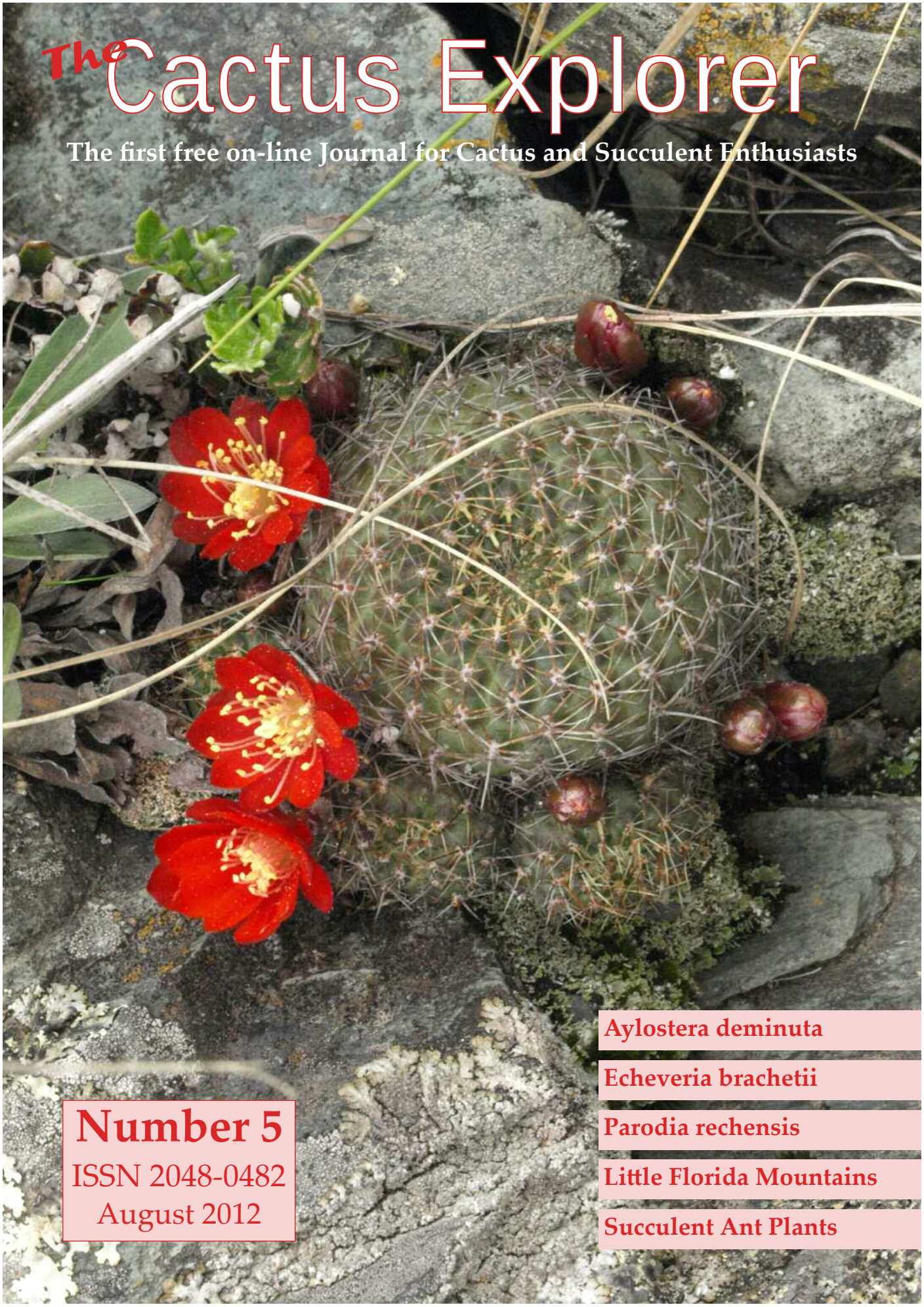
The Cactus Explorer

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



Aylostera deminuta

Echeveria brachetii

Parodia rechensis

Little Florida Mountains

Succulent Ant Plants

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In this Edition

Regular Features

Articles

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

Cover Picture *Aylostera deminuta* VG10-1098 photographed by Victor Gapon at 2213m in Argentina, Prov. Salta, Sra. Candelaria.

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 maximun 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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Introduction

We are One Year old Today!

A year ago, I asked some friends to help me launch this new kind of cactus journal. Of course, it is not difficult to give something away for free! But, a famous Brit once said 'The best things in life are free' and, although he wasn't referring to a cactus journal, price isn't the only way to judge value. The readers' response has been consistently positive so our challenge is keep it that way.

Since the last issue in May, the weather in England has been extremely wet, raining almost every day and breaking rainfall records. Readers around the world may think we get weather like this all the time here, but in summer there are usually days when it is too hot to work in the glasshouse, but not this year. The plants look as if they are missing the sunshine and are a bit lush so let's hope that August will be better, for the plants and the Olympic Games.

August is also the month when the BCSS will hold the National Show on Saturday 18th, a great day out with lots to see and do. It will be the biggest plant sale in the UK this year and the competitive classes should provide plenty of inspiration. See the BCSS website for all the details.

This edition of the **Cactus Explorer** is not, as I expected, smaller than the last. I thought that our authors would be too busy with summer jobs to write, but not so. We have a good range of articles, including some from new contributors. I urge you to read Derrick Rowe's article about some bizarre succulents of Australasia and Oceania.

There have been a number of new on-line journals published this year and I am aware that if our journal gets too big it could become daunting to read. Do let me know if you have an opinion about this.

I am very pleased to publish an article from Professor Len Newton, president of the IOS

and well-known student of succulents, especially Aloe. In the picture above, he can be seen in a glasshouse at the Jardin Exotique, Monaco, admiring a flowering plant of *Aloe pillansii*.

As another summer passes, I look forward to the Cactus Explorers weekend in September and meeting friends at ELK in Belgium.

Graham Charles

We are sorry to hear that Graham Slack passed away on 12th May 2012. He was well known to many of us through his activities with the Chileans.
An obituary appears on Page 37

The next issue of the **Cactus Explorer** is planned for November 2012. 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

Oxford Show with the Mammillaria Society

It has been a record-breaking wet Summer in England but happily it was dry for the big show at Oxford on Sunday 15th July. This annual event has earned a reputation for being one of the highest quality shows in the country and this year visitors were again treated to a splendid display of plants.

As well as a wide range of competitive classes for cacti and other succulents, there were many more especially for Mammillaria and associated genera organised by the Mammillaria Society. These classes especially attract plants of the highest quality and many wonderful plants went home without a prize card.

The day was rounded off by an expert lecture given by Wolfgang Plein from Germany about the Mammillarias of north-western Mexico, the result of his extensive fieldwork. The many images of flowering plants in habitat gave an insight into their variation in nature, illustrating how difficult it can be to decide what constitutes a different species. Wolfgang explained his theories about plants and how their identity correlates with the river systems

Wolfgang Plein (right) discusses the show with Alasdair Glen, judge of the Mammillaria Society classes and Chairman of the BCSS.

in which they are found. The relationships between the many names, both old and new, from the region were discussed.

It was a really great day out and a sampler for the National Show in August.

GC

The BCSS National Show 18th August

Every four years, the British Cactus and Succulent Society organises its National Show and 2012 is the year. If you are planning to be in Britain in August, maybe for the Olympic Games, it's an event not to be missed. The venue is about one hour's journey north of London, near to the A1.

The competitive show has 134 classes and attracts the best plants in the country. As well as the show, there are lots of trade stands selling plants, books and accessories so a great day out is guaranteed.The BCSS National Show Saturday 18th August 2012 at Wood Green Animal Shelter, Godmanchester, near Huntingdon.

http://www.bcss.org.uk/nat_show.php

There are many local show, meetings and sales held in Britain every year. The BCSS publishes a list which you can view on-line at

http://www.bcss.org.uk/events.php

GC

ELK Meeting 2012

The 47th staging of this ever-popular international meeting of cactus and succulent enthusiasts will take place from 7th to 9th September 2012 at the usual venue on the coast of Belgium, east of Blankenberge.

As well as the biggest plant sale in Europe, there will be five talks given in various languages:

Friday 7th

20.00 **Cacti of Peru. Land of the Incas.** *Guillermo Rivera*, Argentina

Saturday 8th

10.30 **Echinocereus.** *Mieke Geuens*, Belgium

15.30 **Kleine Chilenen: Bodenschätze unter den chilenischen Kakteen.** Ricardo Keim, Chile.

20.00 **Cacti of the Marañon Valley, Peru.** *Graham Charles*, U.K.

Sunday 9th

09.00 **Echeveria.** *Jean-Michel Moullet*, France.

Details of the event can be found at www.elkcactus.eu

German Society Calendar 2013

The German Cactus Society (DKG) are again publishing their calendar this year and, as usual, it has twelve high quality images of plants in cultivation and in habitat.

For 2013, the pictures include *Astrophytum caput-medusae, Tacinga subcylindrica, Pterocactus valentinii, Puya raimondii* and *Pachypodium namaquanum.*

This edition has a different, narrower, format than those recently published. There is a brief description of each plant in German, French, Italian and English.

The 2013 calendar is available for DKG members at 7.00€. See the DKG website for details.

If you are not a member of DKG, you can order it from Kakteen Haage for 7.50€.

Recent New Descriptions

Paul Hoxey describes his search for *Browningia hernandezii* – A remarkable new species from Colombia.

Photos by the author

Fig.1 *Browningia hernandezii* PH960.01 above Corrales, Río Chicamocha, 2520m

Colombia, a country in the north-western part of South America is not commonly associated with cacti but nevertheless it has a reasonable cactus flora of 35 species according to Hunt (1999). It is often thought of as a country predominately covered in tropical jungle but in fact, it has a far more diverse range of habitats because of the Andes that form a mountainous backbone north to south through the centre of the country.

The mountains are dissected by a number of rivers that form deep valleys and within some of these valleys there are arid enclaves due to the rain shadow affects of the high mountains. Not surprisingly, these arid habitats are favoured by xerophytic plants and are home to a number of cactus species. This short article concerns one such valley in central Colombia and a noteworthy cactus that has recently been found there and described.

In 2006, the Colombian botanist José Luis Fernández-Alonso described a new species of *Browningia* from central Colombia. The detailed and well-illustrated description was published in a Colombian scientific journal but fortunately it is available online for download.

This is a particularly interesting discovery since, until then, the genus *Browningia* was only known from Peru, with one species extending into northern Chile (*Browningia candelaris*) and another just entering into southern Ecuador (*Browningia microsperma*). The new species, *Browningia hernandezii*, is restricted to the Cañon del Chicamocha, a deep and arid river system over 1000km distant from the nearest *Browningia microsperma* populations. It is remarkable to find a *Browningia* so far disjunct from the remainder

Fig.2 *Browningia hernandezii* PH955.01

Fig.3 *Browningia hernandezii* PH955.01

Fig.4 *Browningia hernandezii* PH955.01 partially developed fruit.

Fig.5 *Browningia hernandezii* PH960.01 flower bud.

of the genus and it is far from a simple range extension of a known population.

The discovery was little noticed by the cactus fraternity, perhaps because cereoid cacti are not the most suitable for pot cultivation and *Browningia* is not a genus commonly found in UK collections. However, I find such unlikely discoveries very enticing and hoped one day to visit Colombia to see this species for myself. A look at the map indicated that the Cañon del Chicamocha is relatively close to Bogotá and reasonably accessible, so a plan was hatched to stop off in Colombia for 3 days on my return to the UK from Peru in April 2011. My goal was to try and see *Browningia hernandezii* in habitat.

I arrived in Bogotá and by bus found my way to Sogamoso, a town at the head of the Río Chicamocha. Sogamoso lies at an altitude of 2600m and has a relativity damp climate and, apart from a few cultivated *Opuntia* around

Fig.6 *Agave species* PH955.05

town, it did not look to be an ideal place to search for cacti. Very intense rains had hit Colombia shortly before my arrival and there has been significant flooding country-wide. Sogamoso had been affected and large areas of farm land around the town were under standing water. After a few enquires I was fortunate to find a local guide, Luis, who I contracted along with his 4x4 vehicle for a day of cactus hunting.

Early the following day and using the location details given in the first description we headed down into the Río Chicamocha canyon. The road followed the swollen river that was nearly overflowing its banks. It did not look at all like a cactus habitat with green and densely-vegetated slopes but as we descended the conditions became a little drier and eventually we encountered cereoid cacti on a gently inclined hillside at approximately 2500m. Could this be *Browningia hernandezii*?

The plants were surrounded by dense vegetation and consequently difficult to approach. The terrain was scattered with large boulders underneath the vegetation and I carefully clambered from one boulder to the next to reach a few of the cacti for closer inspection.

At this location (PH955) the plants were limited to 3-4m tall, a little smaller than the maximum 7m quoted in the description for *Browningia hernandezii*, but branched readily. Older stems had a bluish-grey colour but fresh growth was bright-green and the plants had clearly responded to the recent rains with a spurt of growth. The stems are about 8-12cm in diameter and have up to 12 fairly deep ribs.

On older stems the spines are grey and number 20 to 30 but fresh growth has fewer, only 15 or so, brown spines. Perhaps further spines develop as the stem matures. I found a few green and partially developed fruits [Figs.2, 4 & 7] which unfortunately only contained unripe seeds. However, they showed the naked scaly fruits typical of the genus to confirm that this was indeed *Browningia hernandezii*. Fig.16 shows a fruit of *Browningia candelaris*, the type species of the genus, for comparison. Ripe fruits turn a deep red colour and contain seeds within a white pulp. I imagine the colour makes them attractive for birds to eat, so subsequently

Fig.7*Browningia hernandezii* PH955.01 with partially developed fruits

dispersing the seeds.

The only other cactus species growing here was a yellow-flowered *Opuntia*, perhaps *O. schumannii* or *O. elatior*, but the habitat was full of other interesting plants. I illustrate here a few of the more noteworthy plants for succulent enthusiasts, including a succulent-leaved *Peperomia* species that formed clumps on exposed rocks [Fig.9] and a nearly leafless, scrambling Asclepiad (Cynanchum?) [Figs.10

Fig.8 *Passiflora species*.PH955.07

Fig.9 *Peperomia species* PH955.04

Fig.10 *Cynanchum species* (?) PH955.09

Fig.11 *Cynanchum species* (?) PH955.09

& 11] with tiny white flowers, just a few millimetres in diameter. The cacti were home to a number of different plants especially a *Tillandsia* species growing as an epiphyte but also a *Passiflora sp*. [Fig.8] that clambered over the branches.

I was particularly interested to find an *Agave* species with attractive blue-coloured leaves with closely-packed teeth along the margins [Fig.6]. A few *Agave* have been described from Colombia so they are native to the country, but published information on Colombian species is scarce and I have been unable to determine a name for this one. Comments on its identity from *Agave* experts are very welcome!

We continue descending down into the Río Chicamocha canyon and passed the village of Corrales. A large group of inflorescences with reddish yellow flowers on a steep muddy bank by the side of the road caught my eye and I was pleased to discover a population of *Echeveria quitensis* [Figs.12-13]. After scrambling up the bank I was surprised and quite unprepared for the size of the plants. I have seen several *Echeveria* species in Peru and Mexico but here the largest plants had naked stems exceeding one meter high topped off with a green rosette of leaves and then an inflorescence of 50cm or more.

The *Browningia* were not frequently encountered but we took a side road which descended to a bridge over the river. We crossed to the other side and by making enquires with some local residents we found another small stand of *Browningia*. The plants are known locally as "dato" and once we learnt the name and started asking if there are any "dato" in the area the local population immediately understood what we were searching for.

This second population (PH956) consisted of just a handful of plants situated on a small but

Fig.12 *Echeveria quitensis* PH956.01 Near Corrales, Río Chicamocha, 2450m

Fig.13 *Echeveria quitensis* PH956.01 Near Corrales, Río Chicamocha, 2450m

steep rocky slope surrounded by farm land. Again they were covered in epiphytic *Tillandsia* and growing well. Buds, recent flower remains and unripe fruits were all in evidence but unfortunately they were lacking flowers. The flowers are nocturnal and presumably pollinated by bats, like the other members of the genus. They are described as 4.5-6cm long and 4.5cm in diameter in the original description.

A third micro-population (PH959) of just two roadside plants was seen from the car and briefly examined as we started the return journey to Sogamoso. The fourth and final location visited was above the village of Corrales. We were told that cacti grew on the hills above the village so we set out to investigate. We took a small track that climbed up the hillside above the village. The land was mainly used for grazing with no sign of cacti other than a few *Opuntias* until we reached a steep rocky slope on the edge of a field. Once again we encountered a small number of *Browningia* (PH960) but here the plants grew

Fig.14 *Browningia hernandezii* PH959.01with stems densely covered with Tillandsia

Fig.15 *Browningia hernandezii* PH958.01 Road to Betéitiva, Río Chicamocha, 2550m

significantly larger with more impressive proportions than we had seen previously. One plant had in excess of one hundred branches and reached perhaps 5m tall and wide. Other specimens growing further down the slope reached in excess of 8m and perhaps as high as 10m but the steepness of the terrain made it impossible to reach them to make accurate measurements.

The Cañon del Chicamocha is probably a refuge for arid-adapted plants within the northern Andes where they remain isolated and have little opportunity to escape to other arid habitats. *Browningia hernandezii* is probably a relict species hanging on in this one valley in rather small, fragmented populations. We found four scattered populations within a 15km section of the valley, all at an altitude of 2500m. The description states it is found along 75km of the valley so I explored only the upper end of the range and I cannot assess how frequent or otherwise it occurs throughout the range. *Browningia hernandezii* is reported to grow in a relatively narrow altitude band of 2500 to 2150m so does not appear to grow in the more arid lower altitude section of the valley.

Fig.16 Fruit of *Browningia candelaris* PH884.01 Road to Tarata from Tacna, Peru 2540m (for comparison).

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Paul Hoxey

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Zlatko Janeba provides us with more information about *Maihueniopsis glochidiata*, a new species recently described by Graham Charles and discussed in the last issue of the Cactus Explorer. **Photos by the author**

Fig.1 *Maihueniopsis glochidiata* ZJ 180. This plant has been in cultivation since 1998 when a single tiny segment was collected in the mountains of Sierra Sanogasta, E. of Los Tambillos. The joint had travelled in my backpack through Argentina and Chile for almost 2 months before successfully rooting in cultivation.

