

TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera
plus other small *Opuntias*



Austrocylindropuntia lagopus and *Austrocylindropuntia floccosa* BB774.01.
South of Macusani, Peru. Photograph by Brian Bates.

STUDY GROUP
Vol. 17
No. 1 March 2011

SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

Subscriptions for 2010 were due on the 1st January 2011

Subscriptions and any other correspondence must be sent to the Secretary.

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THE 2011 TSG ANNUAL MEETING.

All preparations for the 2011 TSG meeting have been made and it will be held on Sunday 8th May 2011 at the Great Barr Ex Service Men and Women's Club, Birmingham, which is very near Junction 7 of the M6. A loose sheet inserted in the last issue provides directions to the meeting place. If you require another one please inform me. The room will be available from 10.15 and a buffet lunch costing £5 will be provided. To help the Caterer, notification of the number of people having lunch is needed by April 22nd. I would be grateful if people intending to attend will let me know by that date and whether you will have the provided buffet lunch.

The location is the same as last year and the date is chosen to avoid the meeting being held on the day before the May Bank Holiday Monday. There will be a short AGM starting at 11.00. Ivor Crook will give a presentation on Mexican *Opuntias* and Paul Oxley will give a presentation on the *Opuntias* he has seen during his travels in Peru including his 2011 expedition. Unfortunately Brian Bates is now unable to visit the UK. However, he has said that he will post to me the fresh *Opuntia* seed that he has collected in habitat.

There is no charge for attending the meeting and guests who are not members of the TSG are welcome. Please will members promote the meeting at local BCSS branches? Please bring any plants of interest or for identification. Plants for sale are also very welcome and there is no commission charge.

<p>I intend to do an article on the TSG numbered plants that were distributed as cuttings at early TSG meetings. Please will members send me photographs of the TSG plants in their collection? It will also be of interest if members will provide the names they consider fit the plants. Please will members respond to this request? Ed.</p>
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GRUSONIA BRADTIANA

The genus was erected by F. Reichenbach to include only one species, with cylindrical joints which are distinctly ribbed. Areoles exist along the ribs, bearing white spines which are set against a bluish-green body.

In habitat (Coahuila in Mexico), the plants form low thickets up to two metres high and several metres broad. New growth has rudimentary leaves which soon fall off. The yellow flowers are three to four centimetres broad but are unlikely to be seen in European cultivation.

The species benefits from a bright and warm environment and will produce one or two stems per year (Fig. 1). In the author's experience *Grusonia bradtiana* requires a minimum winter temperature of 40 F.

In "Studies in the Opuntioideae", published in 2002, DNA sequence profiling enabled the species to be grouped in the tribe "*Cylindropuntia*", along with other cylindrical segmented genera such as *Quiabentia*, *Pereskopsis* and *Cylindropuntia*. Prior to the publication of this work, some authorities considered there to be more than one species in the genus. The names of *Grusonia santamana*, *G. hamiltoniae* and *G. roserica*

are occasionally encountered: all these three names have now been assigned to *Cylindropuntia*.

Grusonia bradtiana is a delightful plant which is comparatively non-invasive and gives few problems.

John Betteley. Newark.

MIQUELIOPUNTIA MIQUELII. (Monv) Ritter

This is a monotypic genus with attractive, short, thick bluish joints having prominent warts.

In habitat (Atacama province in Chile), the plant is a spreading bush growing to about one metre high and is quite slow growing. The joints are cylindrical up to twenty centimetres long and often with a powdery blue appearance. The large areoles have brownish glochids and white to grey spine up to six centimetres in length.

The flower is large, with bright pink petals, pink stamens and a green stigma. However, the flowers are unlikely to be produced in cultivation.

In growth pattern *Miqueliopuntia* differs significantly from other South American *Austrocylindropuntias* where the stems have indeterminate segments in cultivation. The species remains quite slow, producing no more than a few segments each year when confined to pot culture. A minimum temperature of 40 f is recommended.

J. Betteley, Newark.

When I read the draft of this article I thought how nice it was for one of Ritter's names to still be accepted. N.L. Britton & J.N. Rose in their book *The Cactaceae*, 1920, P78, list the initial name with four synonyms:

Opuntia miquelii Monville.1840.

Opuntia pulverulenta Pfeiffer 1840

Opuntia pulverulenta miquelii Salm-Dyck 1844

Opuntia geissei Philippi 1894

Opuntia roseiflora Schumann 1898

In the CITES Cactaceae Checklist. Second edition. D. Hunt 1999 lists "Accepted Taxa.

Opuntia miquelii Monville

Synonym *Austrocylindropuntia miquelii* Monville (Ritter) Backeberg
Miqueliopuntia miquelii (Monville) Ritter."

The New Cactus Lexicon. D. Hunt et al 2006 lists

"*Miqueliopuntia miquelii* (Monv) Ritter 1980

Descr. as genus."

Several collections of seed were made by the late Alan Craig and there have been some very nice seedlings raised (Fig. 2). As John says the plant can look very attractive with its powdery blue appearance and thus one can have this feature in the greenhouse without having to resort to the blue cerei from Brazil which require much higher temperatures.

Ed.

COLLECTING SEED OF OPUNTIOIDAE.

Of all the plants, in all the World, you have to study those with GLOCHIDS. Most of the plants have glochids, a lot of the fruits have glochids, and even some of the seed have glochids. When ever I get glochids in my fingers, I invariable curse Alan, our Chairman/Editor, and a friend of 30 years, as I always think, that I am collecting the seed for him personally, which of course is not the case.

Producing seed has 3 phases

- 1: collecting the fruit
- 2: separating the seed from the fruit
- 3: cleaning the seed

Collecting the fruit

Tools of some sort are usually necessary, although some fruits can be collected with bare hands. Tools that I most commonly use include screwdriver, large tweezers or forceps. The tool depends on the species. For Airampoa I use tweezers/forceps, for *Austrocylindropuntia* I use any, usually screwdriver for *floccosa* or *lagopus* as they are “harmless” or unarmed, this is just to separate the fruit from the plants and then you can pick up the fruit with bare hands. In June 2010, with Chris Sherrah, we collected five plastic bags full of fruit, three of *floccosa* and two of *lagopus*, (Fig. 13) as well as taking our photos, in two and a half hours at BB 774 south of Macusani. For the *vestita* group, *vestita*, *shaferi*, *teres* etc, I use tweezers/forceps since the fruit has many glochids. *Exaltata* is the worst of all. It is completely covered in glochids and the plants are also very spiny and difficult to navigate, I have only ever collected quantities of seed of this species once, in November 2010, and will probably never do it again. *Tephrocactus* s.s. dehisce with a lateral split and fold out flat, but are very spiny, though not with glochids. I believe the seed have glochids, but I might be wrong. It is necessary to use tweezers/forceps to collect the fruit, although you can collect with bare fingers, but you need to be very careful, and you end up with a very spiny bag, which requires careful handling. *Cumulopuntia* are somewhat similar to *Austrocylindropuntia floccosa* to collect and clean. Often it is possible to flick the fruit out with the screwdriver or a pocket knife and then collect bare handed. *Opuntia* s.s., usually here, only *sulphurea*, is rather like the *vestita* group. *Pereskia* have two different types of fruit, the larger *Pereskia sacharosa* is like a small pear, whilst *P. diaz-romoana* is like blackcurrents. You have to dodge the spines and glochids of the plants, but can collect the fruits with bare hands. *Quiabentia* is rather like *A. exaltata* in that the plant is very spiny and the fruits are difficult to get to.

Separating the seed from the fruit.

Again, rather like collecting the fruits, separating the seeds from the fruits requires different techniques. The tools I use are my camping knife, fork and spoon set, which is usually on my belt. *Austrocylindropuntia floccosa* is easy, cut in half lengthways, then insert the teaspoon and scoop out the

pulp. I usually do the driving whilst “in the field”, but with Chris Sherrah, he was the driver, so I was able to clean the seed whilst he drove. The fruit skins were spread over 100s of km from the asphalt south of Macusani to the Nasca valley a distance of almost 1000 km. *A. lagopus*, has a thin fruit skin, and sometimes requires rehydrating. I separate the seed by squeezing them from the fruit, like toothpaste. These skins almost lasted to Lima. The 5 bags took 3 or 4 days to separate the seeds from the fruits. For the *A. vestita* group, I use the fork to hold the fruit whilst I cut it in half and then, with fork and knife, separate the seed from the fruit. Care is necessary with this group; it is not for doing on the fly like the previous species. *A. exaltata* is like the *vestita* group except I use fork and spoon to separate the seeds from the fruit. *Cumulopuntia* is like *A. floccosa* except you need to hold carefully to separate the seed from the fruit because of the glochids on the skin. For *Tephrocactus* s.s. you can hold the spines with fingers and flick out the seeds with the point of the knife, although it is very time consuming. *Opuntia sulphurea* is like the *A. vestita* group. The two types of *Pereskia* are like *A. floccosa* and *A. lagopus* except with *P. diaz-romeroana*, you can't squeeze like toothpaste, you have to split the fruit with the knife and separate from the skin with the blade of the knife.

Cleaning the seed

I use canvas bags, which I had made here in Sucre. The seed and pulp are placed in the bag, not too much per bag. The bags are usually hung from the handle above the door, but if they are “leaking” pulp, I cover with a plastic bag. If the pulp is fairly solid, squash with the hands, this also helps it to start decomposition/fermentation. Then wash, wash, wash, wash and wash again. You cannot wash too much. Wash even if the seed is dry, since the pulp which would have dried on the seed, has a germinating inhibitor. When you first wash the seed, the liquid is thick and slimy, but this gets thinner with each subsequent wash. When I think it is almost pure water coming from the bag, I dry the bag, on the dashboard in the sun, turning a few times. Then the dried seed can be transferred to paper bags and stored for counting into smaller bags. My three children usually do the last part, although they are not allowed to handle the seeds with glochids. They first counted seeds in 1999 when aged 8, 5 and 3 although the son managed to count 100 seeds in a 25 seed portion of *Cumulopuntia pentlandii* (aka *boliviana*), but at 5 years old I didn't say too much. Now they do better and I don't check their work. Although it's supposed to be usually cheap using child labour, in my case it is expensive, since I give them ALL the money gained from seed sales.

From the opening lines, you will gather that I am a true Humphrey Bogart fan. I am also a Cagney fan and often when high in the Andes, I will say “Top of the world ma!” a line from “White Heat” starring James Cagney.

Brian Bates, Sucre, Bolivia.



Fig. 1. *Grusonia bradtiana*.
Photo by J. Betteley.



Fig. 2. *Miqueliopuntia miquelii*. AWC227
17 Km W of Vallenar 270m Photo Ed.

Fig. 3. *Lobivia maximiliana* growing in an *A. floccosa*. BB774.03 South of
Macusani. Photo by B. Bates





Fig. 4. Photo 1
Fig. 6. Photo 3



Fig. 5. Photo 2
Fig. 7. Photo 4



Figs 4 – 13 *Austrocyllindropuntia pachypus*. Photos by E. Roberts



Fig. 8. Photo 5



Fig. 9. Photo 6



Fig. 10. Photo 7
Fig. 12. Photo 9



Fig. 11 Photo 8
Fig. 13 Photo 10



Fig. 14. Bagged fruits of *A. floccosa* & *A. lagopus*. Photo. by B. Bates.



Fig. 15. *Austrocylindropuntia floccosa*. BB774.03

Fig. 16. Hybrid. *Austrocylindropuntia floccosa* x *A. lagopus* BB774.04

Photos by B. Bates South of Macusani.



MY FAVOURITE CACTUS LOCALITIES.

Since my first visit to habitat over twenty one years ago, I have spent well over two years and travelled over 200,000 km, in eight countries, searching for plants. I have visited over 1800 different localities, some of them many times. Some make the pulse race in anticipation whilst others remain purely for the record and are not worthy of revisiting. The most successful stop was BB 085 20+ km west of Morro de Chapéu in Bahia Brazil where I logged 18 “interesting” plants: 11 different cacti, 3 different *Euphorbia*, *Jatropha*, *Bursera* and *Portulaca*. I think if I revisit this site, there will be even more “interesting” plants, since my interests have got wider since moving to South America. In Bolivia, my favourite place is the school at Quiquijana (pronounced kicky harna). This is the place, BB 371 then BLMT 185, where, in 1998, I made the decision to emigrate to Bolivia.

