensis* as a new species in KuaS 63(10):267-274 (2012).

Pictures Graham Charles



Fig.1 *Browningia utcubambensis* near to the Chachapoyas turn, Utcubamba Valley, Amazonas, Peru in April 1998

I saw this plant when I first visited the Utcubamba Valley in 1998. At the time, my interest was more focussed on the naked *Espostoa* which was growing with the *Browningia*.

I was very impressed by the valley which is nearly parallel with the Marañon, that is the next further west, the two valleys separated by a high mountain chain. The effect of these mountains is to make the Marañon Valley dry because of the rain shadow. The Utcubamba Valley obviously gets plenty of rain in the summer and during my visit in April 1998, the lower part of the valley was flooded by intense rainfall.

When I saw the *Browningia* in the valley, I identified it as *B. altissima*, a species originally described by Ritter as *Gymnanthocereus altissimus* with its type locality at Bellavista, a

town quite near the confluence of the Marañon and Utcubamba rivers. Plants and flowers of *B. altissima* not far from Bellavista are shown in Figs.3 & 4 and as far as I recall, can be found



Fig.2 *Browningia utcubambensis* (right) with *Espostoa utcubambensis* (left) near to the Chachapoyas turn, Utcubamba Valley, Amazonas, Peru in April 1998



Fig.3 *Browningia altissima* GC1061.01 at 520m near to Bagua Grande, Amazonas, Peru



Fig.4 *Browningia altissima* GC575.01 at 520m near to Bagua Grande, Amazonas, Peru

growing from here, on the rocky cliffs up the Utcubamba valley to the populations 1000m higher which have now been named as *B. utcubambensis*.

A number of explorers have reported the *Browningia* in the Utcubamba valley. The first record appears to be by Paul Hutchison when he visited the area in 1964. He describes finding a *Browningia* related to *B. chlorocarpa* which I assume was preserved and has now been designated as the type of *B. utcubambensis* by Holger Witner.

There are some minor morphological differences between *B. utcubambensis* and *B. altissima* but I personally do not consider them sufficient to recognise two species. GC

References

Hutchison, P. (1968) *Browningia pilleifera* (Ritter), comb. nov. *Cactus & Succulent Journal of America* 40(1): 23.

Ritter, F. (1959) Un *Gymnanthocereus* nouveau du Pérou, *Gymnanthocereus altissimus* Ritter sp. nova.

IN THE GLASSHOUSE

Pierrebraunia brauniorum Esteves

Kamiel Neirinck, a well-known specialist in Brazilian cacti, reports on the flowering of this rare plant in his collection, probably the first time it has flowered in Europe.

English translation by R. Fonteyne. Photos by the author.



This columnar cactus was discovered by Pierre Braun and his wife Beate on 26 August 1999 and revisited in 2002. The habitat is situated in a very barren and inaccessible area at high altitude in the Serra do Espinhaço in Minas Gerais, Brazil. The plant grows on crystalline rocks together with *Vellozia*, Bromeliads, Orchids, *Arrojadoa*, *Micranthocereus*, *Pilosocereus* and *Rhipsalis*. The description was published in 'Kakteen und andere Sukkulenten' in 1999. The new discovery was named by Eddie Esteves Pereira after Pierre Braun and his wife.

Up till now no plants nor seeds of this species were commercially offered. One could say that it is unjustly over-protected. Nevertheless, after a long search, 3 years ago I could obtain two seedlings in Malta. One was immediately grafted, while the second one is grown on its own roots. Today, a few years later, both plants are equally large (or small); they measure well over 30cm.

From the literature we learn that cultivated plants of *Pierrebraunia brauniorum* do not branch easily, in contrast to plants in the wild. It is recommended to graft seedlings as soon as possible on *Eriocereus jusbertyi*. In Brazil the plants have been grafted on *Pilosocereus piauhyensis*, then they flower at a height of 20 to 30cm. Temperature in winter should be 5 to



10°C. The plants do want water until December; hence the temperature in the greenhouse should not be too low. Early in May 2012, I discovered on the plant on its own roots a small thickening on an areole near to the apex. Slowly, a reddish bud, about 3cm long, developed. Since the plant, as most Brazilian species, blooms at night, flowering should be observed carefully. By the end of May 2012 it was finally developed! It took until midnight before the flower fully opened; it was pink with a diameter of less than 1cm.

In nature the upright-growing column does not exceed 70cm, with a diameter of 7 to 8cm, branching from the base. The epidermis is light-green to yellowish-green but becomes greyish-green with age. Like *Uebelmannia*, the plant has mucilaginous channels. There are 4 or 5 ribs and 5 to 6 acicular spines per areole; the central spine is up to 2.8cm long. A

pseudocephalium develops on the areoles. The tubular humming bird pollinated flowers are 3cm long, with a diameter from 1.5 to 2.5cm, and have a naked receptacle, the colour is pink. The fruit is berry-like, fleshy, 3cm thick and reddish pink. The seeds are black.

It should be mentioned that the species *Pierrebraunia bahiensis*, originally described as *Floribunda bahiensis*, grows in Bahia, a neighbouring state of Minas Gerais.

Editor's note. The images of this seedling show significant differences from the original pictures of *P. brauniorum*. It has long been thought that *P. brauniorum* may be a natural hybrid which could result in its seedlings reverting to the characters of its parents, perhaps in this case *Pilosocereus*.

References

Esteves, E. (1999) *Pierrebraunia brauniorum* Esteves spec. nov., eine neue Kakteenart aus Minas Gerais, Brasilien. *Kakteen und andere Sukkulenten* 50(12):311-314.

Braun P. & Esteves E. (2001) *Pierrebraunia brauniorum* Esteves spec. nov., *Kakteen und andere Sukkulenten in Brasilien, Schumannia* Bd.3: 156.

[K.J. Neirinck](#), Loppem, Belgium

Arthrocereus rondonianus Backeberg & Voll

A beautiful small-growing cereoid cactus from Brazil. The pretty pink nocturnal flowers are easily produced in cultivation.



Photo: Kamiel Neirinck

Fig.1 *Arthrocereus rondonianus* flowering in the collection of Kamiel Neirinck

Arthrocereus is a small genus of columnar cacti from Brazil. Most of the five species accepted in the New Cactus Lexicon will bloom in cultivation at a manageable size. The flowers are nocturnal and pleasantly scented, a character associated with moth-pollination. All the species except *A. rondonianus* have white flowers, the most usual colour for night opening blooms. The neat pink flowers of *A.*

rondonianus are really beautiful and it is certainly worth visiting the glasshouse at night to see them. Its golden spines makes it an attractive plant, even when out of flower.

In habitat, the plant is limited to a restricted distribution on the Serro do Cobral and the west side of the Serra de Espinhaço in Minas Gerais, Brazil. It makes groups of stems in rocky places, sometimes under trees, often



Photo: G. Charles

Fig.2 *Arthroocereus rondonianus* GC1041.01 in habitat at 890m near Conselheiro Mata, Minas Gerais, Brazil.

growing with large plants of *Discocactus placentiformis*.

A. rondonianus was described by Backeberg and Voll in *Kakteenkunde* (1943)3:62. The name had first appeared accompanied by a good illustration in Backeberg's 'Blätter für Kakteenkunde' 1935-4 but without formal description. According to Egli & Newton (2004), it is named after Candido M. da Silva Rondon (1865-1958), a Brazilian explorer and collector of natural history specimens.

In cultivation, *Arthroocereus* species grow best grafted but cuttings of stems can easily be rooted.

GC

References

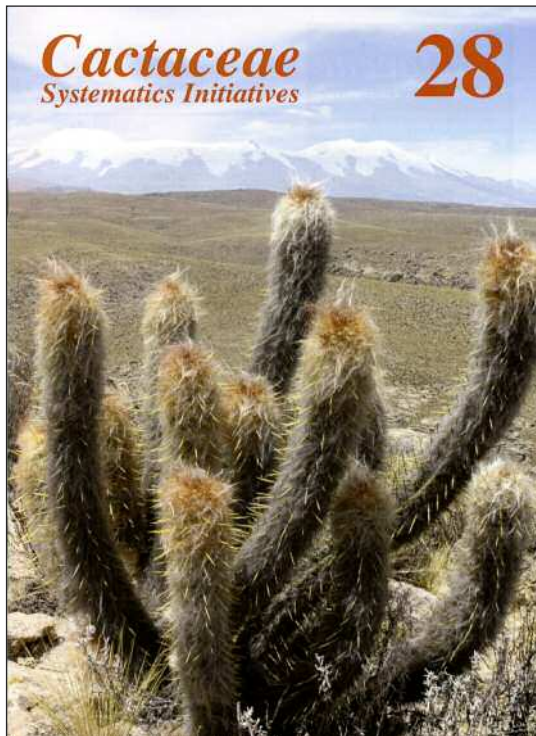
- Backeberg, C (1935)** Blätter für Kakteenkunde 1935-4
- Backeberg, C. (1943)** Die Gattung *Arthroocereus* Berger. *Kakteenkunde* (11)3:56-62
- Egli, U. & Newton, L. (2004)** Etymological Dictionary of Succulent Plant Names
- Taylor, N. & Zappi, D. (2004)** *Cacti of Eastern Brazil*



Photo: G. Charles

Fig.3 *Arthroocereus rondonianus* GC1040.01 in habitat at 1060m near Conselheiro Mata, Minas Gerais, Brazil.

JOURNAL ROUNDUP



Cactaceae Systematics Initiatives 28

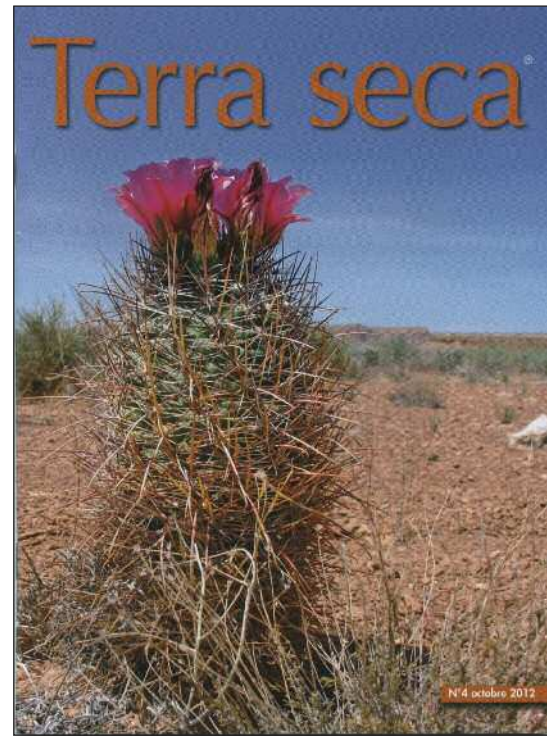
David Hunt continues to publish the bulletin of the International Cactaceae Systematics Group in preparation for the possible update of the New Cactus Lexicon. This issue includes the taxonomic changes resulting from Boris Schlumpberger's valuable paper on *Echinopsis*. See my comments on [page 6](#).

There is also an article from Nigel Taylor about cactus ecology that was originally planned to be included in a mapping project initiated by Bonn University.

There are updates on the treatments of the genera *Austrocactus*, *Cleistocactus*, *Corryocactus*, *Echinopsis*, *Hylocereus*, and *Parodia* in preparation for an NCL supplement.

You can subscribe to this publication that regularly presents the latest thinking in cactus taxonomy by contacting [David Hunt](#).

GC



Terra Seca

This is one of the French language journals to start publication in 2009 following the demise of the excellent 'Succulentés' which had been published since 1977 along with many interesting 'Special' editions.

Terra Seca is produced to a high standard with very good pictures and has carried a number of interesting articles. The four issues of 2012 have featured a series of articles by Jean Bonnefond about cultivation of *Ferocactus*, including some nice images in habitat.