In the last issue of The **Cactus Explorer**, an interesting small species of the genus *Maihueniopsis* was introduced by Graham Charles (Charles 2012). This very recently described cactus (Charles 2011) was quite often brought from field trips to Argentina by various travellers and is often grown in cultivation, but usually under the name of *M. minuta*. I also saw similar plants in nature and want to tell you my story.

In 1998 I visited Argentina for the third time. That time I travelled with my friend Petr Bernat, who was interested mostly in the genus *Tillandsia*. On this trip we were using local transport, i.e. buses and hitch-hiking. Our expedition took 63 days (from 7.1.1998 till 10.3.1998), it was the most strenuous cactus hunting trip I have ever made, but at the same time I have to admit, it was so far the best, most exciting trip and a real adventure. And we also saw a number of very interesting cactus and bromeliad species.

Cutting a long story short …

… on 19th January 1998, we took a bus (company IVANLOR) from Alegro Puerte, where we studied cactus flora, especially nice form of *Gymnocalycium riojense* (today probably called *G. riojense* var. *mirandense*). After more than 1 hour drive the bus stopped at our next destination, Los Tambillos, La Rioja. Since we still had some time before dusk we searched the flat area E of Los Tambillos for cacti and saw *Gymnocalycium* aff. *guanchinense* (flat, very spiny plants) growing mostly under bushes, *Cereus aethiops*, *Echinopsis leucantha*, *Denmoza rhodacantha*, *Tephrocactus alexanderi*, *Trichocereus candicans* and *T. terscheckii* among others. We also found various Tillandsias on the bushes, e.g. *T. bryoides*, *T. capillaris*, *T. gilliesii*, and *T. xifioides*. It was very hot that afternoon, 37°C in the shade, and very windy with a lot of dust in the air, so we got pretty exhausted after some roaming around. After our return to the settlement we got ‘queso

Fig.2 Top view of the same plant as in Fig.1. It can be noticed on the older joints that their epidermis can get easily sunburnt during spring months.

casero de cabras' (homemade goat's cheese) and coke for dinner and the locals let us stay overnight at an unfinished building.

The next day (20th January, 1998) we got up at 7 a.m. and headed eastwards, across the flat bushy area we had searched the day before, to the high mountain range (Sierra Sanogasta, just south of the famous Cuesta de Miranda). After one hour or so we reached the foot of the mountains and started climbing up, using a dry river bed at first … to an elevation of some 2500m and higher (up to ±2700m) where we observed e.g. *Lobivia* (*Soehrensia*) *rosarioana*, quite common *Pyrrhocactus andreaeanus* loaded with ripe fruits, and a very variable small *Opuntia* species.

I was especially very happy for the encounter with *P. andreaeanus* since it was the only Argentinean *Pyrrhocactus* I had not seen before (although it is considered to be only a form of *P. strausianus*). Also, the Opuntias seemed to be very interesting plants. There was something like a small form of *Cumulopuntia boliviana* and the tiny Opuntia mentioned before. Interestingly, the tiny Opuntia was quite variable in spination.

Since I was not sure at the time what species it was, I took a single segment with me and I was able to collect some seeds as well. After some more exploration we started to descend back and the lower we were, the hotter it was. We got back to Los Tambillos at about 2 p.m. and it was already 35°C in the shade. After some refreshment we caught a bus and headed towards Chilecito … (adapted from my travel diary of the 1998 trip).

After coming back to Prague I tried to identify the tiny Opuntia species, but that seemed to be not a very easy task. Finally, I concluded that it might be a form of *Opuntia minuta* or *O. ovata*. I have discussed these plants and their variability in the Tephrocactus Study Group journal (Janeba 2000) in the hope that somebody would tell me what it really was. But I got no response. And since the TSG article (Janeba 2000) is not easily available I use one paragraph from it here:

"… I suppose that they were all forms of *Opuntia* (*Maihueniopsis*) *minuta* (Backeb.) Cast.

As the photographs illustrate, they were very variable and the plants were just a few meters apart. The segments were oval and very small (1 - 1.5cm long) and formed relatively compact groups. The spination varied considerably. There was one extreme form with almost no spines, but many of this form had yellowish, long tufts of glochids. The second extreme form had almost no glochids, but 3 - 5 very distinct spines: up to 1 cm long radials and 1 – 2 central strongly flattened ones up to 3.3cm long. There were also many transitional forms. Seeds were typical for the subgenus *Maihueniopsis*, lentil like and smooth. "(taken from TSG article, Janeba 2000)

Both forms of the *Maihueniopsis* were depicted in the above article (Janeba 2000). In 1998 I offered seeds of this interesting *Opuntia* as: *Maihueniopsis sp*. (tiny bodies), ZJ 180, E. of Los Tambillos (2500m), La Rioja (from my 1998 seedlist).

I do not remember whether anybody bought the seeds from me, but they did not germinate for me. Thus, it seems there is only the single clone that is shown in the two figures (Figs.1 & 2). The single tiny segment taken at the locality E. of Los Tambillos survived the long trip and moreover, it survived many years in cultivation. Unfortunately, it has not flowered yet. But I placed it in a larger pot so maybe next year?

During the repotting I noticed its large tuberous roots, pity I did not take a picture of it then. Although the plant does not want to make me happy with flowers, the segments fall apart quite freely and can be easily rooted in a sandy substrate. It is a modest plant and good option for those who do not have much space and still want to keep some Opuntias to diversify their cactus collections.

Anyway, I am not still sure what to call this plant (*M. minuta* or *M. glochidiata*), as I am not 100% sure they are different (separate) species. Thus, I look forward very much to read the full account of the molecular study mentioned by Graham Charles and I can supply my clone as well, if there is an interest to continue with the DNA testing.

Fig.3 *Pyrrhocactus andreaeanus* ZJ 181 in cultivation. It is a 14-year-old plant grown from the seeds collected in 1998 east of Los Tambillos, La Rioja, Argentina. These seedlings flower freely each year with number of enchanting two-coloured flowers and set many seeds.

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Zlatko Janeba desert-flora@seznam.cz

The first description of *Corryocactus erici-marae* has just been published in International Cactus Adventures No.95 (July 2012). The genus *Corryocactus* (including *Erdisia)* is surely one of the least understood genera of the Cactaceae.

Photos by Paul Hoxey and Graham Charles

Photo: Graham Charles

Fig.1 *Corryocactus erici-marae* RRP1080 from Lic Lic, Cajamarca, Peru in culture

Photo: Paul Hoxey

Fig.2 *Corryocactus erici-marae* PH235.01 on the trail from Huagal to Pai-Pai, Cajamarca, Peru at 2950m

I met Nelson Cieza Padilla when I visited San Marcos, a town south of Cajamarca, Peru. He was working on the project to establish a botanical garden there. During his explorations of the surroundings, he came across this *Corryocactus* and considering it to be undescribed, he named it after his children.

He explains that he has seen similar plants at other localities in Cajamarca Province, even as far north as Baños del Inca which is near Cajamarca City. Paul Hoxey has also seen this plant near Huagal and Chris Pugh saw it, or something similar, above Balsas on the road to Leimabamba, so it would appear to be widespread in the Marañon river valley and nearby.

The plant has thin, erect stems to 1.64m growing from a tuberous root. The red-orange flowers are borne mainly from the upper parts of the stems. Its habitats are said to be steep rocky cliffs between 2325 and 3097m.

The author states that his investigation of other described species led him to conclude that he had found a new one. He compares his find with *Corryocactus erectus* which is certainly a different species and from hundreds of kilometers away near Cuzco. As Paul Hoxey says, there have been a number of new descriptions recently where authors have sought to justify the differences of their new taxa by comparing them with other species that are not the most similar.

A better species for the comparison would have been *Corryocactus apiciflorus*, first described as *Cereus apiciflorus* by Vaupel in 1913 from a collection of Weberbauer. This old name has now been applied to similar-looking plants distributed over a wide area of Peru. It is probably the oldest name for this new description, originating from a similar altitude further south and also in the Marañon valley.

Although they easily flower when young, the small-growing *Corryocactus* species, known by some as *Erdisia*, are not often seen in UK collections, perhaps because the stems are rather plain and poorly-spined. Paul Hoxey has distributed seedlings of the plant in Fig. 2 as well as PH240.01 from the same trail but lower down at 2700m. They are very easy to grow and start to flower for me when less than 25cm tall. GC

In The Glasshouse

Photo: Graham Charles

Stenocereus eruca

Here is yet another really individual plant, a cereoid species which most enthusiasts would recognise. My earliest memory of this remarkable cactus was seeing the specimen exhibited by Tom and Agnes Lavender that won a Diploma at the National Show held in Luton, England in 1979. Not only was it an unusual species to see at a show but it was actually flowering. You can see a picture of the plant, taken at the time by Helmut Broogh, in the National C&S Journal 34(4):84 (1979).

Two years earlier, Tom and Agnes had described their experiences with 'The Devil'. Having obtained their plant from a nursery in Menton, France in 1971, they sensibly laid the cutting horizontally on the soil in a plastic trough, the sort of container often used on window sills. They report that after it established, the plant grew well and needed a further trough to be placed next to the first. They later succeeded in obtaining a succession of flowers during the summer which they tell us opened in the evening and faded the following morning.

I was inspired by this story so when I had the chance to buy a cutting from an imported plant, I was delighted. My experience has been very similar to that of the Lavenders. I also planted my cutting horizontally in a trough and placed it on the top shelf of my glasshouse in the sunniest place I had. It has since grown quickly, not only growing longer but producing wonderfully-spiny side branches that optimistically send roots from their lowest

Photo: Graham Charles

areoles hoping to establish in nearby pots! The fresh growth is adorned with new spines with their prominent pinky-red colour. It has flowered regularly for many years now but photography is difficult since I cannot easily lift the metre-long trough off the top shelf. The picture on the previous page was taken in situ while I was standing on a ladder!

Seed of *Stenocereus eruca* is occasionally offered for sale and it is quite easy to raise. Bryan Goody, owner of Southfield Nursery (which is near where I live in England) planted out a seedling in a big wooden box. The plant sent out arms which radiated from a central point and made an impressive specimen.

A batch of seedlings raised by Chris Pugh produced two cristates. One made a tight mound of thin cristate stems, whilst the other started as a normal stem, the end of which then grew into a single flat cristate fan with roots growing from the underside.

It was not until 2007 that I was able to see this amazing plant in its natural habitat. I had attended the CSSA Convention in Seattle and decided to take the post-convention tour to Baja as an easy introduction with experienced guides. It was the beginning of June and Baja was very dry.

As the bus turned off Rte.1 along Rte.22 across the flat Magdalena plain towards San Carlos, I wondered if we would be able to find the 'Creeping Devil' since I had heard that agricultural activity had adversely affected the populations. I need not have been concerned, a few patches of the plant were soon noticed amongst the roadside vegetation.

Arriving near the sea, on level ground within sight of the prominent power station, we were surrounded by the decumbent stems of *Stenocereus eruca*. It was a thrill to walk among the stems which were pointing in every direction, climbing over each other but not showing signs of flowers or fruits.

As is often described, the stems have their heads raised whilst the back end of the stems shrivel and die. It is as if they are slowly moving forwards like giant caterpillars, hence the name 'eruca', from the Latin 'eruca'

Photo: Graham Charles

meaning a caterpillar. There were specimens of the widespread *Mammillaria dioica* in some parts of the population (see picture bottom right)

Townshend Stith Brandegee was making a botanical expedition in Baja when he came across this plant. It had previously been seen but had never been named so Brandegee named it *Cereus eruca* in the Proceedings of the California Academy of Sciences (1889).

After initially combining *Cereus eruca* in Lemaireocereus, Britton and Rose created a new genus Machaerocereus in Volume II of 'The Cactaceae' to include *M. eruca* as the type species and *M. gummosus*, another related plant from Baja California.

In the 1930s, the area was visited by many famous cactus explorers like Howard Gates, Yale Dawson and Gil Tegelberg. The sandy roads presented major difficulties to their attempts to travel by car but, at that time, the populations of *Machaerocereus eruca* were in pristine condition. They all gave enthusiastic reports of the populations of this extraordinary

Photo: Graham Charles

Photo: Graham Charles

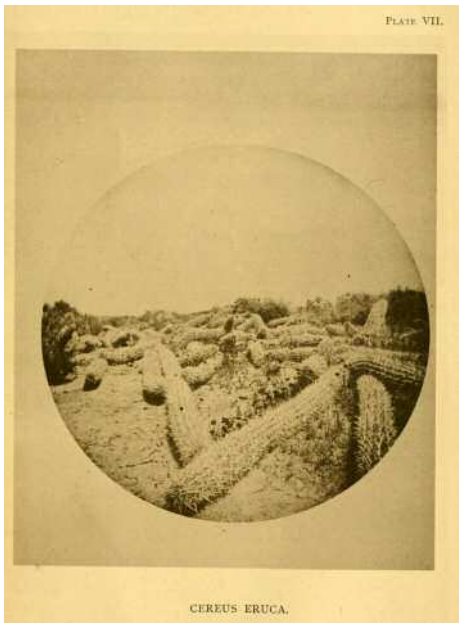
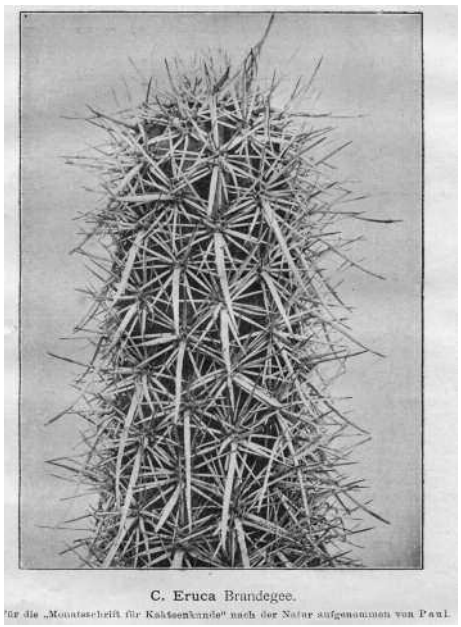


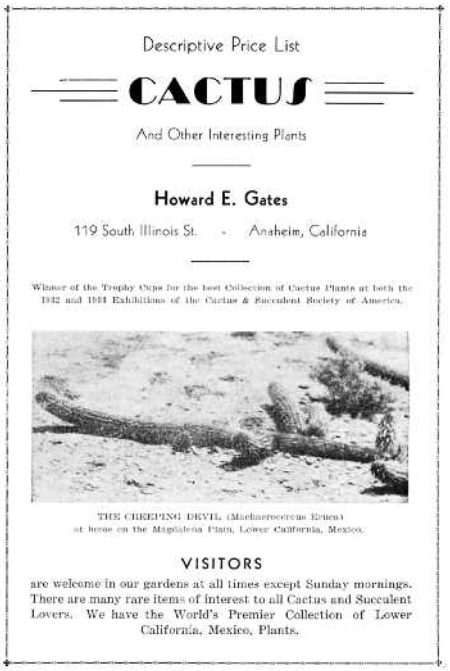
PLATE VII.

CEREUS ERUCA.

Brandegee's picture of *Cereus eruca* that was published with his first description in the 'Proceedings of the California Academy of Sciences' (1889)


C. Eruca Brandegee.

Picture of *Cereus eruca* published in 'Monatsschrift für Kakteenkunde' (1895) and repeated in Karl Schumann's 'Gesamtbescreibung der Kakteen'


Descriptive Price List

CACTUS

And Other Interesting Plants

Howard E. Gates

119 South Illinois St. - Anaheim, California

Winner of the Trophy Cups for the best Collection of Cactus Plants at both the 1932 and 1933 Exhibitions of the Cactus & Succulent Society of America.

THE CREEPING DEVIL (Machaerocereus Eruca) at home on the Magdalena Plain, Lower California, Mexico.

VISITORS

are welcome in our gardens at all times except Sunday mornings. There are many rare items of interest to all Cactus and Succulent Lovers. We have the World's Premier Collection of Lower California, Mexico, Plants.

The Howard Gates catalogue from 1933 in which *M. eruca* is offered in various sizes from 6in. to 6ft.(below)

Machaerocereus eruca. The famous "Creeping Devil" found only on the shores of Magdalena Bay. Plants grow prostrate on the ground, dying behind as the head advances. Diameter of branches 3 to 5 inches, length 1 to 10 feet. Heavy, recurved, flattened, gray spines. **6 in. $2.50, 1 ft. $5.00, 2 ft. $11.00, 3 ft. $17.00, 6 ft. $50.00**

plant. Later reports from the 1960s describe how increased agricultural use of the plain had reduced the extent of the 'Creeping Devil'.

Machaerocereus eruca was its generally accepted name for many years until Gibson and Horak (1978) moved the plant into Stenocereus, a large genus including many columnar cacti from Central America.

Probably because of its unique appearance, the plant created much interest and was in great demand from collectors. Howard Gates had a nursery in Anaheim, California and made a number of trips to Baja California to collect plants. In an article published in the 'Desert' magazine in October 1930, he tells of his experence with the 'Creeping Devil':

"The traveler has to go a long way to see this one, as it only grows near the sea coast in the sparsely settled Magdalena Bay region. The searcher for it feels well rewarded when he finds the eerie place, where hundreds of these "Creeping Devil" crawl around through the brush like great snakes, or a horde of hungry, hairy caterpillars. The plants are covered with a multitude of flattened, stiff spines that curve back toward the body of the plant and heighten the resemblance to a hairy caterpillar. One must be careful of these spines as they are very sharp, and hurt as though they carried a little poison. The most curious feature of these plants is that they lie flat on the ground, rooting on the under side and as the plant advances the hinder part dies. The living portion is about four inches thick, and from a few inches to ten feet in length. A new bark grows over the end of the live portion of the plant at the junction of the dead portion, which part shrinks and disintegrates in a year or two. The tip of the living portion is slightly elevated, which permits it to rise up and climb over an obstacle such as another plant lying on the ground.