As far as the *Opuntioideae*, my favourite spot is south of Macusani in Peru BB 774 (Front cover), which I have visited four times. This is the site, with only three species of cactaceae plus an interspecific hybrid. The species are *Lobivia maximiliana* (Fig. 3), *Austrocylindropuntia lagopus* (Fig. 17&18), *A. floccosa* (Fig. 15) and their hybrid (Fig. 16). The things that make the site such a favourite are the number and variability of the plants. *A. lagopus* grows to about 4 or 5 metres long. The plant is so dense that an adult can stand on it (Fig. 17). *A. floccosa* is very variable, but mostly white haired. It has clumps where the heads are little fatter than a thumb and clumps where the heads are like a forearm. There are also cristates of *A. floccosa*, but I have never seen a cristate of *A. lagopus*. With Chris Sherrah in June 2010, I found a hybrid between the two species. In November, I found another, smaller plant (Fig. 16), but identical in form to the larger plant found in June.

In Argentina, my favourite spot, or more correctly road, is the road west of Fiambalá, where *Tephrocactus geometricus* grows, BB 939 to BB 946. I've spent almost a week on this road, camping on two visits. Along this road, beside the *Tephrocacti*, there also grows, *Maihueniopsis (Puna) bonnieae*, *Maihueniopsis mandragora*, *Maihueniopsis glomerata*, *Pterocactus megloli*, *Cumulopuntia pentlandii*, *Airampo spec.*, *Opuntia sulphurea* as well as several non-*opuntioideae*. The *Tephrocacti* are very common, whilst the *M. bonnieae* needs some searching. The *M. mandragora*, like everywhere it grows, is rather cryptic, small clumps, level with the soil. The *Pterocactus* is also relatively common. The other gem which grows along this road is *Lobivia bonnieae*.

In Bolivia, my favourite spot is as already stated, Quiquijana. However, my favourite *Opuntia* spot would have to be the pass between Sucre and Oruro via Ravelo. Here at 5000m altitude grows the spiniest *Cumulopuntia pentlandii* I have ever seen, and I've seen this species at 190 different localities in four countries.

Brian Bates, Casiilla 937, Sucre, Bolivia.
cactus@cotes.net.bo

WINTER SURVIVORS AND LOSSES.

In most parts of the UK December has been the coldest for one hundred years. The maximum/minimum mercury thermometer sited in my back garden has on several occasions registered a low of minus 20C. Lacking space in the greenhouse I chose to have a number of *Opuntias* in glass cold frames over the winter period. Throughout December these frames were covered with jute sacking and wool blankets, but no heat was provided in the frames. I lost three *Opuntia pachypus*, which's no surprise as they grow in habitat close to sea level near Lima in Peru. I also lost all the clones of *Cumulopuntia sphaerica* and both my *Cumulopuntia rossiana* forms (fortunately those in the heated greenhouse survived). Finally I lost several forms of *Cumulopuntia boliviana*.

All the *Maihueniopsis* survived the cold. That will be of no surprise to former TSG Secretary Rene Geissler who kept his *Maihueniopsis* in an open-sided garden frame every winter. Finally all the *Tephrocacti* (five in total) and *Pterocacti* (three) survived despite the fact that the temperatures in the covered frames must have dipped to minus 15C at the very least.

In future I will provide greater protection to all species of *Cumulopuntia* and *Austrocylindropuntia*.

John Betteley. Newark

I have now got round to writing about plants that I have lost over the very hard winter of 2010/11 and how I am trying to deal with future hard winters. In my unheated greenhouse I lost nineteen plants although I may have saved one or two by taking cuttings off them. Of these nineteen plants sixteen were *Cumulopuntias*, one a *Maihueniopsis subterranea*, one a *Tephrocactus bonnieae* (large pad form) and one a *Tephrocactus alexanderi*, TG27.

In my unheated cold frame I lost twenty two plants mainly *Tephrocactus alexanderi* forms. In the autumn of 2010 I had installed 2 small fans per greenhouse and kept them running 24/7 hoping to keep the moisture down but this did not help in the unheated greenhouse. I have come to the conclusion that these plants require a little heat over our winters (I have not lost one plant in the heated greenhouse) so I have installed a black tube heater in the previously unheated greenhouse and linked it to the thermostat in the heated greenhouse so that when the temperature drops below 3C it operates the heaters in both of the greenhouses.

Alan James. Birmingham.

"TEPHROCACTI"- SURVIVORS AND LOSERS IN THE UK DURING THE WINTER OF 2010/2011

This was the worst winter for years, even worse than the preceding winter. Made worse still because the extreme cold arrived in December and the winter remained dull and cold after this initial freeze with temperatures down to -10/15C in the greenhouse and talk of -30 outside.

I had moved the "*Tephrocacti*" from their normal wooden frame on my allotment here in London up to Manchester. The wooden frame is raised above the ground on legs to keep away from damp ground. The Manchester greenhouse on the allotment down the meadows was also

unheated and the plants were on a shelf near to the glass, though not right up close, whereas in the wooden frame they were further away from what is polycarbonate sheeting.

Nevertheless the losses reflect losses which also occurred in London of other species of cacti, all of which had survived for some ten years in the wooden frame or unheated glasshouse in London through winters where temperatures fell below -10C or more.

I had previously been informed that any genus with the name *Tephrocactus* was not hardy, but the evidence below shows this not to be the case.

Those which died.

Austrocyllindropuntia crispicrinata, *A. lagopus*, *A. sp* "Baker" CJH 371, *A. teres* WR 901. *A.*

verschaffeltii WR 851, *A. vestita* PM561. *A. rauhii* WG 120, *Airampoia multiareolata*, *Cumulopuntia cylindroarticulata*, *Opuntia rossiana* WG 218, *Cumulopuntia spec ex KK.400* WG 481, *Opuntia "aumiacara"*, *O. kleinia*. *Pterocactus spec. nova* JL 101 WG 471 Neuquen 700m High Bajada del Agno, *Tephrocactus articulatus v oligacanthus* WG 206, *T. weberi* WG 243, *T. weberi* RJO2. *Tunilla subcompressa* WG 054. *T. microdiscus* (Sumalo Salta Argentina), *T oruriensis* MLV 14, *T. picardoi* WG073, *Maihue niopsis flexispina* B76-128 WG OGZ, *M. minuta* JL 245 Guesta Pampa Azul Pampa WG472, *M. rossiana* WG 234, *M. sp R. Kiesling* San Juan WG 228, *Puna bonnieae* DJF 319 (*P bonnieae* Clone 1 DJF 319 survived unmarked).

Those which were unharmed.

Corynopuntia bulbispina, *Cumulopuntia pentlandii* WG 472, *Cylindropuntia imbricata*, Canyon City, ex Mesa Garden, Rare form, white flowers, *Maihue niopsis rossiana v fauxiana* WG 061, *M. sp* CMW 4645 ex Dawn Nelson, *M. andicola* PW 6429, *M. darwinii* WG184, *M. nigrispina* WG114, *M. minuta* WG 413, *M. mandragora* WG469, *M. nigrispina* MK HK 2692. *M. leoncito* MK 1477 or 1473, *M. glomerata fm longispina* WG 252, *M. glomerata v gracilior* WG 227, *M ovata* MNW 4645, *M. camacho* Calma to St Pedro 2950m Chile G Hole, *M. nigrispina "atroglobosa"* P162, *M. mandragora* WG412, *M ovata* DJF 335 + DJF 175 + DJF 274 ex Mesa Garden, *Opuntia boliviensis*, *O longispina corrugata*, *O. hickenii* P102, All *Pterocactus* (except the one above),

Tephrocactus sp aff subinermis, *T. russellii* - long silver spines. *T. weberi* RJ 02. *T. minuta*, *Tunilla perita* HS 472, "*T. hintonii* WG 394", *T. longispina v brevispina* Aquas Negras San Juan WG 394, *T. lativirens* WG 196, *T. "argentinensis"* WG 480, *T. lativirens* WG 196, *T. longispina* ("ex Shreck").

Philip Greswell.

Although I have four greenhouses and a cold frame, all containing *Opuntias*, I have always provided some heat (Usually just below 40F in the greenhouses and 5F in the frame). Years ago a member wrote to me asking why I had written an article suggesting the provision of "heat" sinks for winter use – containers full of water which absorbed the heat from the greenhouse during the day and releasing the stored heat as the temperature fell at night. "Why do this?" the member asked "Why provide

any heat? I thought Tephrocacti are hardy". My answer was that although some plants are reputed to be hardy there could, at some time, come a period when the temperatures fell below what the "hardy" plants could stand. Heat sinks could aid the normal provided heating. I do not think the member was convinced by my argument.

I went into hospital in November just before the cold came. Thus I was marooned away from the greenhouses and could only dread what I would find when I came out in December. I expected my heating systems to have failed or at least not have provided enough heat. I was resigned to huge losses of plants. I was pleasantly surprised to find the heating had been sufficient (although the lowest recorded temperatures were lower than usual) and was still functioning. Hence this winter has been normal for me – I have lost a few plants but that is usual. I have had a letter from the Electricity board raising my monthly payments and I definitely must find time to rearrange the plants in the greenhouses so that I can run some at a lower temperature. However, my pessimistic (if expensive this year) approach has saved the plants.

It would appear that those members who normally run unheated greenhouses successfully in winter have been hit by three factors: temperatures fell lower than normal, the low temperatures remained low for a long time (with the plants therefore facing longer periods of cold and perhaps not rising above freezing during the day) and the cold snap came in November (not, as usual, later in winter) thus the plants (and compost) were still drying out. Has anyone noticed a difference between the survival of plants in pots compared to being planted out in beds in the greenhouse?

A. Hill. Sheffield.

I am very grateful to the members who have sent in the information on the fate of their plants this winter. I hope that more of you will send in reports to widen the picture. Comments and analysis on the information so far printed will also be welcome.

Ed.

EASIER WATERING.

Over the years I have watered all my plants by using a hand pumped spray using 5 litres of water per fill and a great deal of time and energy so I set about trying to make life easier. I came up with the following idea!

I bought a 100 litre water butt and stand, a submersible pump, hose pipe and an adjustable spray lance, the head has 8 settings. After trying them all I settled on a shower setting.

I positioned the butt centrally between both greenhouses cut and fitted a length of hose to the pump and long enough to reach all plants in both greenhouses and cold frame, coupled up the lance, filled the water butt (which takes the longest time) and after about an hour all plants have been sprayed and the equipment packed away for the next time. I use about 50 litres of water and I feel it was a job well done with a lot less effort.

Alan James. Birmingham.

AUSTROCYLINDROPUNTIA PACHYPUS. BUD TO FLOWER.

November 10 of 2010 I noticed that my *Austrocylandropuntia pachypus* had a bud on it. I thought it might be fun to keep a running photo history of the bud as it grows and finally opens. Photo 1 (Fig. 4) is of the bud when I first saw it. At that stage of its life I was not sure if it was a bud or if the plant was throwing an off set. Photo 2 (fig. 5) was a while in coming as the bud did not grow all that fast. Photo 2 was taken January 11 of 2011, at this time it is still not showing for sure if it is a bud or not. I am quite sure that it is a bud though for my plants have seldom thrown any off sets. From January eleventh until the first of March all the bud did was grow. It grew to 5.5 cm long and 3 cm in diameter. In February we had some really nice weather and the bud just grew but did not show much signs of any petals. It was March first that I took photos 3 (Fig. 6) and 4 (Fig. 7). The first signs of the outer petals are showing and even with a hint of color on them. Now if you notice in photo 1 there are no leaves on the main plant, even though the bud is covered with them. To me this says that the main plant is not growing. Then in January there are small nubbins of leaves on the main plant. That shows that it is growing and in the middle of one of the coldest months we have here. In photos 3 & 4 (Fig. 6 & 7) you can see that the leaves have turned red and have also grow somewhat longer. As the outer flower petals are showing the leaves also do not cover the bud any more.

