

TEPHROCACTUS

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



Tunilla soehrensii at Aguas Blancas, Jujuy province, Argentina.
Photograph by Mike Partridge.

STUDY GROUP

Vol. 16

No. 1 March 2010

SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

Subscriptions for 2010 were due on the 1st January 2010

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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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THE 2010 TSG MEETING.

As stated in the December issue this will be held on Sunday 9th May 2010 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 for UK members 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 23rd. 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. Contact details are inside the front cover. 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.

The location is the same as last year. The programme will start at 11.00 am with a short businesses meeting. Andrew Gdaniec, based at Kew, will discuss the genera of the North American *Opuntias*. Paul Klaassen will be giving a talk he has specially prepared on the *Opuntias* he has seen during his travels in South America.

A. Hill.

CORRECTION REFERENCE "TYPE FORM" Page 60 Vol. 15 No. 4 Dec. 2009

Brian Bates has very kindly made a comment as follows on the information about Fig. 16 MK 100 –

"On the back cover of the December journal, you state that *M. darwinii* "type form" is therefore collected at Port Desire. This is not true. The "type form" looks like the typical plants of the species and nothing more. I suspect it is of unknown habitat origin. Had Michael Kiesling said "From the type locality" you would have been correct.

I am very grateful to Brian for the information and always welcome corrections. I did ponder about the meaning of the term and obviously came up with the wrong interpretation that it meant from the same site as the type.

Ed.

<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?</p> <p>Ed.</p>

TUNILLA

This article is again drawn from the Willy Smith cactus tour to Argentina and Chile which I enjoyed in November 2008 and will this time will cover the species of *Tunilla* we encountered.

I have a fondness for these plants especially the ones which make fairly neat clumps and I grow a selection of them. The plants I grow are labeled *Tunilla corrugata*, *Tunilla erectoclada*, *Tunilla microdisca*, *Tunilla soehrensii*, and *Tunilla tilcarensis* as well as a selection of others labeled *Tunilla* 'Sp.' to cover those which have arrived unlabelled, have never flowered and will probably remain unidentified. I was quite interested to

see how they would appear in habitat and the promised list of plants to be seen on the trip included four of the above.

We were fortunate enough to see the plants at several disparate locations and in differing habitats as well as in different stages of their growth cycle ranging from plants at rest (and looking very sorry for themselves) to plants actively growing and eventually in flower. They were seen on steep rocky hillsides, amongst small shrubs and grasses, on the more rolling grassy hillsides of the Puna but always at higher altitudes.

The plants are described in the date order we saw them and where the plant was not identified I have left them as *Tunilla* sp. I would be very interested if other members of the TSG group are able to suggest names for these – and indeed if they disagree with any of the names allocated to the plants.

The first plants we saw were on day three of the tour on a mine road which leads north out of Famatina in La Rioja province, Argentina. We negotiated this dirt road for some miles out of the town, crossed an almost dry river bed strewn with moderately sized boulders (no mean feat in a mini bus – 10/10 for the driver) and toiled up the road on the far side until Willy called a halt on top of a narrow ridge. We were at around 2,200m here and the scenery was spectacular with steep hillsides covered with low thorny scrub and tufts of coarse grass. (Fig. 1)

The *Tunilla* which we saw here were introduced to us as *T. corrugata*. (Fig. 2). They were very desiccated with numerous dead and detached segments and few signs of new growth, flowers or seed pods. They grew in association with *Denmoza rhodacantha* and *Soehrensia formosa* which, having much larger bodies, were coping with the lack of rain far better than were the *Tunilla*. We searched the area for other plants and eventually found a few small clumps of *Tephrocactus weberi* which were showing some buds but they were not in good condition and also failed to inspire much enthusiasm amongst the group.

There were no *Tunilla* to be seen on our excursion into Chile and it was not until day nine when we crossed back over the Andes into Argentina and began to drop down the eastern foothills into Jujuy province that we encountered more of these plants. We were some 350 miles further North than the first location where we had seen them and somewhat higher in elevation but the landscape was similar overall.

The first stop this day was at a location Willy referred to as 'Aguas Blancas' – (a name which seemed to crop up regularly) and the *Tunilla* species we encountered was not one of the listed plants for this location.

The hillside we explored was steep and strewn with rocks of varying size and covered for the most part by low growing thorny shrubs. (Fig. 3). The *Tunilla* grew alongside *Maihueniopsis boliviana*, *Soehrensia formosa* and some unknown *Lobivia*. They were all very well spined plants and quite plump but there were no plants in flower nor any sign of seed pods (Fig. 4). *Tunilla soehrensii* was proposed as a name for these plants (Front cover).

An hour later and slightly lower down the mountainside we stopped again at Cuesta de Lipan. This is a very spectacular section of road with numerous hairpin bends and very steeply sloping hillsides (Fig. 5). We walked out across a ridge covered with tufts of yellow grass, small boulders and the occasional small shrub. The *Tunillas* here had quite

differently coloured spines than the earlier plants, these having a reddish colour when young and fading to almost white when mature (Fig. 6). There were a variety of other cacti dotted across the hillside namely; *Oreocereus trollii*, *Soehrensia formosa*, *Lobivia marsoneri* and *Maihueniopsis boliviana*. There was a further gap in the sighting of *Tunillas* until day Twelve when we worked our way South and West from Salta back up into the mountains heading towards Cachi. The scenery was as spectacular ascending as it had been descending three days earlier. We were back up to around 3,400m here and the terrain was a series of low undulating hills (Fig 7). It was cloudy and cold where we stopped and the vegetation was composed of grasses and lichens reflecting the damper atmosphere.

The plants were unidentified and remain as *Tunilla* sp. in my notes (Fig, 8). They grew alongside *Maihueniopsis boliviana*, *Rebutia nigricans*, and *Lobivia haematacantha* v. *kuehnrchii*. Large sprawling clumps of *Austrocylindropuntia verschaaffeltii* were also in evidence – showing the same tendency to shed segments that they do in cultivation.

We progressed across the plain under an increasingly heavy sky and eventually stopped at the viewing point at Payogasta and wandered down the hillside to view a varied selection of plants including *Trichocereus pasacana*, *Tephrocactus weberi*, *Opuntia sulphurea*, *Gymnocalycium spegazzinii* and large clumps of what was suggested as *Tunilla erectoclada* (Fig 9).

We then spent a couple of days heading back to Salta not seeing any *Tunilla* and I assumed that there were not going to be any further opportunities to view them. However on the last day of the trip we drove west out of Salta along route 51 and back up onto the Puna towards Inca Huasi (another one). At a height of around 3,500m beside a cold clear stream (Fig. 10) we found a very well spined *Tunilla* and this time with flowers (Fig. 11). The other members of the group showed little interest but to me this was a wonderful find and having found one I walked up the rocky hillside and soon found several more. They were growing with *Trichocereus pasacana* and a very long spined *Lobiva*. *Tunilla tilcarensis* was put forward as the name of these plants.

I collected seed at a couple of locations and to my surprise they germinated quite rapidly and grew away well to look absolutely nothing like their parents. Having not succeeded in germinating them before I am assuming that the mature spination and segment shape will come with age but the seedlings at present are fairly cylindrical and covered with a short 'down' of spines.