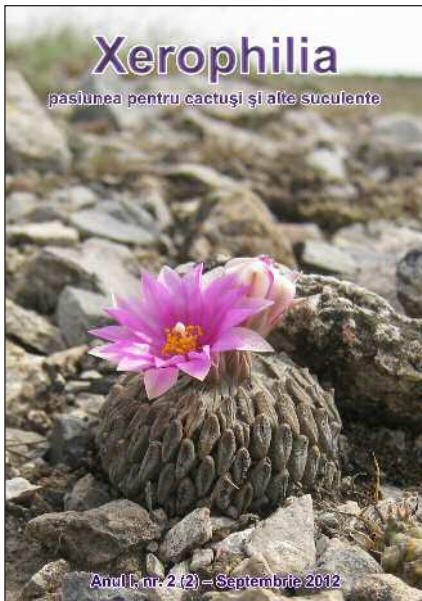
Issue 3 included a well-illustrated article about the new *Gymnocalycium esperanzae*. Then in Issue 4, Detlev Metzger, following the publication of his book, started a series of articles about the genus *Gymnocalycium*.

This is an impressive journal with articles about unusual succulents and even Proteas. Details of subscribing to the four issues per year can be seen at <http://www.terraseca.org>

GC

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 second issue of Xerophilia appeared in September. 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 second edition has 98 pages and includes articles about *Pelecyphora aselliformis*, *Ariocarpus*, cactus growing in New Zealand, *Disphyma*, growing *Huernia keniensis* and Alfriston Botanic Gardens. The next issue is due by the 30th December.

The magazine may be downloaded as a pdf from

<http://xerophilia.ro>

Contact: xerophilia@xerophilia.ro

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

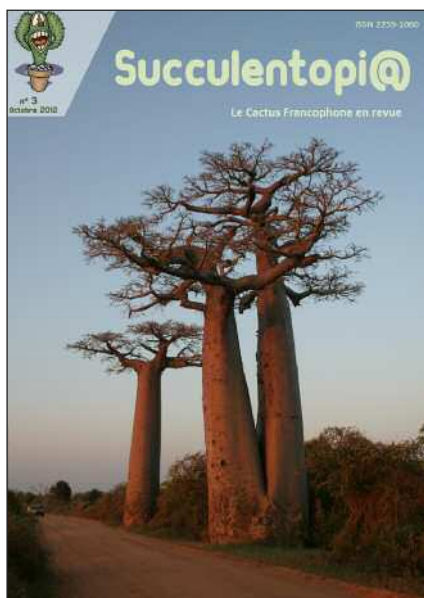
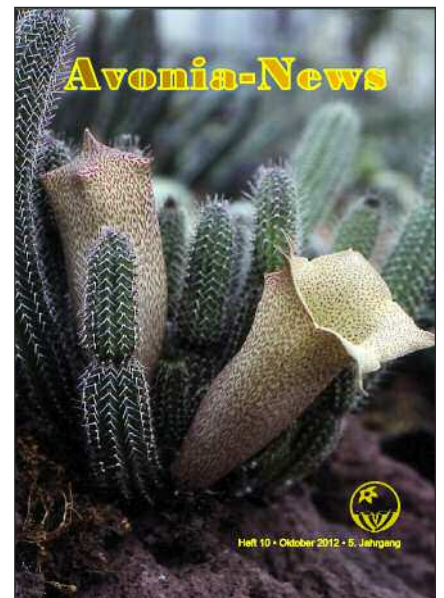
Annual seed list for members and much more.

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 third 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:

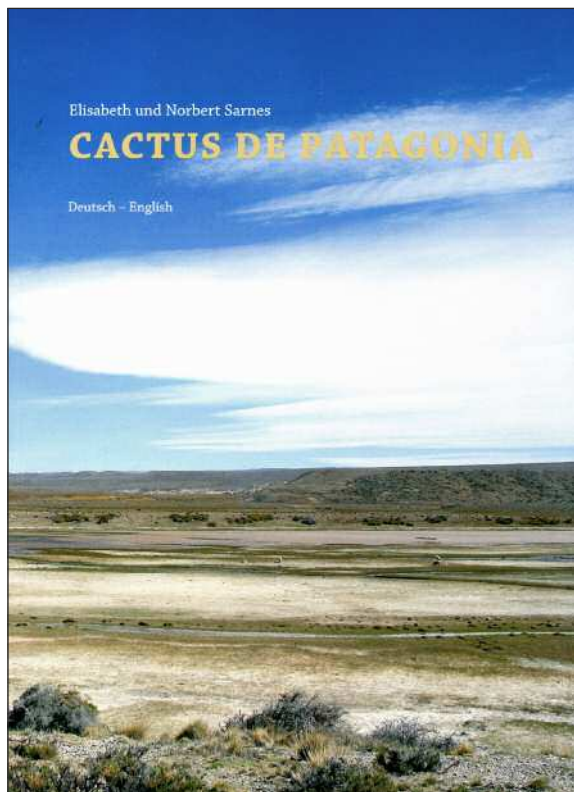
<http://www.cactuspro.com/succulentopia>

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.



Cactus of Patagonia

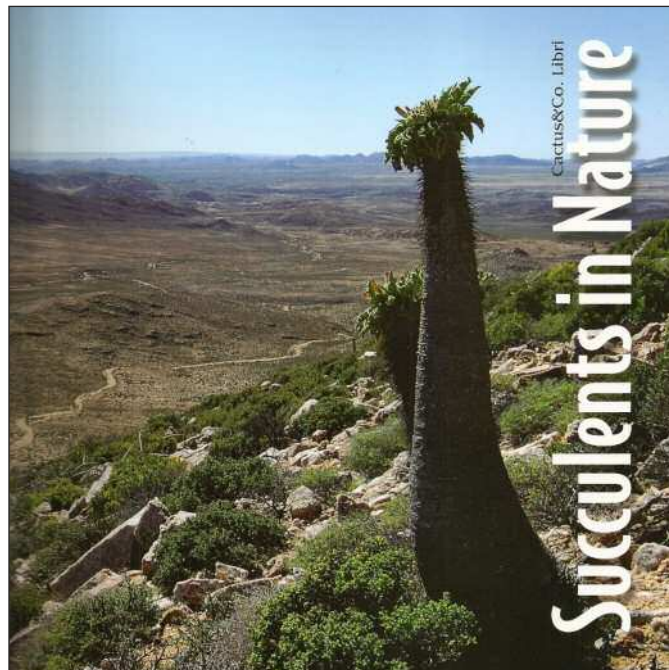
by Elisabeth and Norbert Sarnes

170 x 240mm, perfect bound with soft covers. 80 pages, 89 colour pictures, 3 plates and a map.

Patagonia is a part of South America that is not so frequently visited in the search for cacti but it is the the most southern place where they can be found. We have lacked a well-illustrated account of the cacti from here so the recent arrival of this useful little book is very welcome.

It is produced to a high standard and the text is in German and English making it well worth reading in its entirety. The pictures are very well reproduced and give the reader a clear impression of the plants and localities.

Available from [Keith's Plant Books](#) for just £10, good value indeed! GC



Succulents in Nature

Text by Laura Guglielmone

Drawings by Pierfranco Costanzo

A rather different and interesting book which looks at the concerns over succulent plant conservation. A brief introduction considers the evolution of succulent plants followed by the places and environments where they occur in the world. The areas of the world where they occur are then each considered in detail with their individual factors with final sections considering the risks and hotspots.

Softcover, 128 pages 223 x 223mm. Well illustrated with many interesting colour photos and maps.

£17 from [Keith's Plant Books](#)



Laura Guglielmone, with Luigi Colla, in the Herbarium of Torino University, where she works.

Photo: G. Charles

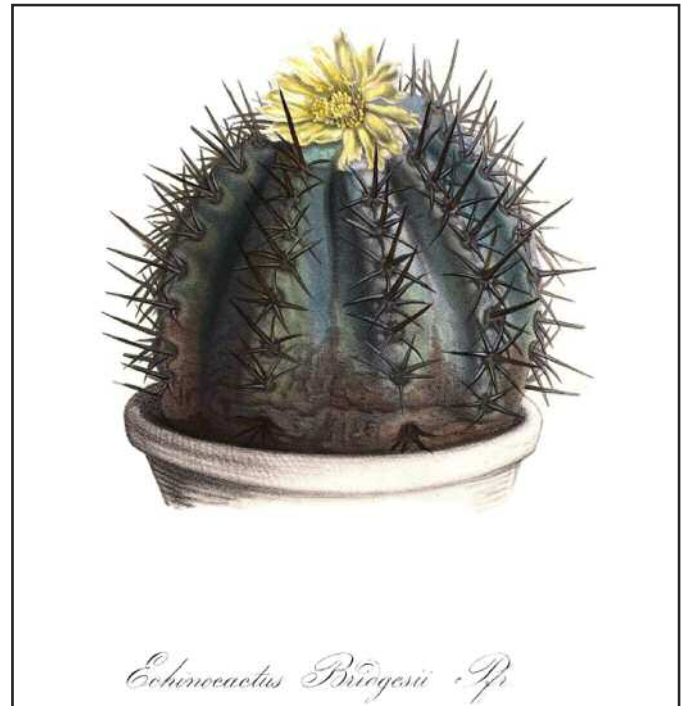
Anyone interested in the history of cactus descriptions will be familiar with the name Louis Pfeiffer. He published many new names during the first half of the 19th century.



Louis Carl Georg Pfeiffer was born on 4th July 1805 at Kassel. He became a medical doctor but after practising for a while, he turned his attention to writing, music and scientific activities. He became accomplished in botany and a specialist in cacti.

His visits to the Schloss Dyck, and the botanic gardens of Berlin and Munich resulted in the 1837 publication of his *Enumeratio diagnostica Cactearum hucusque cognitarum* in Latin and, in the same month, a similar text in German as *Beschreibung und Synonymik der in deutschen Gärten lebend vorkommenden Cacteen*. These books contain many original Pfeiffer descriptions but no illustrations. Over the years there have been some difficulties applying the descriptions to known plants.

Both these books have been produced in facsimile editions. A poor quality (but hard-bound) Xerox copy of the first (Latin) was issued by Klaus Neumann in January 1982. A similar poor Xerox copy of the German version was also published by Neumann in 1979 but in



The lectotype illustration of *Echinocactus bridgesii*, now considered a synonym of *Copiapoa echinoides*.

1988, he produced a second much better quality edition. A print-on-demand version of the Latin text is available but I have not seen it.

In 1845, Salm-Dyck named the cactus genus *Pfeiffera* in his honour. Pfeiffer's magnificently illustrated work *Abbildungen und Beschreibung blühender Cacteen* was published in 12 parts between 1838 and 1850 constituting 2 volumes, the first in collaboration with Christoph Friedrich Otto (1783 - 1856). Original copies of this book are highly prized, especially the very rare copies which have the plates entirely coloured. See the illustration above from this book.

The best way to refer to this book is to read it [on-line](#) or download a PDF file. GC

Reference

Stearn, W. T. (1939) Pfeiffer and Otto's 'Abbildung und Beschreibung Blühender Cacteen' *The Cactus Journal* 8(2):39-46.



CACTUS PEOPLE HISTORIES

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



Paul Carpenter Standley (1884-1963)

©Field Museum, B79460. Chicago Field Museum of Natural History.
Permission granted 25 August 2012 to use photo for historical purposes
in the free on-line journal *The Cactus Explorer*.

The following brief biography touches mainly on the aspects of the life and career of Paul Standley that relate to his contributions to the cactus and succulent plant world. He made wider contributions than those that have been included here, but I hope that for interested succulentists, this will prove a sufficient introduction to his achievements.

Paul Carpenter Standley (1884-1963) was one of North America's most prolific systematic botanists. Born in the small town of Avalon, Missouri on 21 March 1884, his higher education started at Drury College in Springfield, Missouri, continuing at New Mexico State College with a Bachelor of Science degree in 1907 and a Master of Science

degree in 1908.