If you look close at photo 5 (Fig. 8), taken March 15, you will see that the tips of the outer petals are just starting to lift. That usually means that things are going to start moving a bit faster. The leaves are still pointing mostly straight up from the flower parts. In photo 6 (Fig. 9) taken on the 24th the leaves are now curving away from the opening flower. That is to allow the flower to open with out having to fight the leaves. I had not noticed that before on an *Opuntia*. Besides the red leaves there is also red, pink and yellow in the outer petals as they are starting to open. After the hard outer petals opened and were out of the way than the flower petals could start growing which happens quite fast. At first the colouring of the petals is very rich as can be seen in photo 7 (Fig.10). Later on the same day I took photo 8 (Fig.11), there as the petals are much larger the colour has faded and the flower is much closer to the colour it will be at full open. Photos 9 (Fig. 12) and 10 (Fig. 13) were taken on March 28 and show the flower full open, face on in photo 9 and sideways in photo 10.

Elton Roberts. California.

EMAIL ADDRESSES.

Members are requested to please send in an email address, if possible, to the Secretary and inform him when it is changed. It is obviously very useful to have the facility to easily and cheaply, contact members.

MATERIAL NEEDED FOR THE NEXT ISSUE PLEASE.

Will members please send in material for the next issue as soon as possible? Thank you very much to everyone who rallied to the recent request for material for this issue.



Fig. 17 Brian Bates on *Austrocylindropuntia lagopus*. BB774.01
Fig. 18 *Austrocylindropuntia lagopus* BB774.01 South of Macusani.



TEPHROCACTUS

Incl. Maihueniopsis, Puna and related genera
plus other small Opuntias



Pterocactus fischeri. FK93-238-722. Buta Ranquil, Neuquen Province,
Argentina.
Photograph by Alan James.

STUDY GROUP

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SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

Subscriptions for 2010 were due on the 1st January 2011

Subscriptions and any other correspondence must be sent to the Secretary.

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If you write to any Officer and expect an answer, please to include a S.A.E.

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THE 2011 TSG ANNUAL MEETING.

The 2011 TSG meeting took place as outlined in the March TSG issue on Sunday 8th May 2011 at the Great Barr Ex Service Men and Women's Club, Birmingham.

At the AGM all the officials were re-elected. Ivor Crook gave a presentation on Mexican *Opuntias* and Paul Oxley gave a presentation on the *Opuntias* he has seen during his travels in Peru including his 2011 expedition. Unfortunately the fresh *Opuntia* seed that Brian Bates had collected in habitat was not available. However, it has now arrived and it is planned to advertise it for sale in one of the next two issues.

During the AGM the loss of many plants by members due to the recent abnormal winter was discussed. It was agreed that a special effort should be made to help members restock their collections if possible. Please will members send in to the Secretary details of plants they wish to acquire and also will members who have spare plant material to dispose of please inform John? It might then be possible to publish this information in a loose leaflet. This planned extra facility does not prevent members sending in material for the usual short advert service facility we have always offered to members.

I, as serving Editor, indicated to the meeting that I wished to stand down. When Tony Higuera stood down as editor in 1998 I took over as temporary editor which morphed into permanent editor in the absence of another volunteer. For several years I have said that it would be good for the future of the Society to have a younger replacement for me. Now I have health problems which make it sensible for me to retire whilst still being able to help an incoming new editor. If any one wishes to volunteer or wants information about the actual work involved please contact me. The issue was discussed at the meeting. Several people offered to help but no new editor actually emerged. Thus it was agreed that I would continue for a few more issues whilst a new editor was sought. I apologise for this issue again being late.

Alan Hill. Editor.

WORK IN PROGRESS

Unless you're a member you probably don't hear much about the International Organization for Succulent Plant Study (IOS) these days, though we now have a good website (www.iosweb.org). And as one of our on-going projects we are trying to promote research on *Tephrocactus* et al. in the sense of 'the Andean *Opuntias*' covered by James Iliff in his monumental article in *Studies in the Opuntioideae* (2002). Our long-standing member Fred Kattermann has recently published a number of articles on the Chilean taxa in the American C&S Journal, Graham Charles has written on *Maihueniopsis* in *Bradleya* and Paul Hoxey has improved our knowledge of *Cumulopuntia* in Chile and Peru with his three-segmented article in this journal. Not to be left too far behind, I myself have recently spent a month in southern Argentina looking more closely at taxa currently included in what the *New Cactus Lexicon* calls *Maihueniopsis darwinii* and *M. glomerata*.

My fieldwork, in collaboration with botanists at the Universities of Córdoba and Buenos Aires, was aimed at extending the DNA study of the Andean Opuntioideae launched two years ago at an IOS meeting in Bonn, Germany, in collaboration with Dr Christiane Ritz, then at the University of Giessen and now at the Senckenberg Museum, Görlitz. Members of the British Section of IOS provided samples of documented material from their collections, and others of us, including James Iliff, contributed about £1000 towards the cost of laboratory consumables and the DNA extraction and analyses.

Just before we gave our project the go-ahead, a paper by the Americans Griffith & Porter was published which suggested that *Maihueniopsis* is polyphyletic (i.e. an artificial genus containing several different ancestral lineages) and other conclusions that are hard to swallow. We decided to go ahead with our project anyway, partly because we thought we had more reliably documented material but also to check the Griffith & Porter results. With the help of students, Christiane has made excellent progress and hopes to submit a formal paper to one of the specialist journals fairly soon. The taxonomic implications will be summarized in the next issue of *Cactaceae Systematics Initiatives*.

Informally, the results have clearly shown that Griffith & Porter's conclusions are unreliable, for reasons to do with one of the DNA markers they used. Amongst other indications, they show that Ritter was right to include *Opuntia subterranea* in *Cumulopuntia*, not *Maihueniopsis*, a conclusion since confirmed by Dr Wolfgang Stuppy after looking at seeds sent to him by Dr Martin Lowry. This, by the way, leaves *O.*, *M.*, or *P. clavarioides* as the only species left in Roberto Kiesling's proposed genus *Puna*.

On Christiane's evidence the genus *Maihueniopsis*, excluding *C. subterranea* and *T. bonnieae*, also appears to be monophyletic, as we had expected, but she examined only single documented samples of *M. glomerata* (as currently understood) and some of its close relatives. So we agreed that further sampling would be desirable. The need for chromosome data had also been mentioned, as polyploids are frequent in the Opuntioideae.

Argentina has tight restrictions on the collection and export of live material, but the possibility of extending our survey arose when Dr Laura Las Peñas, of the University of Córdoba, Argentina, joined IOS in 2009 and I contacted about her cytogenetic studies of Argentinean cacti.

The upshot of this was my trip to Argentina in March this year, when, with the collaboration of botanist colleagues there, I collected samples of various taxa of *Maihueniopsis* and delivered them to Laura. She will not only use them for cytogenetic studies, including determining ploidy levels, but, since legal exportation of live material from Argentina to Europe is now virtually impossible, will arrange for the DNA to be extracted from a duplicate set of the samples and sent to Christiane in Germany. Laura's work, like Christiane's, will be supported financially via IOS.

We hope the work now envisaged may help to resolve the status of various Argentinean taxa associated in the *New Cactus Lexicon* with *M. glomerata*, especially *M. darwinii* and its var. *hickenii*, and the taxa popularly known as

Opuntia platyacantha and *M. ovata*. The typification of several of these names, and hence their correct application, is a big problem in itself, but DNA and cytological data may at least help us discuss and decide what taxa are recognizable and revise our treatment for the next edition of the *New Cactus Lexicon* accordingly...

Watch this space!

David Hunt, IOS Secretary,
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MAIHUENIPSIS DARWINII TSG15 WG427

Over the last few years I have acquired several substantial plants of the *Opuntioideae* from the collections of former members of the Birmingham branch of the BCSS. In a couple of cases these have been from growers who are no longer with us. TSG members may recall a lady named Mary Jackson; she was a keen grower of almost anything, had several greenhouses, and was an early member of our group. Unfortunately she suffered from a long illness before her death and an unavoidable side-effect of this was that her collection was largely left to its own devices.

I arranged to visit her widower, Bill Jackson, as he had offered what remained of her *Haworthias* (cover your ears, Opuntiaphiles!) to a good home. What I didn't know, until I arrived, was that there was also a greenhouse full of *Opuntias*. It's a good job I took my Land Rover, as Bill told me I could also help myself to these, otherwise they would be tipped.

It transpired that the majority of these plants had had no water or ventilation for as many as three years. As a result, of course, the casualty rate was high, and it was no surprise that plants such as a grafted *Austrocylindropuntia lagopus* had long since dried out and withered to nothing. Others had, relatively speaking, been thriving. A large pan of *Corynopuntia grahamii* showed evidence of having flowered the previous year; I subsequently broke it up at great personal risk and redistributed it, as it was too large for me to cope with.

A few of the plants I salvaged turned out to be lost causes from the outset, and refused to get going again, despite promising outward appearances. Yet more perished in the winter of 2009/2010 having not, I suspect, re-established themselves enough to cope. The real troopers have been Mary's assorted *Maihueniopsis* plants; in the main they have sailed through and come back to life as if nothing had ever happened to them, although most look slightly more rugged than their softer-grown friends in my greenhouse. I find it a humbling reminder of just what adversity some of these plants can survive.

My plant of the TSG distribution of *Maihueniopsis darwinii* WG427, TSG15, is from Mary Jackson's collection and has that unmistakable "burnt habitat" look as a result of its experiences. Two years on from its rescue it has been pruned extensively, as it was (for me) of an unmanageable size when I obtained it. Only this year has it finally started to produce a decent number of new shoots (Fig. 1), but I am optimistic that it will now begin a full recovery. I shall update members with its progress!

Stuart Estell, Birmingham.

AUSTROCYLINDROPUNTIA PACHYPUS AFTER FLOWERING.

The flower bud on *Austrocylindropuntia pachypus* is of a different kind of structure than most flower buds. The plant throws out a stem-like growth to allow the flower to grow on the end of the growth. I measured the last flower to open. The stem-like growth was 5.5 cm long and 3 cm in diameter. The flower which grew on the end of that stem-like growth was about 3 cm long. The bud growth was not much more than 1 cm long for several months. If you look at all the photos except Fig. 6 you can see the yellow end is where it appears the plant wants to make seed. I did not pollinate the flowers so doubted that any seed pods would be made. Fig. 9 plant has two flower stem growths on it. I took off one of the ends that looked like it could have seeds in it but it was nothing but hard flesh. Something in the make up of the plant tells the blooming end to make what looks like a seed pod on the end of the growth even though there is no seed in it.

Figs 3 - 5 show separate stem-like growths which have been taken off the parent plants and planted to root down to form new plants. Each looks as though they have seed pods on the end of the stem-like growth. All the photos except Fig. 6 show new growth developing on the stem-like growth and I assume new stems will be formed. Fig. 9 shows a two stemmed plant that grew from a flower stem growth (Note the base of the plant. Ed). The tallest stem is 29 cm and both stems have bloomed. At the present time each one is throwing some new growth on them. If like before, while on the main stem, it could very well be another flower stem. When removed and planted the flower stem will then grow a new plant. However, as they are all the same clone if two bloom at the same time you seem to not get any seed but a friend, that is long gone, always had a half dozen to dozen plants from taking the flower stem growth off the main plant and planting them.