In conclusion I will have to finish with the observation that if the *Tunillas* are difficult to identify in cultivation they are doubly difficult in habitat. There seems to be a very wide range of spine length and colouration amongst plants which are probably the same species and I would not be 100% certain of most of the plants we saw. Hindsight being a wonderful thing I wished I had brought full descriptions of the species with me to act as a guide but I am not sure it would have really helped – especially with the desiccated plants where the true shape of the segments was lost under a dense covering of spines.

M. Partridge. Forest Hill, London.



Fig. 1. North of Famatina in La Rioja province. Argentina. Approx. 2,200m.

Fig. 2. *Tunilla corrugata* at above location.

Photographs Figs 1 to 11 by Mike Partridge.





Fig. 3. Hillside at Aguas Blancas. Jujuy province. Argentina

Fig. 4. *Tunilla soehrensii* at above location





Fig.5. Cuesta de Lipan
Fig.6. *Tunilla* sp. at above location.





Fig 7. South West from Salta towards Cachi. Approx. 3,400 m
Fig. 8 *Tunilla* sp. at above location





Fig.9. *Tunilla erectoclada* at Payogasta .

Fig.10. Near route 51 west of Salta towards Inca Huasi. 3,500m altitude.





Fig. 11. *Tunilla tilcarensis* at Fig. 10 location.

Photos Fig 1/11 by Mike. Partridge. Fig. 12 by Ray Weeks.

Fig.12. Large fly on *Austrocylindropuntia pachypus*. Note black mould.



UNUSUAL GROWTH ON AUSTROCYLINDROPUNTIA CLAVARIOIDES
(OR SHOULD I CALL THEM "PUNA"?)

The question of finger-like growths (Page 59 last TSG issue) on this taxon has often been raised before and I believe that it is a result of plants being grafted and so the plants are pushed far too much that way! I have grown these plants for quite some years and no elongated finger-like growth has appeared on plants grown on their own roots. My oldest plant on its own roots is in a 25 inch x 30inch deep pot, flowers profusely every year and is right up against the glass in my greenhouse. The only time I have seen the finger-like growths is when I grafted a plant to produce more growth for cuttings. Most plants in shows are usually grafted and show this odd growth phenomenon. Now I never graft these plants but grow them from cuttings. They root very easily and always have only normal growth. One thing to remember with *A. clavarioides* is that it needs a deep pot. It does not matter how deep the pot is(it can never be too deep) because there is a very thin long threadlike root with a potato-like root-ball at the bottom of the pot- something that is often overlooked by novices. In habitat plants are often reported with this tuber 2.5 to 3 feet down in the ground. *Maihueiopsis* and *Cumulopuntia* also require deep pots to accommodate the taproot.
Rene Geissler. Slimbridge.

Rene is correct that the question of the reason for the finger-like growth has been mentioned before in TSG issues and grafting has been mentioned as a cause. Gilmer & Thomas (5) state that plants on their own roots seldom show such growth. What intrigued me about Elton's article were his illustrations of the way the cuttings developed, with potential finger like growth being apparently absorbed back into the normal growth. Elton also drew attention to the possibility of the lack of an obvious growing point on the segment causing the eruption of the finger-like growth. In the last issue I very briefly commented on the difference of the plants in cultivation compared to habitat hoping to have information sent in on the morphology. I have also recently re-read/read articles on *P. clavarioides*.

R. Kiesling (1) in an in depth article states that in habitat there is a tuber with some roots growing down but some grow upward. The roots are contractile which means that in the dry season the roots contract, pulling the top of the plant further down into the "soil". This movement up and down helps to form a neck above the tubers. R. Kiesling defines the neck as "A specialized underground stem with apical and lateral growing points from which the aerial stems are produced yearly". Each of the latter produce a disc shaped body that appears on the soil surface. The surface of the body extends by growing outwards at the edges. In the dry season the stems withdraw into the soil causing the single segment on each to break away. Although a few of the segments might root the vast majority die. Plants in habitat produce only a few heads which sit closely to the ground. Gilmer & Thomas (5) report almost all plants they found had 2-5 heads and note the shedding of the heads, similar to the caudex *Pterocacti*, allows new growth to develop whilst maintaining a small plant to face the elements. No finger-like growth was seen in habitat.

Growing conditions in cultivation obviously contrast greatly with that in habitat. David Whiteley (3) has drawn attention to Plate 23 in Backeberg's

Cactus Lexicon which clearly shows the neck. David, however, points out that because we re-plant the bodies of our cultivated plants at the same depth there is not the same chance for a neck to develop on cultivated plants as would be with the shifting soil conditions in habitat where the plants can be completely buried and have to grow through the new overlaying soil.

Although we rest our plants they do not become so dehydrated as to cause the initial segment to die off each year. Our plants are not deciduous as in habitat. Thus each year in cultivation the growth takes place on the previous year's segment (whereas in habitat there would be only a single new head to grow at ground level at the top of an aerial stem). The previous year's cultivated segment is therefore encouraged into growth. Some growth might arise from the edges of the top of the segment, where the most active growth took place the previous year, whilst some cells on the surface might start to send up shoots. It is therefore at this stage that a cultivated plant segment is encouraged to develop in a way that would not happen in the wild. Some of the new growth might result in the "natural" conical segments but many others will be finger-like shoots. In R. Kiesling's article (1) he suggests that the thin cylindrical growth is an adaption of what happens with stems growing underground in the field before the normal growth appears at the apex when the soil surface is reached. What ever the cause the result is not natural habitat behaviour. Now if one gives a boost in cultivation to the conical segment (either through extra nutrient to the roots or grafting) then the unnatural forces acting on the conical segment will be even greater and one should not be surprised by unnatural (in habitat) results. It should be mentioned at this point that there are various types of "finger-like" growth. The common one is a single upright. Multiple uprights can develop with sometimes a growth arising which looks like a hand with fingers on it. I suggest the latter is just a more grotesque result of the unnatural growing forces on the plant.

R. Kiesling (1) describes the surface of the habitat (2300-3000 metres above sea level) as "desert paving"- a carpet of pebbles. Underneath is the "real soil - mixtures of very thin soil (clay) plus a thicker material (sand) plus pebbles and stones." Noon day temperatures can reach 30 degrees C or more, nights are cool (not more than 10 degrees C in summer) and several degrees below freezing in winter. There are strong winds nearly every day in the afternoon with irregular scarce summer rain and a little snow in winter (average of 100 – 300mm total precipitation). This should help indicate the type of growing conditions for cultivation.

R. Kiesling (1) stated that each of us needs to cultivate according to our own growing conditions: light, temperature and its variations. However he recommends well drained compost, winter rest and as much light as possible, although in habitat the plants grow on slopes and therefore are not exposed to full sun all day long. He suggests submerging pots in sand on a bench will help to control the soil temperature whilst giving the plants much sunlight. D. Brewerton (2) stated he used "a standard open compost, plenty of water May-September, some fertilizer once a month, and a sunny position" resulting in the species thriving and flowering. He agreed grafted plants do better and flower sooner. However he made no reference to the appearance of the plants. Rene Geissler (4) reported that his first cutting

rooted in about three weeks but D. Whiteley (3) has pointed out that, as most tuberous rooted species tend to make little growth at first until quite a sizable tuber has been formed, people should not be disappointed if initial growth appears slow. Brian Scott has sent comments and a photograph (Fig. 13). He says that the latter illustrates plants grown from four well shaped heads he took off a grafted plant, which also had finger growth, three years ago. Each rooted head has offset but disappointingly all have produced some finger like growth. The plants are growing in his normal compost mix of 50% John Innes soil based compost and 50% grit. He feeds with Champak 8 at half strength and keeps the plants on a top shelf. The plants are only in 3" deep pots and Brian wonders if this is restricting root development and therefore having some effect on the top growth. Finally I have to report that early last year I repotted four plants I have grown hard for several years on their own roots in small pots. They all had some finger like growth. They responded to deeper larger pots, new compost, top shelf and water. I recently examined them closely and found that a plant at the back of the shelf has produced a seven fingered hand plus a thumb (Fig 14), close to the glass. It is clear that whilst grafting is most likely to boost a plant's growth, which will include finger growth, the same effect can be produced on plants growing on their own roots. I suggest that Rene's experience of plants development on their own roots is due to his expertise as a grower rather than the potential within a cultivated plant, on its own roots, to produce unusual growth or not. In a recent conversation about the contents of this article Rene stressed the need for a deep pot. This enables the tuber to grow more naturally and also helps to keep the tuber cooler.