The region where the Eruca grows is subject to very heavy fogs at certain seasons. This causes a lichen to grow on the spines, making the strange spectacle of a moss-backed cactus. The natives call this species, "Chirinola," but the common English name of "Creeping Devil" fits it very nicely."

His collecting activities provided growers with a chance to buy lengths of *M. eruca* and this remarkable plant was introduced into widespread cultivation. GC

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Gibson, A.C. & Horak, K.E. Systematic Anatomy and Phylogeny of Mexicn Columnar Cacti. Annals of the Missouri Botanical Gardens (1978) 65(4):999-1057

Lavender, T. & A. Machaerocereus eruca NCSJ 32(1):13 (1977)

The 1979 National Show NCSJ 34(4):81-86(1979)

Zeissold, H. Kakteen-Neuheiten *Cereus eruca* MfK5(5):73(1895)

The Story of a strange Hamatocactus

René Zahra, Dar ix-Xewk, 44 Triq il-Gistakor, Ghaxaq GXQ2373, MALTA Photos:René Zahra

For almost 20 years, I have been growing these cactus plants in my collection. Everyone who has seen them has asked me what they are. All I know about them is that they are a form of *Hamatocactus*, possibly even a new species or subspecies.

These plants were grown from seed given to me by my friend Alfred Lau when he was in Malta to give us a few talks. I asked Alfred several questions about this cactus, but with all the problems he had in his last years it was impossible to obtain the details I had asked for. I also waited a long time for Alfred to publish something about this particular form, but days rolled into years and now that our friend is not with us anymore, I feel that I have to share with you the scanty information I have about this strange plant.

The story behind this cactus (of which I now have 6 mature plants all of them with a free root run) started in 1992. That year Alfred Lau was in Malta to give us talks. It was after his first talk that he gave me a small envelope with some seeds and told us by word of mouth that this was "*Hamatocactus* spec. nova from Sta. Eugeade, Mexico". I shared these seeds with a friend, but my friend wrote Sta. Engracia instead.

Alfred told us that he had collected the seeds from plants he had found growing on a hill in the shade of trees in a small pine forest where he never expected to find any cacti growing. He also told me that the plants were spineless, but he was sure that it was a form of *Hamatocactus*. Although he had collected the seeds, he had never seen the flowers.

In the spring of 1993 I sowed the seeds Alfred had given me and from them I managed to grow a number of plants. I kept a number of them in my collection, but I also distributed some of seedlings amongst my friends, both in Malta and abroad. When the plants I kept had matured, I noticed that most of them had no spines at all, but some of them had a few very short spines. Some of the mature plants

remained solitary, but others produced a few offsets. When my plants finally flowered, the big flowers were lemon yellow in colour and both flowers and fruits were quite typical of those produced by *Hamatocactus hamatacanthus*.

A friend from France who specializes in *Ferocactus* was visiting my collection and, on seeing these cacti, wanted to know more about them. To start with I looked through the booklet with Lau's field numbers, but here there is no mention about any unnamed *Hamatocactus*. Maybe Lau had found these plants after the booklet went to the press, because it covers only 1972 to 1992. Next I tried to locate Santa Eugeada in Mexico using

Google Earth, but no such place was to be found. In spite of this it was suggested that I might be looking for Santa Egueda in north Baja California. I looked at this place and I found that it is a very small village consisting of a few huts and, interestingly enough, there was indeed a small forest to the north of it.

Knowing that species of *Hamatocactus* are found in Texas, New Mexico, Durango, Nuevo León, San Luis Potosí, Zacatecas and Tamaulipas that are all on the eastern side of the continent, I had to rule out this location. On questioning my friend about this matter he told me that he had written Sta. Engracia and not Sta. Eugeade. Looking once again at Google Earth, I found that there are two Sta. Engracia: one in Nuevo León and the other in Tamaulipas. I looked at both places, and the most promising one was Sta. Engracia in Tamaulipas where, to the west of the town, there is a hill which has its sides covered with what look like trees.

The main reason why I'm publishing this information is because it seems that, here in Malta, we are the only ones to whom Alfred gave the seeds of this form of *Hamatocactus*. Another reason is to encourage anyone travelling in the area mentioned above to check the locality because, if these cacti grow there, one might be able to give this form a much needed official name to be able to identify properly this very interesting cactus.

Rene Zahra

Thrixanthocereus senilis

Photo: Chris Pugh

I had always thought the flowers of *Thrixanthocereus senilis* are dark pink, so when Chris Pugh told me that his plant had white flowers, I was surprised. I had always thought that dark pink was unusual for a nocturnal flower that is presumably pollinated by bats.

The plant is known from a few isolated habitats in Peru so perhaps the flowers are white at one of these places. It would be interesting to hear from readers if they know of any other white-flowered plants or any reference to them in the literature. GC

Photo: Graham Charles

A New Locality for *Matucana comacephala*

Photo: Chris Pugh

Matucana comacephala is widespread in the drainage system of the River Marañon in Peru. In the last issue of the **Cactus Explorer**, Holger Witner explained why he considers it to be a different species from *M. myriacantha* which occurs further north in the same river system. He published a number of pictures showing flower colours from pale pink to red-orange.

When we were at the habitat of *Matucana oreodoxa* ssp. *roseiflora,* we met a local man who told us that the *M. comacephala* there had orange flowers. They were not flowering at the time but we were able to find some seeds. Now we have seen flowers in cultivation and orange is a reasonable description of the colour of its spectacular flowers.

These Matucanas are easy to grow, enjoying as much sunshine as you can provide. They usually grow on steep slopes in nature, so need a well-drained compost and a pot that is not too big .

GC

Old Favourites: *Mammillaria saetigera*

Photo: Graham Charles

What makes a cactus species popular? I often wonder why some plants are always in demand, whilst others that are more attactive to my eyes, are rarely requested or talked about. I am still very fond of plants I grew as a beginner all those years ago and I plan to share some of these with you in the **Cactus Explorer**.

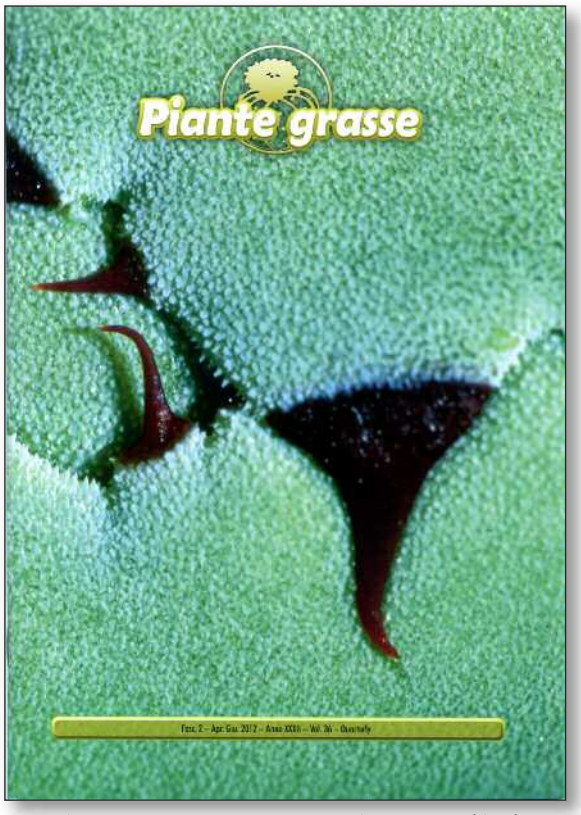
My first example is *Mammillaria saetigera*. I had my first plant with this name more than 40 years ago so, when I saw it offered under the field number Rog 432 in the seedlist of the German Mammillaria Society, I had to grow it again.

One of the tiny seedlings had three heads so that was one I kept. It grew easily and quickly and now fills a 22cm bowl. Every year it has rings of pretty pink flowers. The other seedling I kept is a single head and is overall much smaller so perhaps three heads are better than one! I cross-pollinated the plants and the red fruits started to appear in July. I think it is the symmetry which attracts me to Mammillarias and this is certainly a good example.

The application of the name *M. saetigera,* which was described in 1933, is uncertain, but in cultivation plants with this name usually look like the illustration above. If you accept a wide concept of species then you would probably include it in *M. hahniana*. The location given for *Rogozinski* 432 is Guamúchil, in Guanajuato state, Mexicó.

GC

Journal Roundup



Piante grasse now in English

The second issue available in English has just been published and it is a welcome addition to the journals I can easily understand. The layout is very attractive and represents a significant improvement over previous years.

This issue includes the description of a new species *Corynopuntia nigrispina* and a review of *Digitostigma caput-medusae*. Al Laius writes about 'Gasterias in the Veld' and there is an account of *Kunkeliella subsucculenta*, a rare succulent endemic from Tenerife. Cold-hardy Agaves and detailed review of *Sempervivum wulfenii* completes the core of this impressive production.

It is a brave venture to start a new English language journal at this time, so please consider subscribing to it:

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

Cactaceae Systematics Initiatives

The latest issue of this Bulletin of the International Cactaceae Systematics Group includes updates to the treatment of various genera in preparation for the second edition of the New Cactus Lexicon.

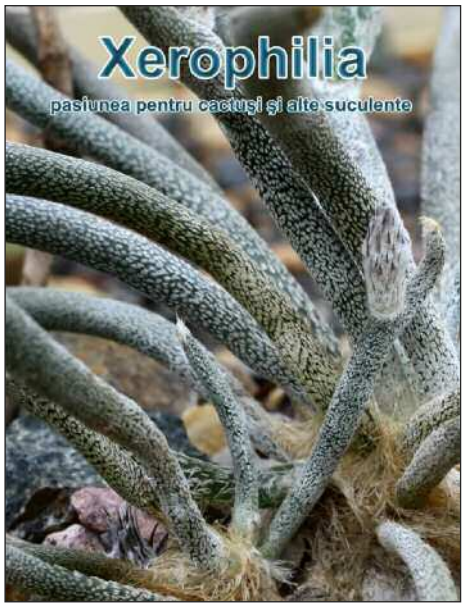
There is also more information about the proposed publication of Ritter's photographs in colour, including some sample pages. Paul Hoxey comments on the recently-described *Copiapoa griseoviolacea* (see the **Cactus Explorer** 2:16) , suggesting that it could well be a re-description of Ritter's *Copiapoa cuprea*.

The posthumous publication of an article by the late Beat Leuenberger, concerning the application of the name *Cereus tupizensis* Vaupel, is most welcome. The name was used by Backeberg as the earliest name for the Cleistocactus growing near Tupiza, Potosí, Bolivia. However, it is now clear that it was a re-description of the plant named *Oreocereus celsianus*. So, the Cleistocactus we have in our collections needs to be re-named *C. buchtienii* according to the New Cactus Lexicon.

You can subscribe to CSI by contacting the publisher: David Hunt 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 first issue of Xerophilia appeared in June this year. 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 first edition has 88 pages and includes articles about *Corynopuntia*, the Pinya de Rosa garden, *Digitostigma*, *Opuntia fragilis*, *Mammillaria schiedeana*, succulent ant houses and *Adromischus*. The next issue is due by the 30th September.

The magazine may be read online or 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 a.s.), 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 second issue of this new free online journal has recently appeared. This is the first one 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:

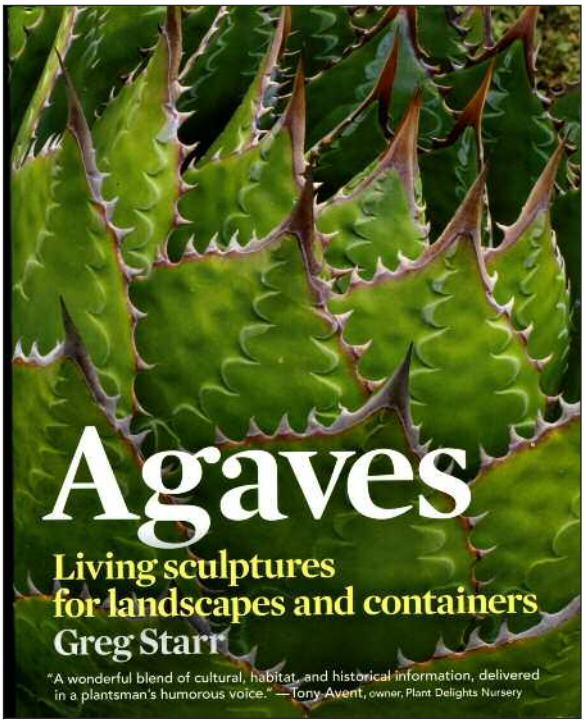
http://www.cactuspro.com/succulentopia

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.



New Agave Book

Even cactus specialists enjoy the symmetry of Agaves. They make spectacular specimens and, even in parts of the world where they cannot be grown outside all the year, they are excellent container plants for summer display. So, a new book about these sculptural plants is very welcome.

'Agaves. Living sculptures for landscapes and containers' by Greg Starr. 342 pages, 228 x 175mm, 225 colour pictures, 1 map, hardbound in green cloth with colour dust jacket. Published by Timber Press.

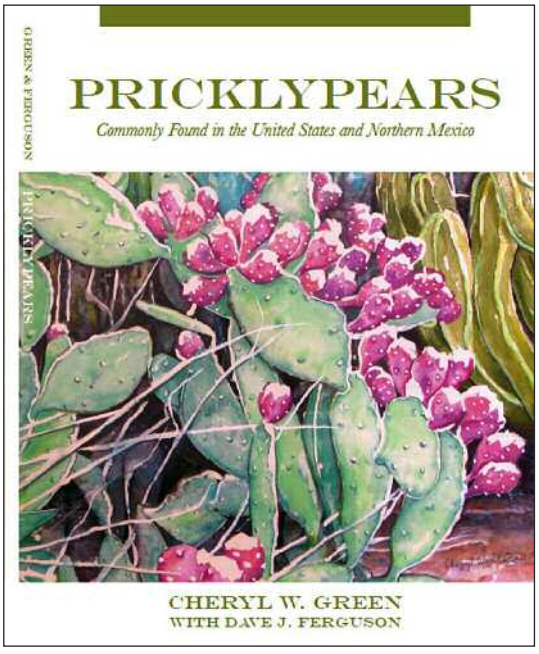
This book is impressively produced, printed on good quality paper with consistently high quality colour pictures of plants in habitat and cultivation, all technically and artistically pleasing.

The introduction covers Agave reproduction, distribution, conservation, horticultural history, taxonomy and common names. The following chapter explains how to grow them, including information about their size and hardiness. Then, the majority of the book is dedicated to describing 80 species, cultivars and hybrids with field observations, plant descriptions and taxonomy, as well as specific cultural information.

This is a very recommendable book and it will certainly become my first place of reference for information about the genus. Price $39.95 or £16.50 from Keiths Plant Books.

A Photographic Guide to Pricklypears

Here is an attractive and well-produced book about a subject which has been largely ignored in recent years. Although Opuntias have



spectacular flowers and are often the dominant cactus genus in habitat, few of us have taken much interest in them. For instance, it was difficult to find good pictures of them when we were assembling the New Cactus Lexicon.

This book is designed to help amateurs to tell the species apart by providing good pictures and grouping them by growth habit. The introduction prepares you for the identification of 60 species, varieties, forms and cultivars

commonly found in the USA and northern Mexico. They are grouped by growth habit: Chapter 1 has mainly tree-like plants; Chapters 2 and 3 have large schrubby plants and Chapters 4 to 7 have low-growing plants.

Every plant has a full page profile with information on names, ornamental uses, distribution, hardiness, and morphological characters. Each page has photographs of the growth habit, stem segments, spines, flowers and fruits to help direct comparisons and aid identification.

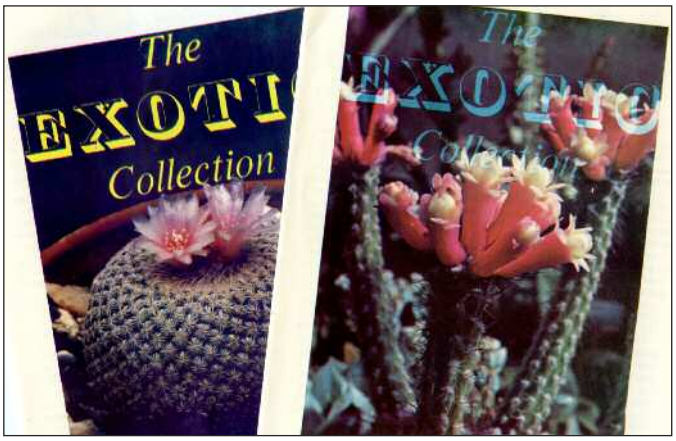
'Pricklypears Commonly Found in the United States and Northern Mexico' has 144 pages 279 x 216mm, softbound with laminated board cover. Illustrated with 420 good quality colour pictures and 3 maps.

Cheryl Green (pictured below on a trip to Brazil) wrote and organised the book with the help of Opuntia specialist Dave Ferguson. She is an artist as well as a cactus enthusiast and did a series of paintings of Opuntias. In an endeavour to find out their scientific names, she spent 6 years photographing the plants with the aim of producing a book to help others with identification.

I shall certainly find this book useful in putting names to my pictures of '*Opuntia sp.*' and I recommend it to our readers. Priced at $23.95 and available from book dealers or http://www.pricklypeargreen.com GC

The Printed Legacy of Edgar and Brian Lamb

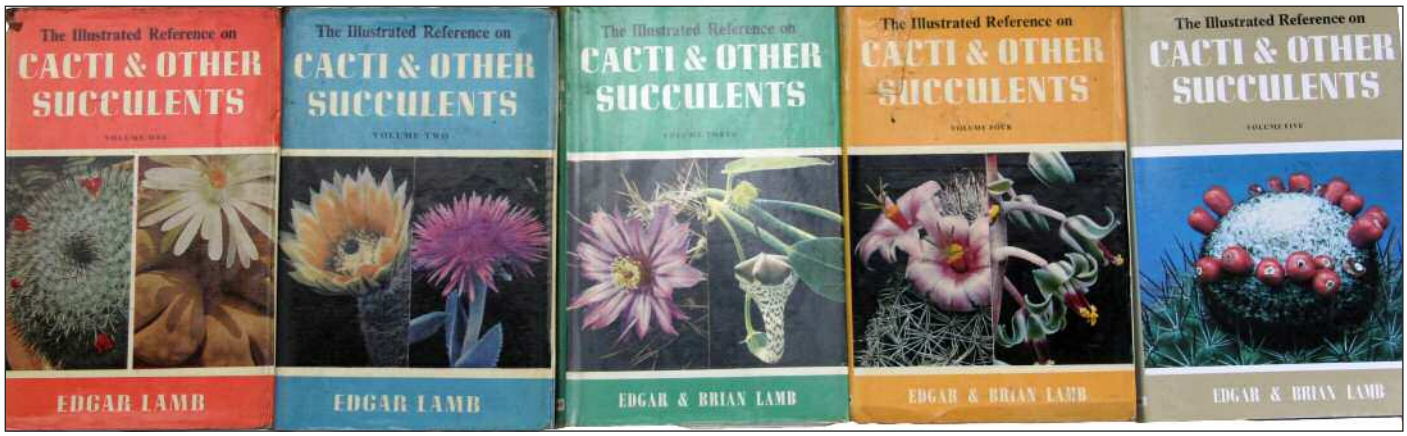
Chris Leather recalls how he became interested in the work of E. & B. Lamb and how he created useful indexes for their serial publications which you can download.