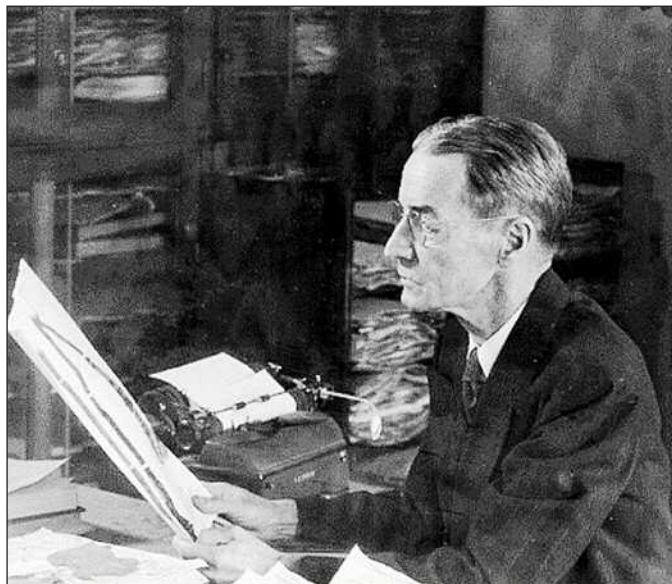
From 1909 until the spring of 1928 Standley worked at the U.S. National Museum—a three-story building built of stone in 1881 and placed next to what was then referred to as the Castle (Smithsonian Institution) in Washington DC. Moving on, Standley spent the rest of his pre-retirement career at the Field Museum of Natural History in Chicago, Illinois from 1928 until his retirement in 1950.

Upon retirement in 1950 Standley continued his career by moving to Central America—specifically to the Escuela Agrícola Panamericana (Zamorano Pan-American Agricultural School {University}) in Honduras—where he studied the flora of the central part of Central America. He continued field work and was involved with the herbarium and library at the university until early 1956. The Paul Standley Herbarium was named in his honor in 1964.

According to an Index to American Botanical Literature, Paul Standley had over 250 publications spanning some 65 years. (This Index was first published in the Bulletin of the Torrey Botanical Club in 1886 with Elizabeth Gertrude Britton [née Knight] (1858-1934) as its first editor and later in Brittonia from 1996—to an entirely electronic format by 1999. Elizabeth was a bryologist [student of mosses] and the spouse of Nathaniel Lord Britton (1859-1934), co-author of the famous 1919-1923 book *The Cactaceae*.)

During his years at the U.S. National Museum and Field Museum of Natural History, Paul Standley was the known expert on the flora of tropical Central America with such publications as *Trees and Shrubs of Mexico* (1920-1926), *Flora of Costa Rica* (1937) and *Flora of Guatemala* (1946, as a co-author).

During his years at both museums he studied and determined between 200,000 and



Paul Carpenter Standley (1844-1963). ©Field Museum, B80332. Chicago Field Museum of Natural History. Permission granted 25 August 2012 to use photo for historical purposes in the free on-line journal *The Cactus Explorer*.

300,000 specimens for other botanists such as: 1) Thaddäus Haenke (1761-1816) Mexican collection of some 500 plants, and 2) Martin de Sessé y Lacaste (1751-1808) & José Mariano Moçiño Suárez Lozano (1757-1820) collections – primarily of 7,000 sheets from the Sessé & Moçiño Herbarium, Madrid, Spain. He made over 75,000 collections of his own from Mexico south into Panama. Standley was fluent in both English and Spanish and he was able to read in several other languages.

He may have been the undisputed authority of his day on the vegetation of Central America. When anyone was asked about tropical plant identification, the answer was always “ask Standley”. He had an encyclopedic knowledge of plants and was a prodigious writer of scientific publications.

In our succulent plant world, Standley described the genera *Bonifazia* (now a synonym of *Disocactus*) and *Pachycormus*, along with species of *Agave*, *Bonifazia* (*Disocactus*), *Echeveria*, *Sedum*, *Talinum* (several), *Vincetoxicum* (*Matelea*), and *Yucca*. He discovered species of *Echinocereus*, *Jatropha*, *Lemaireocereus* (*Stenocereus*) and *Neomammillaria* (*Mammillaria*). Named in his honor were species of *Matelea* and *Neomammillaria* (*Mammillaria*). He received a CSSA Fellow award in 1941.

He spent his final years in Tegucigalpa, Honduras until his death on 2 June 1963.

References

Williams, L.O. (Editor). 1963. Homage to Standley. 115 pgs.

Staples, C.J. ca.2013. A Historical Record of Authors of C&S Plant Names & Books, etc. Over 600 pgs.

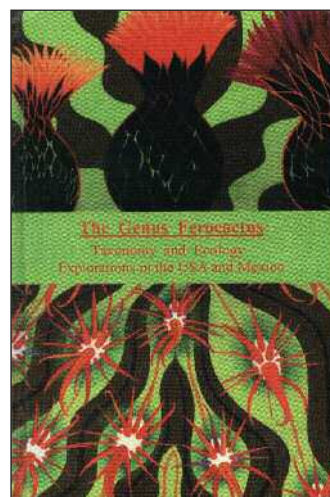
Ferocactus cylindraceus or *Ferocactus acanthodes*?

A proposal to reject the name *Echinocactus* (& *Ferocactus*) *acanthodes* submitted in 2011 has now been voted upon and is not recommended by 16 votes to 1 with 2 abstentions. In Lindsay's 1955 thesis on *Ferocactus*, eventually published in 1996, he neotypified *E. acanthodes* with the holotype of *E. cylindraceus*, thereby making them identical, and the earliest epithet applies.

So this means that the correct name for this plant is *Ferocactus acanthodes*, not *F. cylindraceus* as proposed by Nigel Taylor. His argument was considered to be insufficient to justify overturning the Lindsay neotypification. Roy Mottram

Reference

Applequist, W. L. (2012) Report of the Nomenclature Committee for vascular plants: 64: 2021 Proposal to reject *Echinocactus acanthodes* Lem. (Cactaceae) by Hodgson & al. in *Taxon* 60: 910. 2011. *Taxon* 61(5): 1113. International Association for Plant Taxonomy, Bratislava.



George Lindsay's 1955 doctoral thesis was eventually published in 1996 along with other material in this book. It is now out of print and difficult to find.

GC

PARODIA TURBINATA (ARECHAVALETA) HOFACKER: A CONFUSED TAXON

Based on their habitat explorations, Giovanna Anceschi & Alberto Magli discuss the application of the name *Parodia turbinata* and compare it with its closest relatives

photos Anceschi & Magli



Fig.1 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349

In October 2010, a few days after the launch of cactusinhabitat.org, we received an email from Norbert Gerloff urging us to reconsider the idea we had about *Notocactus turbinatus* (Arechavaleta) Krainz. His useful observation led us to re-examine a case that, even during our first surveys in habitat, had highlighted some difficulties in interpretation.



Fig.3 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349



Fig.2 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Uruguay, Montevideo, Montevideo, 17 Feb 2011, AM 349

This article is our attempt to clarify this matter.

With "Further nomenclatural adjustments in *Frailea* and *Parodia*" in Cactaceae Consensus Initiatives 6: 11-12(1998) Andreas Hofacker completed his taxonomic proposal on the two genera, in view of the forthcoming second edition of Cites Cactaceae Checklist (Hunt 1999). Page 12 lists *Parodia turbinata* (Arechavaleta) Hofacker, of which the following is the full text.

***Parodia turbinata* (Arechavaleta) Hofacker comb. et stat. nov. Basionym:**
Echinocactus sellowii var. *turbinatus*
Arechavaleta, Anal. Mus. Nac. Montevideo 5: 235-237 (1905). *Comment:* *P. turbinata* differs from *P. sellowii* in its flat body and less and shorter spination. No hybrids or intermediates are known. Seed-grown plants always show the distinctive markings of their parents.

In 1905 *Echinocactus sellowii* var. *turbinatus* was described by Arechavaleta. Today, this taxon does not differ at all (see Table 1) from



Fig.4 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.5 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.6 *Parodia (Notocactus) calvescens*. Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008, AM 275



Fig.7 *Parodia erinacea*. Uruguay, Maldonado, Piriapolis, 2 Jan 2007, AM 54 (cactusinhabitat.org 2010)

the concept that we currently have of all the populations forming the species known as *Parodia erinacea* (Haworth) N. P. Taylor (Fig.1). This species also currently includes *Parodia sellowii* (Link & Otto) D. R. Hunt (Hunt et al. 2006, text: 219, 223-224, 309; atlas: 307, fig. 307.4, 308, fig. 308.4).

Parodia erinacea is one of the dominant

species (i.e. more opportunistic and therefore better at adapting to different habitats, resulting in a greater numerical progression of individuals and populations, and higher variability) of the genus *Parodia* Spegazzini, in the eastern part of its distribution range, consisting essentially of the Pampa biome and its rocky outcrops. The range of this species is

	<i>Parodia erinacea</i>	<i>Echinocactus sellowii</i> var. <i>turbinatus</i>
habit	simple	simple
stem	depressed-globose, globose or short cylindric 15 (-20) x 6-30cm (length x diameter)	deep seated, discoid above ground
ribs	12-30, shaply acute, areoles situated in notches	12-20, acute but dilated around the areoles
spines	straight to strongly curved, subulate, <2cm, central: 0-1; radial: 2-12, mostly appressed to stem	central: (0-)1, 1-1,5cm, straight; radial: 5-10
flowers	glossy yellow, 3-5 x 4-7cm	chrome yellow, about 5cm diameter

Table 1 Comparison of original descriptions of *Parodia erinacea* and *Echinocactus sellowii* var *turbinatus*.



Fig.8 *Parodia erinacea*. Uruguay, Rivera, Tranqueras, Valle del Lunarejo, 21 Nov 2006, AM 75 (cactusinhabitat.org 2010)

between Argentina (provinces of Buenos Aires, Córdoba, Corrientes, La Pampa and Rio Negro), Brazil (state of Rio Grande do Sul) and Uruguay.

It is clear that differences such as those



Fig.9 *Parodia erinacea*. Brazil, Rio Grande do Sul, São Gabriel, 23 Oct 2011, AM 786



Fig.10 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Montevideo, 17 Feb 2011, AM 349

given by Hofacker (i.e. flat body, less and shorter spination) are insufficient in taxonomically distinguishing populations which are so similar to widespread and variable species such as *P. erinacea*.

Considering *N. turbinatus*, Gerloff et al. (1995, 169) also emphasize that in recent years *Notocactus* enthusiasts have split into two groups. Those who claim that the taxon should be attributed to *Notocactus sellowii* (Link & Otto) S. Theunissen, for the shape of the flower, and those who want to see it assigned to *Notocactus erinaceus* (Haworth) Krainz, because of the short spines. In other words, this supports the hypothesis that *E. sellowii* var. *turbinatus* is just a form of *P. erinacea*. Moreover, Arechavaleta had already correctly identified the plant he described as a variety of *Echinocactus sellowii* Link & Otto.

The type of *E. sellowii* var. *turbinatus* is not preserved, but the “penascales del Cerro” in the author’s description, are very likely to be referable to the Cerro de Montevideo, 135m above sea level, i.e. the only Cerro dominating the city. The hypothesis that this “Cerro” is located in Montevideo has also been put forward by Hunt et al. (2006, text 224).

Our last trip to South America (in 2011) began on February 17th, starting with the study of the cactus populations living in this Cerro. In this rather deteriorated habitat, we found that the population of the genus *Parodia* Spegazzini which lives on the Cerro of Montevideo can be assimilated into the current concept of *P. erinacea*; and that the majority of individuals of which it is comprised show characteristics similar to those in Arechavaleta’s 1905 description (Figs.2-3).

In the light of these observations, i.e. considering *E. sellowii* var. *turbinatus* only as a further group of populations of *P. erinacea*, Hofacker’s comment on the absence of intermediates or hybrids between the two taxa appears meaningless.

We also emphasize that regarding the assertion “Seed-grown plants always show the distinctive markings of their parents”, phyletic distinctions on such similar taxa, based on



Fig.11 *Parodia erinacea* (*Echinocactus sellowii* var. *turbinatus*). Montevideo, 17 Feb 2011, AM 349

morphological features of a few pot-grown plants, are likely to bring us back to a typological and not biological concept of species.