I had a plant that actually threw another flower growth stem out of a previous one to bloom and the new growth then threw another growth. The weight of the combined flower growths was so much that it snapped the main plant stem in two. Fig. 6 shows the remains of the bottom part of the snapped of stem. It is now growing a new off-set stem. (Note no yellow area. Ed) That off-set could get large enough that it could snap off the lower part of the stem again. I will have to keep an eye on it and take the off-set off if the main stem starts to lean. That off-set has a way to go as it is only about 4.5 cm long. New growth is from the areoles and in Fig. 8 you can see where that flower-growth stem has four growths trying to become either a stem or a flower-growth stem. There is one nice thing to it all and that is that even though the plant is not making seeds you can take the flowering stem and plant it and get another plant. I have never seen any growth come out of the yellow part that would be where the seed would form. All growth is always below that area. If I wanted I could remove the two tall stems on the plant in photo 9. That would leave the old flower stem-root base and it would throw another stem or two, maybe even several. Plant the two tall stems and in time you could have two nice tall plants. That is if you remove all the flowering stems after they bloom and before they weigh the plant over and it snap in two!

As *Austrocylindropuntia pachypus* is not very plentiful I grow mine in an open fast draining soil. I have had my plants for many years and they have



**Fig. 1. *Maihueiopsis darwinii*. (Henslow) Ritter. TSG15. WG427.
Photograph S. Estell.**

**Fig. 2. *Cumulopuntia pentlandii*. (Salm-Dyck) Ritter. BB1592.04 Argentina.
Photograph B. Bates.**



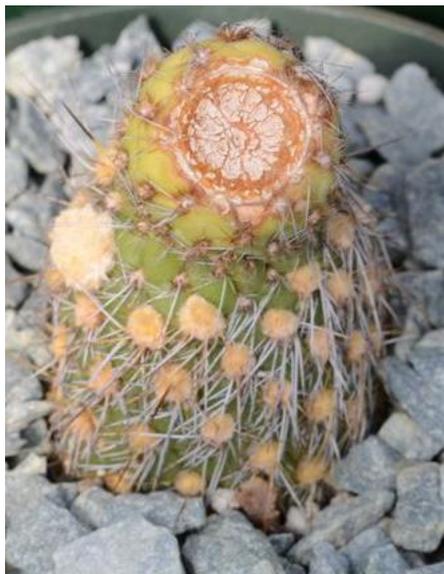


Fig. 3



Fig. 4



Fig. 5

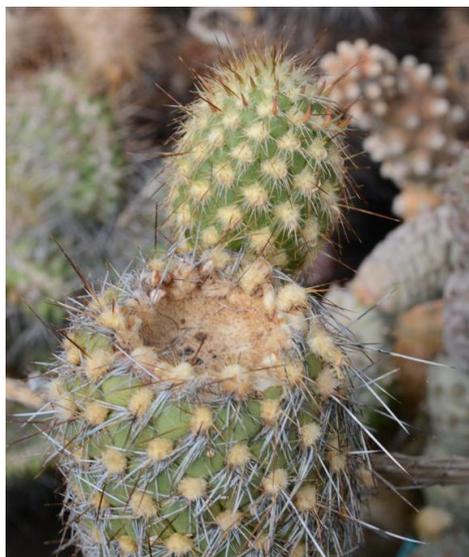


Fig. 6

Austrocylindropuntia pachypus (Schumann) Backeberg.
All photos 3 to 9 by Elton Roberts.



Fig. 7



Fig. 8

Fig. 9





Fig. 10. *Tacinga palmadora* (B&R) Taylor & Stuppy. Photo J. Betteley.
Fig. 11. *Pterocactus tuberosus*. (Pfeiffer) Britton & Rose.
Photograph C. Papathanasiou.



not shown any frost damage. If you look at the book “*Cacti*” by Innes and Glass you will see that they say to keep the plant above 55 degrees F. But then plants that can grow in temperatures in the teens, they say to keep above 50 degrees F. One woman I worked for kept her plant in her hot house where it did not get below 40 degrees F. The woman that I got my plant from grew hers outside but sheltered from the winter rains. I have mine in cold greenhouses*. I keep them dry over the winter but if I can remember that they are growing in the winter I will give them a light watering and see how they take it. As was seen in the photos of the bud growing in January (mentioned in the March issue page 14. Ed) and the plant was also growing it just may like a light watering then. That will be something I will have to try to remember to test out.

Elton Roberts. California.

* Elton says that he keeps his plants in “cold greenhouses” but remember that he lives in California. My two plants of *A. pachypus* survived last winter at 40°F but were kept dry. Elton also mentions lack of seed whilst saying that he did not try to fertilise the flowers. Has anyone set seed on *A. pachypus* or seen seed on plants in habitat? One wonders how far the species relies on vegetative reproduction in habitat rather than seed production. Any details on an actual seed pod would be very welcome. Ed.

A FEW COMMENTS ON TSG BULL. 16(4)

My first comment is that *Maihueiopsis clavarioides* is one of the few plants that I’ve not seen in habitat although I have looked for it. Another plant I have not seen is *Weingartia neumanniana* in Argentina although I have seen it in Bolivia.

In my comments on TSG 16(3) I made a typo. The *Airampo* was collected in 1992 not 1982, but the 18 years was correct. Also the spelling should be glabrous not glabrous.

I love the comment by Ed., the last comment on p 49 quote “which adds more confusion when trying to identify the plants.” I think it should be against the law for plants in nature to grow without labels! Some taxa are so difficult to identify. In particular *Airampo* species. How many are there really? I would probably accept even less than David Hunt (!) and I’m not particularly a lumper, but not a splitter either. I might be midway between the two extremes - Hunt and Halda. I like Josef Halda, he is a friend of mine, (he’s a very funny man) but I do not always agree with his work. When together we are likely to discuss taxonomic matters. It was I who suggested to him that *Yavia* might be a *blossfeldia*. He then made the combination.

P 51 RMF photos. I think the place name is correctly Tafí del Valle (Tafí of THE Valley). Place names and people’s names should not be translated, in my view. Here, in Bolivia, we talk about Principe Guillermo (Prince William).

P55 The first couple of sentences about “droopy” or plants falling apart are the two extremes of growing this group of plants which include *A. verschaffeltii*, *A. vestita*, *A. teres* and *A. shaferi* (aka *weingartiana*). If you grow them, you get green pencils with leaves, if you bonsai them you get fragmentary plants which self prune due to lack of water. In north western Europe, it is very difficult to grow them successfully. Pot culture is difficult

anyway and then there is the lack of light. The amount of water given should be tied to the amount of light. There are people in Europe who flower these taxa, maybe they can enlighten us about their cultural methods.

I get a little annoyed when I still see the use of the name *A. weingartiana*. In *Cact. Succ. J. Gr. Brit.* 42(4):109-110 (1980) Dr. Roberto Kiesling wrote a learned article, presenting good evidence that the name should be *shaferi*.

[Errata. On page 56 TSG 16(4) "*Austrocylindropuntia, Weingartianas*" should read "*Austrocylidropuntia weingartianas*". Typing error by me. Ed.]

Royston's article on *Cumulopuntia rossiana*.

His use of the word *Tephrocactus* is not in line with current taxonomy. In my opinion, there are NO *Tephrocactus* in Bolivia, only *Cumulopuntia* and *Maihueniopsis*.

Whilst I agree that most visitors to habitat are interested in the globular, "choice" species, not all are so narrow in their interest. I, for one, go out of my way for the *Opuntioideae*, and believe that Royston has misidentified some of his plants. From the list on P 58, I disagree with six of his identifications, having visited the collection sites with him, or by myself. I agree with two identifications and am not qualified to comment on the others. However, it does cast doubt on the whole article. *Cumulopuntia pentlandii* (aka *boliviana*) and *C. chichensis* are clearly not *C. rossiana* and would show variation from it.

I identified RKH 161 (as BDH 5) as *C. boliviana* (now *C. pentlandii*) but not *rossiana*

RKH 193 (as BDH 19) as RKH 161

RKH 204 (as BDH 24) as RKH 161

B/K 13A (not 13/1A) as *C. chichensis*

I am not qualified to comment on the Graham Charles or Franz Kühhas collections or the KG collection.

P 56 line 3, the place name should be Challapata.

Although Pentland was very interested in plants he was not a trained botanist. This is my entry for him: Joseph Barclay Pentland (1797-1873): British diplomat and geologist, Secretary to the British Consul in Peru 1827 and British Consul in Bolivia 1836-1839, collecting plants in the region.

Wikipedia has the information: Joseph Barclay Pentland (1797 – 12 July 1873) was an [Irish geographer](#), [natural scientist](#), and [traveller](#). Born in Ireland, Pentland was educated at [Armagh](#). He also studied in [Paris](#), and worked with [Georges Cuvier](#). With [Woodbine Parish](#), Pentland [surveyed](#) a large part of the [Bolivian Andes](#) between 1826 and 1827. He published his *Report on Bolivia* in 1827. From 1836 to 1839, he served as [British Consul](#) in [Bolivia](#). He corresponded with [Charles Darwin](#) and [William Buckland](#). Pentland died 12 July 1873 and is buried in [Brompton Cemetery](#), London.

During his time in Bolivia, Sucre was the seat of government. However, I do not know where the British Consulate was based. If it was based at La Paz, he would have collected on the Altiplano, and there ONLY grows *C. pentlandii* (*boliviana*). Details of both names were described on adjacent pages of *Allg. Gartenz.* 13(49):387-388 (1845). The whole journal can be downloaded from <http://www.biodiversitylibrary.org/bibliography/14651>

The protologue gives the author of both names as “Nob.” The New Cactus Lexicon gives the author as Salm-Dyck, either way, it is not Pentland. Therefore whether he considered the two plants to be the same or different is not relevant, since Nob. or Salm-Dyck considered them different when publishing the two names. From the protologue *pentlandii* is ½ foot (6”, 15 cm) high and *boliviana* is 1 foot (12”, 30 cm) high. This precludes *rossiana*. The only *Opuntias* of this group which grow this high are the two afore mentioned names, and there is only one in nature.* As Roy Mottram stated, Britton & Rose selected the name *pentlandii* as the name, and this set the precedence. *C. rossiana* is ALWAYS flat to the ground and therefore never ½ or 1 foot high.

I have seen *C. pentlandii (boliviana)* at 190 localities in four countries, *C. rossiana* at 53 sites in two countries and *C. chichensis* at 67 sites in two countries. Best wishes to all. Brian Bates, Sucre, Bolivia.

cactus@cotes.net.bo

*Brian has very kindly supplied a disc containing all his photographs of *Opuntias* he has photographed in Argentina and Peru. Fig. 2 shows a plant from Argentina labelled *Cumulopuntia pentlandii* by Brian. One can see the mound that is formed. However, (dare I say), the spination on this plant, especially the nearer segments does have some resemblance to the spination of some specimens of *C. rossiana* (although I am not suggesting that it is *rossiana*).

Ed.

TACINGA PALMADORA. (Britton & Rose) Taylor & Stuppy.

In the early 1970s I wrote an article for the National Cactus and Succulent Society of Great Britain on the subject of *Tacinga funalis*. At the time there were only two species of *Tacinga* recognised: the aforementioned and the rather dubious violet red *Tacinga zehnteri*. I have never seen the latter for sale and it was probably an obscure variety.

Tacinga funalis has pencil-thick rounded stems and is a climbing and branching plant which is highly unlikely to flower in the UK. A few years after I wrote the article *Tacinga braunii* was discovered by Esteves Pereira and introduced into cultivation. It is very similar to *Tacinga funalis* but has a flattened stem and appears equally non-floriferous.

In the early part of 2000, morphological and seed structure characteristics led to four species of *Platyopuntia*, all native to eastern Brazil, to be assigned to the genus *Tacinga*: namely *inamoena*, *saxatilis*, *wernerii* and *palmadora*.

Unlike *Tacinga funalis* and *Tacinga braunii*, the species *Tacinga palmadora* is incredibly free-flowering. It is an erect, flat-padded plant with thin elliptical segments, ten to fifteen centimetres in length. Flowers are borne on old and new joints and are four centimetres broad, varying from blood red through to deep orange – as shown in the illustration (Fig. 10). The flowers last for several days.

The species is well worth growing. I would recommend a minimum winter temperature of 50°F, given its habitat of Bahia in Brazil.

John Betteley, Newark

THE GENUS PTEROCACTUS.

I am neither an expert on *Pterocactus* nor a botanist. However in my humble opinion, derived from my observations and experiences in growing plants of the species, I would like to pass out a few comments for the benefit of those who want to read about them. I must warn those Buffs and Taxonomists, that I am not re-writing their books, so please do not jump down my throat.