I would imagine that nearly everyone who grows cacti and succulents will have at least one book by Edgar Lamb. Indeed, for many, the names Edgar and Brian Lamb will recall memories of their early collecting days. Perhaps the most famous set of books is *The Illustrated Reference on Cacti and Other Succulents* – five volumes of Cactus and Succulent pictures. Other familiar books are *The Pocket Encyclopaedia of Cacti in Colour*, *Colourful Cacti and other Succulents of the Deserts* and *Popular Exotic Cacti in Colour* to name just three.

Some of you may be familiar with the *Photographic Reference Plates* and the *Monthly Notes on the Exotic Collection*. These were, in a way, early examples of those "part works" that you see advertised on the television. Each month there was a magazine with growing tips, travelogues and other general articles. With each issue there were two numbered reference plates published, each comprising short notes about a particular plant together with a photograph. They were issued over a period of nearly 40 years (1948–1987) and in the end there were over 1000 plates published.

Many, many years ago I was given a part set of The Exotic Collection magazines by one of our late Manchester Branch members in a number of A5 ring binders. Harry Ormerod, the member in question, had been sorting through some drawers at home and when he



had pulled out the drawer containing the magazines, it had fallen to pieces. Not wanting to go to all the trouble of putting the magazines back, he brought them to the next meeting and gave them to me. "They need sorting," he said. "I tried filing them in some sort of order, but then I gave up as it was too complicated."

I spent a few hours over the next few days pulling everything out of the ring binders and putting all the magazines back together with the plates. I suppose I read quite a few, but then they got filed away for years and years until recently I saw some for sale in a catalogue.

Having bought those, I decided to try and find more and quickly purchased another two or three sets of plates. One of the problems with such a long running "part work" is that it is very unlikely that those who were there at the start would see the collection through to the end, and those joining later wouldn't have the earlier plates. What was obvious was that you can find lots of incomplete sets of plates. So I decided to try and get a complete set. As each batch arrived I would merge them into the ones I'd already had and, after about five or six batches, I found I had no more to insert, but lots of duplicates.

At this point, it became apparent that to make just a list of numbers and plant names wouldn't take into account the variations in plate types. Many plates have at least two different versions. Once all the numbers and plant names had been listed in a spreadsheet, I had to sort all of the plates into the different types. It turns out that there are five major types with seventeen minor variations.

I also thought it would be useful to know with which magazine each plate was issued. Fortunately, on the inside front cover of the magazines there is a list of which plates were published with that magazine. My own magazines provided some information and I also had some information from Ralph Martin. Hopefully Martin Doorbar and Graham Charles, who are checking their sets, will be able to add more of this information too.

My website has two PDF files available for download – a numerical listing and an alphabetical listing. There is also a brief outline of the history of the plates, magazines and the Exotic Collection. The PDF's are free for you to download for your personal use. I hope they prove useful to anyone trying to assemble a collection of plates. Having taken a lot out of the hobby over the years via Branch meetings, the Journals and latterly the CactusWorld Forum, I hope my lists go someway to putting a little bit back.

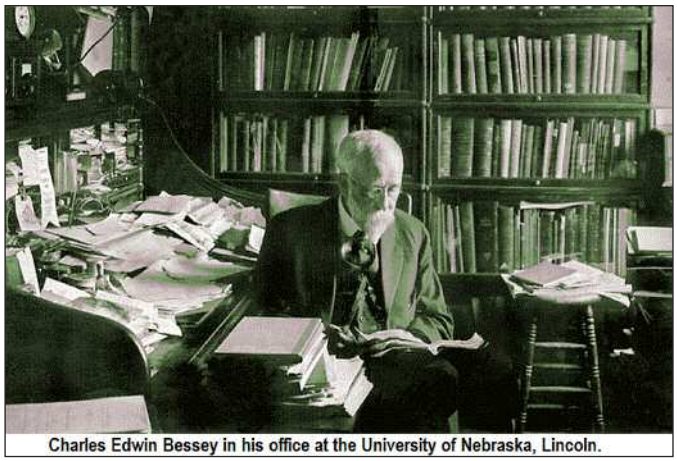
It's been fun doing all the research and all the sorting (even if it was a little tedious and repetitive at times) and I've also made quite a few friends along the way who have given a lot of help and support, for which I am very grateful. I would like to think that Harry would be pleased to know that I have eventually sorted what he thought to be impossible.

Christopher Leather

Downloading indexes from website .

Cactus People Histories

The Cactus Explorer welcomes Chuck Staples and his first article about people who have made significant contributions to the study of cacti and succulents



Charles Edwin Bessey in his office at the University of Nebraska, Lincoln.

The following brief biography touches mainly on the aspects of the life and career of the person above as they relate to his contributions to the cactus plant world. This person made wider contributions than I have included here, but we hope that for the interested cactologist, this will prove a sufficient introduction to the personality of the individual.

Charles Edwin Bessey (1845–1915) was probably the most important botanist west of the Mississippi from the 1880s to about 1910 and was immortalized in the cactus plant world by having the genus *Neobesseya* named in his honor.

Born in a log cabin on a farm in Wayne County, Ohio on 21 May 1845, Charles Bessey became an educator, agriculturist and botanist. His primary education was under the direction of his mother and father. After teaching school for a couple of years he began his college education at Michigan State Agricultural College, Lansing in the summer of 1866, receiving a Bachelor of Science degree in botany in 1869.

He was hired as an instructor of botany and horticulture at Iowa State College, Ames in 1870, and a full professor by 1872, where he established the first laboratory as part of the course. He met and studied under Dr. Asa Gray (1810–1888) at Harvard University, Cambridge, Massachusetts during the summers of 1872, 1873 and 1875. Moving to Lincoln, Nebraska he became chair of botany and horticulture at the University of Nebraska and a dean of the College of Agriculture at the college from 1884 until his death in 1915. He started agricultural research at both Iowa State College and University of Nebraska.

Professor Bessey received an honorary Master of Science degree from Michigan Agricultural College in 1872, an honorary Doctor of Philosophy degree from Iowa University, Iowa City in 1879 and an honorary Doctor of Law from Grinnell College, Grinnell, Iowa in 1898.

Scientific honors for Professor Bessey include: 1) President of Society for the Promotion of Agricultural Science (1889–1891), 2) President of Botanical Society of America (1895–1896), 3) medal for distinguished service in botany from the International Academy of Geographical Botany (1899), 4) President of American Association for the Advancement of Science (1910–1912).

Publicatons by Professor Bessey include: Botany for High Schools and Colleges (1880); The Essentials of Botany (1884); Elementary Botany (1904); Plant Migration Studies (1905); The Phylogenetic Taxonomy of Flowering Plants (1915).

The genus *Neobesseya* was named in Professor Bessey's honor by Nathaniel Lord Britton (1859–1934) and Joseph Nelson Rose (1862–1928) in 1923. However, the genus name *Neobesseya* later became a synonym of *Escobaria*.

Charles Edwin Bessey passed away on 25 February 1915.

Chuck Staples

The last populations of *Parodia rechensis* (Buining) F. H. Brandt

Giovanna Anceschi & Alberto Magli report on their search for plants of *Parodia rechensis* in habitat. The plant, which is better known as *Notocactus rechensis*, is difficult to keep in cultivation and its future in nature is also in doubt.

Photo: Anceschi & Magli

Fig.1 *Parodia rechensis*. Brazil, Rio Grande do Sul, Caxias do Sul, Ana Rech, 16 Nov 2011, AM 821

We spent October and November 2011 in the state of Rio Grande do Sul (Brazil) amongst the 'gauchos', who are wonderful people, dedicating ourselves to the study of different cactus populations that make up 17 of the taxa of the genus *Parodia* Spegazzini.

This article is about a part of the journey last year when we worked in South America between mid-February and the end of December, studying and documenting in the field, about 130 taxa of the Cactaceae at a species level (the forthcoming publication of these materials on our site cactusinhabitat.org and a related booklet are planned for the beginning of 2013).

In mid-November we were in São Gabriel, a town in the Pampas area in the centre west of the state, we rested and then moved on after we had conducted a series of surveys in the district of Santana do Livramento (also in the Pampa Biome) in the extreme central south of the Rio Grande, just on the border with Uruguay.

Here we studied populations of *Parodia allosiphon* (Marchesi) N.P. Taylor, *Parodia nothorauschii* D.R. Hunt and *Parodia tenuicylindrica* (F. Ritter) D.R. Hunt; and we were really satisfied after having found *P. nothorauschii*, a very scarce taxon in habitat.

The next destination was Caxias do Sul, in the Mata Atlantica zone, in the northeast of the

F. Celli Marchett

Fig.2 Habitat of *Parodia rechensis* and *Parodia linkii*. View from the margins of Represa do Faxinal, Ana Rech (Celli Marchett 2008, 64: ANEXO XII, Fig.F.)

F. Celli Marchett

Fig.3 *Parodia rechensis*. Ana Rech, Reprensa do Faxinal, 3 Nov 2009

state, in order to get to the Ana Rech district, where we would start the research of *Parodia rechensis* (Buining) F.H. Brandt (Fig.1).

We had very little information about the taxon location, i.e. information about the discovery of the type: BR, Rio Grande do Sul, nr Ana Rech, 10 Feb 1967, Büneker et al. s.n. (U). (Hunt et al. 2006: 223) and the field number HU 98: *Notocactus rechensis*, Ana Rech to Caxias, Rio Grande do Sul, Brazil, 10 Feb 1967 (according to Ralph Martin's field number search).

We also had two other pieces of information about the conservation status, neither of which were promising about the health of the taxon. The first, Gerloff et al. (1995: 135), indicated that *P. rechensis* had been eradicated by intensive grazing; while the second, contained in a Schumannia special issue dedicated to Brazilian cacti and succulents, Braun & Esteves (2001: 48), see Gerloff (1998), included *P. rechensis* in the list of extinct or near extinction taxa in the wild.

Upon arriving in Ana Rech, we inevitably noticed that between Caxias city centre and the district the area is completely built up. Since 1967, urbanization and industrialization have invalidated the HU 98 information. Today, between Ana Rech and Caxias, there is only a continuous settlement, without traces of natural elements.

Through intuition and a bit of luck, we found our way to the headquarters of the cultural association SAMAR (Societade Amigos de Ana Rech), where we thought we might get some information about the territory.

As always in the Rio Grande, the people we met on this occasion (Adriana Guazzelli and Ilea Camassola) were fantastic, and with the support of the Subprefeito Helio Dall'Alba, we were immediately put in touch with Valmor Bertin, the Ana Rech green areas technician, and with Professor Ronaldo Adelfo Wasum, of the Jardim Botânico de Caxias do Sul - JBCS.

The day after, accompanied by Valmor to the JBCS, we met Professor Ronaldo, whom we briefed about our research on *P. rechensis*, and explained that our only objectives were to study, document and preserve plants, and we believed that this did not require the collection of any living material from its habitat. We were more than happy to be accompanied by those responsible when the plants are living in protected areas, are very rare, or both; and finally that the results of our investigations will be made freely available to the scientific community and to all enthusiasts through our website and booklet.

For further details about conservation and our contributions to this delicate and constantly evolving subject, please refer to the booklet South America 2005/2010 (Anceschi & Magli 2010, 35 – 41), downloadable from here.

Professor Ronaldo, who is overseeing the project "Salvando os Cactos", of JBCS and Universitade de Caxias do Sul, put us in touch with his former student, Franco Celli Marchett, because he knew where the populations of *P. rechensis* live, having studied them for his thesis A Família Cactaceae Juss. no Município de Caxias do Sul, RS, Brasil (2008), which is also


Photo: Anceschi & Magli

Fig.4 *Parodia linkii*. Ana Rech, 16 Nov 2011, AM 822


Photo: Anceschi & Magli

Fig.6 *Parodia rechensis*. Ana Rech, 16 Nov 2011, AM 821


Photo: Anceschi & Magli

Fig.5 *Parodia rechensis*. Ana Rech, 16 Nov 2011, AM 821


Photo: Anceschi & Magli

Fig.7 *Parodia rechensis*. Ana Rech, 16 Nov 2011, AM 821

part of this project.

The meeting with Franco was crucial for our work (and also very important at a personal level): despite our training in searching for cacti, we would never have found the taxon without him. He told us that there were only two surviving populations of *P. rechensis* living in the Ana Rech territory, and since we had decided to devote our efforts to the larger population, which was located on a private fazenda, he provided us with detailed information on the smaller one.

At the time of the survey for his thesis (10 Sep 2008), the minor population was composed of about 40 individuals living on a rocky outcrop at the edge of the forest (mixed Ombrofila forest) and which are (or were), near the Represa do Faxinal in the Parque Ecológico do Faxinal (Fig.2). All this information is published in his thesis (ibid. 37-38), but then he added that about a year later (3 Nov 2009) he had verified that the surviving individuals had been reduced to 10, i.e. 75% fewer (Fig.3), and that the population seemed to have been destroyed by climate change created by the dam and the capybaras (*Hydrochoeris hydrochaeris*, the largest rodent that currently exists) due to the new water reservoir.

On November 16th 2011, after reaching the private fazenda and asking the owner (who did not seem to be aware of the presence of *P. rechensis*) for permission to enter the woods, we walked for a good half hour.

Franco could not remember the exact location as he had not been there since his last visit on 4th March 2005, which was about seven years earlier when he was carrying out research on his thesis. We came across a small clearing created by a flat rocky outcrop covered in moss, at the centre of the outcrop there was a large population of *Parodia linkii* (Lehmann) R. Kiesling (Fig.4) which was in good health,

F. Celli Marchett

Fig.8 *Parodia rechensis*. Ana Rech, 4 Mar 2005, (Celli Marchett 2008, 63: ANEXO XI, Fig.C.)

Photo: Anceschi & Magli

Fig.9 *Parodia rechensis*. Ana Rech, 16 Nov 2011, AM 821

while at the edge of the stone, right at the edge of the forest, we finally saw some small groups of *P. rechensis* blooming (Figs.5-7).

We had conflicting feelings, we were happy to have found the taxon and appalled because so few individuals (we counted only 42) were perhaps the last of a species that is disappearing; given that the population studied in 2005 numbered 120 individuals (ibid.: 37), we registered a decrease of 65% (Figs. 8-9).

Both populations are very small, which is why Franco reported to us an attempt that was made to reproduce the species in greenhouses at that time. On the 4th March 2005 living material was collected and placed into cultivation in the JBCS (No. 5) under Professor Ronaldo's supervision.

Unfortunately, of the plants that initially seemed to grow vigorously, flowering and fruiting, not one survived to the second year (ibid. 37-38).

The fact that the taxon is problematic in cultivation is something that is well-known. Mace (1978: 60) summarized this problem: "This is a species which has remained very scarce in cultivation and plants which have been imported seem weak and unwilling to re-establish".

The reasons that can lead to the extinction of a species, in a case such as *P. rechensis*, can be imagined. The populations in question, though known to be coveted by collectors, were safe from this kind of danger. On the other hand, for the population we visited we cannot attribute the decreasing plant problem to the dam, nor can we assign a large amount of damage to capybara: nevertheless the plants are gradually disappearing.

Franco thinks that the advancing forest is suffocating the survivors, but it must be remembered that in the same place, and under the same conditions, as we already said, *P. linkii* reproduces itself and lives in excellent health (Fig.10).

Certainly in the past, *P. rechensis* has been plagued by theft. Also, the urban and agricultural expansion has severely altered the landscape. It is equally certain that those factors have isolated the favourable areas for the population's survival, causing local extinction and reducing its own genetic variability (Celli Marchett 2008: 1-2) and that is probably the key point.

While *P. linkii*, in Darwinian terms, is a dominant species, i.e. the one that proves to be the most opportunistic, since it is the most widespread of the genus *Parodia* among the six living in the rocky outcrops of the Caxias do Sul Municipality (ibid.: 44); *P. rechensis* is a species that has always been "genetically weak", and that no longer enjoys potential genetic variability in its habitat due to the scarcity and fragmentation of its populations. Unfortunately it is very unlikely that this variability can now be recreated in cultivation.

We are aware that in the Plano de ação nacional para conservação das Cactacéas, Série Espécies Ameaçadas n° 24 (Zappi et al. 2011), which lists *P. rechensis* at the rank of risk DD (ibid.: 25) following Hunt et al. (2006), there has been an initiative described by João Larocca

Photo: Anceschi & Magli

Fig.10 *Parodia rechensis* and *Parodia linkii*. Ana Rech, 16 Nov 2011, AM 821; AM 822

(UNISINOS) as follows: "To propose priority areas for conservation based on studies of the distribution and presence of *Parodia rechensis* (RS)", where the difficulty is considered medium, the priority is high, and the deadline is scheduled for October 2013 (ibid.: 84).

What we can say, based on the surveys conducted and from the data and information gathered (using the IUCN categories and criteria), is that it seems appropriate to propose an update of the risk assessment of the conservation status of *P. rechensis* from the previous sources:

Gerloff & Hofacker in Braun & Esteves (2001): Extinct in the Wild?, EW?