In the subsequent Cites Cactaceae Checklist. Second Edition (Hunt 1999), we still find *P. erinacea* (ibid.: 248) and *P. sellowii* (Ibid.: 253) as separate taxa, while *P. turbinata* is introduced (ibid: 254).

Synonyms of the latter are: *Notocactus calvescens* Gerloff & Nilson, *Wigginsia schaeferiana* Abraham & Theunissen, *Notocactus schaeferianus* (Abraham & Theunissen) Havlicek, *Wigginsia turbinata* (Arechavaleta) Porter and *Notocactus turbinatus* (Arechavaleta) Krainz.

To better understand the attribution of these taxa as synonyms of *P. turbinata*, we must go back to 1997 when Reto Nyffeler in "Further referrals of 'limbo' species in CCC1 "Notocactus" in Cactaceae Consensus Initiatives 4: 8-9, took on the job of reviewing the about 60 "limbo" species in *Notocactus* (K. Schumann) Frič still present in CCC1, concluding that the majority of them could be referred as synonyms.

Among the taxa reviewed, those that concern this discussion are the following:

- Notocactus calvescens* = *P. sellowii*
- Notocactus schaeferianus* = *P. sellowii* [*turbinata*]
- Notocactus turbinatus* = *P. sellowii*



Fig.12 *Parodia* (*Notocactus*) *calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275



Fig.13 *Parodia* (*Notocactus*) *calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275

If the assimilation of *N. schaeferianus* and *N. turbinatus* into *P. sellowii* (i.e. *P. erinacea*) is possible, and in our judgement it is correct (i.e. the holomorphology of the third taxon overlaps and includes the holomorphology of the first two), the holomorphological (i.e. morphological, physiological, ecological and chorological) characters of *N. calvescens* are distinct and cannot be assimilated into *P. sellowii*.

First of all, *N. calvescens* is distinguished from all other *Notocactus* (i.e. *Parodia*) by the display of a delicate spination only as a juvenile, which comprises 3-6 whitish radial spines, 2-5mm long (Fig.4).

Once at puberty, the old areoles lose their spines, and the new ones cease to produce them (Gerloff & Nilson 1994, 15 (3): 76-77, 83), leaving the plant completely bare. Hence the epithet 'calvescens' (Fig.5).



Fig.14 *Parodia (Notocactus) calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275



Fig.16 Habitat of *Parodia (Notocactus) calvescens*. Parque Estadual do Espinilho, Brazil, Rio Grande do Sul, Barra do Quaraí, 9 Nov 2008

Upon seeing a population of *N. calvescens* in habitat, we can confirm that it is a completely glabrous taxon (Fig.6), not taking into account small plants (i.e. less than 5cm in diameter). This absence of spines is something unique in the genus *Parodia* Spegazzini, even taking into consideration the Andean species.

On the other hand, the description of *P. erinacea* (Anderson 2001, 542; Hunt et al. 2006, text: 219) takes us back to a plant with a clear spination. The plant has, as already been mentioned, subulate spines, straight or strongly curved, < 2cm in length (finding spines of this kind on *N. calvescens* is completely unlikely), in a quantity of 0-1 central, and 2-12 radial, often flattened against the stem surface (Fig.7).

Also the photos that illustrate the taxon in The New Cactus Lexicon (Hunt et al. 2006,



Fig.15 *Parodia erinacea*. Uruguay, Maldonado, Piriapolis, 2 Jan 2007, AM 54 (cactusinhabitat.org 2010)

atlas: 307, fig. 307.4, 308, fig. 308.4) show very spiny plants. The same evidence can be collated by studying the populations of *P. erinacea* in habitat (Figs.8-9). They all show more or less clear spination, and even when some populations have shorter spines, as in the case of the Cerro de Montevideo, they are however strong spines (Fig.10), within a population where some individuals may also have longer and tougher spines (Fig.11).

The normal evolutionary progression of the spines from the juvenile phase to adulthood in *P. erinacea* populations, strongly contrasts with the unique feature of *N. calvescens* to definitively "block" the growth, once the age of reproduction is reached. In the comparative holomorphology of the two taxa, we believe that the difference highlighted in this character is very important for their assignment to two distinct lineages.

Another distinctive element between *N. calvescens* and *P. erinacea* is illustrated by the fact that the description of *N. calvescens* (Gerloff & Nilson 1994, 15 (3): 75-78) shows a plant with slightly sharpened ribs, and again only in juveniles (Fig.12), to become then rounded and divided by the typical serpentine shape in adulthood (Fig.13). Instead, the description of *P. erinacea* and the images that illustrate it (Hunt et al., 2006, atlas: 307, fig. 307.4, 308, fig. 308.4), highlight a taxon with acute ribs *tout-court*. This difference is confirmed by the populations of the two taxa in habitat (Figs.14-15).



Fig.17 *Parodia (Notocactus) calvescens*. Barra do Quaraí, 9 Nov 2008, AM 275

Finally, even the geographical distribution is different. The vast range covered by *P. erinacea* has already been discussed, whilst we would emphasize the much smaller range of territory occupied by the few known populations of *N. calvescens*. These are concentrated in the area of Parque Estadual do Espinilho at Barra do Quaraí, Rio Grande do Sul (Brazil), and in the neighbouring province of Corrientes in Argentina.

Even the topology of the habitat occupied by *N. calvescens* is quite specific. The taxon seems to prefer phytogeographic areas, populated by various arboreal members of the Leguminosae family, such as the Espinilho (*Acacia caven*), the Inhanduvai (*Prosopis affinis*) and the Algarrobo (*Prosopis nigra*) (Fig.16). It grows between herbs, in a sandy soil with a strong chalky component (Fig.17).

We don't know of any populations that are adapted to live on rocky outcrops, something that is rather common in *P. erinacea* (Fig.18).

The specificity of the phytogeographical distribution area, the small number of populations and the low numerical progression inside them, plus the only slight variability of *N. calvescens*, identify it as a non-dominant species in the genus *Parodia* Spegazzini, in contrast to the very dominant character of *P. erinacea*.

Moreover, even if the latter can adapt to territories similar to those of *N. calvescens*, for example in the "blaqueales" of the Rio Negro in Uruguay (Fig.19), there are no known cases

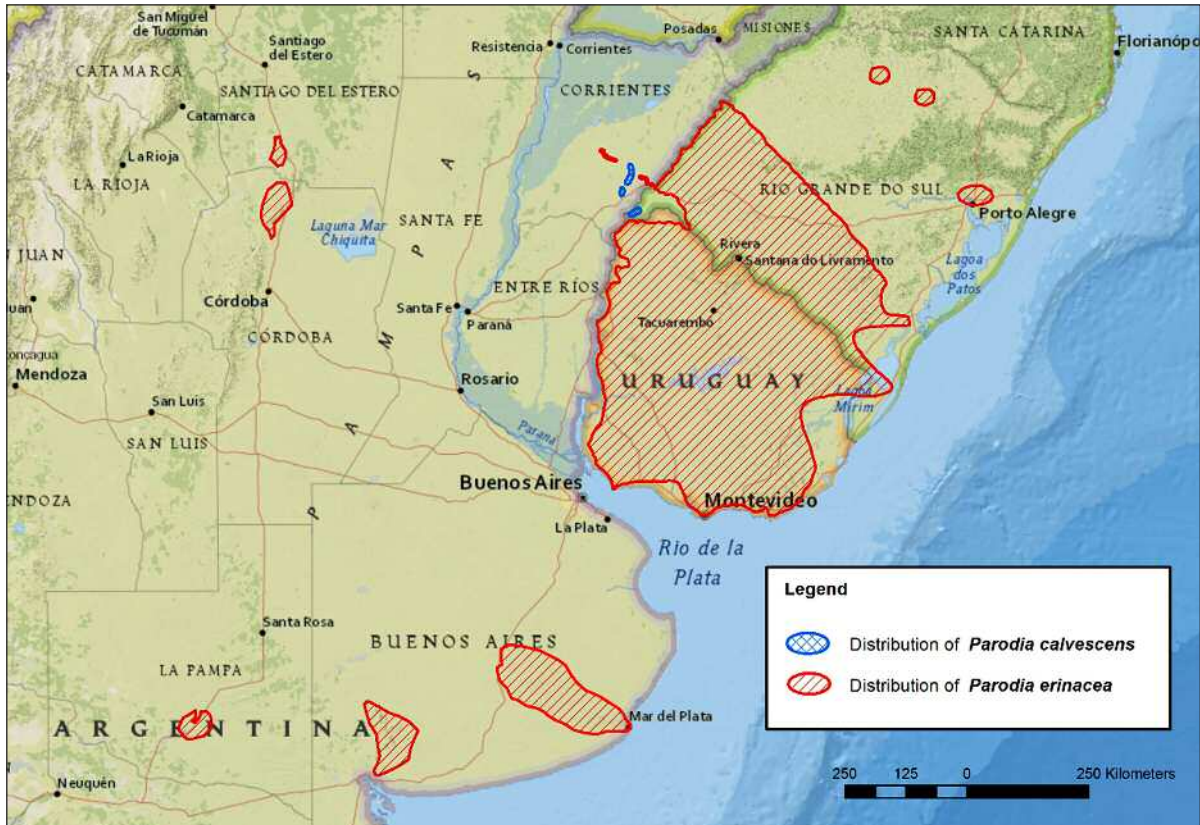


Fig.18 *Parodia erinacea*. Uruguay, Cerro Largo, Aceguá, 5 Nov 2008, AM 272 (cactusinhabitat.org 2010)

of sympatry, an element that considering the extreme diffusion of *P. erinacea* gives further evidence for distinct phyletic lines for the two taxa.

In confirming the misconception that supports *P. turbinata*, we would point out that in N.C.L. (Hunt et al. 2006), the two figures that illustrate the taxon show plants that are glabrous with rounded ribs (Hunt et al., 2006, atlas: 308, fig. 308.5, 309, fig. 309.1), while the description is fundamentally the same as Arechavaleta's *E. sellowii* var. *turbinatus* from 1905 (ibid.: text, 224), i.e. of a plant with spines, sharply acute ribs, etc., which as we saw does not include that of *N. calvescens* (Gerloff & Nilson 1994, 15 (3): 75-78). Indeed, both figures illustrate *N. calvescens*, the first of which (HU 1564) is in one of the areas known for the taxon, in the province of Mercedes, Corrientes, Argentina; neither illustrate the plant described.

The distribution (ibid.: text 224) is also unclear. Only AR (Corrientes) and UY have been reported. We remind you that in CCC 2 (Hunt 1999), the distribution of *P. turbinata* was UY (ibid. 254) and that Hofacker (2000, 10: 12) added AR, with this comment: "*Notocactus calvescens*, treated as a synonym, was from Argentina on the border with Brazil. One field number is for example HU 1564. Piltz found it also in the province of Entre Rios". However, we know that the populations of *N. calvescens*, even the type locality, are living in Parque Estadual do Espinilho, N of Barra do Quaraí.



Map 1 (above) The distribution of *Parodia calvescens* and *P. erinacea*.
 Map 2 (below) Detail of Map.1 showing the AM locations mentioned in the text.
 The data are gathered from: Ralph Martin's [field number search](#); Christophe Ludwig's [C & S field number search](#); Norbert Gerloff (Gf) field number list; Anceschi & Magli's [cactusinhabitat.org](#) and the literature cited.