Bibliography.

1. Kiesling R. Cactus and Succ. Journal (US). Vol.75 (2003) No. 3. p98-106.
2. Brewerton D. BCSJ Vol 10 (2) 1992 p41- 42.
3. Whiteley D. BCSJ Vol 10 (3) 1992 p12. & Vol 11 (2) 1993 p63.
4. Geissler R. BCSJ Vol12 (3) 1994 p121.
5. Gilmer K & Thomas H. Kakteen und andere Sukkulente 51 (11) 2000 p. 281-284. I am deeply indebted to Rene Geissler for translating for me this article.

A. Hill. Sheffield

FLYING VISITORS AND NECTAR.

When I started growing cacti seriously I noticed small flies in the greenhouse. I discovered that what I was seeing were sciarid flies. The soilless peat based compost, that I was advised to use, attracted them because they could easily lay their eggs in pots of seedlings (especially the rarer species) and the resultant larvae thrived on the seedlings and any weak plant. I do not know what the adult flies fed upon.

I knew that bees collected nectar so bees I saw busy wandering from plant to plant were searching for flowers and would help the production of seed. I mentally classified wasps' intentions depending on the season of the year. Early in the year there were a few large individuals which I thought were queens looking for a site to prepare a nest. Hence I made every effort to kill them as I did not want wasps' nests in the greenhouse. Later on in the year "workers" appeared and were left alone (although I did not try to understand what they were doing) but I reverted to killing off the wasps in autumn to avoid any overwintering in the greenhouse. I have recently

found out that after the queen cells have been produced in late summer the colony cohesion breaks down, the worker wasps become disorientated and leave the nest. These wasps are those most likely to sting without provocation although they are doomed to soon die.

I also noticed large flies, I know as “bluebottles”, flying from plant to plant. This had me puzzled as I could not understand why these flies worked along the benches going from plant to plant (Fig. 12) – what was the attraction? I found out the answer at a Cactus Explorers’ Weekend when extra floral nectaries were mentioned.

It is common for plants to produce nectar to attract insects to the flowers and thus in the process carry out pollination. However, more than 2,000 plant species in more than 64 families have nectar producing glands away from the flowers. These are the extra floral nectaries and can be based on various parts of a plant. Hoyas have them on the leaves – hence my mistake in thinking that the nectar I tried to clean off the leaves had dropped off the flowers. The size and location of the glands vary with different plant taxa and in cacti the glands are usually located in the tubercle grooves or in the axils. The extra floral nectary in cacti is sometime called the areolar gland. The gland secretion of the sweet viscous juice can accumulate in locations away from the extra floral nectary. There are several hypotheses for the reason for the production of the extra nectar: to help maintain the balance of waters and sugars within the plant and/or attract ants which will “defend” the plant against damage by predators and carry off seed thus aiding distribution. Unfortunately fungus thrives on the sticky material. Thus if bees, wasps and flies are visiting the plants and consuming the nectar the insects presumably are helping the grower to keep the plants clean. To help avoid black mould the advice is to spray the plants with water. However, this is not the fine mist which is sometimes used to provide moisture. It is to minimize the accumulation of the nectar and thus will need a stronger flow of water to wash off the nectar. Plenty of ventilation for the plants is also beneficial. I now think that I have been too harsh, in the past, on wasps because they also eat small insects (i.e. they are carnivores with a sweet tooth) although I do not know if their diet actually includes mealy bug and red spider. Although the insects mentioned can be welcome visitors it will be for the grower to decide if the insects’ nests inside the greenhouse are acceptable.

Not all species in a plant genus have the extra floral nectaries. Years ago I grew *Cleistocacti*. One batch of seed I raised was *Cleistocactus laniceps*. There was some discussion as to whether my seedlings were that particular species. A well known grower asked me if the plants suffered from sticky material on the spines. On this being confirmed he in turn confirmed that the plants were *C. laniceps* as, it appeared, this was the only *Cleistocactus* to have the feature. This therefore leads to a study of our special interest plants: do members find particular *Opuntia* species have the feature whilst others lack it? Lists will be very welcome.

Via Internet Google “Floral nectaries”:

Dictionary of botanic terminology index of names.

Edis. University of Florida.

Hutchinson encyclopedia.

A. Hill. Sheffield.



Fig. 13. *Puna clavarioides* on own roots all showing finger-like growth. Photograph by Brian Scott.



Fig. 14. *Puna clavarioides* on own roots after a year growing in new compost and treated far better than previously. Now $2\frac{3}{4}$ inch pot, 3 inch deep. Many years ago had been originally a finger cutting. The original finger had elongated to form the present "stem". The top of the "stem" had died back and was removed when repotted last year.



Two new normal growth plus "a right hand with seven fingers and a thumb". Cupped palm shown in top photograph. Back of hand shown in bottom photograph. One can understand why this type of plant was classified as "monstrous" or "cristate" and even at one time as a separate variety:

Austrocylindropuntia clavarioides v. *ruiz-lealii* (Castell.) Backbg. See D. Whiteley BCSJ Vol 10 (2) 1992. Photographs by A. Hill

TEPHROCACTUS

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



Maihueniopsis darwinii SAR 3991 at Meseta de Somuncara, Patagonia,
Argentina.

Photograph by E. & N. Sarnes.

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REPORT ON THE TSG MEETING IN BIRMINGHAM ON SUNDAY 9TH MAY

The reports in the short AGM showed that the group continued to be successful. However, as Chairman/ Editor I announced that whilst I was willing to continue to serve as Chairman I felt that it was time, after twelve years, to step down as Editor. Advancing age and deteriorating health mean that it would be better to step down now, whilst being still able to help the new Editor if required. The present Assistant Editor is prepared to continue and the retiring Editor is willing to continue to oversee printing and distribution if required. An appeal was therefore made for someone to come forward as a volunteer for the position and I repeat that request now.

The two talks were solidly *Opuntia* based with superb illustrations and informative detail. The talks were enhanced by interaction between the audience and the speakers which is far better, at such a meeting, than having a passive audience.

Again it was very pleasing to see the support of attendance from members who had attended previous meetings at the venue plus some extra members and non-member visitors.

I wish to thank Alan James for all the work he did in preparation for the meeting. I also thank the speakers for their interesting and very informative presentations. Members and their guests who attended are also thanked. Finally I thank the Officers of the TSG for the work that they have done for the group over the year and thank all those members who have contributed to the Journal.