Justifications: fire, habitat destruction, grazing and urbanization

Hunt et al. (2006): Data Deficient, DD

Anceschi & Magli (2012): Critically Endangered, CR B1ab(ii,v)+2ab(i,ii,v); C2a(i);E

Justification: the extent of occurrence is 8.5 km2, the only two known populations are very small and during the last 7 years have decreased with percentages ranging from 65% to 75%, the area of occupancy of the two populations combined is estimated to be a few square metres, the quantitative data shows that there is a 50% probability that the taxon will disappear from its habitat in the next 10 years.

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What is the world's largest tuberous plant?

Len Newton challenges readers to find caudiciform plants with the largest tubers and record their dimensions.

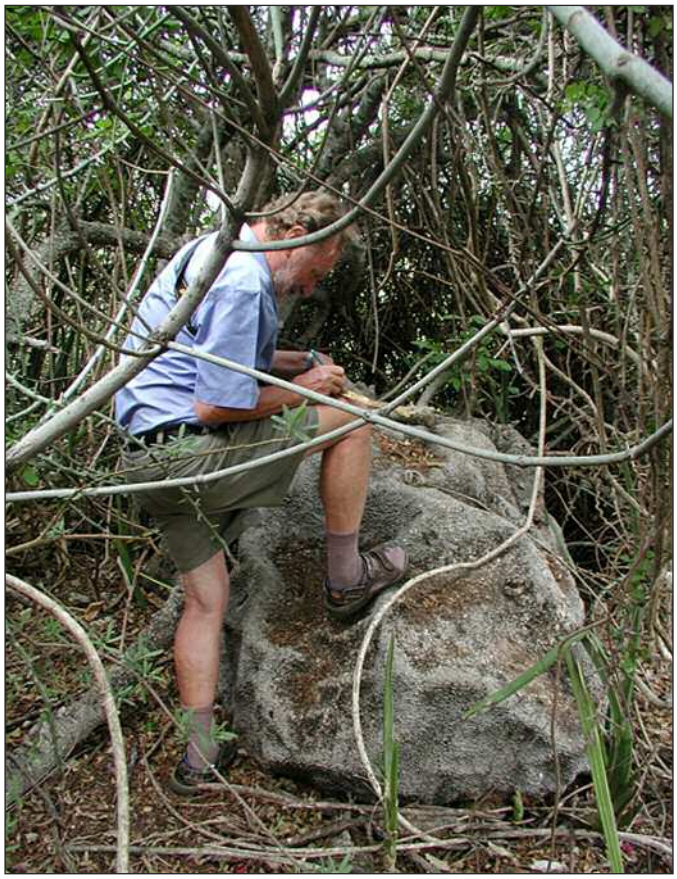

Fig.1 *Adenia globosa* ssp. *globosa* near Voi, south-east Kenya, with the author.

Daiv Freeman's article "The largest Echinocereus in the world (?)", appearing in the last issue, reminds me of a claim some years ago that the world's largest tubers, up to 100kg in weight, are to be seen on a Chinese cucurbit in the genus Thladiantha (Tianzi Biodiversity Centre, 2007). From the photographs the plant appears not to be a cucurbit, but a member of the genus Stephania, in the family Menispermaceae. Four Stephania species have been featured in succulent plant literature, one in tropical Africa, one in Cambodia, and two in Thailand (Eggli, 2002). When reporting this in the local succulent plant newsletter in Kenya (Newton, 2007), I invited readers to send in details of the largest tubers they could find to see if we could match this claim, but there was no response. Now I can throw out the challenge to a wider audience.

Fig.2 *Adenia globosa* ssp. *pseudoglobosa* in the Rift Valley, Kenya, with Alan Butler.

Fig.3. Flowers of *Adenia globosa* ssp. *pseudoglobosa*.

When I wrote my note in 2007 I had in mind the caudiciform members of the genera Adenia (Passifloraceae) and Pyrenacantha (Icacinaceae), both of which occur in Kenya. Some species in these two genera have tubers that can reach a metre or more in diameter. They mostly occur in savanna woodland, and the leafy shoots climb in surrounding trees.

Fig.4. *Adenia venenata* in Yemen.

Fig.5. *Pyrenacantha malvifolia* near Ramu, northeast Kenya, with the author.

Without the supporting trees the shoots form a tangled mound above the tuber, making it difficult to access the tuber for photography or measuring. An exception is *Adenia globosa* ssp. *pseudoglobosa*, which has stiff erect shoots arising from the tuber. In old plants there are so many shoots arising from all over the tuber that even here the tuber itself is largely hidden.

Adenia globosa ssp. *globosa* is found in Kenya, Tanzania and Somalia, whilst *Adenia globosa* ssp. *pseudoglobosa* occurs only in Kenya. *Adenia*

Fig.6. *Pyrenacantha malvifolia* in the growing season.

venenata, with a more upright caudex, also occurs in Kenya but the largest I've seen was in Yemen. *Pyrenacantha malvifolia* is widespread in Kenya, Tanzania, Somalia and Ethiopia. Another species, *Pyrenacantha kaurabassana*, is more widespread, from Kenya down to Zimbabwe, but its tuber is entirely underground. In South Africa many years ago, Gordon Rowley and I came across a fairly large tuber of *Dioscorea hemicrypta* (Dioscoreaceae) — as the specific epithet suggests, the tuber is partly hidden underground.

A good number of contenders for the record were illustrated by Gordon Rowley (1987), but dimensions were not given for most. It would be interesting to compile a record of the largest tubers observed for each species as well as the largest tuber of all. Most of the accompanying photographs were taken before 2007 and I had not measured the tubers, though people included in some of the photos give an idea of scale.

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Fig.7. *Dioscorea hemicrypta* near Kalitzdorp, South Africa, with Bruce Bayer.

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Len Newton, Nairobi, Kenya.

E-mail: ellyen@yahoo.com

CactiGuide.com

Images wanted!

As many of you know, CactiGuide.com has one of the most extensive collections of identified cactus photos anywhere. This is thanks in a major way to the many volunteers who offered images where they were lacking. However, even with approx. 9,000 images, there are still roughly 500 species without a single picture and even more when infra-specific taxa are included.

For the first time, I would like to pro-actively solicit images to help fill in these gaps. Additionally, some species are poorly represented with just one picture or perhaps no picture of the flower, or only an immature plant. If you have good quality digital photos of species that you believe would enhance this resource, please contact Daiv via e-mail at: daiv@cactiguide.com

I would be happy to give you more details about this project and agree the best method for getting images to me. I am quite flexible and can work with e-mail, drop-box, CD, thumb drives, etc. The copyright of your pictures will remain with you.

Please note that I'm not interested in images with watermarks unless I can find nothing else, and likewise, if the images are already easy to find on another website. If the images are only on a personal page that gets few visitors, then that would be fine.

Lastly, like the **Cactus Explorer**, the CactiGuide.com site is also completely free. That means there is no money involved - either coming in or going out. This project is for the love of the hobby alone.

I hope you are able to help. The web needs reliable images of plants to aid identifiaction and raise the profile of succulent plants.

Thank you!

Daiv Freeman

Sydney Graham Slack

12 Jan 1942 – 12 May 2012

Sydney Graham Slack, Sid to his workmates, Graham to his wife Irene and to the cactus world, lost his fight with cancer on 12th May 2012.

Graham along with Tom Tate was a founder member of Doncaster branch of the then National Cactus and Succulent Society (NCSS). He was always an official and financed the branch almost single handedly by supplying raffle prizes every month. These were usually seed grown plants. There were usually more prizes than raffle tickets sold.

For his services to the branch Graham was awarded the Robert Holt Meritorious Award in 1999 having previously been awarded the Award of Merit.

Brian Bates
Sucre, Bolivia

Echeveria brachetii
A Newly Described Species

John Pilbeam tells us about the formal description of an Echeveria he had been shown some years before.

Photographs by John Pilbeam.

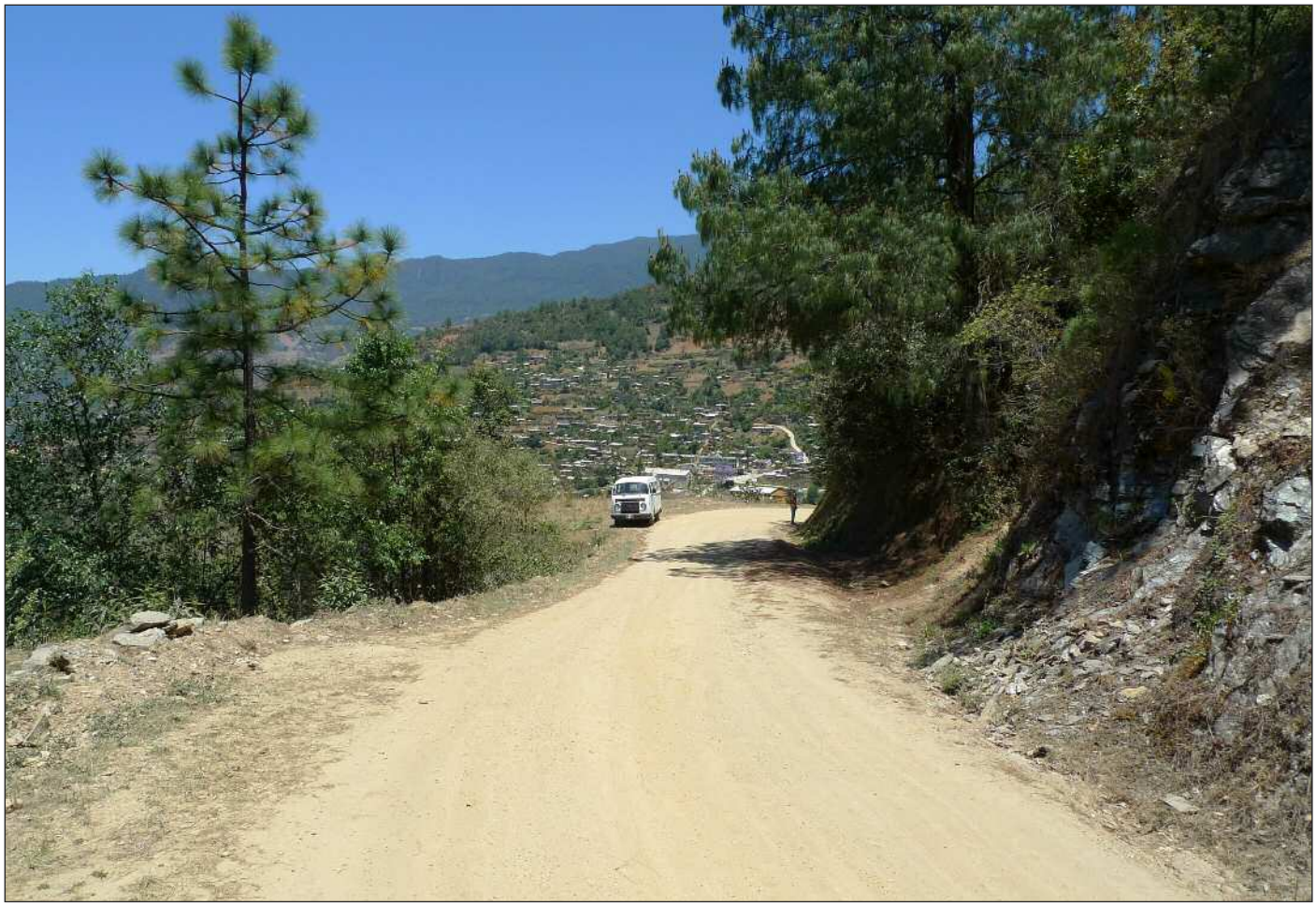

Fig.1 The type locality of *E. brachetii* (syn. *E.* '*Macuiltianguis*' Pilbeam)

After the nebulous experience of visiting *Echeveria nebularum* [see page 6 in the **Cactus Explorer** 4], the next on our schedule for that day was to see again what was believed to be a new species of Echeveria, near the small village of Macuiltianguis, which had been discovered at this locality in 2004, and shown to us a few years before this present visit.

We came to a fairly steep stretch of a dirt road cutting along the side of a rocky, shaded slope with a goodly number of plants growing in the cracks. Because of the situation they were all small plants, and many other than succulents were not familiar, although there were the attractive, tight rosettes of a Pinguicula species, with the characteristic flowers betraying their identity, as well as some unflowering Peperomias, with small columns of windowed leaves, not that the flowers would have helped much in their identification.

But here and there were small, mostly solitary, low-growing rosettes of an Echeveria, looking distinctly like the current year's growth, reminiscent of other mountain species we had seen which become deciduous during the dry months. Some had made a short, thin stem with just one or two branches, each with

Fig.2 Six plants within a square metre on the near-sheer rock face.

its end cluster of leaves. The half a dozen or so leaves to each rosette were soft and quite thin, with little fleshiness to them at all. One or two had produced a short, nodding stem of small flowers, few in number, yellow to orange.

In my 2008 book on the genus I included it in the 'Future species?' chapter, as *Echeveria* '*Macuiltianguis*' in the hope that it would be described subsequently as a good species, as from the first time I saw the plants I was convinced that they were quite unlike any species I had ever seen before.

Fig.3 *Echeveria brachetii* in cultivation.

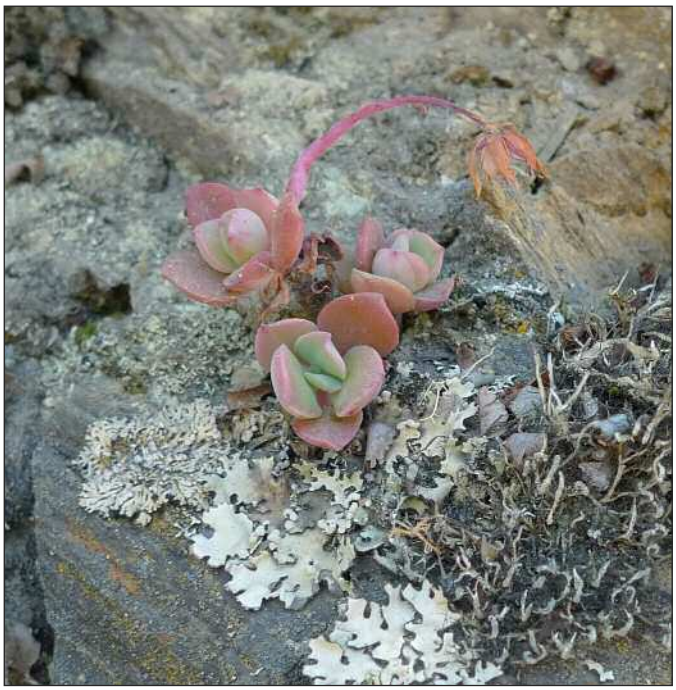

Fig.4 Three of the tiny rosettes hanging on for dear life.

It has subsequently been described as *Echeveria brachetii* by Jerónimo Reyes and O. González in the Cactáceas y Suculentas Mexicanas (2009), surprisingly with no reference to its earlier discovery, or its inclusion in my Echeveria book – ah well, that's life in the naming game.

In cultivation I understand that it makes a charming little shrubby plant of no great height, and delightfully produces its flowers during the winter months on every stem it has made in the spring and summer, always a bonus in a collection of plants mostly hunkered down for the winter, and awaiting kinder weather to do their thing.

John Pilbeam

Fig.5 Pinguicula species thriving in this shady situation.

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Fig.6 Close-up of single rosette, about 3cm across.

Fig.7 Peperomia species doing well here too.

The first Aylostera

Roy Mottram re-examines the application of the name *Aylostera deminuta* in the light of new discoveries along the northern borders of the province of Tucuman, Argentina by Victor Gapon.

Photo: Roy Mottram

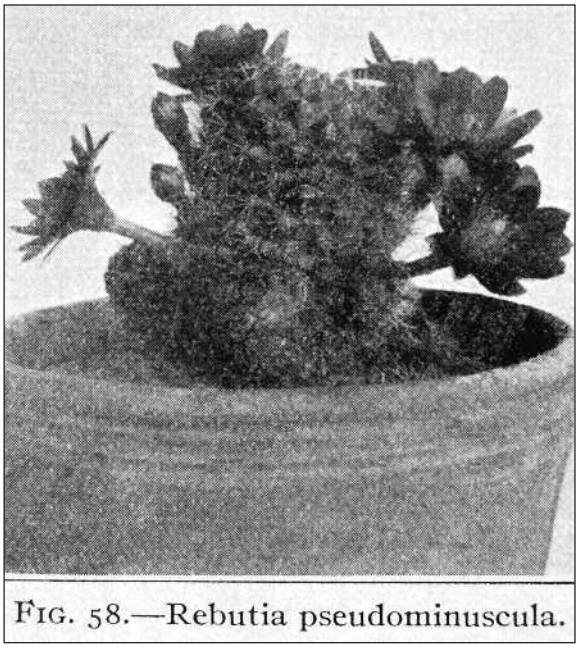

Fig.1 *Rebutia pseudominuscula*. Copy of the photo sent to Britton & Rose who reproduced it in their monograph (1922: 46).

The genus *Aylostera* was established in 1923 by Carlos Spegazzini, based on the single included species *Echinopsis pseudominuscula*, that he himself had earlier described (1905: 488). *Aylostera pseudominuscula* has a type at the La Plata Museum, LPS 23002, comprising three envelopes containing flowers, fruits, and seeds and a photo of a plant from Prov. Salta, Argentina, 3500m, where it was said to be very rare in the mountains. A copy of the photo was sent to Britton & Rose, and they reproduced it in their monograph (1922: 46) [Fig.1]

Aylostera pseudominuscula is therefore well documented and well understood, but it has unfortunately become confused with another species, *Aylostera deminuta* (Weber) Backeb., described about a year earlier, also as an *Echinopsis*, and the subject of the present article.

Echinopsis deminuta was described by Dr. Weber, Paris, in some notes that he had compiled shortly before his death. He reported it as "reçue de Trancas", in the north of Prov. Tucuman, probably sent by Schickendantz.