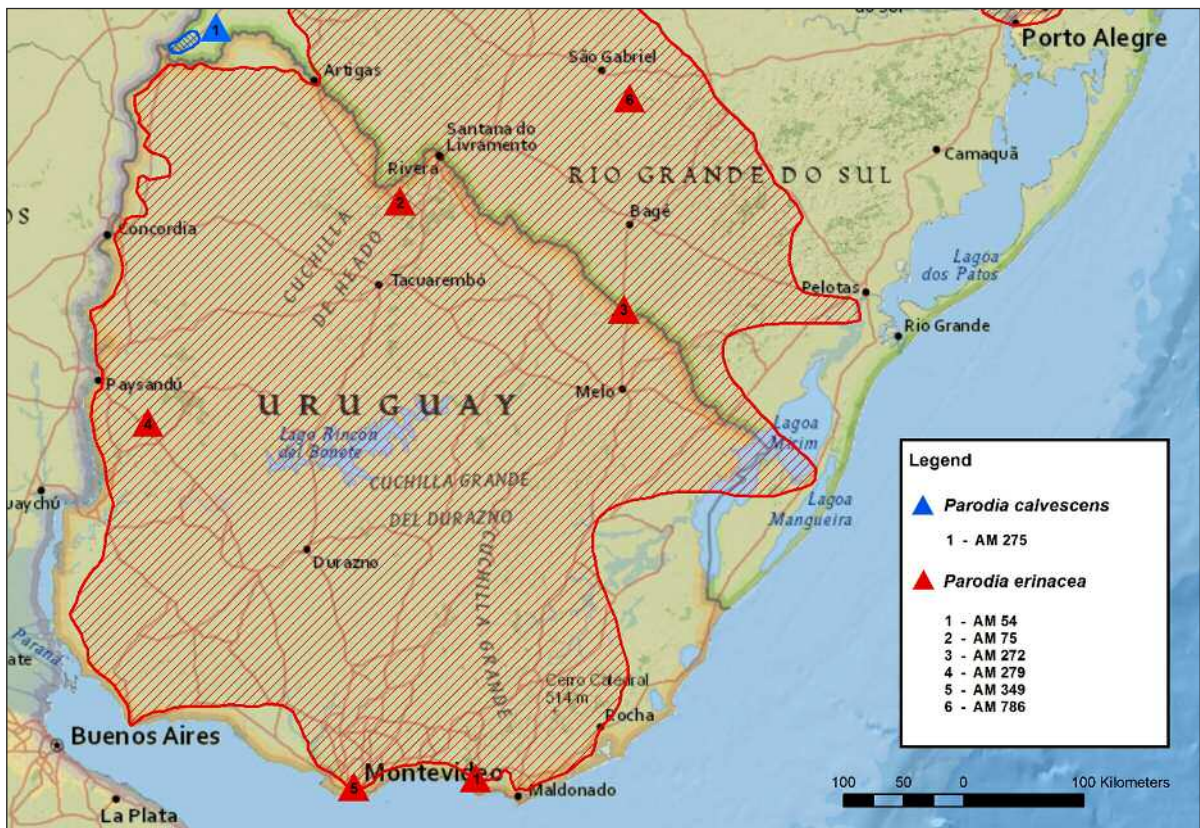




Fig.19 *Parodia erinacea*. Uruguay, Rio Negro, Young, 16 Nov 2008, AM 279 (cactusinhabitat.org 2010)

Therefore, a distribution of *P. turbinata* that would include *N. calvescens* as a synonym should also consider BR (Rio Grande do Sul). In short, it seems that the ideas on the ranges of *P. turbinata* also have always been a bit confused.

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

New Combination

Parodia calvescens (N. Gerloff & A. D. Nilson) Anceschi & Magli **comb. nov.**
Basionym: *Notocactus calvescens* N. Gerloff & A. D. Nilson, *Internoto* 15 (3): 78 (1994).
Type: BR, Rio Grande do Sul, N of Barra do Quaraí, AN 384 (JBPA 32.896, holo.).

Distribution of *Parodia calvescens*

AR (Corrientes), BR (Rio Grande do Sul)

Synonymy in *Parodia calvescens*

Notocactus calvescens
Wigginsia calvescens

Conservation status of *Parodia calvescens*

Endangered, EN B2ab(ii,iii,v)

Synonymy to be transferred to *Parodia erinacea*

Echinocactus sellowii var. *turbinatus*
Notocactus schaeferianus
Wigginsia schaeferiana
Notocactus turbinatus
Parodia turbinata
Wigginsia turbinata

Names whose current application is debatable

Parodia turbinata sensu N.C.L.

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[Giovanna Anceschi & Alberto Magli](http://cactusinhabitat.org)



IT IS A PRIVILEGE TO SEE DISCOCACTUS HORSTII IN HABITAT

Graham Charles tells us about one of his favourite cactus habitats. Brazil has many wonderful places to see but Grão Mogol in the state of Minas Gerais has a National Park with amazing plants

Photos by the author



Fig.1 A rich habitat at Grão Mogol photographed in June when the many plants of *Micranthocereus auriazureus* were in flower and being visited by humming birds. It is truly a pleasure to see a habitat in such good condition.

The level of protection to give to a fragile ecosystem is a difficult balancing act. Creating a park can certainly help to keep out grazing animals and perhaps humans who want to steal the plants, but stopping access completely is counter-productive. Making access possible for responsible people, perhaps with an entry fee to cover the costs, can generate local income by promoting eco-tourism and need not be a threat to the wildlife.

The famous and remote place where *Discocactus horstii* grows has been made into a National Park and I am told that it is now practically impossible to go there. So I have been fortunate to visit the place on two

occasions, the last time in June 2005. The place is a hidden valley some way from a road, which would take a lot of finding without help.

I often wonder how Horst and Buining felt when they first visited this remarkable place and saw the plants growing there. They saw three taxa, all new to science, so descriptions followed in 1973. I assume that when Leopoldo Horst first went there in 1971, he was taken by local people who were involved in the mining of the quartz crystals which fill the valley. The mining has now stopped but the holes and spoil heaps are still prominent near the entrance to the valley. Many plants must have



Fig.2 When you find a place which particularly suits *Discocactus horstii*, you can find a lot of plants spanning all ages. It appears that the size of the quartz pieces and the slope are factors that affect population density.

been displaced but there are extensive parts which were never mined and healthy plant populations thrive. I was pleased to see that young plants of *Micranthocereus* are starting to re-colonise the spoil heaps.

The most iconic cactus here is *Discocactus horstii* Buining & Brederoo. It was described in 1973 in 'Die Kakteen', issued as a series of loose leaf instalments published by H. Krainz. The plant caused a sensation in the cactus world and today it still remains a much sought-after plant. It is the smallest species of the genus *Discocactus* and has a unique spination, thought to have a role in absorbing water. It would be wonderful to be at the habitat at night when the plants are flowering and being visited by hawk moths.

Another lovely plant discovered here was *Micranthocereus auriazureus*, its species name referring to its blue body and golden spines. The small pink flowers (Fig.6) are produced in profusion. The first description appeared in the Cactus & Succulent Journal (US) in 1973 and it has since remained a popular plant with collectors, although rather more difficult to flower in cultivation than some other species of



Fig.3 A mature plant of *Discocactus horstii* with a diameter of about 5cm and a well-developed cephalium.



Fig.4 *Discocactus pseudoinsignis* growing in fine white quartz sand lower down the hill than the *D. horstii*.



Fig.5 The densely hairy flowering zone at the top of a stem of *Pilosocereus fulvilanatus*.

Micranthocereus.

The third new taxon found here belongs to the genus we now call *Pilosocereus*. Its species name *fulvilanatus* refers to the yellow-brown hairs in the flowering zone, a spectacular sight in conjunction with its pale-blue body (Fig.5). Described in *Kakteen und andere Sukkulenten*, the journal of the German Cactus Society, also in 1973, seeds of this cereoid plant are often available. I have found it much slower growing than the more commonly cultivated *Pilosocereus pachycladus*.

Another species of *Discocactus* grows at this place, *D. pseudoinsignis*. I have not seen it in close proximity to *D. horstii* but rather growing in fine white sand lower down the hill (Fig.4). Buining (1980) considered this plant to be a rediscovery of Pfeiffer's *D. insignis* but this was refuted by Taylor & Zappi (1991) who described it as a new species *D. pseudoinsignis*



Fig.6 A dramatic plant of *Micranthocereus auriazureus* with its blue stems, golden spines and pink flowers.

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GC

A DAY TRIP TO THE PEAK OF BOTIJA, CHILE.

Philippe Corman recounts his visit to one of Chile's most interesting valleys, the Quebrada Botija. There are at least five species of Copiapoa to see and the recent rain had made the plants look really good.

Photos by the author



Fig.1 *Copiapoa solaris* between Quebrada Botija and Quebrada Iscuña in good condition after recent rains.

In 2006, I visited the coast of Chile with some friends to see Copiapoas during a memorable 'Raid Chili Pèpère' (pèpère = old man or quiet). One of our most remarkable stops was at the Quebrada Botija in the midst of *Copiapoa solaris*. During our second trip in November 2011, the second 'RCPBis' we decided to explore a little further up to the summit of Botija.

From Antofagasta we took the trail to El Cobre. Shortly before the old copper mine we encountered the first clumps of *Copiapoa solaris*. In 2006, we did not stop at these Copiapoas which were visibly dead, and this year the older ones in our group would probably have done the same if the rookies had not insisted. And indeed, among the many dead and dried



Fig.2 *Copiapoa decorticans*,. looking the best it can! It is scarce in cultivation because seed is rarely available



Fig.3 The T junction which is about 2.5km into the Quebrada Botija. This is the first place you can see *Copiapoa solaris* on the slopes. The party turned right (South) here towards Quebrada Izcuña.

Copiapoa solaris, we were surprised to find those which were living, showing some colour because of the rain during the previous two years. We made another stop before El Cobre on a ridge where *Copiapoa tenuissima* is supposed to grow, but we only found *Eulychnia*, almost all dead, and some annuals.

We made a quick stop at the copper mine of El Cobre, then another a little further on to



Fig.4 *Copiapoa ahremephiana*, a small plant flowering near the entrance to the Quebrada Botija.

photograph a group of South American sea lions (*Otaria flavescens*) and finally, 11 kilometers before our goal, to photograph some *Copiapoa solaris* growing near the road in the middle of *Nolana aplocaryoides*. Then we arrived at the Caleta Botija.

We tried to drive into the quebrada to set up camp in the middle of *Copiapoa solaris* but the recently-created track had been washed away by rain and we had to stop at the entrance in the midst of *Copiapoa ahremephiana*. It was only noon, and after a good lunch, we took a walk in the Quebrada Izcuña, a little further to the south, to see *Copiapoa variispinata*.

The next day we started our hike to the summit of Pico Botija. The Quebrada Botija climbs for 2.5km where can be found *Copiapoa atacamensis*, *Copiapoa decorticans*, and *Eriosyce paucicostata*, some individuals having more hair can be regarded as the 'floccosa' form. One then arrives at a T junction where, on usually green-black rocks grow many *Copiapoa solaris*. Then, following the right turn to the south, the valley leads to a ravine which should allow us to climb up to the pass between the Quebrada Botija and the Quebrada Izcuña.



Fig.5 *Senecio botijae* RCPB 205.06, a rarely-reported succulent from the valley.

For me, as someone who hardly grows Copiapoas, the plant that I definitely wanted to see that day was *Senecio botijae*, a succulent that grows in a ravine of the Quebrada Botija at 700m altitude and which I had not found in 2006. But I had no confidence that it grew in this precise ravine. I briefed my comrades in order not to miss the opportunity for them to make fun of my taste for those plants that do not interest anyone.

So I stopped to photograph an *Eriogyne paucicostata* whilst my friends continued on their way and just as I was leaving, in the middle of the ravine, I saw three beautiful shoots of *Senecio botijae* which they had passed without noticing. A look around did not enable me to find others, although I was at the altitude stated in the original description, so I began to photograph them before joining my friends.

They were already far ahead, but signalled me to encourage me to rejoin them. Shortly after we met, the ravine widened and on its sides we found a slight slope which rose gradually towards the pass. This slope was covered by *Copiapoa* aff. *variispinata* in flower and fruit with clumps of *Copiapoa solaris* and *Copiapoa atacamensis*, more numerous at the pass. *Copiapoa* aff. *variispinata* proved to be highly variable to the point that we sometimes felt that we were dealing with two different species. So we have chosen this name *Copiapoa*



Fig.6 *Eriogyne paucicostata* can be found in the valley, some woolly individuals are known as 'var. *floccosa*'



Fig.7 *Eulychnia* with hairy flower buds on the ascent to Pico Botija.



Fig.8 *Echinopsis (Trichocereus) deserticola* at the top of Pico Botija.