The venue has been booked again for a TSG meeting on Sunday 8th May 2011.

Alan Hill. Chairman.

ROGER MORETON.

I am very sorry to inform you of the death of Roger several weeks ago. He was an early member of the TSG and has been a very strong supporter with contributions to the issues and attendance at events. He also acted as our seed seller.

TUNILLA OR TEPHROCACTUS?

I obtained this plant as "*Tephrocactus* sp. collected Vebruda del Toro Mendoza, Gonjian Argentina". I am not at all convinced that it is a *Tephrocactus* but with some of the things the NCL has done like put *Puna bonnieae* and *Maihueiniopsis nigrispina* under *Tephrocactus*, who knows what they would do with this plant. I checked out the description of *Tunilla microdisca* but the plant does not match or come close to matching that plant. If you look at Figs 1, 3 & 4 you can see that the segments are not micro sized discs. They are all kind of cylindrical with maybe one here and there showing a bit of maybe going flattish. I think that is from kind of

drying out a bit from ten or more days of temperatures or over 100 degrees F. To put it straight as I can the segments are a pear shape. I mention *T. microdisca* because the NCL shows a photo (Page 482) of that plant with a flower. Its flower is some what like the flower on my plant but still way different in color and size. My plant has segments no longer than 2 cm and they are 7 to 10 mm in diameter. That is 1 cm or less in cross section. The areoles are in spirals around the segments. The areoles have bicolor wool with the wool closest to the plant being light tan to tan while the wool away from the body is dark chocolate. Some areoles seem to lose some wool while others really fluff it up. In Fig. 3 you can see several areoles that are really throwing the fluffy wool. Just as not all segments have the really powder puff wool, not all the segments have the heavy duty spines. All the segments have spines at the areoles and on the young segments they are fine and about no longer than 8 mm. There are several different sizes of spines. The medium size spines grow out and then bend toward the bottom of the segment. The small spines that are 2 to 5 mm are like a starburst. On the young segments there are up to 10 spines that I can count. On the older segments and those with the powder puff, the number of spines has more than doubled and there are as many as 24 that I can count. Several of the areoles have what look like a central spine that is 2 cm long. All spines start out almost black or black and in age they lighten to ash gray. On the young segments are leaves that cup tight down over the wool but the spines flare out from all around it. The leaf is a very dark purple and it looks as if not all areoles have a leaf. The skin of the segments reminds me of that on some *C. sphaerica*, in that it is rough looking and seems to have a spraying of wax-like matter on them.

The flower, Fig 4, is exactly 3 cm in diameter. Notice that the some of the outer petals have a touch of red at the tip. Other wise the petals are translucent yellow. It is the overlapping of the petals and the yellow of the filaments and style that give the more solid yellow look to the middle of the flower. The anthers that are just opening, or that have not opened quite yet, are yellow. Once the anthers open all the way the pollen seems to pop like popcorn and is then white or looks that white compared to the yellow of the rest of the flower. To that add that dark green of the stigma and what a beautiful flower. I have the plants in my regular soil mix. I also give the plants a bit of a drink in mid winter. The plants seem to go dormant in the heat of our summers which maybe shows up more on these tiny stem segments a lot more than it does on segments of much larger *Opuntia* plants. In Fig. 3 on one of the segments there was a new flower stating to emerge or grow but the plant put it on hold while we had the triple digit temperature days and the very warm nights. Even though this plant comes from a high elevation it seems to do best in areas with hot summers if given light shade.

Elton Roberts, California

Does anyone else possess this plant? I think that I posses it but the label that came with my plant from Graham Charles in 1993 states "*Tephrocactus*. Quebrada Del Toro Mordon. Collected Gonjian. Via Woody Minich". I have often looked at this plant and wondered as to its identity. In my opinion it is definitely not a *Tephrocactus* sensu Backeberg and

therefore, from its South American origin, it would appear to be classified as a *Tunilla corrugata* sp. However, due to the size of its segments and general appearance it appears different than any *T. corrugata* sp. that I have seen. The plant can look very attractive as a miniature with tight red buds turning into the yellow flowers. However, I find it difficult to grow as segments die back or fall off. My main plant (in a cold frame) has partly disintegrated this last winter although that might be partly due to some moisture in the soil due to ingress of rain. My two pots of the plant in a greenhouse are at the stage where any other pots would be thrown away. Please can anyone give more information on this plant either on cultivation or origin? I cannot find any reference to a Quebrada Del Toro Mordon although there is a Quebrada Del Toro near Salta. Elton's label mentions Mendoza which is relatively far from Salta. Mordon and Mendoza could look similar on a faded label. Is "Vebruda" a word, in some language, that translates as Quebrada?

A. Hill, Sheffield

CHIVY, COLCA CANYON AND CUMULOPUNTIA SPHAERICA.

When I was in Arequipa in 1986 there wasn't a road beyond Yura, following the railway line around the left hand side of Chachani, which has now allowed Paul Hoxey to visit Pampa de Arrieros. My trip to Chivay and the Grand Canyon of Colca followed a road around the right hand side of Chachani between it and El Misti. At Pampa de Canahuas just beyond Chachani I found R.K.H. 128 a *Cumulopuntia boliviana* form that formed spherical clumps some 2ft in diameter. These spherical clumps that arose out of the grey, dusty, volcanic ash soil on the slopes to the side of the pampa were unlike those seen before. The *Cumulopuntia boliviana* forms around Puno and Sillustani were all low-hemispherical mounds or mat-like hummocks that fitted the *C. dactylifera* description. As these plants on the right hand flank of Chachani at 4100 to 4200 metres were so close to Sumbay, the type-habitat of *C. ignescens* I assumed that they were that species. With the rising sun behind the upwards and outward directed spines, of yellow to red, they did light up in a fire-like glow. It may seem fanciful to see them as fires erupting out of a volcano but they do grow in volcanic ash on the slopes of Volcano Chachani.

Pressing on from there we climbed up above the 4900 metres contour for a short time before descending towards the Rio Colca valley. At some point we came out of the higher altitude areas to see the valley laid out below. At a suitable point on the zig-zag descent a lookout had been built for the tourists to admire and photograph the views. Chivay, at 3500 metres and upstream, was mostly hidden by a mountain to our right. Some of the villages and the cultivated land around them downstream could be seen ahead and to our left. It was on stepping outside the area of the lookout that I found R.K.H.129. There were just two plants near together (probably the same clone) with large spineless segments and lots of glochids that I considered to be *mistiensis* forms of *Cumulopuntia boliviana*. Two of Alan Craig's plants, collected from East of Arequipa, are spineless and belong in this group. We continued on down to the floor of the valley and along it towards the Grand Canyon of Colca and the Cruz de Condor lookout above it at 4000 metres. Along the road which undulates between 3200 and 3400

metres we made a stop to observe Inca tombs. The land to our right was relatively level and cultivated towards the river whilst on our left were steep slopes with near vertical cliffs beyond them. On these slopes grew a mixture of head high, and a little taller, *Trichocereus* and *Corryocactus* encrusted with *Tillandsia*. Also I found, at the base of these cacti, a number of clumps of *Cumulopuntia sphaerica*. Unexpected as this was, it was a bigger surprise to find a couple of these plants growing near to the Cruz de Condor lookout (R.K.H.133) although admittedly they were partly sheltered in their growing position.