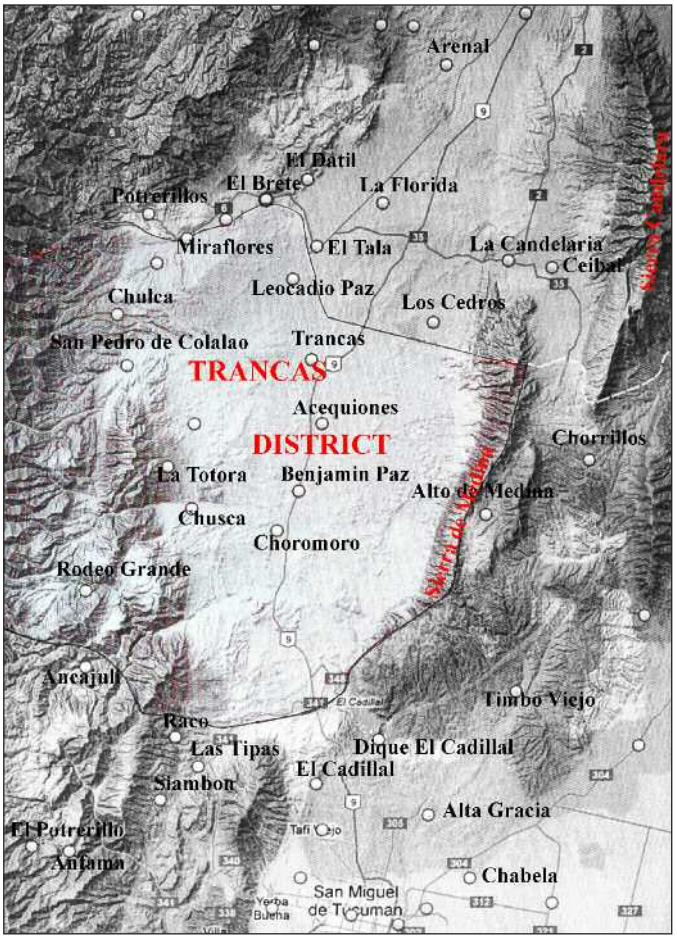

Fig.2 Map of Tucuman Trancas District, showing the positions of the Sierra Candelaria and Sierra de Medina.

Aylosteras do not grow in the vicinity of the small town of Trancas, so the voracity of this information was subsequently questioned. However, Trancas also happens to be the name of a large administrative district of northern Tucuman bounded by the Sierra de Medina to the east, which is probably where *E. deminuta* was originally gathered. No other documentation has survived about Weber's plant, other than the fairly detailed first description published posthumously by Roland-Gosselin, and the holotype is said to be missing.

As it happens, you don't have to travel too far north or east in order to locate plants that agree very well with Weber's description, because Aylosteras are a component of the

Photo: Roy Mottram

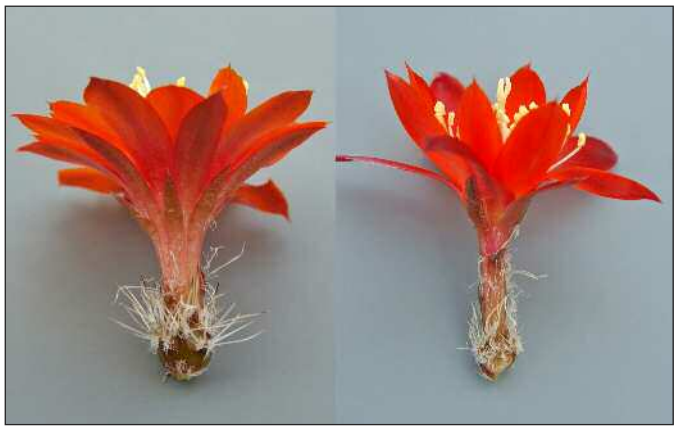

Fig.3 [left] The flower of *Aylostera deminuta* VG10-1098/5 4781/5 (Argentina, Prov. Salta, Sra. Candelaria, 2213m) showing an exceptionally spiny pericarpel (not all are as spiny as this), compared with [right] a typical *Aylostera pseudominuscula* BLMT 54.04 (Bolivia, Potosi, Saavedra, Betanzos).

cactus floras of the Sierra Candelaria in Salta to the north, and the summit of the Sierra de Medina to the east, where they grow in both places with *Rebutia senilis*. They are equivalent to what has come to be known by the later name *A. pseudodeminuta*.

Naming confusion began with Frič, who introduced the incorrect name *Rebutia pseudodeminuta* without description in his catalogue of 1928 as a synonym of *Rebutia deminuta*. In 1933 Backeberg described *Rebutia pseudodeminuta* as new, without any reference to the earlier usage by Frič. Then, in 1934, his looseleaf pictorial encyclopaedia carried a photo of *Rebutia pseudominuscula*, which he was later to claim was actually a photo of *R. deminuta.*

In 1936, Backeberg adopted Spegazzini's genus *Aylostera*, accepting the name *Aylostera deminuta* and reducing *A. pseudominuscula* to a variety of it. Perhaps because of this and the earlier confusion, later authors have tended to think of *Aylostera pseudominuscula* as just a variant of *A. deminuta*, and therefore submerged both under the earlier name. This mistake has persisted. However, close inspection of Weber's description reveals that it agrees well with the plants from the two sierras, so it is now possible to correct the misapplication of the name *deminuta*. A replacement will be needed for the missing holotype in due course when a suitable specimen from the Sierra de Medina, the

Photo: Victor Gapon

Fig.4 *Aylostera deminuta* VG11-1179 (Argentina, Prov. Tucuman, Sra. de Medina, 1865m, at the top)

putative type locality, has been preserved.

The *Echinopsis deminuta* protologue calls for a plant that is 5-6cm in diameter, while *A. pseudominuscula* is only up to 3.3cm diameter, having 11-13 ribs as opposed to 15-19, and radial spines 10-12 compared with 6-8. Also *A. pseudominuscula* does not occur in Tucuman nor in the hills of southern Salta. The pericarpel of *Aylostera deminuta* is notable for bearing quite strong acicular spines up to 3.2mm long (cf. Weber "Ovaire aculéifère"), but they are less prominent in the related *A. pseudominuscula* [Fig.2].

Nomenclatural history

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Rebutia deminuta (Weber) Britton & Rose, The Cactaceae 4: 285. (24 Dec) 1923.

Echinorebutia deminuta (Weber) Frič, in Kreuzinger, Verzeichnis amerikanischer und anderer Sukkulenten mit Revision der Systematik der Kakteen: 26. (31 Apr) 1935.

Aylostera deminuta (Weber) Backeberg, in Backeberg & Knuth, Kaktus-ABC: 274. (12 Feb) 1936.

Etymology: A Latin adjective, deminutus, diminutive. Diminutive Rebutia.

Type: Argentina, Prov. Tucumán, Trancas [District].

Recollected by Victor Gapon (2010-11) in Tucuman, Sierra de Medina, 1800-1950m, and in Salta, Sierra Candelaria, 2000-2280m Argentina.

Holotype: P. Not found according to Hunt (2006 1: 247).

Other synonymy (in chronological order):

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Rebutia pseudodeminuta var. *schumanniana* Backeberg, Rebutien, Der Kakteen-Freund: 7-8. (Jan) 1933.

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Rebutia pseudodeminuta var. *albiseta* Backeberg, Kakteen-Index 1936: 48. 1935 nom. nud.

Rebutia pseudodeminuta var. *grandiflora* Backeberg, Kakteen-Index 1936: 48. 1935 nom. nud.

Rebutia pseudodeminuta var. *schneideriana* Backeberg, Kakteen-Index 1936: 48. 1935 nom. nud.

Aylostera pseudodeminuta (Backeberg) Backeberg, in Backeberg & Knuth, Kaktus-ABC: 275. (12 Feb) 1936.

Aylostera pseudodeminuta var. *albiseta* Backeberg, in Backeberg & Knuth, Kaktus-ABC: 275. (12 Feb) 1936 nom. inval. (Art. 36.1).

Aylostera pseudodeminuta var. *grandiflora*

Photo: Victor Gapon

Fig.5 *Aylostera deminuta* VG11-1180 (Argentina, Prov. Tucuman, Sra. de Medina, 2061m, at the top)

Photo: Victor Gapon

Fig.6 *Aylostera deminuta* VG10-993 (Argentina, Prov. Salta, Sra. Candelaria, 2044m, c. 20km from the Tucuman/Salta border)

Backeberg, in Backeberg & Knuth, Kaktus-ABC: 275. (12 Feb) 1936 nom. inval. (Art. 36.1).

Aylostera pseudodeminuta var. *schneideriana* Backeberg, in Backeberg & Knuth, Kaktus-ABC: 275. (12 Feb) 1936 nom. inval. (Art. 36.1).

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Aylostera pseudodeminuta var. *grandiflora* Backeberg, Some results of twenty years of cactus research, Cactus and Succulent Journal

Photo: Victor Gapon

Fig.7 *Aylostera deminuta* VG10-1098 (Argentina, Prov. Salta, Sra. Candelaria, 2213m)

Photo: Victor Gapon

Fig.8 *Aylostera deminuta* VG10-1100 (Argentina, Prov. Salta, Sra. Candelaria, 2277m)

(US) 23(3): 82. (May-Jun) 1951.

Aylostera pseudodeminuta var. *schneideriana* Backeberg, Some results of twenty years of cactus research, Cactus and Succulent Journal (US) 23(3): 82. (May-Jun) 1951.

Victor Gapon gatherings of *Aylostera deminuta*:

VG10-801 (Argentina, Prov. Salta, Cuesta del Lajar, 1948m)

VG10-993 (Argentina, Prov. Salta, Sra. Candelaria, 2044m) [Fig. 6]

VG10-1097 (Argentina, Prov. Salta, Sra. Candelaria, 2111m)

VG10-1098 (Argentina, Prov. Salta, Sra. Candelaria, 2213m) [Fig. 7]

VG10-1100 (Argentina, Prov. Salta, Sra. Candelaria, 2277m) [Fig. 8]

Photo: Victor Gapon

Fig.9 *Aylostera deminuta* VG10-1101 (Argentina, Prov. Salta, Sra. Candelaria)

VG10-1101 (Argentina, Prov. Salta, Sra. Candelaria, 2273m) [Fig.9]

VG11-1179 (Argentina, Prov. Tucuman, Sra. de Medina, 1865m, at the top) [Fig. 4]

VG11-1180 (Argentina, Prov. Tucuman, Sra. de Medina, 2061m, at the top) [Fig. 5]

Acknowledgement

My opportunity to study the true *Aylostera deminuta* is thanks to the painstaking explorations of Victor Gapon, Moscow, who has made several journeys to study the cacti of the two sierras mentioned above, and for supplying young plants, seeds, and photos.

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Mammillaria scheinvariana rediscovered?

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Photo: Jaroslav Záhora

Fig.1 The Zimapan dam – are there more hidden localities?

Abstract

Mammillaria scheinvariana (Ortega et Glass, 1997) as well as *Echinofossulocactus sulphureus* (Dietr.) Y. Ito in eastern Querétaro, Mexico are still alive despite the assumption of some authors that the entire habitat has disappeared under the water of the Zimapan dam and that they should be considered as extinct in the wild. The extraordinary small number of *M. scheinvariana* plants may be endangered in the near future by another threat there, by non-native invasive natal grass *Melinis repens* (Willd.) Zizka of South African origin.

The Story

It has been repeatedly stated (Glass 1998; Weightman 2003, and Nagl et Perndl 1995) that both *Mammillaria scheinvariana* (Ortega et Glass 1997) and *Echinofossulocactus sulphureus* (Dietr.) Y. Ito are possibly extinct in the wild because the localities of original populations were in 1996 inundated by the filling of the Zimapan dam (the reservoir for a hydroelectric plant in Eastern Querétaro).

There were many trips undertaken to the surroundings of Zimapan dam with the aim of rediscovering these plants but they were not found elsewhere. As an example we could read in the diary of Grzegorz Matuszewski, second co-author: "11.07.2010 - Sunday - Hotel Esperanza, Cadereyta, Que. We packed up and went back toward the dam 'Presa Zimapan'. After we crossed the cactus habitats in Hidalgo we went down again to see what is hidden between the local rocks. I principally looked for the legendary *Mammillaria scheinvariana*,

Photo: Jaroslav Záhora

Fig.2 Rediscovered *Mammillaria scheinvariana* (Ortega et Glass, 1997), Eastern Queretaro, Mexico

Photo: Grzegorz Matuszewski

Fig.3 The same plant of *M. scheinvariana* six weeks later with flower buds

but at that time we had not found it. In reality, the surviving plants were very close, not more than 200m away. (source: http://www.kaktusymeksyku.pl/3.html)."

The new story about *M. scheinvariana* began with the interest in another cacti group, in the genus *Echinofossulocactus*. Thanks to the Czech cacti hobbyist Jiří Horal, the attention was focused in 2009 on the 'extinct' *Echinofossulocactus sulphureus*. He has made an effort to identify potential localities, which are close to the flooded habitats of original *E. sulphureus*. In the same year, on July, 2009, J. Horal visited one of these supposed localities which was mentioned by Nagl and Perndl (1995).

The first pictures of rediscovered *E. sulphureus* appeared on my computer in August 2009, through another Czech cactus hobbyist, Jaroslav Bohata, with the wish for confirmation of species identity. It was a simple task and a beautiful surprise because not all members of the genus *Echinofossulocactus* are as recognizable as this species is. There were no doubts that the pictured wild plants looked directly like my cultivated plants of *E. sulphureus* which I obtained 18 years before from Helmut Nagl.

It means that this exceptionally uniform *Echinofossulocactus* species is still alive, but the pictures of the flowers from the rediscovered locality were still missing. This gap was filled on February the following year (2010) when we (me together with third co-author Vojtěch Myšák) visited the exciting locality in rocky hill slopes above the Zimapan dam. All *E. sulphureus* plants were flowering yellow, but on this occasion we did not record any plants of *M. scheinvariana*.

Two years later, in February 2012, 16 years after the original plants of *E. sulphureus* were drowned in the dam, were we back in this habitat, photographing and documenting another interesting plant, decorative but non-native tall grass *Melinis repens* (Willd.) Zizka which is strongly competing there with the *E. sulphureus*.

As often happens in one´s life, coincidentally on this occasion have we observed one alive and one dead clusters of *M. scheinvariana*. Six weeks later Grzegorz Matuszewski visited the locality again with the aim to find more plants. The result was not satisfactory. He found only four other clusters, and two of them were dead as a consequence of infestation by some unknown insects.

Mammillaria scheinvariana belongs to the Series Stylothele. According to Bill Weightman (2003) this plant became well-known as the only cactus discovered by boat. It happened during the plant rescue operation undertaken by the Federal Electrical Commission during the 5 years prior to the filling of the Zimapan dam (Glass 1998).

Rafael Ortega, working then as the biologist with the Commission, discovered the

Photo: Grzegorz Matuszewski

Fig.4 One of the surviving plants *M. scheinvariana*

Photo: Grzegorz Matuszewski

Fig.5 Flowering cluster *M. scheinvariana*

unknown *Mammillaria* and asked Charles Glass to help him with its identification. So it was that *M. scheinvariana* was described and published by Rafael Ortega and Charles Glass in 1997. The plant was named in honour of Dra. Leia Scheinvar who had helped Rafael Ortega with identifying plants rescued during the 5 year operation.

From the description of the plant can be extracted (see references below for further information): - the plant is solitary or sparingly caespitose, about 5cm diameter and 2-3.5cm tall. Radial spines, 20-24, to 2cm long, white, soft, smooth, hairlike. Central spine, 1 (if present), ca. 1.6cm long, porrect, pale yellowish tan to pale reddish yellow, darker towards the tip. Flowers are funnelform, nearly 2cm long, pinkish, opening about 1cm wide. Weightman (2003) noted that a central spine is not usually present. Based on observed plants, we can support this. Nevertheless, our commentary is far away from significance because of the negligible amount of discovered plants.

And why the question mark in the title? Because it is difficult to say that the extremely small number of living plants is sufficient to maintain a stable population there.

Furthermore, it should be noted that the surviving plants of *M. scheinvariana* are now under serious threat represented both by insect infestation and by a wide-spreading of *Melinis repens* (Natal grass). As was described by Skerman et Riveros (1990), this tall grass is a very efficient nitrogen-fixing species that can fix over 300g N/ha/day. This is due to a special group of non-symbiotic free-living nitrogen-fixing micro-organisms in the rhizosphere. The

Photo: Jaroslav Záhora

Fig.6 *Echinofossulocactus sulphureus* at the rediscovered locality

Photo: Jaroslav Záhora

Fig.7 A new threat - invasive Natal grass *Melinis repens* from South Africa


Photo: Jaroslav Záhora

Fig.8 Invasive Natal grass *Melinis repens* of South African origin

activity of nitrogen fixation by micro-organisms is found exclusively near the roots of *Melinis repens* and is closely linked to plant photosynthesis and to the production of root exudates. A sufficient source of nitrogen favours the grasses in competition with native vegetation. The presence of Natal grass is definitely associated with cactus and results in a high production of biomass. Larger amounts of litter with higher content of nitrogen compounds open up the habitat for other invading tall grasses, change the soil nutrient status as well as the preferences of decomposing (micro)organisms and the flammability of the ecosystem. All of these may modify the survival of *M. scheinvariana* and *E. sulphureus*. So we can conclude our short article with the same sentence that Weightman did in 2003: "With such slender possibilities the future is bleak indeed."

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Photo: Jaroslav Záhora

Fig.10 View of the seeds of *Mammillaria scheinvariana* showing the seed coat. Bar indicates 1000 µm.


Photo: Jaroslav Záhora

Fig.9 The overproduction of very decorative seeds is one of the key strategies for spreading of *M. repens*.

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Photo: Jaroslav Záhora

Fig.11 A flowering seedling of *Mammillaria scheinvariana* in cultivation.

The Little Florida Mountains

Peter Berresford describes a return visit to New Mexico to search for *Echinocereus chloranthus* ssp. *rhyolithensis*. **Photos by the author.**

Fig.1 A white-spined *Echinocereus chloranthus* ssp. *rhyolithensis* and view from the habitat.

For three weeks in March and April 2011 and in the company of Simon Mentha, I explored several locations from south Texas to west of Phoenix, Arizona. It was an ambitious trip and included an unreasonable number of locations and plants to squeeze into our limited time.