Fig.9 Near the top of Pico Botija as the mist is clearing to reveal all the cacti.

variispinata with much hesitation, the plant also made us think of *Copiapoa humilis*, unless it is a new species! One of my colleagues also noted what he thought were hybrids between *C. atacamensis* and *C. solaris*, but it is most likely that they were forms of *Copiapoa atacamensis*, the spines a little more twisted than usual.

We now began the ascent of Pico Botija by a steep route but without great danger, amid

Eriosyce. At first, we arrived at a flat area where we were in a thick fog amidst beautiful clumps of *Copiapoa atacamensis*. A little further on we found some large clumps of *Copiapoa solaris*. Were we already at the summit? It was impossible to know because of the fog and my friends wanted to go back down. I thought it was a shame to stop so I decided to continue alone. In the mist, I came upon what seemed to me to be the summit, marked by a heap of



Fig.10 *Cylindropuntia tunicata* at the top of Pico Botija



Fig.11 *Copiapoa* aff. *variispinata* RCPB 205.01 Quebrada Botija.

stones.

All around me were growing, besides the usual clumps of *Copiapoa atacamensis*, large plants of *Eulychnia* that showed intermediate characters between *E. taltalensis* and *E. iquiquensis*. Also there were *Echinopsis deserticola* and cushions of *Cylindropuntia tunicata*. These latter plants were in great shape while at other places we had found them, near the fog traps at Pan de Azucar Park, or on the ridge overlooking the sea above the Quebrada San Ramon, they were in bad shape. Here they were in flower, the red flower matching the description of Ritter, but not the original description of *Cylindropuntia tunicata*, which states yellow. Backeberg had identified similar plants in Peru as likely to be *Cylindropuntia rosea*, but noting that the stem and spination were closer to *Cylindropuntia tunicata*. Ritter treated them as *Cylindropuntia tunicata* considering that flower colour was variable. After all, perhaps the two taxa are forms of a single species for which *Cylindropuntia tunicata* has priority.

Despite the fog, the site was beautiful and I spent a lot of time taking photos. I also tried to find *Copiapoa tenuissima* which is also supposed to grow here, but without success.

Then I went down and found my comrades just 50m below, where they had eaten lunch whilst waiting for me. We had some discussion and, while I took my turn for lunch, one of them went to the summit. Then the fog broke, being replaced by strong sunshine, so we went together. Despite our searching, we could not find *Copiapoa tenuissima*, but the bluish appearance of *Copiapoa atacamensis* in sunlight was a beautiful sight.

The clear sky allowed us to see the coast, but also on the other side, shining in the sun, the Paranal Observatory. Formally, we offer Alain Laroze, the man who prepared this itinerary, a heavy stone from Botija Peak which he hastened to place on the summit mound. It was time to descend. Because of a fall, one of my friends injured his shoulder, but fortunately it did not prevent him from walking to camp. We stopped at the *Senecio botijae* that my comrades had not seen on the



Fig.12 *Copiapoa atacamensis* at the top of Pico Botija.



Fig.13 *Copiapoa atacamensis* at the top of Pico Botija



Fig.14 *Copiapoa solaris* near the top of Pico Botija



Fig.15 *Copiapoa decorticans* in flower in habitat, a sight that few visitors to the valley have seen.



Fig.16 *Copiapoa solaris* near the coast road, 11km north of the entrance to Q. Botija. It shows the golden spines characteristic of plants from the south of the distribution.

way up.

As we arrived at the T junction by the first *Copiapoa solaris*, three of us were trying to win the last challenge of the day: finding seeds of *Copiapoa decorticans*. This plant is scarce in cultivation because the seeds are rarely available. In 2006 I was the only one to find a single fruit in a beautiful woolly apex. This year at first I was less happy after a fruitless search, and my friends went back to the camp. I was not discouraged and continued my search alone, as the evening fell. It was eventually on another side, on three plants, each with a very woolly apex, I found ten fruits containing a thousand seeds (RCBP 204.02).

On our return to France, these seeds



Fig.17 A beautiful little scorpion, perhaps a species of *Brachistosternus*, not the perfect bed companion.

germinated well without treatment. We had also harvested seeds of *Copiapoa solaris* at the fork, on the pass, and near the top (RCBP 204.01, 205.02 and 206.02). Their sowing revealed that the higher the altitude, the better the germination rate, which suggests that the better quality seeds are those from plants which have benefited most from the moisture of the camanchaca mist and rain during the fruiting time.

I arrived just before night at the camp where my comrades had prepared Pisco Sour, the national drink of Chile, to celebrate this day. This report, however, would not be complete without mentioning Alain's mishap in the morning. When he was folding his sleeping bag, what looked like a small twig found underneath started to move; a beautiful little scorpion, perhaps *Brachistosternus*, who had not wanted to spend the night alone!

[Philippe Corman](#)

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A MUST SEE SITE – SURIPUJIO

Brian Bates shows us one of the most spectacular cactus forests in South America where an unusual hybrid occurs. Photos. by Brendan Burke, Graham Charles & the author.



Photo: B. Burke

Fig.1 A small section of the ridge which comprises BB 589 a.k.a. "The Blossfeld site". The density of the *Oreocereus* forest is fairly consistent. This is a view from the nearby road.

What is a must see site? Well, that depends on you. For me, a must see site is a site with plants that you cannot see in a greenhouse. This usually means large specimens, sometimes spectacular, which make national show winners uncompetitive. Another criterion might be the diversity of species, a minor consideration might be the scenery.

Suripujio (pronounced sue re poo he oh) has spectacular plants which contribute to the scenery. It is about 20km past Yavi when you are travelling east, in provincia Jujuy of



Photo: B. Bates

Fig.2 X *Oreonopsis* "celox" with Xiaoqing Li (Mrs. Ralph Martin) with a good-sized specimen of the hybrid.

Photo: B. Bates



Fig.3 *Oreocereus trollii* BB 589.02 on the slope.



Photo: B. Bates

Fig.4 X *Oreonopsis* "celox" BB 589.06 showing the density of *Oreocereus celsianus* BB 589.01.



Photo: B. Burke

Fig.5 *Cumulopuntia boliviana* BB 589.12 on the slope.



Photo: B. Bates

Fig.6 *Maihueiopsis molfinoi* BB0589.08 on the flat.



Photo: B. Burke

Fig.7 The author with collected fruits but not from the hybrid which is sterile.

northern Argentina. It is about 40km from La Quiaca, the border town with Bolivia. The place was first photographed by Harry Blossfeld in the early 1930's and published in *The Cactus Journal* December 1935 p.31. The same picture was later published in *Kakteenkunde* 1936(5): 85. The photograph shows a small portion of the site which is, in total, a ridge of about 5km in length.

The part which I like to visit is where the wall finishes at about 2km past Suripujio village. I select this part because there are good specimens of the intergeneric hybrid between *Oreocereus celsianus* and *Echinopsis ferox* which I call "celox" because there is more *O. celsianus* than *E. ferox* in it, if it were the other way round I would call it "cerox".

I first visited the site in May 2000, and have revisited it many times since. Even after many visits, I found another plant, a bulb of the onion family (Amaryllidaceae, Allioideae) and even later *Cumulopuntia subterranea*. The list includes 10 members of the Cactaceae, 5 members of Cactoideae and 5 of Opuntioideae.

The dominant plant is *Oreocereus celsianus* which is present in the thousands. This is on the slopes along with a much lesser quantity of *Oreocereus trollii*. I've often wondered what the hybrid would look like and have never positively identified one, but there must be plenty here. On the slopes are *Echinopsis ferox*, the hybrid x *Oreopsis* "celox", *Cumulopuntia chichensis*, and *Airampoia soehrensii*. On the flat are *Tephrocactus nigrispinus* (is this really not



Photo: B. Bates

Fig.8 *Cumulopuntia subterranea* BB0589.11 on the flat but invisible, i.e. below ground, until January after rain.

Photo: B. Bates



Fig.9 *Airampoa soehrensii* BB0589.05



Fig.10 *Tephrocactus nigrispinus* BB589.07 on the flat.

Photo: B. Burke

Photo: G. Charles



Fig.11 *Echinopsis ferox* GC177.02, an example of the coloured-flowered forms found in this area.

Cumulopuntia or Maihueniopsis?), *Maihueniopsis molfinoi* (also known as *M. hypogaea*, and *M. glomerata* ssp. *hypogaea*), *Cumulopuntia subterranea* (only visible above ground from late January, after rains) and *Rebutia pygmaea*. The *Rebutia* is also encountered on the flattish top of the ridge.

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[Brian Bates](#)



Fig.12 A cristate stem of *Oreocereus celsianus* BB 589.01 in flower.

Photo: B. Bates



Fig.13 *Rebutia pygmaea* BB 589.09 on the flat and on the flat top of the ridge.

Photo: B. Burke

ECHEVERIA TRIANTHINA & E. HALBINGERI VAR. SANCHEZ-MEJORADAE

John Pilbeam tells the story of two Echeverias hiding in Hidalgo with a couple of neglected Mammillarias.

Photographs by the author



Fig.1 *Echeveria trianthina*

In 2010 two regular companions (Derek Bowdery and David Neville) and I had an invitation to come and play in the 'back yard' of Jim Peck and Mary McLenahan, ex-pat Canadians living for about two decades now in Oaxaca, in the deep south of Mexico, with like plant interests to ours.



Fig.2 *Echeveria halbingeri* var. *sanchez-mejoradae*

And so another chance to explore the delights of Oaxaca and surrounds was seized with alacrity. After an arduous journey from the UK to the USA and thence to Oaxaca, we arrived to be greeted with broad smiles by our hosts, and knew that once again we were in for a most enjoyable few weeks in the cactus and succulent-rich southern part of this equally c & s-rich country. All feelings of the discomfort of the long flight and the most intimate examination I had ever suffered at the plastic-



Fig.3 Flowers of *Echeveria trianthina*



Fig.4 *Mammillaria lloydii* at a botanic institute in Mexico

gloved hands of the US customs official watched by my highly amused companions (I always set off the alarm at the check-in with my metallic hipjoints) disappeared as we were driven through the bustling, weaving traffic of Oaxaca city, where the prevalent principle followed is preference to whoever has his nose in front.

One of the propositions put to us by our hosts was that we should embark on a five-day trip north, through the state of Puebla to the state of Hidalgo as far as Metztitlan or possibly farther, time permitting.

After frequent stops to explore the surrounds of the early part of our journey, we came to the Tolantongo canyon, famed for its caves, where cavers and spelunkers would spend hours underground exploring the cracks and crannies of the tons of rock through which they would squeeze their distinctly uncomfortable and uncomfoting way; a pastime for which I have never been able to understand the appeal, but then like many things which people enjoy you never know until you try it maybe.

Our interests were above the ground and on a high, rocky, alpine-like area we stopped to explore; where there are rocks there are often our sort of plants. Firstly we came across *Mammillaria lloydii*, mimicking the cavers in its liking for the narrow spaces between rocks. We were a week or two early for the flowers, but buds were forming on the solitary, small plants we found. A summons to look at a find by our



Fig.6 *Mammillaria amajacensis* by the Puente de Dios.



Fig.7 *Mammillaria amajacensis* ML46



Fig.5 *Mammillaria orcuttii* at the Valle de Fantasma, San Luis Potosí



Fig.8 *Mammillaria lloydii* on a steep mountainside about 45km NW of the city of San Luis Potosí



Fig.9 *Mammillaria lloydii* at the location of *Echeveria trianthina*.

hosts brought us together to view small rosettes of an *Echeveria*, which was quite unfamiliar, and at the time I could not hazard a guess at its identity. On close examination the leaves were purplish, and somewhat bronzed where they were exposed to the sun, but there were no flowers to offer assistance in their identity. Some bookwork was needed to determine what we had found, and it was some time before it became clear that this was

the rarely seen *Echeveria trianthina*, the leaves of which had this unusual colouring and varied from pointed ovate to spatulate. The flowers confirmed its identity.