It has always been difficult to sort out the old *Tephrocactus* plant group with so little material with provenance and so much material incorrectly named or habitats wrongly stated. Paul Hoxey has had the privilege of visiting many of those places other cactophiles have not managed to reach and his *Cumulopuntia sphaerica* finds make interesting reading. All the *Cumulopuntia sphaerica* I saw and collected, except for the Colca Canyon ones, were found on the landward edge of the coastal desert.

Chosica/St Eulalia.	900/1100 metres. November 1980/81.
Puerto Uchumayo, Arequipa.	2300 m. Nov. 1980. April 1986. R.K.H. 59 & 126
Torata, Moquegua.	2300 metres. November 1981. R.K.H.85.
Yura.	2590 metres. April 1986. R.K.H.138.
Tinajas Canyon/Chillon Valley.	700 metres. April 1986.

Extracts from my notes, at the time, on this list of sightings are as follows:
Santa Eulalia. Segments were spherical to ovoid $\frac{1}{4}$ " to 2" diameter very variable in size and shape, spination almost absent to 1" long often pointing upwards and outwards from the upper half of the segment.

Chosica 1980. Similar to the above, but segments spherical with spines all over twisted and flexible. 1986. Clumps to 15" across, outer segments to 1 $\frac{5}{8}$ ", inner segments to 2 $\frac{1}{2}$ " diameter, very spherical with the twisted spines I'd seen in 1980. Across on the other side of the gully the plants had straight spines.

Torata. Segments were compact and wrinkled (very dehydrated) $1\frac{1}{4}$ " in diameter 2" long. Red/brown spines to $1\frac{1}{4}$ " long were all over each segment.

Puerto Uchumayo 1980. Very dehydrated clumps of 1" diameter segments wrinkled with 1" long spines radiating in all directions. 1986. The very spiny segments were both spherical and ovoid about $1\frac{1}{2}$ " diameter with some ovoid ones to 2" long. A couple of plants were found with much larger segments. Most clumps were rather open with segments forming short branches perhaps due to the arid conditions.

Yura. The plants here littered the ground not so much as clumps, but the more open lax segments tended to form small stem or branches one above the other and seemed the same all over the area. The size of the segments varied a great deal as did the shape of the segments although most seemed spherical.

Rio Chillon valley. Here the plants seemed to be everywhere as small to large clumps with small to large segments. The segments could vary from ovoid to spherical where the length may be twice the diameter. Although the spination was open the glochids were denser and longer which were



Fig. 1. "*Tephrocactus* sp. Collected Vebruda del Toro Mendoza, Gonjian, Argentina". Photograph by E. Roberts.

Fig. 2. "*Tephrocactus*. Quebrada Del Toro Mordon. Collected Gonjian. Via Woody Minich". Photo by A. Hill.





Figs. 3 &4. "*Tephrocactus* sp. Collected Vebruda del Toro Mendoza, Gonjian Argentina". Photographs by E. Roberts.





Fig. 5. *Maihueniopsis darwinii*. SAR4113 at Puerto Deseado, Patagonia,
Fig. 6. *Maihueniopsis darwinii* SAR 4071 east of Jaramillo, Patagonia





**Fig.7 *Maihueniopsis darwinii* SAR 4121 South of Puerto Deseado, Patagonia.
Figs 5 – 7 Photographs by E. & N.Sarnes.**

**Fig.8. *Mihueniopsis pentlandii* (Salm-Dyck) Kiesling. IGR 2903.
Yavi. Jujuy Province. Photograph by I. Robinson.**



effective in hiding all but the briefest of glimpses of the grey/green body and almost impossible to handle.

Tinajas Canyon, These were rather similar to those in the Rio Chillon valley. Two other of my plants relative to discussion on the *sphaerica* group are *Cumulopuntia dimorpha* and *Cumulopuntia zehnderi*. My ISI *Cumulopuntia dimorpha* came from a gentleman in Wales who grew it on a shelf near to the glass in a small greenhouse. It had produced 4 or 5 segments that were long and cylindrical end to end, just like a string of blue sausages lying along the shelf. My plant grows well but with large ovoid segments. I have always thought of my *Cumulopuntia zehnderi* being halfway between the *sphaerica* group of plants and the *boliviana* group of plants.

Getting back to the Colca valley . Between Chivay and the Colca Canyon it is obviously very fertile considering there are eight sizable villages supported along both sides of the river. It is also surrounded on each side by mountains that reach well above 5000 metres altitude. During the summer rainy season, the growing season for our plants, any excessive heat from the sun will be tempered by the cloud cover in the approximate 14 hours daylight. In the winter dry season we can assume there is enough heat from the sun absorbed into the surrounding rocks during the 10 hours daylight to help the plants survive the cold nights. In Huancayo, of a similar altitude but more open valley, I was told the rare frosts occur in the spring because in the winter it is so dry there is not enough atmospheric moisture to form frost. Also in the Colca valley the columnar cacti are covered in *Tillandsia*. This may indicate there could be a lot more atmospheric moisture available outside of the rainy season than one might expect. Finally we were delayed in Chivay for an hour while the driver tried to find petrol to get us back to Arequipa. This meant we left as it went dark. Then as we crossed the high altitude section we passed through a snow storm. Obviously a rare event as it was the talk of Arequipa next day.

Royston Hughes, Liverpool.

CULTIVATION QUESTIONS.

Several cultivation questions have been raise in the December issue (Vol. 15 No. 4 page 58) and also in many previous issues that were apparently not answered. I have a feeling it is because we do not have all the facts. It is sometimes difficult to understand why plants react to new surroundings, new potting medium, watering regimes and many other sometimes obscure factors.

I will take Roger Moreton's query first. Roger does not say what potting medium he used before the plants were handed over to the care of the Winterbourne Gardens nor the conditions the plants enjoyed with Roger. We do not know what potting medium Roger used, but I believe he grew them fairly hard in garden frames so we have a clue! I also do not know the make up of the Petersfield Professional compost and what nutrients it contains. Nor do we know the size of pots they came out of and the ones they were re-potted into or the real condition of the Winterbourne Gardens, including ventilation.

Older plants do react to new conditions in various ways. Knowing Botanical Gardens they are usually quite lofty, hot and humid. Not knowing the Petersfield compost I would assume that it contains all the usual nutrients as in J13 without peat. When re-potting plants as these I would not remove too much compost and would plant them into generous sized pots, deep enough to accommodate the tap root. They would not receive water for at least a fortnight and receive as much light as possible (no overhanging trees or other obstructions) and plenty of air movement. Even in summer watering generously once a fortnight is ample and I certainly would not feed them for the first three months after re-potting. This should acclimatise the plants alright. One other point could be that they were in square pots with Roger and suddenly put into deep round larger ones. That would give the plants too much of a boost and they would have felt free to take off with lush elongated growth.

I do not know if the above information is of help in this case but I am clutching at straws here by not having more information of the unknowns.

Rene Geissler. Slimbridge.

The unusual growth of Rogers R.K.H.129 I took to be the result of too much warmth and water with insufficient light. This said the lower segments look very much like those grown in my conditions although my plants seem to retain their green skins for longer than Roger's. The segment size however is about half that seen in habitat. The abnormal growth may in fact have produced the true length of a habitat segment but without the accompanying thickness. I have one plant from a collected segment and three from seed that I germinated as clones A.B. and C. They all grow well, although, as said above, with segments smaller than in habitat I have to remove some mature segments as well as any small or misshapen ones from time to time to contain them in their pots.