In early April I had planned to search for *Echinocereus chloranthus* ssp *rhyolithensis* in the Little Florida Mountains, Luna County, New Mexico partly for the challenge of finding it, but also to try to understand the plant and how it fitted into the *E. chloranthus/russanthus/viridiflorus* complex. Around lunchtime we found ourselves on a dirt road south of Deming, venturing along an access road to a ranch to seek permission to climb the surrounding mountains. I had tried to understand where Gerhard Böhm and his wife, Gisela had found these plants but their description of the location was insufficient to work out exactly where they were so I was very much "taking a punt" in trying this ranch.

We were greeted by three individuals who were managing the ranch for absentee owners and they not only gave us permission to go where we pleased, but also gave us a tour of the ranch. Although interesting, this ate into the time available for exploring. We eventually set off, working our way around to the highest of the peaks. The lower hills detained us whilst we took photographs of *E. arizonicus* ssp. *nigrihorridispinus* [Fig.2]. There were no flowers but this was encouraging as the Böhms had described this plant growing at "their" location.

By now, the day was inexorably passing and we needed to be at our next overnight stop in time for the next day's hunting. We also did

Fig.2 *Echinocereus arizonicus* ssp. *nigrihorridispinus* found on both visits but its presence does not guarantee that of *E. chloranthus* ssp. *rhyolithensis.*

Fig.3 *Eschscholtzia californica* ssp. *mexicana* on the gentle slopes at the base of the mountain.

Fig.4 *Pinaropappus roseus* commonly known as "the white dandelion".

not relish the prospect of driving back to the highway in the dark on a very rough road in our budget saloon! I made an attempt up the largest of the peaks and reached 1,760 metres

Fig.5 *Echinocereus fendleri* ssp. *rectispinus* growing on the rocky plain.

without any sign of the plant which is documented as growing above 1,400 metres. As I turned to descend my foot struck a desiccated, uprooted plant. I picked it up and close inspection showed the spination to be what I imagined a dead plant would look like! I suppose that perhaps an animal had dislodged this individual from further up the mountain and it had fallen to its final resting place. I promised myself that I would return.

With all my previous travelling companions busy, I travelled on my own in April 2012 and, as part of my trip, put a full day aside to explore up to the summit of this mountain. I arrived at the ranch early in the morning and was again greeted with the same courtesy. With plenty of water and "energy bars" to last the day, I headed for the base of the mountain. In Oklahoma and in New Mexico there had been rain for the previous week, which I had mostly managed to avoid, so all the plants such as golden *Eschscholtzia californica* ssp. *mexicana* [Fig.3] and white-flowering *Pinaropappus roseus* [Fig.4] around the approach to the mountain were in flower, as well as some *Echinocereus fendleri* ssp. *rectispinus* [Fig.5]. *Echinomastus intertextus* was also here and many yellow-fruited *Ferocactus wislizeni* [Fig.6]. With several small *Yucca baccata* [Fig.8] in flower in the early sun, the place was beginning to take on a magical quality. This was a remote place. Apart from the distant ranch house, there was no sign of human activity.

Fig.6 *Ferocactus wislizeni* in abundance on the approach to the mountain.

Fig.7 *Allium lacunosum* which seemed to be a marker plant for the lower altitude plants of *E. chloranthus* ssp. *rhyolithensis.*

The base of the mountain was around 1,560 metres. As I ascended, *Agave neomexicana* [Fig.9] and flowering *Allium lacunosum* [Fig.7] peppered the slopes. I reached 1,795 metres and suddenly *E. chloranthus* ssp.*rhyolithensis* was immediately in front of me [Fig.10]. I was just 35 metres above where I had stopped the previous year. Both white and red centrals projected from its areoles, the white centrals on each areole projecting downwards with age, forming neat rows.

Although the buds were green, the flowers opened russet-coloured with a darker mid-stripe and loaded with a projecting green stigma and yellow filaments. In this population the flower colour did not vary and

Fig.8 *Yucca baccata* an unexpected flowering plant.

Fig.9 *Agave neomexicana*, detail of markings on the individual leaves.

certainly did not bear a resemblance to a green *E. viridiflorus* type. As I continued to climb, I saw many plants that were dead and looked very similar to the specimen I had encountered in 2011, the stems drained of water and spines extremely close together, more resembling *E. russanthus* in this respect [Fig.11]. Perhaps 50% of plants which were alive and, in some cases,

Fig.10 *Echinocereus chloranthus* ssp. *rhyolithensis* - the first plant and lowest of the population.

Fig.11 *E. chloranthus* ssp. *rhyolithensis* (denser-spined example)

Fig.12 A view of the open flower and fine spination of *E. chloranthus* ssp. *rhyolithensis*

flowering showed similar desiccation. The colour of spination was not consistent amongst the plants, some showing more presence of red and some with virtually no red colouration at all.

I climbed to a height of 2,226 metres which was very close to the summit but I had not seen *E. chloranthus* ssp. *rhyolithensis* since 2,052 metres which would give this plant a range of 1,795 to 2,052 metres at this location. The Böhms had indicated they found plants at 1,800 metres so I believe the documented height of 1,400 metres is probably too low.

This is an extraordinary plant with a very specific habitat [Fig.1], growing as it does on silica-rich rhyolite rock. There are no plants resembling any of the *E. russanthus/chloranthus/viridiflorus* group in the vicinity, but the spination and flower colour is much closer to *E. chloranthus* than *E. viridiflorus* which has been suggested elsewhere. So, for me, the name *Echinocereus chloranthus* ssp. *rhyolithensis* remains the best fit for this plant.

I would like to finish on a positive note. When I returned to the ranch house with my photographs in the early evening together with several ferocious blisters on my feet, I was told that the owners were "selling up". I am of the opinion that the plants are at a high enough altitude to be unlikely to be threatened by any new human occupants but this trading in precious land resources does highlight the vulnerability of rare forms of life so dependent on the lack of interference by humans.

Peter Berresford

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Some Bizarre Plants of Australasia and Oceania

Derrick Rowe introduces us to some remarkable succulent and xerophytic plants that we have probably never heard of before. You may think that they do not interest you, but when you read about their amazing adaptations to the harsh environment, you are sure to be impressed!

Photos by the author.

Fig.1 Creekside vegetation in the far north of Cape York Peninsula. Home of ant-house plants *Dischidia major*, *Hydnophytum moselyanum*, *Myrmecodia tuberosa* "papuana", *Lecanopteris sinuosa* and a very few succulent to xerophytic orchid species. Creekside soaks contained numbers of carnivorous plants.

The hot and very humid tropical regions of our planet are not popularly associated with succulent plants but as we will see, they certainly do exist in these environments. Many of the places that harbour such plants are still difficult and dangerous to explore, hence these plants will probably prove to be our world's very last frontier of xerophytic and succulent plant explorations.

Although tropical and sub-tropical regions generally have high rainfall, they often experience dry seasons of durations sufficient to create rehydration challenges for many plants, especially those that live in fast draining habitats or niches. It follows that plants growing as epiphytes or lithophytes may frequently be water stressed.

Plants herein photographed in Papua New Guinea had already experienced four months of drought, and an annual seven month dry season is typical for the frontier lands of Cape York Peninsula, North Queensland, Australia, especially when subject to the drier vagaries of the Pacific Ocean's El Niño/La Niña weather cycles.

When rainfalls are erratic, plant species that grow perched upon trees inherently have problems maintaining their water budgets, challenges further compounded by the imperative of all life forms to obtain sufficient nourishment. Hence, most vascular epiphytes

prefer benevolent habitats beneath lush canopies that provide highly protective measures of shade, humidity and ever falling supplies of animal and plant organics (and consequent leachates) that can be exploited in various ways according to the varied survival strategies of resident plants.

In response to their habitat-induced moisture limits, many epiphytes have evolved water conserving forms and physiologies that permit the best-adapted species to spread far beyond (or above) protective canopies. Indeed, there are probably more epiphytes that use the highly water conserving crassulacean acid metabolic (CAM) pathway than do terrestrial succulent plants. (Luttge 2004) Certainly, many epilithic and epiphytic plant species qualify as being fully succulent, while others are as xerophytic as many caudiciform or pachycaul species accepted as 'succulent' in temperate climate plant-houses.

It follows that as epiphytes become better able to survive in tropical environments without the benefits of lush canopies, they experience ever higher insolation levels and at the very least, more frequent dehydration stresses. Thus they have ever increasing struggles obtaining sufficient nutrients because it is difficult for plants to imbibe nutrients without water.

Yet some epiphytic succulents have evolved fascinating ways to bypass such problems by actually manipulating ants to purposely, yes purposely, feed them. Not that the ants have any understanding of what they are doing. This is achieved, if only initially, through the vital incentive of providing ant colonies with ready-made homes. However, exactly how ants are further manipulated is still not completely understood.

Plants that provide homes to ants are called myrmecophytes which translates as ant-plants but the term ant-house plant is probably better.

So successful are guilds of varied arboreal living ant-house species that myrmeco-epiphytes frequently dominate their habitats in open savannahs with poor soils to the exclusion of virtually all non ant-house epiphytes.

Tropical North Australia has representatives of two of the most important forms of ant-

Fig.2 *Dischidia major* growing on a huge Paperbark *Melaleuca* species tree, Iron Range National Park, Cape York Peninsula, Queensland, Australia.

housing, so I will start with them.

Dischidia major (Vahl) Merrill published in 'An Interpretation of Rumphius's Herbarium Amboinense' 1917. (Rumphius's Herbarium Amboinense was published posthumously in 1741.) Basionym *Collyris major* Vahl, published in 'Skrifter af Naturhistorie-Selskabet' 1810. Synonym, *D. rafflesiana* Wallich, 'Plantae Asiaticae rariores' Vol 2, 1831.

Dischidia major has hollow domatia leaves (domatia means little homes) that in early literature have been termed pitchers. Yet these leaves are not at all analogues of the water-holding rosettes of phytotelm (tank) bromeliads or the urn-like leaves of carnivorous plants such as *Nepenthes* that often share the very nutrient-poor habitats of many Old World ant-house plants.

As you will see in the accompanying photographs, hollow domatia leaves are seldom positioned where they could possibly catch rainfall, even in the torrential downpours of the North Queensland high-summer monsoons and certainly not falling plant debris. However, Australian author Attila Kapitany has made the interesting and probably correct hypotheses that often a few leaves may be positioned sufficiently to catch at least small quantities of leachates flowing down plant stems without unduly disturbing resident ant colonies. *D. major* also grows normal laminate leaves but these are disposed of at an inbuilt abscission layer during drought, showing most definitely which form

Fig.3 *Myrmecodia beccarii* "northern form" festooned with the asclepiad vine *Dischidia nummularia* a facultative hemiparasite of ant-plant symbiotic mutualisms. Younger plants of the northern form are heavily spined but this is a mature specimen. Cooktown, North Queensland, Australia.

is most beneficial for this species survival. It is therefore not at all surprising that laminate leaves are rare in habitat.

Ant colonies choose to rear their broods in hollow domatia leaves while gradually filling them with their plant nutritious debris to then abandon them for roomier leaves that host plants are continually growing. Adventitious roots originating at nearby leaf nodes gain entrance through a single hole at the petiole (leaf stalk) end also used by resident ants. Roots then ramify throughout stored composts enabling access to products of decomposition such as nitrogen, phosphorus, potassium etc. Yet perhaps of even greater importance is access to concentrated amounts of plant-essential carbon dioxide (CO_2) emitted, not only by resident ants, but by all respiring life forms especially microbes living within domatia. Because CO_2 is absorbed by larger numbers of stomata within enclosed, humid,

Fig.4 *Myrmecodia beccarii* "southern form" with the orchid *Cepobaculum tattonianum*, Hinchinbrook Channel swamps near Cardwell, North Queensland, Australia. There is a small section of *Dischidia nummularia* (top.) It is rare to see this dischidia species close to this orchid species.

domatia interiors (compared with far fewer stomate numbers on outer leaf surfaces) it ensures much less transpirational water losses than would occur from a need to open (or more fully open) stomata on external domatia surfaces.

Research has shown that in unoccupied domatia leaves, ant-derived CO_2 measured only about 4% of a plants total CO_2 uptake, but in newly ant-occupied leaves it had risen to about 27%, finally rising to 39% in occupied leaves that also held stores of decomposing ant-composts. This study also found that an average 29% of a plant's nitrogen was derived from ant-supplied composts. (Treseder et al. 1995.)

Resident mutualist ant colonies bring in nutrients from far beyond what the root systems of host plants or indeed entire host trees could possibly reach. These various morphological and physiological traits allow *D. major* to survive in habitats where extremely few other epiphytes can, or indeed do exist.

Certainly, *D. major* is an extremely successful species with a range spanning an enormous area across southern Asia with records as far west as eastern India (e.g. Assam) across the

Indian Ocean to the Andaman & Nicobar Islands, onward through Burma (Myanmar), Thailand, the Indo-China nations, down through Peninsular Malaysia, Singapore Island, and onward throughout the innumerable island archipelagos of Indonesia, the Philippines and New Guinea then at last to north-east Australia. Local habitats range from sea level to about 900 m (2953 ft) but low elevations are most frequented.

Myrmecodia beccarii Hooker, published in the 'Botanical Magazine' 112: 1886, is a species endemic to North Australia; however, in this genus ant-houses are provided in tunnels and chambers that form entirely without help from ants within a caudiciform base (technically a tuber.)

Myrmecodia have two types of internal hollows; smooth walled, light brown chambers in which ants live and rear their broods and darker brown 'wart'-lined tunnels in which resident mutualist ant colonies deposit their various organic wastes. The so-called warts are highly shortened adventitious roots able to absorb moisture and nutrients from decomposing ant wastes.

The complex tunnel and gallery systems within *Myrmecodia* are very similar to the nests that ants themselves build in soil. What is most intriguing is that somehow *Myrmecodia* species can manipulate ants to store their wastes in suitably 'warted' tunnels when it would be hygienically safer for resident ant to simply throw their wastes to the ground below.

Compared to other *Myrmecodia*, this species has a particularly high tissue to space ratio in its tubers and a recent study "demonstrates unequivocally the presence of crassulacean acid metabolism" (Tsen & Holtum 2012)

M. beccarii is a littoral species that also occupies mangrove forests where, however, it prefers fairly open exposures especially on deciduous tree species. Although this is a heavily canopied environment its exposure to salinity and other unique environmental factors make it a habitat harsh to most non ant-epiphytes.

Australia has two other *Myrmecodia* species namely *M. platytyrea* subsp. *antoinii* and *M. tuberosa* "papuana".

Fig.5 A peek into a windfall *Myrmecodia* species, Lockhart River region, Cape York Peninsula, Queensland, Australia.

Fig.6 *Hydnophytum moselyanum* in scrubby riverine forest on very poor silica sand soils at the outer edges of the Jardine River catchments, Cape York Peninsula.

Myrmecodia have thick fleshy stems that, according to the species, are more or less ornamented with shield-like leaf insertion scales called clypeoli which are particularly distinct in *M. platytyrea* subsp. *antoinii*. Stems are also ornamented to a greater or lesser degree according to species with rather unique depressions called alveoli from which flowers and eventually ripe fruits emerge.

Fig.7 *Myrmecodia tuberosa* and *M. platytyrea* subsp. *antoinii* growing on a She-oak *Allocasuarina* tree in open savannah, Iron Range National Park, Cape York Peninsula, North Queensland, Australia.

A complex of four New Guinea species also has tunnels that extend from those of the tuber to run the entire length of their stems to open in the deep depressions of stem alveoli.

Hydnophytum moseleyanum Beccarii, published in: 'Malesia Raccolta' 2: 1885, inhabits the monsoon tropics of Cape York Peninsula, Australia, primarily near the east coast where it too has tubers filled with complex tunnel and gallery systems; however, in *Hydnophytum* species, 'warts', where they exist at all, are restricted to certain dead-end galleries hence there is little differentiation of the surface textures and colours of internal walls.

The species also occurs in nearby New Guinea and some of that island's smaller archipelagos where in some regions it prefers mangrove forests.

Along with *Myrmecodia* they are members of the subfamily Hydnophytinae of the plant family Rubiaceae.

Hydnophytum have rather ordinary twiggy stems, very different to those of *Myrmecodia* but their flowers and fruits are very similar.

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Fig.8 *Myrmecodia tuberosa* "papuana" Iron Range National Park. Cape York Peninsula.

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More Australian Ant-house species.

Myrmecodia tuberosa Jack, published in Transactions of the Linnean Society of London 14: 1823.

This is an extremely widespread species with numerous forms, some of which are very aesthetic but also particularly weird. Its form in Australia and nearby Papua New Guinea has been given the informal trinomial "papuanum." It appears to be rarer and more localised in Australia than the two other native *Myrmecodia* species; however, it has some easily photographed populations growing in scrubby heath savannahs of the Iron Range region on the east coast of Cape York Peninsula. None were located by our party further north than Iron Range but it is not at all impossible that other populations exist in such an enormous and mostly trackless wilderness. This form also grows further south in the difficult of access McIlwraith Range area, north-east of Coen, Cape York, and Huxley & Jebb report that it occurs in mangroves in New Guinea. Considering the species is enormously widespread and has extremely varied forms beyond Australia, it is inconsistent that it is

Fig.9 *Myrmecodia platytyrea* subsp. *antoinii*, Iron Range National Park, Cape York Peninsula. Note the very distinct rows of shield-like clypeoli.

apparently less common and far less widespread on the island continent.

Myrmecodia platytyrea subsp. *antoinii* (Becc.) C.R. Huxley & Jebb, published in: Blumea 37(2): 1993.

This is a New Guinean and Australian native that appears to be more numerous and widespread in Australia than *M. tuberosa* which is anomalous because the latter species has a truly enormous distribution throughout Southeast Asia.

It has longer and thicker stems than *M. tuberosa* and much longer but usually less branching stems than *M. beccarii*. Unusual diagnostic features, certainly among Australian hydnophyta are its very distinct rows of elevated, hence highly prominent, densely spine-edged clypeoli (leaf-insertion scales) in rows along its stems. Another diagnostic feature, if only for Australian taxa are its opaque, orange-coloured, soft, sweet, bird-eaten fruits.

Some were seen high in lush rainforest inland at Mossman Gorge about 80km (50 miles) north of Cairns where it extends far into northern latitudes of *M. beccarii* habitats which, however, are primarily coastal.