The pleasure of finding this species as yet unseen by any of us was endorsed by further success in locating *Echeveria halbingeri* var. *sanchez-mejoradae* on a seemingly unending and *Echeveria*-barren side road, until, when we had almost given up hope and I was beginning to think I had directed the party down the wrong side road, suddenly it was all over the rock wall by the road. And a further delight came when we found on another side road to the Puente de Dios (the Bridge of God) another as yet unseen *Mammillaria* species, *M. amajacensis*.

Almost as a footnote seeing both *Mammillaria lloydii* and *M. amajacensis* endorsed my view of them as recognizably separate species from where they are sometimes referred, respectively *M. uncinata* and *M. orcuttii*.

[John Pilbeam](#)

iSpot South Africa <http://www.ispot.org.za>

Derek Tribble tells us about a place to look at interesting pictures and get names for those plants and animals we saw while on holiday.

Every web site seems to want to host our photographs these days. They can be useful to give confidence when an identification is already suspected, but have many short-comings. Far too many pictures are wrongly identified, wrongly spelt or with out-of-date names. Something better is needed.

I am impressed by iSpot (provided by the UK Open University & funded by the National Lottery). This is a new generation of bio-photo gallery, adding community facilities for registered users. Identification is by majority voting, but established experts are given greater weight. Status is earned by others agreeing with your identifications. All forms of life are covered, so it is great for getting those holiday photos of fungi, birds, insects and other things-we-don't-know-much-about identified. Observation locations are linked to Google Maps via a single click. The system claims to work exceptionally well: over 90% of species posted on iSpot are identified within 24 hours.

After three years, the southern African iSpot (operated by SANBI, their National Biodiversity Institute) has achieved a critical mass of content (over 1,500 users and 25,000 observations with 55,000 photos), such that it is well worth visiting even just for succulent plants. This site knows about common names & taxonomy & spelling, so you can search by species, genus or family. You can even search for "cactus" and

find which are invading!

iSpot is easy for anyone to search, but you will have to register (free) to use the social facilities. Via "My Spot", you can receive a list of the latest "Unread" observations in the "Plants Group", or track "Changes" to "Favourites" observations such that conversations build up.

The UK iSpot <http://www.ispot.org.uk> tries to cover the rest of the world, with a few "cactus" in habitat, but more from cultivation. Even cactus pests are being identified.

These are some favourite photos of interesting succulents:

- *Dactylopsis* by Priscilla Burgoyne from the Pretoria Herbarium: <http://www.ispot.org.za/node/156527>
- *Euphorbia*: <http://www.ispot.org.za/node/159541>
- *Haworthia*: <http://www.ispot.org.za/node/151571>
- *Muiria* in glorious flower
<http://www.ispot.org.za/node/156159>
- An entertaining winter cactus story:
<http://www.ispot.org.za/node/159945>

[Derek Tribble](#)

MATUCANA AURANTIACA IN THE CORDILLERA BLANCA?

Graham Charles tells us about 2 reports of a *Matucana* in the Cordillera Blanca, Ancash, Peru, that looks like a fine-spined *M. aurantiaca*. This extends the range of the type ssp. further south than previously recorded. Photos: P.Hoxey, P.Laney, G.Charles



Photo: G Charles

Fig.1 The habitat of *Matucana aurantiaca* aff.GC1091.01 (= GC548.01), 30km west of Sihuas, just west of the highest point of the pass at 3955m, Cordillera Blanca, Ancash, Peru

Following information given to him by Ernst Markus, Paul Hoxey visited this locality high in the mountains on the road to Sihuas where it crosses the north end of the Cordillera Blanca in 2001 [Fig.1]. He told me about what he had seen so I was able to visit the place during my trip to Peru the following year. I gave the locality my habitat number GC548 and seedlings of the *Matucana* were subsequently distributed as *M. aurantiaca* aff. GC548.01. A couple of these seedlings have now flowered in my glasshouse at about 10cm diameter.

My notes record the location as a steep slope

of loose white rocks next to the road, wet, with moss pockets around the edges. The *Matucanas* were growing in the more stable ground around the scree slope, in the moss. The exposed rock made the place stand out from the surroundings that were mainly covered by shrubs. Nearby, we were able to see *Austrocylindropuntia floccosa* near its most northern limit.

The *Matucanas* at this habitat grew into large solitary heads with fine spines, varying in colour from pale straw brown to almost white [Figs.2&3]. Paul Hoxey speculated that there may be some introgression with the other

Photo: P.Hoxey



Fig.2 *Matucana aurantiaca* aff. PH639.01 near the top of pass at 4040m on the road to Sihuas, Ancash, Peru

Photo: P.Hoxey



Fig.3 *Matucana aurantiaca* aff. PH373.01 from near the top of the pass at 3950m on road to Sihuas, Ancash.

Photo: G.Charles



Fig.4 *Matucana haynei* ssp. *herzogiana* GC547.02 in culture. From road to Sihuas at 2050m, west of GC548. *Matucana* of the area, called *M. haynei* ssp. *herzogiana* in the NCL. I saw this other plant on the same road but further to the west and almost 2000m lower at 2050m [Fig. 4].

So, it was very interesting to be told by Paul Laney that he had seen the two species growing together near to Lago Llanganuco in



Map 1 The upper square is habitat PH373 = GC548 on the road to Sihuas at 3955m.
 The lower square is the location of the recent report from Paul Laney near Largo Llanganuco at 3700m.



Photo: P.Laney

Fig.5 *Matucana aurantiaca* aff.growing with *M. haynei* ssp. *herzogiana* near Lago Llanganuco at 3700m

the same mountain range but 50km further to the south [Fig.5]. Although a popular tourist destination within easy reach of Huaraz, I have never visited Largo Llanganuco. A road goes to the lake from the valley of the Rio Santa.

There are a number of valleys further south in which maps show there are roads, so I wonder if the *M. aurantiaca* aff. can be found there?

[Graham Charles](#)

COPIAPOA TALTALENSIS IN THE VICINITY OF SIERRA ESMERALDA

Marco Giani describes his visit to the valleys near Esmeralda in Chile to see *Copiapoa taltalensis* (Werdermann) Looser and its relatives.

Photographs by Ignazio Blando, Isabella Pieri and the author

Photo: Marco Giani



Fig.1 *C. taltalensis* grows with *C. columna-alba*, *C. longistaminea* and *Eriosyce rodentiophila* in the Caleta Tigrillo

It was December 28, 1997, and having left the Panamericana highway and turned towards Esmeralda to admire the wonderful cacti that live in the surrounding areas, I was

walking along the Quebrada Cachina along with Isabella and Carlo, who accompanied me on a journey we had long desired to make and looked forward to so much.

Photo: Marco Giani



Fig.2 A plant of *Copiapoa taltalensis* seen in 1997 at the Quebrada de la Cachina



Fig.3 A plant of *Copiapoa taltalensis* seen in 1997 at the Quebrada de la Cachina

Photo: Marco Giani

Photo: Ignazio Blando



Fig.4 *Copiapoa taltalensis* at the Quebrada de la Cachina in 2005

Carlo was driving the SUV when he stopped without warning, and approaching the side of the road said 'here!'. He spoke of a place where plants of *Copiapoa* were growing that he had long sought during several previous trips and eventually found in 1992, through the tracks in the valley following the instructions given by Friedrich Ritter for the location of *Copiapoa taltalensis*: "Quebrada Cachina near Placilla Esmeralda".

Walking along the side of the mountain facing to the west, we found some plants of *Copiapoa*, rare and scattered on the rocky ground with solitary bodies and a diameter of about 10-15cm, globose to flattened, with very long spines from acicular to slightly curved. They were in good condition with signs of growth and flowering as a result of a favourable winter that had brought moisture to the area.

I remembered the little black and white picture in Ritter's 'Kakteen in Südamerika', volume 3, Abb.990, and the plants we had seen, albeit with some variability, were really very similar to the one in the photo. Comparing the plants with the description of Ritter, as far as I could make out, they were a match. The latitude S25° 50', however, did not correspond to the data, probably because of an error in the measurements or the maps used by Ritter, since the location Placilla Esmeralda is a

Photo: Ignazio Blando



Fig.5 *Copiapoa taltalensis* at the Quebrada de la Cachina in 2005



Fig.6 A plant of *C. taltalensis* about 5cm in diameter, flowering for the first time when 12 years old from seed.

Photo: Marco Giani



Fig.7 Who eats whom? *Copiapoa taltalensis* at the Caleta Tigrillo in 2005

Photo: Ignazio Blando



Photo: Marco Giani

Fig.8 *Copiapoa taltalensis* at the Caleta Tigrillo in 2007.



Photo: Isabella Pieri

Fig.11 *Copiapoa taltalensis* in the Quebrada Tigrillo 2007.

little further south, right in the Quebrada de La Cachina, about 12km inland from the coast.

On a subsequent trip in 2005, Carlo returned to that place together with Ignazio and had the sad surprise to find very few living plants, many infested with insect larvae that live inside plants, or uprooted by guanacos that feed on the base and the collar of the large tuberous root. Probably due to a long period of drought, guanacos had gone to eat these prickly plants. From the remains of the roots, however, he noticed the presence of buds, a sign of hope for future development of this very much threatened population.

Then he explored a little further north in the Quebrada Tigrillo and found some very similar plants distributed in various parts of the valley, from the coast to higher altitudes inland. The plants were very dehydrated and completely flattened in the soil and, as I could see in 2007, they grew very scattered and there were very few examples found, even with extensive searching.

No doubt it was the population described by Ritter as *Copiapoa hornilloensis*, both descriptions and the photo, Abb.793, are a good match, as well as the type locality indicated by him 'Cerro Hornillos, to the north of Planta Esmeralda, at low altitudes'. Curiously, the latitude of these locations is about S25° 50', as previously indicated for *Copiapoa taltalensis*.

Evidently, *C. hornilloensis* must be considered synonymous with *C. taltalensis*. Comparing the two photos of Ritter, we see



Photo: Ignazio Blando

Fig.9 *Copiapoa taltalensis* showing shoots growing from a plant damaged by larvae, Caleta Tigrillo 2007.



Photo: Isabella Pieri

Fig.10 *Copiapoa taltalensis* at the Caleta Tigrillo in 2007.

Photo: Isabella Pieri



Fig.12 *Copiapoa taltalensis* in the Quebrada Tigrillo 2007.

that they are very similar, and show the variability in colour and shape of the stems, dark to light green, more or less emerging and spines, grey to reddish-yellow and acicular to slightly curved.

This species was discovered by Ivan Johnson and described as *Echinocactus taltalensis* by Erich Werdermann in 1929, with some deficiencies in the description, and an indication of the locality "dept. Taltal, Sierra Esmeralda "(Backeberg, Die Cactaceae, Band III). Various authors, from Hutchison to Backeberg up to the self same Ritter identified it as *C. humilis*, perhaps due to its characteristic of dehydrating and reducing its volume that is characteristic of the 'soft-bodied' species, but probably this was an error of assessment or confusion of cultivated and incorrectly identified material at the time (Backeberg, Die Cactaceae , Band VI, Abb. 3467). In this region, plants of *C. humilis* have never been found.

In the description of *C. hornilloensis*, Ritter had the intuition to include it with plants of the *C. rupestris-desertorum-rubriflora* group, which grow further north between Cifuncho and Taltal, for the obvious similarity in the arrangement of spines and in the form of the flowers and seeds. For this reason E.F. Anderson in 2001 included *C. taltalensis* in this group, to which later in 2005 was added *C. aphanes* described by W. Maechler and H.



Fig.13 *Copiapoa taltalensis*, young plants at the Cerro Hornillos in 2005

Photo: Ignazio Blando



Fig.14 *Copiapoa taltalensis* at the Cerro Hornillos in 2005

Photo: Ignazio Blando

Walter.

Later, since *C. taltalensis* has date precedence over other names, in the New Cactus Lexicon (2006), these plants were all included as synonyms of the species *C. taltalensis*. The name *C. taltalensis* ssp. *taltalensis* was therefore applied to all those plants previously described as *C. rupestris*, *C. rubriflora*, *C. hornilloensis* and *C. aphanes*, now considered synonymous, admitting only the subspecies *C. taltalensis* ssp. *desertorum*.