Royston Hughes. Liverpool

MAIHUENIOPSIS DARWINII – FOLLOW UP.

We read with great interest John Betteley's article about *Maihueniopsis darwinii* in December 2009's issue of the TSG. We have just returned from our journey to Patagonia and we want to add some habitat pictures of this species. SAR 4113 Fig. 5 shows a plant that grows exactly at Puerto Deseado (Port Desire). Unfortunately, its habitat is in great danger of extinction as civilization is getting closer and closer. On our way to Puerto Deseado, coming from the north, we were lucky to find one plant in flower. This was east of Jaramillo (SAR 4071) Fig. 6. South of Puerto Deseado we discovered another habitat with flowering plants (SAR 4121) Fig 7. During our travels through Patagonia we saw quite a lot of *Maihueniopsis darwinii* but never with yellow flowers. All flowers ranged from apricot to vermilion (e.g. SAR 3991 at Meseta de Somuncurá. Front cover). Also, we did not find any kind of *Maihueniopsis* south of 49°S. This is more than 200 kilometres north of the Magellan Strait. We had previously read about plants growing close to the Magellan Strait but have never seen any ourselves. Is there anyone who has ever found *Maihueniopsis* in this part of Patagonia? We found our most southern *Maihueniopsis* at the Atlantic ocean near Tres

Cerros (48°20'S) and in the Andean region at the Cueva de las Manos (47°20'S). However, we did see *Austrocacti* and *Pterocacti*, (which are much more difficult to find than *Maihueniopsis* in habitat) further south as far as 50°S.
Elisabeth & Norbert Sarnes. Eschweiler, Germany

CUMULOPUTIA PENTLANDI AND CUMULOPUNTIA BOLIVIANA.

Cumulopuntia was erected by Ritter in 1980 but the two species names were erected by Salm-Dyck in 1845. There has been various references/discussion in TSG issues to whether the two are separate species or synonyms and it is not the intention of this note to go over the discussion. It is sufficient to say that most recent authors have considered the two to be synonyms. However, there is the question as to which name has preference. On the one hand there is the statement that "If they are one and the same, then, as both names were published simultaneously, the first author to choose the priority name ought to be followed. Britton & Rose (1919:97) made a definite selection of *Opuntia pentlandii* over *Opuntia boliviana*" (*Opuntia Index*, *Bradleya* 19/2001 p.96). The argument then goes that in order to follow the rules of nomenclature (which should be followed) the name *pentlandii* should be used. The counter argument is that the name *boliviana* has been used for the taxon for some time, with doubt as to what was meant by "*pentlandii*". Therefore practice of common usage and understanding of what the taxon looks like means that "*boliviana*" should be used. Both names are validly published and both sides will defend their position whilst most people will not really care. However, confusion can be caused as the two names crop up and it is a problem for editors. Members, when seeing either name, should therefore be aware of the situation and thus not be confused. The neutral statement is simply that the two names are synonyms and I leave it there in this note. I am, however, very willing to publish comments/articles on the subject. Ed

HABITAT AND CULTIVATED GROWTH.

In TSG Vol. 11 No 2 June 2005 p23 there is figured a plant in habitat with a caption name of *Maihueniopsis pentlandii* (Salm-Dyck) Kiesling. Ian Robinson found the plant and he uses the acronym IGR for his field numbers not IRR as stated in Vol 11. The photograph in Vol.11 shows the plant almost buried in the soil with only the top part of segments showing. Fig. 8 in this publication shows a plant in cultivation and how it has changed with segments growing above the soil. The areoles are also showing more wool than in habitat although this could be partly due to the plant being grown in a peat compost. The difference between the two photographs emphasizes the difference of cultivated growth compared to habitat.
A. Hill.

FOR SALE.

Access cold frame, 8ft x 4ft, GBP100 (cost over GBP300 new).

Also small frame, approx, 4ft x 3ft GBP30.

Both dismantled, buyer collects.

Martyn Collinson tel: 01243 785356 or email:

martyn.collinson@talk21.com (Chichester, W.Sussex).

PTEROCACTUS RETICULATUS R. Kiesling. FK 209-666

I do not know who this FK is so can not find out where he collected his plant of *Pterocactus reticulatus*. For those of you that have Anderson's book or have the NCL you can see a photo, taken by Graham Charles, of a *Pterocactus reticulatus*. It is the same photograph in both books, the NCL just cropped the photo a bit more. As the books both use the same photo of the flower and plant the photographs cannot be used for comparison with each other. If you look at the photograph in the NCL, which is larger, you can see that the body of the plant looks like it has rough scales with the areole at the very tip of the scale. The description in the NCL says that the plant segment has conspicuous tubercles and this is shown in the photograph. The description also says that the plant has 0 - 1 central spine which are 2 cm long. No central spine is shown on the plant in their photograph. (Anderson states central spine to 5mm long, if present. R. Kiesling in his description in *C&SJGB* Vol. 44(3):51-56 (1982) makes no mention of the size of the one central spine, if present. Ed). If they are correct with the name of the plant they are showing then my plant has to be from a much different collection or it is something different? The described segment size is correct to my plant but their plant in the photo is about 5 cm long - the description says that the flower is 4 to 5 cm in diameter and the segment they show is a bit longer than the flower is across.

Now I come to my plant: Fig. 9 shows my plant and its 3 segments. The entire plant measures 8 cm across. The largest segment is 3.5 cm long and 1.5 cm in diameter. In Fig. 10 you can see a segment of my plant. It looks nothing like the plant shown in Anderson and the NCL. On my plant there are no scale like tubercles, the areoles are more a dimple in a slight bump on a short sausage shaped stem. On the plant are only 3 segments and two of them are more or less dehydrated. The one with the flower on it is the one that is 3.5 cm long. The other one is 3 cm long. None of the segments that plant has ever produced has ever looked like the one in the two books mentioned. The flower on my plant, Fig. 11, opened to only 3 cm across and did not get any larger. The first day the flower opened and I measured it, it was 2 cm, I did not measure it at night fall. The flower did not close at night and for the rest of the four days it was open it measured 3 cm in diameter. I was waiting for it to open out to 4 to 5 cm as stated in the books but it did not do so. I do not know if it is because our weather was all over the place or what but 3 cm is all it got to. I will have to wait till next time the plant blooms to see if the flower size stays the same or if it expands to the size the two books say. Both books give almost exactly the same description of the flower colour. Anderson gives the colour of the flower as "pearly white with light pink tint." The NCL gives the flower colour as "pearly white, lightly tinged pink." (The latter is the description of the flower colour in Kiesling's description. Ed.) Most people would say that the flower is a very light pink or is white with a touch of pink. The colour of the flower on my plant is light translucent pink with a bit darker mid-stripe up the petals. The filaments and style are also a light pink and the stigma is a very dark velvet red. With the yellow of the pollen the flower inside seems to have a yellow glow.

I have had this plant for many years and it seems to only throw one good segment out a year. Both books say that the segment shape is globose

(ball shape) to pear shaped (pyriform). None of the segments on my plant have ever been pear or ball shaped so I have to wonder if my plant is a true *P. reticulatus*. Is their plant shown really a *P. reticulatus*? How variable is *P. reticulatus*? As for the photograph used in the two books I have to say that it appears to me that the segment shape of the plant shown is not as stated in the description. I would say that in their photographs the segment shape is cylindrical with quite rough scale like tubercles.