It occurs sporadically in rainforest at Iron Range National Park but far more abundantly

Fig.10 *Myrmecodia horrida* at over 2134m on Rondon Ridge, above Mt Hagan City, Western Highlands Province, Papua New Guinea. This is a member of a closely related complex of four species that, in addition to having this genera's internal ant-gallery systems within tubers, also has tunnels connecting to them that run within the length of stems to exits at entrances in alveoli near stem apexes. Alveoli in this context are sunken, somewhat areole-like stem depressions from which flowers and ripe fruits emerge.

in lower growing, open-canopied heath and savanna scrubs with very poor silica based soils. It was also located in somewhat open, low-canopied riverine scrub on very poor sandstone derived soils nearer the tip of Cape York in outer edges of the Jardine River catchments where it grew with *Hydnophytum moseleyanum*, *Dischidia major*, *D. nummularia*, *Lecanopteris sinuosa* and a very few tenacious succulent/xerophytic orchid species. This, the most northerly point of Australia is situated only about 150km (93miles) from the large island of New Guinea. During the lower sea levels of past ice ages, New Guinea and some of its nearby islands were connected to Australia.

Lecanopteris sinuosa (Hooker) Copeland. Published in University of California Publications in Botany 16: 1929.

This is an extremely tough ant-house plant that is a member of a number of ant-house guilds throughout the Malesian Floristic Region that varies according to local species. In Australia it forms ant-house guilds with *Dischidia major*, *D. nummularia*, *Hydnophytum moseleyanum*, *Myrmecodia platytyrea* subsp. *antoinii* and a few particularly tough xerophytic to succulent orchid species that are able to survive in these seasonally harsh habitats. On widespread trees in the vast lowland plains of Western Province, Papua New Guinea, *L. sinuosa* and *M. tuberosa* "papuana" join a similarly dominant ant-epiphyte guild that excludes virtually all other epiphyte species.

Dischidia nummularia published in 'Prodromus Florae Novae Hollandiae' 1810 by Richard Brown in the very first flora of Australia ever published. Type Collection: Australia, North Queensland, Endeavour River. This was a Banks & Solander 1770 collection made during Captain Cook's famous voyage of exploration.

A gateway to Cape York, the small frontier city of Cooktown with its many ant-house plants and other tropical wonders sits at the mouth of the Endeavour River but explore with care, salt-water crocodiles are very unforgiving of the unwary. There is now an excellent bitumen highway from Cairns but beyond Cooktown it is 4wd only and usually impassable in the wet, with seemingly endless corrugations and the infamous bull-dust patches.

D. nummularia is another immensely widespread, hence extremely successful species that consequently is very variable occurring as it does from India right across southern Asia to southern China and down through the various island archipelagos to Australia and beyond to Oceania.

Yet it is not an ant-house plant and its constant appearance in the habitats of ant-house species is unique. Indeed, it is often the first epiphyte found in the field and an assurance that ant-house plants surely lurk nearby. There are a number of morphological, physiological and 'strategic' reasons for its success, not the least being that it is frequently a hemiparasite of ant-plant symbiotic mutualisms sending invasive roots within debris-containing domatia of true ant-house species. Symbioses involve any life forms that live closely together on a long term to permanent basis, while mutualisms are varied ecological relationships where all species involved gain survival benefits.

Derrick Rowe

An amazing afternoon south of La Poza, Nuevo León

Chris Davies shares the excitement of visiting the habitat of two remarkable plants that eluded discovery for so long. **Photos by the author.**

Fig.1 The gypsum slopes leading to the cliffs

It was about three-quarters way through my recent 18 day field trip to Mexico, and we had been hard at fulfilling our plan to try to see as many species as possible, with a special focus on *Turbinicarpus* and *Mammillaria*.

We had started in Hidalgo and worked our way through northern Querétaro, eastern Guanajuato, San Luis Potosí, then directly into Tamaulipas, and now into Nuevo León. We'd spent the last night in a hotel in the centre of Aramberri, and "ticked off" several more *Turbinicarpus* and *Mammillaria* on our way north.

By mid-afternoon, with plenty of time before finding a hotel near Galeana, we turned off the main road and headed south-east of the village of La Poza. The road was not bad, very winding as usual, and we were scanning the hillsides waiting to see the pale slopes of the gypsum hills that we hoped to see. The hillsides were lovely, and as we twisted and turned we had glorious views of them.

After about only 20km, though it seemed rather more, we passed close to the tiny village of Tomates, and then we knew we had arrived! The road was on the south western side of the valley, and the hills to our right as we came along the road were now quite bare and exceedingly white [Fig.1]. Gypsum literally shone through here in the sunshine and,

Fig.2 *Geohintonia mexicana* in flower

although there were sparse trees in places, the predominant impression was white. This was reinforced as we made our way across the lower slopes to where we expected the plants to be.

The gypsum was relatively firm in places, but broke away easily in others, making the climb up the slopes a very hit and miss affair. We started to find plants, initially just a few *Thelocactus bueckii* in flower [Fig.8], though they looked quite dry, and then higher up in the rocks, there it was, my first *Geohintonia mexicana* [Fig.3]! It was about 5cm across, and looked very happy sitting there in almost splendid isolation.

I started to gingerly make my way round some rocky outcrops, and soon started to see more plants. Not all of them looked in quite as good condition as this first plant, but as I worked my way round towards the mouth of a narrow ravine, the plants appeared to be

Fig.3 The first *Geohintonia mexicana* seen

Fig.4 Aztekium hintonii

Fig.5 A group of *Aztekium hintonii*

better, and I saw the first plant in flower [Fig.2].

By this time, I realised that I was about ten metres above a ravine and there was no easy way down. So it was a careful and lengthy back-track and then the entry to the ravine was easy. The entrance narrowed so that it was only possible to walk in single file, and then it widened just about enough to allow two people to stand. As well as the *Geohintonia* that we had seen earlier, these were now joined by *Aztekium hintonii* plants in numbers.

As I worked my way further in and up, the numbers of plants increased dramatically. Almost all of them were on the one side of the ravine, though both sides were gypsum [Fig.7]. I have wondered what produced this unusual distribution.

Maybe it had something to do with the way in which that the ravine was oriented as, from making a rough approximation of the way in which the sun might travel, the populated side was probably the sunnier one. It didn't seem to have any advantage in terms of nutrients or water. My assessment was certainly imprecise, as it was by now well after 5pm, and the sun was low in the sky with sunset at about 7:30pm.

The *Geohintonia* were the most floriferous here, though there were a few *Aztekium* plants showing buds. It was difficult to make an

Fig.6 *Geohintonia mexicana* in flower

Fig.7 Just how many plants!!

accurate assessment of how many plants were in this ravine, but we estimated that there must have been hundreds, possibly even thousands. There were probably 3 times as many *Geohintonia* as *Aztekium*, with many examples of young plants of both species. It was just an amazing sight, and my companions at this time in the ravine, Norbert Rebmann and Christophe Assalit, were just as dumbfounded by the profusion of plants.

It had been another long and hot day, but the exhilaration of having had the privilege of seeing this site stayed with us, and a can of cold Modelo Especial at the first convenience store (yet another OXXO) was an appropriate reward. When we found our hotel at the Laguna de Labradores, we asked if they could provide us with food, which they said they could, but in order to do so, the staff had to go back into Galeana for a carry-out. The beers they brought back were very cold and the food hot and spicy, which rounded off what had been a superb day.

Fig.8 *Thelocactus bueckii*, dehydrated but flowering.

The more I see of Mexico, the more I am amazed that such species have remained undiscovered for such a relatively long period of time. This location, and others within the area, have really only been widely known for some 20 years, after their discovery by George Hinton in 1991. As new roads are driven into the more remote areas, we can hope for more such discoveries, although the sheer profusion of these particular plants might never be matched. A unique gypsum habitat has combined with the remoteness of the area to make this just an amazing place to visit.

Chris Davies

http://www.woodedge.co.uk

Travel with the Cactus Expert (4)

Zlatko Janeba continues his travels around the US where he saw lots of interesting plants in beautiful scenery. **Photos: Z. Janeba**

Fig.1 Landscape south-west of Beaver Dam Mountains, near Arizona-Utah border. This area is one of the richest biotopes in the state of Utah for the number of plant and animal species there.

During that day (April 29th 2006) we managed to visit one more locality in Utah (Washington County), north of Littlefield (Arizona), just where we crossed the Arizona-Utah border. This is a really great place with a beautiful scenery [Fig.1] and one of my most favourite cactus places in the USA.

The south-western corner of Utah represents part of the Mohave Desert and it is probably the richest habitat in the state for cactus species. I counted some nine species of cacti there. But, although both varieties of *Echinocactus polycephalus* (var. *polycephalus* and var. *xeranthemoides*) are also reported from southern Utah, I personally did not encounter either in this area.

Since it was getting dark and Josef prefered to stay in a hotel that night, we went back several kilometers across the state borders to the city of Mesquite (Nevada), where you can gamble if you wish to do so. But it was not the best idea since we paid $100 for the double room in Virgen River, the most costly hotel during our whole cactus hunting trip. Furthermore, it was really a pity to miss camping in the Beaver Dam Mountains Wilderness. It is a gorgeous area, extremely quiet at night, with the sky full of stars and excellent visibility without any light pollution. I had slept there alone three times before and it was always a really enjoyable experience.

The next morning (April 30th 2006), we

Fig. 2. Desert tortoise (*Gopherus agassizii*) is rarely seen in nature. I got really lucky with this one.

Fig. 3. *Echinomastus johnsonii*, one of my favourite species from the south-west of the USA, especially for its heavy spination and gorgeous bicoloured flowers. It is very common in the flat area with numerous washes that run to the south and west into the Beaver Dam Wash.

Fig. 4. Flowers of *Echinomastus johnsonii*, Washington County, Utah. A picture is better than a thousand words.

Fig.5 Seedling of *Echinomastus johnsonii*, about 5cm in diameter. At this size it starts to develop beautiful, colourful, and strong spines. Can we get such seedlings in cultivation?

headed back there since we were not able to shoot good pictures the day before. We entered the Woodbury Desert Study Area which was designated in 1977 by the Bureau of Land Management (BLM) and includes over 3000 acres of unspoilt wilderness. It is a desert biotope, dominated by Joshua trees (*Yucca brevifolia*) and creosote bushes (*Larrea tridentata*), with many desert animal and plant species living there that are not found anywhere else in Utah. It is worth mentioning the desert tortoise (*Gopherus agassizii*) [Fig.2], desert iguana (*Dipsosaurus dorsalis*), Mohave rattlesnake (*Crotalus scutulatus*), and desert kangaroo rat (*Dipodomys deserti*), among other desert-dwelling creatures.

The cactus flora is also rich there and you can often get several species in one shot [Fig.6]. It is the northernmost habitat of *Echinomastus johnsonii* [Figs. 3-5]. This is my favourite cactus of the Mohave Desert and I had the chance to study it at some 30 localities in total (Janeba 2008). In this area of south-western Utah it is common, both in the flats with numerous washes, and on rocky slopes of the Beaver Dam Mountains. This species usually flowers in April and the beginning of May. *E. johnsonii* has pink to magenta flowers with darker centres at this Utah location, and this is the place where I was extremely lucky to observe an unusual pollinator (or flower visitor?) of this remarkable cactus, hawk moth *Hyles lineata* Fabricius, although its flowers are

Fig.6 Rich desert flora in the south-west corner of Utah, Washington County. You can see *Echinocereus engelmannii*, *Ferocactus cylindraceus*, *Mammillaria tetrancistra* with reddish fruits, and *Yucca brevifolia* growing together here.

Fig.7 Flowering *Opuntia polyacantha* var. *erinacea*, Washington County, Utah.

Fig.8 On the rocky outcrops of the Beaver Dam Mountains *Agave utahensis* is plentiful together with more specimens of *Echinomastus johnsonii*.

primarily mellitophylic, i.e. bee pollinated (Janeba 2009a).

There are other common cacti found in this south-west corner of Utah. Clumps of *Echinocereus engelmannii* (ssp. *engelmannii*) and *Opuntia polyacantha* var. *erinacea* [Fig.7] are usually in bloom at the same time as *Echinomastus johnsonii*. *Mammillaria tetrancistra* can be easily spotted, especially when it is decorated with its orange to reddish sweet fruits. Also *Ferocactus cylindraceus* can be seen here, but it flowers much later than *Echinocereus* and *Echinomastus*, usually during the hot summer months. Although this population is said to belong to *F. cylindraceus* spp. *lecontei* (e.g. Pilbeam & Bowdery 2005), I personally do not see any convincing distinct characteristics of the spination to be able to distinguish these two subspecies.

Yucca brevifolia (Joshua Tree) is an important dominant feature of the landscape in this region, as well as the Mohave Desert in general. *Agave utahensis* [Fig.8] commonly grows on the rocky outcrops there (Janeba 2010) and *Escobaria vivipara* can sometimes be encountered at higher elevation [Figs.9-10]. We spent most of that day at this interesting location where one could roam through the wilderness forever.

Afterwards, I took Josef to one more special place nearby, just south-east of the city of St. George (Utah). There I showed him a nice population of another gem of the cactus family, *Pediocactus* (*Utahia*) *sileri* [Fig. 11]. This might be the only population of this species in the state of Utah, although it is known from several locations along the Arizona-Utah border. This exceptionally healthy population comprises really huge plants (up to 30cm) and the flower colour here varies from yellowish to reddish (Janeba 2009b). We spent the rest of the afternoon there admiring this rare cactus and its special biotope where it grows on barren gypsum hills at 900m elevation [Fig.12].

We ended up at Hurricane (Utah) in some cheap hotel. That day I had my 35th birthday so we got several six-packs of beer. We had seen wonderful plants ... it had been a really good day.

To be continued ...

Zlatko Janeba

Fig.9 View of the pass north of Castle Cliff with *Agave utahensis*. On many plants here was severe damage from recent wildfires.

Fig.10 At higher elevation you can encounter *Escobaria vivipara*. This specimen is from the pass north of Castle Cliff, Washington County, Utah.

Fig.11 *Pediocactus* (*Utahia*) *sileri* south-east of St. George, Washington County, Utah. At this location there are some really old specimens of this amazing cactus.

Fig.12 Habitat south-east of St. George, Washington County, Utah with *Pediocactus* (*Utahia*) *sileri*. Notice the barren gypsum hills of this very specific biotope.

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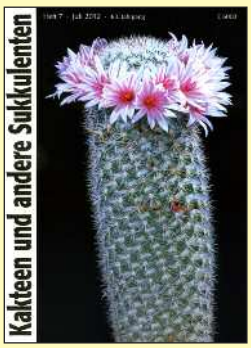

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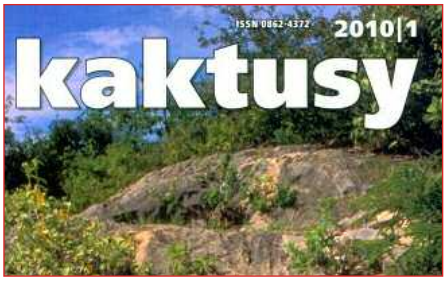

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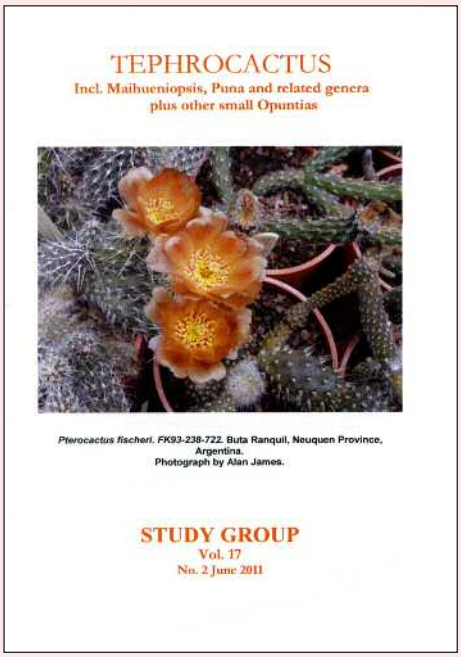

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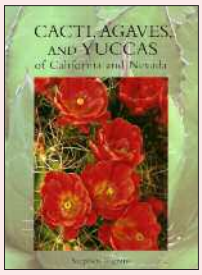

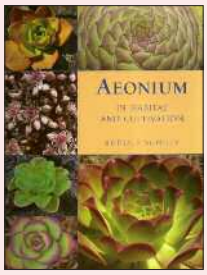

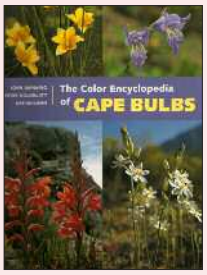

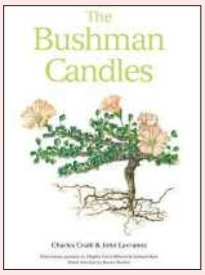

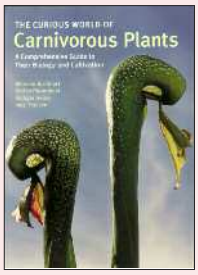

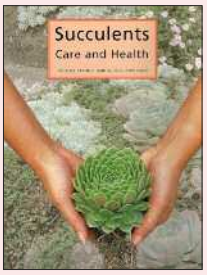

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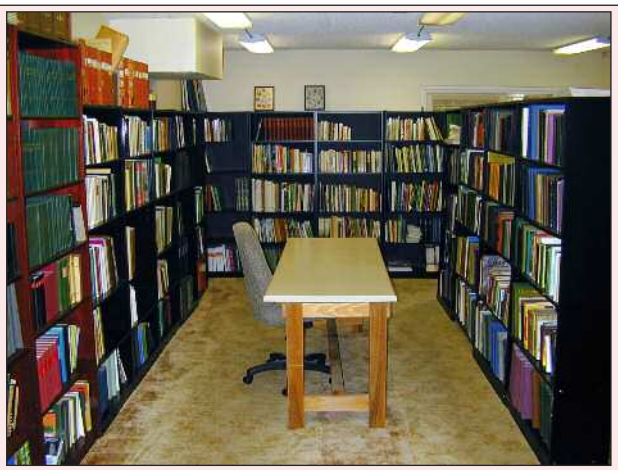

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