I believe there are two kinds of *Pterocactus*. The first one has long branches, arms, tentacles call them what you like. These grow in various lengths and thickness from a stem just above ground, supported by a tuber somewhat deeper in the soil. The flowers appear at the end of the arms during the late summer. Plants appear under various names such as *tuberosus*, *kuntzei* and *decipiens*, but they look the same to me, apart from a variation in the length and thickness of the arms and a slight difference in the colour shade of the flowers. Of course there are intermediates such as *megliolii* and *gonjianii* with very thick arms. They are not self pollinating and therefore can not reproduce themselves. Seedlings can look different from the parents and therefore, should one need to maintain the clone, one must resort to vegetative propagation.

When growing from seed one can wait for four to five years before any growth becomes noticeable and therefore a vegetative propagation is a much easier option. Branches can be removed as they detach easily from the stem at the end of the growing season. I myself prune the plant completely after flowering in the autumn by cutting the branches about one centimetre away from the stem, so avoiding any damage to the epidermis. I then select the most vigorous and turgid bits and lay them flat to heal. One notices in a little while that the cuttings thicken, shorten and start to curl. They must then be planted in loose sandy soil and for the next three to four years not much will happen as they are growing the tuber underneath. One should avoid putting any stones in the soil, if one wants the tubers to be beautiful round balls. When the cuttings start growing new arms, they should be pruned to allow the strengthening of the stem and the enlargement of the tuber.

I grow my plants in plastic tall toms and use a mixture of half John Innes and half coarse sand, fine stone chippings, perlite and fine Cornish grit. I never plant in a dry soil mixture and then leave the plants to acclimatise them. Cuttings and growing plants are planted in moist soil and left to settle for some weeks before watering. The soil is initially prepared, watered and then turned over several times in order to lose the wetness and only when it is loose and moist is it used for planting cuttings into it.

The plants need re-potting every three to four years especially when the pots start distorting due to the pressure from the growing tuber. When eventually the plant fills an eight to ten inch pot it is time to expose the tuber and prepare the plant for the show. Expose two thirds of the tuber and cut back the stem to the required length. One notices that the tuber is a little rough on the outside and the roots are still live on the showing part of the epidermis. There is no need to worry, as within a year the epidermis will harden up and the surface exposed will become clear, shiny and very attractive. The drawback to this is that the growth slows down to about one

millimetre every couple of years. Therefore the tuber growth is minimal and if forced by over watering, it will cause the tuber to split and subsequently to rot. People say sometimes that they had their plant for twenty five or thirty years and that during this time it hardly grew. It must therefore be a slow growing plant. I say these plants are not slow growing, because if the tuber is buried, watered, fed and re-potted frequently, then a twenty centimetre tuber can be attained within twelve years.

The second kind of *Pterocactus* has spherical or oval branches and a shorter thicker stems on a tuber growing just below the surface. Plants appear under various names such as *australis*, *fischeri* and *hickenii*. The round and oval arms grow in clusters and form beautiful mats above ground. Of course there are intermediates such as *reticulatus* characterised by its very thick stem and special areoles. In my opinion this group is the better kind by far. They keep within the boundaries of their pots forming beautiful, aesthetic and structural mounds, they flower profusely and need very little yearly maintenance. I also value them very highly on the show table.

Pterocactus require bright light and plenty of direct sunshine, if they are to grow well and flower. They also need watering during the growing season. Left in shaded places and they etiolate i.e. growing long, thin and unsightly arms. One should remember that the tuber produces the arms and the arms, through photosynthesis, feed the tuber back, so helping it to grow in size and vigour. Good growth each year is vital in order to maintain a healthy tuber, which in return will throw up good enough shoots to flower. Flowers are only produced from the new yearly growth. If kept dry in the winter the plants can easily survive very low temperatures. Some eight years ago I had propagated many of them thus occupying precious space in the greenhouse. With no one showing any interest in them I had no choice but to get rid of them. May be this article will rekindle my interest in them and I will start all over again.

I am leaving the taxonomy of the species to the experts. There is plenty of literature on the genus, conveying lots of information on their country of origin (Argentina), habitat, terrain and locations.

Have fun in growing them and they in turn will award you with a cascade of growth and flowers or a mound of yellow blooms.

Costas N Papatthasiou, London.

<p>I wish to give a special thank you to the members who have sent in contributions. I made a special plea at the AGM and a number of members have made a special effort to respond. In fact I have now some material left over for the next issue, which is unusual. However, will members please not relax and think that therefore more material is not now required –the more material in hand makes it easier to put together the next issue and more material is in fact still required.</p> <p>Ed.</p>



**Fig 12 &13 *Pterocactus australis* (Weber) Backeberg.
Photographs by C. Papathanasiou.**



TEPHROCACTUS

Incl. Maihueniopsis, Puna and related genera
plus other small Opuntias



Micropuntia pygmaea Wiegand & Backeberg
Photograph by Elton Roberts.

STUDY GROUP

Vol. 17

No. 3 September 2011

SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

Subscriptions for 2011 were due on the 1st January 2011

Subscriptions and any other correspondence must be sent to the Secretary.

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May I please remind you to let me know of any changes to your address, telephone number or e-Mail address.

If you write to any Officer and expect an answer, please to include a S.A.E.

Members may advertise their “Wants” and “Surplus Plants” free in the Journal, in no more than 30 words.

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CACTACEAE SYSTEMICS INITIATIVES.

It is several years ago that David Hunt ceased to publish *Cactaceae Systemics Initiatives* and I am pleased that he is to start to issue it again on a regular basis. I am also particularly grateful that he has kindly provided free copies of the first of the new issues, No. 25, to be sent out to all TSG members. The number 25 issue will be of special interest to TSG members because it contains a new classification by David of the "cylindroid" *Opuntias* of South America plus some NCL updates of *Opuntias*. The enclosed sheet in No 25 gives information if you wish to subscribe to CSI and there are some very attractive discount offers on previously published books. Ed.

COMMENTS FROM ROYSTON HUGHES.

It is good to see Brian is contributing to the journal from his home in Bolivia. His list of favourite places contains all ones I would like to visit. Especially to the Fiambala, Chaschuil, San Francisco Pass area of Argentina.

Bill Christie was kind enough to send me some offsets off his plants from his visit to Brian with BB numbers that are of interest. BB1209 is a *Cu. boliviana* form with the smallest segments I have seen so far. They do appear to be mature segments. BB1198 is a *Cu. rossiana* that is the same form as the unusually robustly spined R.K.H.211 from B.D.H.26 that I collected. It would be nice to have some more clones of both these interesting plants. Unfortunately my R.K.H.211 was a casualty of the winter but I have two small rooted segments left.

It would appear Colin Sherrah from Australia, who once spoke at a Chilean Weekend has been going on trips with Brian. I had some of his collected seed via Harry Middleditch. The ones that germinated seem to be *Ma. camachoi*, as one would expect, from around Salar de Atacama. Also there were just 5 seeds of *Cu. echinacea*. Iliff quotes this species as a distinct seed type, having a dark brown seed with a very pale arillus ring. I had noticed this with the above 5 seeds. Then a picture by Paul Hoxey of sectioned fruit also showed it. Although the taxon seems correctly placed as a *Cumulopuntia*, I thought the seed was more like a *Maihueniopsis* seed that had lost its lenticular shape because it was so fat. I planted the 5 seeds in 2002 with no results until one germinated in 2010. It appeared to be doing well, then suddenly collapsed and died with no obvious reason. I've never had this species until I obtained a rather small R.M.F. segment from Graham Hole that struggles to grow larger.

Cu. corotilla is reputed to be halfway between a *Cu. sphaerica* and a *Cu. boliviana* with a pink-flushed white flower but mine, a J. de Vries collection, looks very close to a *Cu. sphaerica*. Paul's pictures of what he thought was *Cu. corotilla* didn't seem to match this view, nor did they look like the other halfway species *Cu. zehnteri*.

A recent article in the latest journal of the *Chileans* shows the difficulty in identifying plants around San Pedro de Atacama. I suspect it is the harshness of the terrain that gives the different species the same appearance. I would agree with a point that Paul Hoxey has made that the most arid places produce plants with smaller segments and longer spines

regardless of species. All my *Ma. camachoii*, from various collections and from seed, show a similar form of growth in cultivation. This is quite different from the various forms of *Ma. glomerata* that I grow.

Now for the information on winter losses recently asked about. Here to the north of Liverpool we seem to be sheltered from the worst of the very cold weather instead we suffer from westerly gales and the rain that they blow in. The resultant high humidity, when it does get cold, is not good for the growers of cacti. However the milder winters of the last ten or more years has meant only a layer of bubble polythene inside the greenhouses has been sufficient to protect the plants over the cold spells.

The more sustained winter cold spell of Jan/Feb 2011 caused the loss of some plants. Of the T.S.G. types of plants lost was a 10" pan of *Cu. ferocior* plus 5" and 4.5" pots of *Cumulopuntias* that included *boliviana*, *ignescens*, *ferocior* and *rossiana*. In each case it was the inner segments and roots that had suffered whilst the majority of the outer segments remained unscathed and available for rooting down. Some were taken to the T.S.G. meeting in Birmingham.

As my bubble polythene, after years of careful handling, had started to disintegrate in places I was looking round to replace it before winter. So like everyone else I was unprepared for the prolonged winter weather in Nov/Dec 2010. First came the gales that damaged the greenhouse roof. After making inadequate repairs I then had to reuse the old insulation in the hope it would protect the plants. In addition, on one bench, I was able to use the old fashion method of covering the plants with a layer of newspaper. This worked well except where condensation dripped from the roof in one place onto the newspapers undetected until it was too late.

The devastating loss of plants, due to the long period of low temperatures, was mainly of my large plants. Of the T.S.G. type of plants *Cumulopuntia* and *Austrocyllindropuntia* from Peru, Bolivia and N.W. Argentina suffered. The survival of unscathed plants was usually zero, or at most just one or two. Occasionally a few more of the *Boliviana* groups also suffered. 15 plants in 4.5" square pots were lost. Of the *Ferocior* group one 7" square pot, one 5" square pot, 3 in 4.5" square pots, 2 in 3.5" square pots, and one 2.75" square pot were lost. Of the *Sphaerica* group 6 plants in 4.5" square pots were lost. Of the *Rossiana* group 5 plants in 4.5" square pots, 6 plants in 3.5" square pots and 8 plants in 2.75" square pots were lost.

Having been disillusioned with the difficulty of getting *Au. floccosas* in cultivation to resemble those in habitat they had become somewhat neglected. Then I started them off again in a different compost but now these 8 plants in 3.5" square pots were lost. *Au. shaferi/weingartiana* from lower altitudes weren't expected to survive: 2 plants in 3.5" square pots and 6 plants in 2.75" square pots were lost. Similarly with *Au. teres*: one plant in a 4.5" square pot and one plant in a 2.75" square pot were lost. Also with *Au. vestita*: 4 plants in 2.75" square pots were lost. Also lost was *Ma. conoidea* in a 4.5" square pot and a *Tephrocactus alexanderi* in a 4" square pot.

Having related all these losses I still have material of most of them, as a plant in a 2.75" square pot or a 2" square pot or an un-rooted cutting segment, all of which came through unscathed. Of those that I lost and

don't have spares, then hopefully they may have survived in other peoples collections from material I have brought along to the T.S.G. meetings over the last few years.

The survival of these plants in small pots whilst the same plant in a larger pot was killed by the cold is surely due to its smaller mass that readily dries out and therefore hardens off the plant, in preparation for the winter.