E. Roberts. California.

Whilst a number of collectors, such as jointly R. Kiesling and O. Ferrari, have used KF/FK letters the initials FK initially bring to my mind Fred Katterman and Franz Kuhhas who have both collected in South America. F. Katterman (FK) uses a simple ascending list of numbers. F. Kuhhas (KF), however, uses a more elaborate system with at least two sets of numbers, each being in separate ascending order. F. Kuhhas has used the acronym FK but mainly KF, presumably inverting his initials to avoid mistaken identity with F. Katterman. *The Chileans' Compendium of Field Number Lists* and the very useful on-line site "*Cactus and Succulent Field Number Query*" (<http://ralph.cs.cf.ac.uk/Cacti/findex.html>) both record nothing for FK or KF 209-666 but show details for KF 209-664 as *Pterocactus reticulatus*, Arrequentin, Argentina, 2600m in 1993. The web site does warn that some lists are incomplete. However, the Kuhhas numbers go 209-664, 209-665 (a *T. clavioides* at Arrequentin) and then 210-666 (which is a *Denmoza* from west of Jackal) so it would appear that 209-666 never existed and the correct number for Elton's plant is KF 209-664. The above establishes a locality and suggested name for the taxon but the latter could be incorrect. Please can anyone help Elton in his query as to whether his plant is really a *Pterocactus reticulatus*? Also it would be helpful if members will comment on the points Elton has raised about the plant featured in the NCL. On a general point does the colour or size of a flower matter when trying to identify a taxon?

Ed

Please will members send in items for publication? They can consist of articles, comments, queries etc and be submitted in any format although digital is preferred. Requests for specific comments on a particular topic are often made in an issue. I am very grateful to the members who respond but it would be very nice and helpful if more members would take part. Please do not think that any contribution you can make to any topic is too small or insignificant as anything sent in is useful. Often a small contribution can lead to a much more extensive article or attract more comments.

My request on page 2 in the last issue for information on TSG plants has so far attracted no response.

Ed.



Fig. 9. *Pterocactus reticulatus* “KF 209-666” plant.



Fig. 10. *Pterocactus reticulatus* “KF 209-666” segment.



**Fig. 11. *Pterocactus reticulatus* “KF 209-666” last day of flower.
All three photographs by E. Roberts.**

TEPHROCACTUS

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



Pterocactus reticulatus R. Kiesling. FK 209-664. Arrequentin, San Juan
Province, Argentina. 2600m.
Photograph by J. Betteley.

STUDY GROUP

Vol. 16

No. 3 September 2010

SECRETARY'S PAGE.

All articles and comments should be sent to the Editor.

Subscriptions for 2010 were due on the 1st January 2010

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

Subs for 2010 remain at £10.00 per annum for the U.K and Europe (European members please note that no Euro-Cheques are accepted by our banks – but you may send £ Notes). The subscriptions for Overseas Members is £14.00 or \$25 (in \$bills only). Please make all cheques payable to: "The Tephrocactus Study Group" (not individuals).

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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CUMULOPUNTIA PENTLANDI AND CUMULOPUNTIA BOLIVIANA

Reference the article on page 27 in the last TSG about the above names:

The rule is under Article 11.5 of the ICBN, and it says: "When, for any taxon of the rank of family or below, a choice is possible between legitimate names of equal priority in the corresponding rank, or between available final epithets of names of equal priority in the corresponding rank, the first such choice to be effectively published establishes the priority of the chosen name, and of any legitimate combination with the same type and final epithet at that rank, over the other competing name(s)."

Britton & Rose (1919) were the earliest authors to consider *O. pentlandii* and *O. boliviana* to be the same species, and therefore they must be followed. The fact that a mistake was made in using the epithet *boliviana* by later authors and has become entrenched in common literature is irrelevant. Use of that name is incorrect under the rules and must be corrected. The only way of changing this situation is by the process of conservation. A case would have to be submitted to the Spermatophyta Committee to vote upon a proposal to conserve *boliviana* over *pentlandii*. The case would have to demonstrate that not to apply the name *boliviana* would be contrary to current usage and that to revert to *pentlandii* would cause confusion. I don't believe that this is justified in this case and is unlikely to succeed because there is no obstacle to applying the rule in the normal way. I also certainly do not approve of preserving mistakes made by modern botanists who have erroneously applied incorrect names. That to me is completely unscientific, and where the standard rules can be applied then they should be, irrespective of how long the mistake has remained unnoticed. In fact, since I pointed this out in 2001, users have had plenty of time to correct this mistake, but seem reluctant to do so for reasons that are beyond my comprehension.

Roy Mottram. Thirsk

COMMENTS BY ROYSTON HUGHES.

Normally I don't find time to write in the summer but the latest TSG Journal has thrown up a number of interesting bits and pieces other than my article. First of all is the sad loss of Roger Moreton one of the good growers and seed raisers in the Chileans and latterly the T.S.G. We know his heart attack restricted his activities quite some time ago, but disposing of his collection indicated he was having increasing problems. A few weeks ago I re-potted a *Cumulopuntia sphaerica* that he collected at Ovalle and had given me on a visit to talk to the Liverpool Branch. I also have a *Stenocactus coptonogonus* from Roger dated 20/9/2003 which flowered this year and seemed fine until it was knocked and came out of the pot showing it had lost its roots. As well as having these two plants I germinated two lots of seed collected by Roger. The first was from the road to Caspana. There was a lot of seed that gave good germination as other people also found. It appears to be *Maihueniopsis camachoi*. The second was from Montes de la Luna (near San Pedro de Atacama). I had fewer seeds and only two germinations survived. Both were sown 12/4/2000 but these latter two have been very slow growing. It is only now that I can say that they (as I suspected) look as if they are *Maihueniopsis conoidea*.

Whilst staying with Graham Hole, so I could visit the National show, I obtained from him a collection of cuttings. So with more clones of *Maihueiopsis conoidea* to compare I can see, over time, the range of variability in the species under my cultivation conditions.

I too have the *Airampo Opuntia* with small joints and brown spines from the Quebrada del Toro which I obtained years ago, but without the "Morden" name. We know handwritten labels are often transcribed incorrectly elsewhere. Lose the Q off Quebrada and it easily becomes "uebrada". I assumed Quebrada del Toro was the famous one in Salta but if Morden is really Mendoza it changes everything. I vaguely remembered, in a past Chileans magazine article, it was stated that the yellow spined *Denmoza rhodacantha* came from another Quebrada del Toro elsewhere. This said I found jotted on the back of an envelope this species comes from 20km E of Uspallata in Mendoza province. However, a later check found a mention in Chileans Vol 6. No. 23 page 93 in an article by Buining that he had visited the Quebrada del Toro in Mendoza noting that it had the same name as the one in Salta.

It was interesting to read of the Sarnes' visit to Patagonia and finding *Maihueiopsis darwinii* in the far south of its range. I had understood that *Maihueiopsis darwinii* and *Maihueiopsis platyacantha* had orange flowers. Certainly my ex. Harry Middleditch plant of *Maihueiopsis platyacantha* with upright directed spines does so, although a rather yellowy-orange. Also my very spiny *Maihueiopsis darwinii*. Hoffmann 90-283-943 from south of Mendoza is orange but a rather brownly-orange towards the tips of the petals. However, my *Maihueiopsis darwinii*, F.K.91-78-383 from Cueva de las Manos, near Perito Moreno (a place the Sarnes visited), had a yellow flower only tinted orange by an orange mid-stripe to the petals. My very poor map shows Lakes Buenos Aires and General Carrera feed the Rio Deseado in the Andes from Perito Moreno to Puerto Deseado on the coast. I suppose it is possible that the strong orange colour reported in habitat could be due to something in the Patagonian soil that we lack in cultivation.