Having examined the populations in habitats that grow between the north of Taltal and south of Cifuncho, it appears that the



Fig.15 Copiapoa taltalensis, north of the Quebrada Tigrillo towards Cifuncho in 2010.

plants in the area between Quebrada Tigrillo and Quebrada La Cachina have some special characteristics that set them apart from those previously mentioned; the body is always solitary, only rarely divided into two heads in the case of re-growth from the roots of damaged plants, smaller than the other taxa, flattened and perhaps even more soft, almost underground in dry periods, and the central and radial spines are much longer and thinner. Moreover, while the other populations of the northern group have a certain continuity of distribution and sometimes turn out to be neighbours, it is doubtful that the populations presented here are continuous or adjacent to those in the currently unexplored area between Cifuncho and south of the Quebrada Tigrillo .

For these reasons, one might think that the plants described as *C. rupestris-rubriflora-aphanes* should be distinguished from *C. taltalensis* ssp. *taltalensis*, or have at least the rank of a subspecies of *C. taltalensis*.

Marco Giani

marcogiani62@gmail.com

via Beethoven, 26

I-21049 Tradate (VA) – Italy

If you would like to read the article in the original Italian language then you can download the file here:

[Testo in Italiano](#)

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Dave Whiteley tells us that there are some good pictures of Chilean, Peruvian and Mexican cacti if you click on this link:-

<http://www.kaktusmeksyku.pl/4.html>

TRAVEL WITH THE CACTUS EXPERT (5)

Zlatko Janeba tells us about his hunt for *Navajoa* and his joy at finding them in flower. There were lots of other plants in spectacular scenery. Photos by the author



Fig.1 A beautiful landscape at Toroweap Point, Arizona.

The next morning (1st May 2006) we got up early. That day we were supposed to see attractive plants of the former genus *Navajoa*, which are currently considered to belong to *Pediocactus*. North of the Colorado River that should be *Pediocactus peeblesianus* ssp. *fickeiseniorum* (usually better known to growers as *P. peeblesianus* ssp. *fickeisenii*). For simplicity, I refer to these miniature cacti as *Navajoa* here. And we were very eager to find out whether *Navajoa* plants were in flower and if we could discover them at all.

After breakfast, we headed eastwards on Hwy 389 and then turned to the north on Moccasin Rd first. We spent some time roaming around the visitor center of the Pipe Springs National Monument. The landscape here is just wonderful. Red rocks and red



Fig.2 *Sclerocactus parviflorus* at Pipe Springs National Monument, Arizona.



Fig.3 View of the habitat at Pipe Springs National Monument with *Sclerocactus parviflorus*, Arizona.

sediments strongly contrast with the sparsely distributed dark green juniper trees (*Juniperus osteosperma*) and pale-grey sagebrush (*Artemisia tridentata*). The aromatic smell of

various terpenoids released from the sagebrush bushes completes the very intense experience of this place, as well as many other places in the south-western USA. As for cacti, we saw many *Sclerocactus parviflorus* with flower buds (Figs.2-3. These plants correspond to the var. *intermedius*, which is not recognized anymore), *Opuntia phaeacantha* var. *discata*, and my favourite *Opuntia aurea* with spineless bluish-green elliptic stem segments and dense tufts of yellow glochids. *O. aurea* is sometimes called the Creeping Beavertail since its segments often grow in a row, rooting one after another, thus forming nice chains of joints on the soil surface (or sometimes partially buried).

Then we went back on Hwy 389 and, after a while, took a dirt road towards the south which leads to Toroweap point. This road is called Mt. Trumbull Road or Mt. Trumbull Loop (on some maps marked as Mohave County Road 5) as it enters Mount Trumbull Wilderness Area. This is a wilderness of some 7900 acres lying just north of the Grand Canyon in Mohave County, Arizona.

After some 20 miles on Mt. Trumbull Loop we stopped for the first time and we easily found our first *Navajoa* (elevation of 1500m, at 11a.m. the air temperature was 28°C, while 1cm below ground surface the temperature was 36°C). Within half an hour we found 18 plants, from 4mm seedlings up to 4cm mature plants (Figs.4-8). Some of the adults were bearing flowers or at least buds. We were very



Fig.4 The first plants of *Navajoa* were easy to find thanks to their yellowish flowers.



Fig 5. Specimen of *Navajoa* with rounded to retuse tepals.



Fig.6 *Navajoa* plants are difficult to find when without flowers.

happy. For me, that was the first time I saw *Navajoa* in flower in the field.

The flowers of *Navajoa* are pollinated by small bees native to the south-western USA, i.e. the flowers are melittophilic. We observed some variability of *Navajoa* at this location (similar to that at other places where I saw these tiny cacti). The flower tepal apices are usually tapered to a sharp point (lanceolate), as for example in Fig.4 and Fig.7, but more rarely have rounded or slightly retuse apices (Fig.5). Also their spination can vary, as the centrals can be shorter or longer, thinner or thicker, straight or bent over the plant body. Nearby, we also found *Coryphantha vivipara*, *Echinocereus engelmannii*, *Opuntia phaeacantha*, *O. whipplei*, and *Yucca baccata*.

Some 5 miles further to the south, we saw some more yellowish flowers along the road (Fig.9). We immediately stopped but we did not find more *Navajoa*, since the flowers belonged to *Escobaria (Neobesseyia) missouriensis* var. *marstonii* (Clover) D. R. Hunt (1978). This name is often considered as synonymous with *E. missouriensis* ssp. *missouriensis*, but there certainly are some morphological differences, so I prefer to keep this as a separate taxon. The elevation was almost identical as at the previous stop (1520m). We also encountered *Coryphantha vivipara*, *Echinocereus engelmannii*, *Opuntia phaeacantha*, *O. whipplei*, as well as *Yucca baccata* again, and furthermore *Agave utahensis*. Several plants of *E. missouriensis* var. *marstonii* were bearing both yellow flowers and



Fig.7 One has to lie down to get good pictures of flowering *Navajoa*.



Fig.8 A *Navajoa* specimen with centrals bent over the body.



Fig.9 *Escobaria missouriensis* var. *marstonii* hidden in grass. Mount Trumbull Loop, Arizona.



Fig.10 A view of the deep canyon with the Colorado River winding along the bottom. Toroweap Point, Arizona.

red fruits, thus being really photogenic.

After several more stops – in addition, we also saw gopher snake (*Pituophis catenifer*) - we reached Toroweap Point. This area represents a gorgeous landscape and natural beauty with wonderful views. It is a rocky area with a deep narrow canyon through which the Colorado River winds its way. It is paradise for a nature photographer. The place (1400 - 1450m)



Fig.11 Flowering *Echinocereus toroweapensis*, Toroweap Point, Arizona.

abounded with flowering *Echinocereus engelmannii* and *E. toroweapensis* (with attractive orange-red flowers with greenish stigmas), as well as with *Opuntia hystricina* (with buds), *O. phaeacantha* (with buds), *Agave utahensis*, *Nolina microcarpa*, red flowering *Castilleja* sp. (Indian Paintbrush), white and pink flowering *Phlox* sp., ephedra, and sparsely occurring juniper trees.

There is a pleasant and secluded campground at the Toroweap Point (Toroweap Point Campground), which sits right at the edge of the gorge and was almost empty during our visit there. Nevertheless, pushed by lack of time, we preferred not to stay there (unfortunately) and went on further. (Later, in 2007, camping was banned at this place, so we probably missed the unique opportunity to experience an overnight stay there).

After enough time for explorations at Toroweap Point we returned to the Mount Trumbull Loop and headed westwards. We drove through the beautiful pine forest just south of Mt. Trumbull. Mt. Trumbull is a large,



Fig 12. *Agave utahensis* at Toroweap Point, Arizona.



Fig 13. *Echinocereus engelmannii* at Toroweap Point, Arizona.

basalt-capped mesa located at the southern end of the Uinkaret Plateau and is part of the Uinkaret Mountains. Its slopes are dominated by pinyon pine and juniper trees, interspersed with groves of aspens and oaks and its summit is covered with ponderosa pines. Not many cacti can be seen there.

Some 4-5 miles before (east of) Mt. Trumbull village we reached a pass in Hurricane Cliffs (elevation of some 1900m). There the vegetation suddenly changed. The western slopes seemed to be much drier and warmer, with a more xerophilous plant community. Among sparse juniper trees we observed *Agave utahensis*, *Echinocereus triglochidiatus* with small buds, *Opuntia phaeacantha*, *O. whipplei* with numerous yellowish fruits, and also *O. chlorotica*.

Later we stopped about 5 miles north of the Mt. Trumbull village, in the middle of huge pastures, looking for a place to camp. A certain herb was very numerous there with a very intense odour (or even stink), which after a while gave us a slight headache. When in my sleeping bag, I wondered if we stayed there overnight, whether we would actually wake up the next morning ...

And it was cloudy and stormy somewhere above St. George (to be continued)

[Zlatko Janeba](#)



Fig 14. *Echinocereus engelmannii* at Toroweap Point, Arizona.

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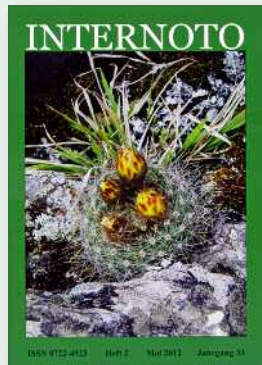
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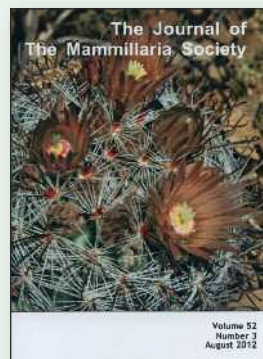
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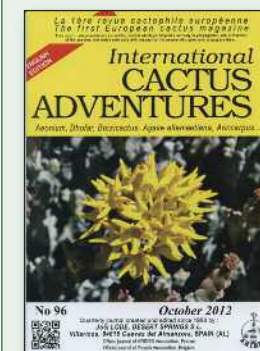
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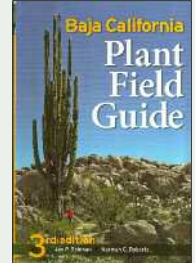
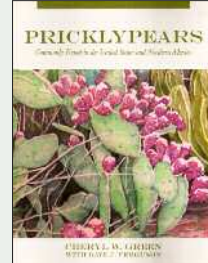
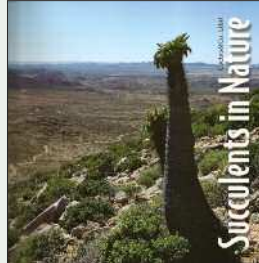
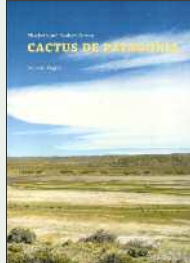
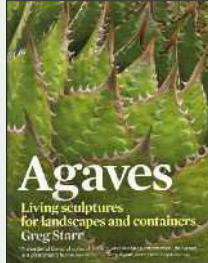
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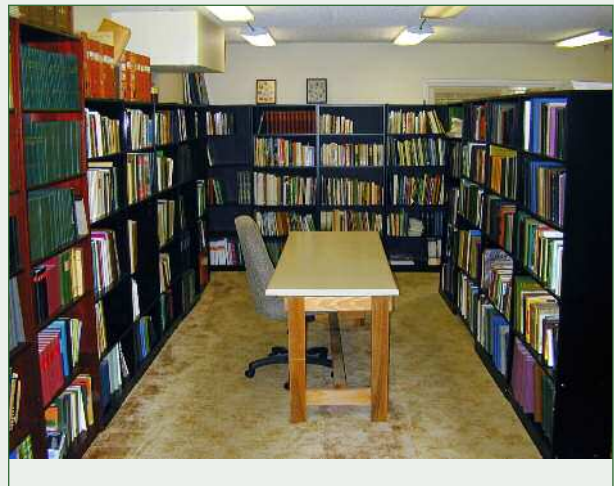
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