In the southern summer (Jan/Feb/March) it is the rainy season and there can be tropical down pours. They do not fall everywhere nor do they occur in a regular pattern. However, between such downpours the sun can appear and very quickly dry up any surface moisture. During southern autumn (April/May/June) with the rains having ended the daily drying process can continue in readiness for the southern winter (July/Aug/September). The day length changes roughly from 14 hours to 10 hours over this period. The perceived wisdom is that during the winter the daylight sunshine puts enough warmth into the ground to protect the cacti over the very cold nights. It is not surprising that in cultivation in Europe we have difficulties in drying and hardening off our larger plants for our winter. We have an autumn of very short days, very little heat when the sun comes out plus high humidity. It is usual to have our plants in individual pots on a slatted bench where any extremely cold conditions can completely envelope them. Then add to this a winter coming two months earlier than expected and you have lost plants.

Most of my *Ma. camachoii* seemed to have survived intact until I checked my old KK clump in 4.5" square pots more closely. Only then was I able to see the inner parts were dead. However the outer branches of about 4 or 5 segments not only were alive but the lower segment of each one had sprouted a couple of roots up to an inch long.

I remember when Ray Allcock first visited his in-laws in Czechoslovakia he brought back tales of how collectors there got their cacti through severe winters. Those with good jobs were able to stockpile enough coal to keep their cacti warm through the winter. More conventional greenhouse owners de-potted their plants, wrapped them in newspaper and stored them in their cellars until spring. Others had greenhouses that looked like cold-frames because they were sunk into the ground to make use of the earth's natural warmth below ground.

Royston Hughes. Liverpool.

Royston has mentioned to me that he would like to replace lost material of the following: *Cu. rossiana* B/K13A, B/K13B and KG1591 and *Cu. sphaerica* R.K.H.59. Ed.

MICROPUNTIA PYGMAEA.

Some plants like what you do for them and others do not. Some are happy in about any soil mix you put them in and others rebel. For years I have been going in circles with *Micropuntia pygmaea*. I have had several kinds of soil and once in a while even had the plants in flower. With the introduction of acidic water the plants came alive. Over the years the plants



Fig. 1.
Micropuntia
pygmaea.
Above
ground
stems.
Habitat
ground level
would be at
start of
secondary
stem level.

Fig. 2. *Micropuntia pygmaea* neck/trunk.





Fig. 3. *Micropuntia pygmaea*
Above ground stems with buds



Fig. 4. *Micropuntia pygmaea*
terminal flower on a main stem.

Figs 1 – 5
Photographs by
Elton Roberts



Fig. 5. *Micropuntia pygmaea*
flower on
a secondary stem.



Fig. 6. *Tephrocactus molinensis*. Best condition clump photographed.



BB 1595.04 288
The rest were of
the calibre
shown in Figs 7 &
9.

Figs 6 – 13
photographs
by Brian Bates

Fig.7.
Note almost dead
looking segments
at base of plant.
BB 1596.04 381

Fig. 8. Flowering segments growing on top section of a plant with almost dead looking segments at base. BB 1596.04 377



Fig. 9. A similar plant in flower. Note the actual dead segments in the base of the plant. BB 1596.04 376





Fig 10. *Opuntia molinensis*. BB1595.04 273. Note black marks where segment has come off in foreground (just like in cultivation).

Fig. 11. *Opuntia sulphura*. BB 1096.07 228. Apparently a white spined clump.





Fig. 12. *Opuntia sulphurea* BB1604.06 259 Usual colour adult spines.
Fig. 13. *Opuntia sulphurea* BB1645.06 DSC4244. Young seedlings.
Note red juvenile spines.



have not enjoyed the several different soil mixes I have planted them in. They may perk up for a few months and then they seem to go into decline. There are several factors to consider in growing these plants. One, is its growing area, two, is how the plant grows, and three, the rain fall season. The growing area is quite wild desert. All the plants I found have been on low sloping hills. The elevation is from about 4,500 feet to over 6,000 feet. In places it grows where sheep have graze. Benson seemed to think that the plant has been changed and that *M. pygmaea*, is a mutant form of a plant, caused by sheep grazing on the plants for less than a hundred years. There are areas where sheep have never grazed and the plants are there, unchanged from the plants where the sheep have grazed. I have seen many plants that sheep or cattle have grazed on and they are not changed like Benson is thinking. [See, The Cactus of the United States and Canada, page 917] I have seen the plants in fairly thick scrub brush, in grassy areas with the occasional bush and in an area that some one had bulldozed the ground and made it level like a landing strip. However, there was no indication that it had ever been used for landing a plane. The area was about 12 metres wide and I do not know how long. The *Micropuntia pygmaea* were thick there, I would say from 5 to 25 plants per square metre. Quite a few plants turned out to be clusters of seedlings growing where seed pods dropped their seeds. I am going to hazard a guess and say that it was because the ground was flat that the seed pods did not roll far and the seed germinated in clusters.

As to how the plants grow, the *Micropuntia* have a large underground water storage root, these roots are carrot like in shape. They are from a few cm long in young plants to about 10 cm in older plants. In the ones that I have seen the bottom of the root is as though it was sliced off. Out of that flat bottom grew the food and water gathering roots. From the root to the surface of the soil there is a long neck or trunk like growth. It can be up to 14 cm long. That carries what ever is need from the roots up to the plant stems that are just above the soil level. The front cover shows the plant from the top of the root to plant tip. Fig. 1 shows the top of the neck and what would be the above ground growth. Actually that area above the start of the stem splitting could also be under ground: where the green stems are growing out at an angle would be about soil level in habitat. For me, the plants start showing growth in mid to late winter. The plants in habitat that I have seen are only to about 2 to 7 cm tall. The taller ones were single stems or at the most two stems. The shorter plants were several stems from the one root as in Fig. 1. Figs 2 and 3 show a different plant to Fig. 1. Both of these two plants are kept growing all year and so have more plant stems than habitat plants. In habitat the plants bloom, set seed and then appear to have gone as the stems disappear. If you go in the early spring, when the plants are in flower, you can see plants all over the place. Go later on in the summer and you will not find a single plant. Some of the stems could very well be harvested for water later on in the summer by mice or rats. So actually you could say that the stems of the plants above ground are annual and the underground roots and root stem are perennial. However, from what I understand, *Micropuntia barkleyana* keeps it's above ground stems all year long

As a possible consequence of keeping the plant in Fig. 2 growing, besides putting on the new growth on top of the older trunk, the plant has also grown another trunk out of the root top and that trunk has three stems on it. The new trunk is still semi-green but should harden off before the season is over.

The third consideration is the rain fall pattern in habitat. In the winter, starting about December, the area receives some rain. Then it goes into snow. I have heard of at least over a metre of snow on the ground and lasting sometimes for a month. The air is quite dry making the snow actually evaporate instead of melting. Usually from about mid April till even into August there is no rain. In the area where I have seen the plants, when the monsoon rains hit they are quite violent. They are thunderstorms that really throw the lightning around. There can be hail and also lots of water. Flash floods are common in the areas. I have to think that it is the absence of rain from April till about mid July that influences the plants to only grow seasonal stems. The stems are there long enough to bloom, set flowers, make seed and then are gone.

The photos on the front cover and Fig. 1 are of the same plant. The front cover photo one shows the top of the root, the root stem and what would be the above ground growth. From soil level to the tip of the bud the plant is 13 cm. From the stem split to tip of bud is 6 cm. In habitat from just above the split of the stems down would all be underground. Only 2 to 7 cm would be above ground and that is only temporary or seasonal. My tallest plant is, roots and all, 26 cm. Notice that the buds are terminal, that is they are growing out of the end of the stem. Once that stem has bloomed it will not bloom again. In habitat I saw no signs that the stems fall off, blow around and then take root. Indications were that all the plants I saw were seed grown. On the flat ground, mentioned above, there were clumps of plants that were seed grown. The seed hulls were still to be seen beside the plants. There were no rooted stems that were laying on the ground. When that stem finishes making seed, if it does, it is then to be dumped as waste. Taking this into consideration I have come to the conclusion that in cultivation my plants do not lose their stems due to the growing medium I use or what ever else I do to it, but they are just doing what has been done in habitat for eons. However, there is one thing that I did for the plants that they did not like, and that was giving them alkaline water. Also they do appear to like a mineral based soil rather than a humus based one. To grow the plant like it grows in habitat, a pot about 30 to 36 cm deep and 12 to 15 cm in diameter would be needed. That would hold the plant and allow the root to grow and thus take on needed water and nutrients. However, since I do not have pots that deep, I have the plants planted with the root neck raised above the soil in the pot.

Backeberg lists six *Micropuntia* names: *M. barkleyana* Daston, *M. brachyrhopalica* Daston (T), *M. gracilicylindrica* Wiegand & Backeberg, *M. pygmaea* Wiegand & Backeberg, *M. tuberculosirhopalica* Wiegand & Backeberg and *M. wiegandii* Backeberg. I will go along with three of them: *Micropuntia barkleyana*, *M. pygmaea* and *M. wiegandii*. If you go back and look at Fig. 1 you can see that the stems are really quite short. The

description of *M. pygmaea* is that it has short stems up to only about 2.5 cm long. Charles Glass did not recognise *M. pygmaea* but did recognise *M. gracilicylindrica*. The description of the latter plant calls for stem segments to be up to 20 cm long. Note that the stems can be up to 20 cm long but it does not say they have to be that long. The same with the stems on *M. pygmaea*, they can also be shorter than 2.5 cm. Figs. 4 and 5 are of the same main stem. The flowers are different. The terminal flower was the first flower to bloom and the flower that looks to be coming out of the side of the stem is blooming today. The stem on which the flowers are blooming is 11 cm long. However, higher up the plant from the flower the stems are much shorter. But it could still be *M. gracilicylindrica* because the stems can be to 20 cm long or they can be shorter than 2.5 cm. The first time I ran into these plants I was out with the *Sclerocactus* Study Group from Europe. They had been visiting the plants for I do not know how many years. They did not think there was any difference in *M. pygmaea* and *M. gracilicylindrica* and neither do I. The reason being is that I have several plants from central Nevada and one year they can fit the description of *M. gracilicylindrica* and the next year they can fit *M. pygmaea*. I think this is caused by the growing season, for one year they will start growing quite early before making buds. The next year they may not grow any stems until late and then they bloom on short stems. Notice that the plant in Fig. 1 has buds on it and that is on short stems. So if you did not study the plants closely you would say that the plant is *M. pygmaea*. The plant in Figs 4 and 5 you would assume to be *M. gracilicylindrica*. A few times I have changed the name back and forth until I discovered that one year they will grow long stems and another year they will grow only short stems. As I have seen the plants grow differently from year to year I have to agree that the two plants are the same species. Quite a few authors seem to think that all the *Micropuntia* are nothing but *Opuntia pulchella* although Backeberg and Glass listed some of them as different species. Still many people think they are one and the same plant. If you look under *Grusonia pulchella* in Anderson's book, *The Cactus Family*, you will find all the names of *Micropuntia* listed as synonyms under *G. pulchella*. In the NCL you will only find *pulchella* under *Corynopuntia* with no mention of any of the other *Micropuntia* at all. Glass did not think they were one and the same species. Under *Opuntia pulchella* he mentions a very large difference in the plants. That is the tuberous root. He says, "A clump-forming species arising from a glochid covered tuber 2 – 3 ¼ inch in diameter". Some years ago some one gave me two of the plants and they were nothing to fool with. The roots were thickly covered with 3/8 to ½ inch long glochids. The roots were about 8 inches long and were shaped like a parsnip. The two plants I was given were bare root and the roots were about 3 inches in diameter at the neck. I had never seen a *M. pygmaea* with glochids on the root before, but seen them only now and then at the neck. The flowers are up to 2.5 cm in diameter and they last only about half a day. Mine have opened around noon and close about five hours later. The flowers change colour. In the first hour or two the flower is a really dark colour but as it opens all the way it lightens up a bit to the colour of the flowers in Figs 4 and 5.

Elton Roberts, California.

TEPHROCACTUS MOLINENSIS (Spegazzini) Backeberg

Tephrocactus molinensis is not a common plant in cultivation. In the early 1980s I went on a journey through Belgium, Holland, Germany and Switzerland visiting private and public collections of cacti and cacti nurseries. Included on my wish list was to obtain a piece of *Tephrocactus molinensis* but I came back to the UK with that wish unfulfilled – I had not even seen a specimen. I have since then obtained several clones but then hit the difficulty of cultivation of the taxon. One sometimes sees a large pan full of a rather lush segmented *T. molinensis* at a show but normally the taxon does not appear in collections nor in comments in our TSG issues. Perhaps the reason is that other people have the same problems as me and find it difficult to cultivate. I find that segments turn black and hard, either partially or fully, whilst whole plants can dry up and my attempts to stop this by giving more water can result in loss of roots and even total rot. Having space to spare I turned to the invaluable disc of photographs of *Opuntias* in habitat taken by Brian Bates. Many of the photographs might be used to support articles by members but I doubt whether those of *T. molinensis* will be in demand. Thus there are, in this issue, several photographs of the taxon growing in habitat. It is hoped this might trigger some response from members to the apparent problems of growing the taxon and therefore some information to print on how to keep it healthy. I note that one cannot say that the plants photographed by Brian are in what could be termed good condition with dead looking segments and even some showing the black feature mentioned above. Perhaps my plants are only tending to do what happens in habitat. I did at one time have some success with cutting a segment in two down the vascular bundle and making a flat graft but I prefer not to graft. However, if that is the secret of the show plants (with a well hidden short graft stock underneath) then please let me know – I promise, in that case, not to reveal names. Ed.

OPUNTIA SULPHURA (Gillies ex) S-D

This Argentinian *Opuntia* was listed in 1830 with only the information that it has yellow flowers (according to the *Opuntia* Index by R. Croke and R. Mottram) but the NCL does give a description “Bo low shrub forming clumps...brseg oblong to obovate, 12 – 25 cm, tuberculate; spines 2-8, 3-10cm, brown or red-brown or paler; fl c. 4cm, yellow; fruit only one cm.” It would therefore appear to be possibly, with judicious pruning, of manageable size in a few greenhouses. Again I have made a selection of photographs, from Brian Bates’ library of plants he has photographed in habitat, to illustrate various facets of the species.

Ed.

The December TSG issue will contain a seed list of habitat seed collected by Brian Bates. I will be very grateful for any contributions (text and/or photographs), as soon as possible, for inclusion in the issue. Ed.



Fig 14 *Opuntia sulphurea*. BB1022.05 DSC4309 . Note old pad with grey spines, new pad with red spines and red ripe fruit.

Fig. 15. *Opuntia sulphurea*. BB1430.04 DSC3734 Runner with some rooted segments started secondary growth.



TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera
plus other small *Opuntias*



Opuntia ficus-indica PH640.06. 13-2726. Rio Rupac, Sihuas to Huacrachuco
road, Ancash, Peru. 2340m.
Photograph by Paul Hoxey.

STUDY GROUP

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No. 4 December 2011

SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

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THE 2012 TSG ANNUAL MEETING.

All preparations for the 2012 TSG meeting have been made and it will be held on Sunday 13th May 2011 at the Great Barr Ex Service Men and Women's Club, Birmingham, which is very near Junction 7 of the M6. A loose sheet inserted in this issue provides directions to the meeting place. The room will be available from 10.15 and a buffet lunch costing £5 will be provided. To help the Caterer, notification of the number of people having lunch is needed by April 27th. I would be grateful if people intending to attend will let me know by that date and whether you will have the provided buffet lunch.

The location is the same as last year and the date is chosen to avoid the meeting being held on the day before the May Bank Holiday Monday. There will be a short AGM starting at 11.00. Graham Charles will give a presentation on some new classification of *Opuntias* and Tony Roberts will give a presentation on the *Opuntias* he intends to bring to the meeting. There is no charge for attending the meeting and guests who are not members of the TSG are welcome. Please will members promote the meeting at local BCSS branches? Please bring any plants of interest or for identification. Plants for sale are also very welcome and there is no commission charge.

Ed.

BCSS NATIONAL SHOW 18TH AUGUST 2012

This event will be held at Wood Green Animal Shelter, London Road, Godmanchester, Cambs, PE29 2NH. The TSG has been invited to have a stand. Will any one who is willing to help to man the stand please contact me? Also if you intend to be there the day before, or very early in the morning of the Show, and are able to bring some plants for the display we would be very pleased to hear from you.

A. Hill.

OPUNTIOIDEAE OF PERU – AN OVERVIEW.

At the Tephrocactus Study Group Meeting on the 8th May 2011 I gave an overview to the members present of the Opuntoid genera and species that are found in Peru. Alan Hill has asked me to summarize the talk for publication in the Journal. I based my presentation around the generic classification of the New Cactus Lexicon so five Opuntoid genera are found in Peru although I added a sixth for a widespread but non-native introduction. I decided to include 2 non-native species overall because although both are introduced by man, the introductions likely occurred many centuries ago in pre-Columbian times.

The summary of the genera and species covered:

Genus.	Taxa (Native / Introduced)
<i>Opuntia</i>	3 / 1
<i>Brasiliopuntia</i>	1 / 0
<i>Tunilla</i>	1 / 0
<i>Cylindropuntia</i>	0 / 1
<i>Austrocylindropuntia</i>	4/(5?) / 0
<i>Cumulopuntia</i>	8 / 0

OPUNTIA.

The genus *Opuntia* in this work just includes the species with flat padded segments. The genus is not well represented in Peru and the majority of species are found in North America. Four species are found in Peru although one is introduced

Opuntia ficus-indica.

Opuntia ficus-indica is a domesticated species widely cultivated throughout the Americas and Peru is no exception. It is likely the species originated in Mexico. It is a large, flat padded-type *Opuntia*, which can grow into a small tree. The spination is quiet variable and plants can range from completely naked segments to having one or two short white spines. The flowers are usually yellow. The fruits of the plant are known as "Tuna" and are commonly sold in markets or at small stalls in the street. The fruits are skinned and the juicy pulp inside is eaten. *Opuntia ficus-indica* is also widely cultivated as a host plant for the Cochineal insect and I have seen whole fields given over to this cash crop. Figs. 1 & 2. In the village of La Joya, near Arequipa shops advertise for the purchase of the Cochineal insects which are then used as a red dye. The introduction of *Opuntia ficus-indica* in Peru probably occurred a very long time ago through trade between the pre-Columbian peoples of present day Peru and Mexico.

Plants are often found near villages but sometime are found in more wild areas. This probably indicates the area used to be inhabited in pre-Columbian times but that conditions are favourable enough to allow the plants to propagate themselves unaided today.

Opuntia inaequilateralis

I am following Ritter and using the name *Opuntia inaequilateralis* for a plant I found in the Marañón valley in Ancash although it is far from certain this is the right name to use. My plant (Figs 3 & 4) formed a low spreading bush plant with elongated and flattened pads. The flower was orange and the flower tube nearly naked. This plant was growing near to *Opuntia quitensis* but is clearly distinct from it. It is perhaps closer to *Opuntia pubescens* but with numerous differences such as larger and more flattened segments and a less fragile nature. Ritter used *Opuntia inaequilateralis*, a Berger name from 1905 for a similar looking plant he found in the Mantaro valley but with yellow flowers. This is also illustrated in the New Cactus Lexicon (Illus. 495.04) and is quite similar to my plant but matches Ritter by having yellow flowers. Further work is required on these Opuntias of the inter Andean valleys to see if they are all one species and if the name *Opuntia inaequilateralis* is correctly applied to them.

Opuntia pubescens

This is a small growing *Opuntia* and is another species found growing very widely in the Americas. The New Cactus Lexicon records the distribution as Bolivia, Ecuador, Guatemala, Mexico, Peru, Paraguay and Venezuela. It is likely that the distribution is natural and is a result of the very fragile nature of the plants and ease by which the segments detach and root.

Opuntia pubescens is an old name from the 1840's based on material from Mexico. The Peruvian populations have been given more recent names such as *Opuntia pestifer* and *Opuntia pascoensis* by Britton and Rose and *Opuntia infesta* by Ritter. Synonym names such as 'infesta' and 'pestifer' give a good indication of the type of plant we are dealing with here. The

species can form low spreading thickets of cylindrical or slightly flattened stems covered in sharp but barbed spines. Figs 17 & 18. Brushing past the plants invariably detaches a few segments which fix themselves to shoes or clothing. I suspect most propagation is by detached segments rooting down but occasionally the yellow flowers are seen and fruits can develop. I have only observed mature fruits once which are reddish and quite small with only two or three seeds inside.

Opuntia quitensis

This is a much more interesting species of *Opuntia* and distinct within the genus. As the name suggests the original material came from near Quito in Ecuador but the species grows as far south as Apurímac in Peru. In Peru I have only found it growing as a small bush to 50cm high but the description says it can grow to 3m tall. The flattened pads are approximately round and with widely spaced areoles. Fig. 19 The spines, up to 5 per areoles, are quite strong and grow to 8cm in length. The flowers are the most interesting feature of this species. They small to only 2.5cm in diameter and the orange petals do not open widely. Sometimes the flower is completely embedded within a normal segment and I do not know of any other species which has that character. The flowers are reported to be dioecious and either male or female. Unfortunately the one time I observed flowers in habitat I did not closely examine the flowers to check this character but the one flower I did photograph appears to be missing the stigma and style so is a male. Fig. 19. The only other species of *Opuntia* that has separate male and female flowers is *Opuntia stenopetala*. Interestingly this species also shares similar but unusual pollen characters with *Opuntia quitensis* so perhaps they are closely related species growing in widely disjunct habitats.

BRAZILOPUNTIA

This monotypic genus contains one widely distributed species found from Brazil, through Paraguay, northern Argentina, Bolivia and into Peru. Not surprisingly for a widespread plant various additions names have been erected but it is generally considered today to be one species.

Brasiliopuntia brasiliensis

This single distinct species is one of the tallest growing of all cacti and is reported to reach 20m or more in height. Fig. 22. It is not a well known plant in Peru and rarely encountered by cactus enthusiasts in that country. My encounter with this species occurred quite by accident when I was exploring a steep densely vegetated slope in a dry tropical valley in central Peru. Climbing was difficult with a lot of leaf litter covering loose rocks. I made extensive use of small trees and bushes to help pull myself up the slope until I saw in front of me a tree trunk with cactus spines (Fig 21) and I realised that I had found *Brasiliopuntia brasiliensis*. On looking up I could make out a canopy of "branches and leaves" which look remarkably like a typical tree. A fallen stem which had subsequently re-rooted allowed me to examine the segments in more detail. Fig. 20. *Brasiliopuntia brasiliensis* has two very distinct forms of growth. Firstly it grows cylindrical stems which with time become woody and form the structure of the tree. Secondly leaf-like pads form which are thin and only partially succulent. They emulate leaves in a normal plant and are deciduous. Both types of growth have widely spaced areoles and sparse spination. I observed that



Fig. 1 Cultivated *Opuntia ficus-indica* PH950A.01 21-1753. La Joya, Arequipa, 1660m.

Fig. 2 *Opuntia ficus-indica* PH950A.01 21-1754 La Joya, Arequipa, 1660m. A cultivated plant with cochineal.





Fig. 3. *Opuntia inaequilateralis* PH640.01 13-2732 Rio Rupac, Sihuas to Huacrachuco road, Ancash. 2340m

Fig. 4. *Opuntia inaequilateralis* PH640.01 13-2731. Same site





Fig 5. *T. molinensis* regular form



Fig. 8. Giant form.



Fig 6. *T. molinensis* "pearl form".

Fig 7. *T. molinensis* a small headed form



Fig. 9. Pearl form.



Fig. 10. Another small headed form.





Fig 11. Another small headed form.
 Fig.12. Glochids on lowest segments



Fig. 13. Flower ready to uncurl stamens
 Fig. 14. Flower fully open.



Fig. 15. *T. molinensis* "Giant form".



Fig.16 After plant trimmed.

Figs 5-16 photos by Elton Roberts



Fig. 17. *Opuntia pubescens* PH736.02 15-1718 Puente Pasaje, Rio Apurimac, Apurimac. 1050m

Fig 18. *Opuntia pubescens* PH736.02 15 1719. Same site





Fig. 19. *Opuntia quitensis* PH641.05 Rio Maranon, Sihuas to Huacrachuco road, Ancash, 1750m

Fig. 20. *Brasilopuntia brasiliensis* PH779.01 16-0549, West of Yurinaki, Rio Perene, Junin. 730m. A close up of trunk of a mature tree. Note the areoles.



the leaf-like pads are usually growing horizontally with a different texture on the upper and lower sides. The upper side is exposed to the sun and has a darker green colour whereas the underside is a lighter green. I find it very interesting that this plant has successfully re-evolved leaf-like structures from stems after the Opuntioideae ancestor lost them to replace them with photosynthetic stems.

To be continued.

Paul Hoxey. Cambridgeshire. (paul@hoxey.com)

RANDOM RAMBLING RUMINATIONS.

In the last issue, TSG 17 3, Royston "[Comments from Royston Hughes](#)" wrote about me travelling with COLIN Sherrah. I don't know a COLIN Sherrah only a CHRIS Sherrah. For those who know me, Chris is almost a clone of me, but 10 years younger (I'll have to count my ribs!). We travelled together twice, once for 16 days in October 2009 from Sucre to Santa Cruz via eastern Chuquisaca and once for just over 3 months. This trip was from Villazon east to Tarija and Villamontes, then north and west again through eastern Chuquisaca into Sucre, then north a very circuitous route via Aiquile, Mizque, Arani, Comarapa, Arani, Mizque, Chagarani, Tiraque, Cochabamba and Tiquirpaya to the border with Peru near Lago Titicaca then to Macusani for the photos, some of which have already been published, of *Austrocylindropuntia lagopus*, then down the main road to the Nasca (Spanish spelling) valley then through Lima north to visit various specific species, back to Lima to post seed and then south to find Islayas and Eriosyce laui.

Back to Royston's comments.

He mentions *Cumulopuntia corotilla* from Johan de Vries. *C. corotilla* is a Peruvian species and Johan has not been to Peru, so although Royston acquired the plant from Johan, it will be a Johan de Vries accession rather than collection number.

Plants that grow together sometimes look similar, it has nothing to do with harshness, which is a subjective term. At Cuchu Ingenio, *Cumulopuntia chichensis* grows with *Lobivia versicolor*, *Parodia maassii* and *Weingartia westii*, and as smallish plants they look very similar. You have to look closely to see the spines are different and thus to identify which genus you're looking at. As far as the comment goes about arid places having plants with smaller segments, I would agree that in situ they probably are smaller, but not necessarily genetically and I would expect them to grow larger in cultivation. I think longer spines are a product more of altitude, i.e. sun, than of aridity. The longest spines I ever saw on *Cumulopuntia pentlandii* (*boliviana* for the ill informed - as Britton & Rose decided priority) was at the pass between Ravelo and Oruro, which also happens to be the highest altitude population that I ever visited. I do however agree that plants around San Pedro de Atacama are not easy to identify at least the *Opuntioideae* are not easy, the other genera are not difficult, being quite distinctive such as *Oreocereus* and *Echinopsis* (*Trichocereus*) etc. As I wrote previously, it should be illegal for plants to grow without labels.

Reference the comment about the people of Czechoslovakia de-potting their plants and storing them in the cellar. I have a very good Polish friend, Tomasz (Tomek) Blaczkowski, who still uses this practice today. Also we

visited East Germany six months before the wall came down and Werner Sporbert had a sunken greenhouse. Walter Rausch's main greenhouse is partially sunken.

Micropuntia pygmaea by Elton Roberts.

I was taken by fig. 3 and how the individual stems remind me of *Austrocylindropuntia vershaffeltii*. I'll need to be convinced that *A. vershaffeltii* is a *Tephrocactus*, but more of that later.

The bulldozed landing strip is probably where the light planes from Colombia land, so would not be used every day. The density of plants might have something to do with the fact that the competing grasses etc have been eliminated, at least temporarily. Elton's description of the plants could almost be the same as *Pterocactus* in Argentina except you would describe the root as a large potato, and both are annually deciduous, at least in nature.

The weather pattern described by Elton reminded me of Sucre, except we don't get snow, just violent rain storms with plenty of thunder and lightening and the drought period also coincides. In a dry year, here, we get no rain from April until August, and a couple of years ago, this went into December. We also have floods which manifest themselves in erosion or houses washing away, even deaths. About ten or so years ago, we had a flood a little to the south, before the peaje at Yotalla, a driver tried to drive through it, and his sixteen year old daughter drowned. A painful lesson.

Tephrocactus molinensis by Alan Hill

The last few digits on the photo number are the original camera designated number, and are not part of the field number. Locality data can be obtained from Ralph Martin's field number database.

<http://ralph.cs.cf.ac.uk/Cacti/fieldno.html>

I can't ever remember seeing a "show worthy" *T. molinensis*. The species often grows sympatrically with *T. weberi*. Maybe the secret to good growing is more water than is usual for *Tephros*. Extra water should also help with ALL *Tephros* which disintegrate in cultivation.

Opuntia sulphurea by Alan Hill

This isn't strictly an Argentinian species. It is also very common in Bolivia. Fig. 12 shows the tuberculate form which to me is diagnostic of this low growing species. Fig. 15 shows the chains of cladodes; the record is something like 22 or 24 cladodes in a straight unbranched line. About 15 to 20 km west of Culpina there is a population all with white flowers. For this species you need tongs to collect the fruit because of the spines on the plant, rather than anything to do with the actual fruit, although the fruit in Fig. 14 shows the small, white glochids round the rim. It isn't a species that I usually bother to collect fruit, thinking that nobody would want it. Maybe I'm wrong. Reply privately. Brian Bates, Sucre, Bolivia cactus@cotes.net.bo

TEPHROCACTUS MOLINENSIS.

I have grown a number of clones of *Tephrocactus molinensis* over the years, most of which still survive in one state or another. All except one are on their own roots, and are grown in a gritty compost (1:1 coarse grit: JI No. 3). They get treated like most of my cacti – watered from March to September, dry for the rest of the time. Fortunately, I don't suffer much from "black segments", at least not on this species. The major problem

with the plants being dry over winter is that many segments often fall off (just like with some forms of *T. articulatus*); these mean the plants stay relatively small, but at least this provides propagation stock.

Tony Roberts

VARIABILITY IN TEPHROCACTUS MOLINENSIS

T. molinensis is a pretty and nice looking plant but it is not to be trifled with. Each areole has many hundreds of very small spines called glochids. These glochids are quite irritating especially if you get them in your clothes for you cannot see them most of the time but you sure can feel them.

In the TSG issue of September 2011 is the statement that *Tephrocactus molinensis* is not a common plant in collections. For about the last twenty years I have not really been visiting other people's collections but I remember before that about everyone had several plants. I have at least ten, none grafted. I could have a lot more than that if I had potted all the joints that fall off the plants. For me *T. molinensis* is like *T. articulatus*, every so often the plants just drop joints. Growing *T. molinensis* is not hard but at times some of the joints will for no apparent reason turn black and hard and then die. Sometimes they just get hard and dried out. I do not recall having an entire plant drying up. Nor do I remember killing a plant or rotting one off from watering. I did have several plants that would be outside taking our weather, but not the rain, but a lot of the heads would turn black. I moved them in side and got a lot less black heads. I have just changed the soil on about half of my plants for I want to see if that will help. Also I got rid of the limestone topdressing. I have seen that some of my *Opuntia* type plants do not like alkaline water, soil or topdressing. That makes me wonder what kind of soil they grow in habitat.

I would like to have a quite large pot of the plant but just when I think I am getting a nice clump it will drop joints. Unlike other *Tephrocactus*, that drop joints which root down, I have never seen a dropped *T. molinensis* joint with roots. Maybe I have not looked close enough. All other *Tephrocacti* species will root while lying on the bench or on the floor. Fig. 5 is my regular small headed *T. molinensis*, in a 15 cm pan. The heads are up to 2 cm in diameter and to 3 cm long but average smaller than that. The areoles are spaced out quite evenly on the stems. Where it looks like the areoles are real close together, that is where new stems are forming. The stems are a medium light green. The red is the glochids and the off white is wool growing in a band around the glochids. There may be some wool between the glochids but if so it is hard for me to see it on most areoles on this plant. On the right hand upper stem; the glochids with the light spot in the middle of them is not wool, but where I removed a dead head.

Fig. 6 as can be seen, looks very different from the plant in Fig.5. I do not know how long I have had this plant but it came with the name of *Tephrocactus molinensis* 'pearl form'. This *T. molinensis* is certainly different from the one in the first photo but it matches with every photo of *T. molinensis* in the TSG journal. The NCL shows one photo of *T. molinensis* and to me it looks to be the small headed form as in Fig. 5. Compare Fig. 7 with Fig.6; here we seem to have the same look to the plant but the one in Fig. 7 is more of an upright growing plant where as the plant in Fig. 6 grows mostly sideways. The plant with the 38 cm spread also

grows out sideways; otherwise it would probably be 38 cm tall. The glochids have some wool around them but if you look closely, you can see lots of wool between the glochids. That on the outside seems to want to fall out like cotton rotting in the cotton fields.

Fig. 15 is what was sold as *T. molinensis* 'Giant Form' but you will see that there really is no difference between it and the 'pearl form'. The joint sizes are to 4 cm in diameter and to 7 cm long for both forms. One thing I have noticed is that with these plants there are few of the joints turning black and dying back. They also do not drop their joints as readily as the small headed plant. I do not remember from where I obtained the 'pearl form' plant but I do remember the origin of the 'giant form'. Here in California we had a vendor who would enhance the names of plants in any way he could in order to increase his sales. I would not put it past him to have come up with both of the plant form names to increase sales. So as to compare the joints of both plants look at Fig. 8, "giant form" and Fig. 9 "pearl form". Both forms show the glochids hugging the centre of the areole. The plants in Figs 10 and 11 are different clones of my small headed plants. The plant in Fig. 11 has round stems and looks like it just fell out of bed and has not combed its hair as yet. Fig. 10 has elongated stems and its spines are different from Fig. 11 in that its glochids are not red all the way down to the plant. Around half way down the glochids, they fade from red to a yellowish color. Fig. 10 also has quite a bit longer glochids and the wool on Fig. 10 looks like it has been blown around and does not look like rotten cotton. FIG. 12 shows the glochids on the lower joints of a plant. Here the areoles are almost twice the size of the areoles on the upper segments. Also the glochids have spread out instead of clumping toward the centre.

Fig. 16 is the giant form plant shown in Fig 15 after I took off some side growing stems. I am hoping that this will help keep the plant under control and maybe I will get to see it bloom again. Before trimmed; as seen in Fig. 15, at the end of the stem nearest the edge of the page, you can see some of the dead and black growth that Alan Hill was talking about. I have just potted these plants in much larger pots and I will see if having larger pots helps. All the plants except for the 38 cm one were in quite small pots.

For the many years I have had my plants I have only seen them bloom a couple times. I have a pearl form of the plant that has a span of 38 cm and it has never bloomed. It was the "giant form" that bloomed a time or two. When I first saw the flower I thought it was strange for the filaments appeared to have a green tent or covering over them; see Fig. 13. A little later I checked the flower again and saw that the covering of filaments had opened back and allowed the filaments to stand up. When I first inspected the photograph really closely I saw that the filaments are flat spear head shaped. But now, when I increase the photo so the flower is to 36 cm across, I see that the filaments on the outer area are flat whereas the inner filaments are rounded. This is the only plant that I have seen that has several rows of filaments that are wide and seem to protect the inner filaments. The flowers are 3+ cm in diameter; petals are very light pink with a bit darker midstripe. The outer petals have a greenish midstripe. The filaments, style and stigma are green; the anthers pods are white until they open then the white disappears.

Elton Roberts. California



Both *Brasilopuntia brasiliensis* PH779.01 West of Yurinaki, Rio Perene, Junin. 730m. Fig. 21. 16-0538. A fallen stem that has rooted and produced a new shoot. Fig. 22. 16-0552. A mature specimen growing on a steep slope in woodland. Figs 1-4 & 16-22 photographs by Paul Hoxey.