Ian Robinson's photo of his I.G.R. 2903 is a plant I know as *Cumulopuntia boliviiana* spineless form from Yavi. (See Roy Mottram's remarks on page 32. Ed.) At our branch meeting on Monday evening Geoff Bailey showed us an almost identical plant from Quebrada del Toro around the Tastil area but alongside other plants from nearby that had varying degrees of spination at that site. In contrast to the Yavi plants being almost buried in the soil at very high altitude on the Altiplano, those around Tastil in the Quebrada del Toro were the more normally encountered clumps, with all segments above ground. Ian's other pictures at Yavi, *Puna subterranea* and *Maihueiopsis hypogaea* (given as *glomerata*) are similarly nearly buried due to the harsh terrain. His *Maihueiopsis hypogaea* at Toqueros is of a plant that is large and above ground showing again this contrast.

I don't grow *Pterocactus* well. My broken brick mineral compost doesn't appear to suit them. I know one person who grew *Pterocactus tuberosus* in hanging baskets in a peat rich compost and he had masses of flowers hanging down. Tony Johnson from Scunthorpe was the one in the Chileans Society who used to grow, flower and produce seed very well of the various species of *Pterocactus* along with his *Austrocacti*. After the TSG

May meeting at Birmingham I visited Alan James again and he showed us his very nice collection of *Pterocactus*. I did have a *Pterocactus reticulatus* for a few years and it looked very similar to Elton Roberts' plant in Figs 9 and 10 in the last issue.

A great many plants from Graham Hole have come with F.K. numbers. On my last visit I acquired two clones of F.K.93-209-665, one G.E.H.506 and the other G.E.H.509. I also had a third clone but only labeled F.K. 209 Arrequentin. The Kuhas numbers give year, place and species but the named species may have a number of clones. It was only when I was at Graham's that I realised Graham's accession numbers could separate the clones. Some Kuhas collections didn't have numbers - possibly *Mahueniopsis camachoii* forms from sites around San Pedro de Atacama which had no identifying place names to list.

I drafted the above before my attention was diverted by the BCSS Convention where I had a free sales table. When I left home my large bodied, three single segments tall *Tephrocactus articulatus* had produced two new segments, on the previous top one, each of which was producing a flower bud. On returning home from the Convention I discovered the larger of these two segments had fallen off. On Sunday a week later this fallen segment opened its flower. Also over that week my regular flowering plants of *Tephrocactus articulatus* have managed to open flowers, (although not fully) despite all the cloud and rain, at the same time. It is the first time this has happened so I have done my best to pollinate them and hope, in time, they will produce fruit and seed. I now have a decent plant of *Cumulopuntia mistiensis*, after breaking up the original plant that regularly flowered. The offspring has now produced its first flower. An *Airampo* I collected, R.K.H.196 from B.D.H.20, also had two flowers for the first time. One of my small bodied *Maihueiopsis ovata* (the common one with a short thin single spine from the upper areoles) produced a fruit with six seeds in it. I have two clones of a similar plant collected by Graham Charles at Villavicencio. Both clones have more spines per areole and look more like a small version of what I have considered to be *ovata* or *russellii*. Graham's numbers also require his accession numbers to separate the clones. Ritter cites Villavicencio as the type habitat of his *Maihueiopsis ovata* form *calva*. Ritter's book is in German but I think that he might state that this is a spineless form growing alongside the normal form (?)

Royston Hughes. Liverpool.

SEED GERMINATION TIP.

In correspondence recently received from a friend in Belgium, when exchanging our knowledge about seed germination with the hard coated seed varieties like *Opuntia*, he supplied a tip used in Belgium.

He sends seed of *Echinocactus horizonthalonius* to a well known seed grower, Julienne Jacobs. She keeps the seed immersed in sugar water overnight, or longer if harder seed, in a thermos flask at 40° C.

She states, "What can attack dental enamel should attack the hard testa of these seeds," and it works. She is a fervent seed raiser of many rare species and grafter of young seedlings, and supplies many growers in Europe.

May be worth a try to improve your *Opuntia* germination? David Parker.

I am very grateful to David for sending the tip and to Julianne for being willing for it to be mentioned. David says that two tablespoons of sugar is put in a thermos flask of water. Has anyone tried this method or, in fact any type of immersion of seed before sowing? Receipt of this tip stirred a long forgotten memory to me. In the early 1960s I had not yet started growing cacti but I was a keen gardener. From somewhere I obtained a tip that to increase germination of sweet peas one should soak the seed overnight in water. One night I placed the seed in water and the following morning the seed coats were soft – in fact I recall some seed coats had split and here was a danger that the testa might fall away when handled. I recall thinking that the seed might not germinate as it was disintegrating so much. However, the seed did germinate but I do not recall whether the germination did improve – my actions were totally unscientific and I had no control batch for comparison.

In more recent times I have read various methods such as freezing or chipping being described on how to improve germination of hard coated cactus seed by helping the testa to open but I have not seen the above method mentioned. There appears to be three actions working on the seed: water, constant heat and sugar. The sugar obviously being there for its chemical contribution. Please will some of you try the method and report back on your experience? (One could extend the experiment by using different lengths of time for the immersion). Has anyone tried any other chemical stimulus or can provide us with reference to it in the literature?

An article in the recent *American Cactus and Succulent Journal*, July/August 2010, P174 contains the comment that the literature is not encouraging when it comes to germinating *Opuntia* seeds. The authors had tried pre-treatment with hydrochloric acid according to Mandujano and others (2005. Breaking seed dormancy in *Opuntia rastrera* from the Chihuahua desert. *Journal of Arid Environment* 62:15-21) but their sprouting efficiency as a result was still very meagre.

Ed.

PTEROCACTUS TUBEROSUS. (Pfeiffer) Britton & Rose. DJF 188.

Alan James has sent in two emails on this topic.

11th July.

This year has been a good one for a lot of my plants to come into flower especially my collection of *Pterocactus*. Maybe this was due to the long cold winter. On June 16th *Pterocactus tuberosus* DJF188 came into full bloom (see Fig.1). I have noticed that when I am working in the greenhouses bumble bees come in and visit all the open flowers (I wonder what their honey tastes like) and obviously this could result in some cross pollination between species. At the end of June I went away for two weeks. On returning I found that the flowers had died off and the ends of the flower stems had started to swell (see Fig. 2). These have continued to carry on swelling. On inspecting other *Pterocactus* I have notice several other plant developing seed pods. If I get seed it will be interesting to see if they germinate and what these plants will look like.



Fig. 1. *Pterocactus tuberosus* DJF188 in flower.

**Fig. 2. *Pterocactus tuberosus* DJF188 with seed pods swelling.
Both photographs by A. James.**





Fig. 3 *Cumulopuntia rossiana*. P? Figs 3 – 6 Photographs by J. Betteley.
 Fig. 4. *Cumulopuntia rossiana*. Carmargo region of Bolivia





Fig. 5. *Cumulopuntia rossiana* from 3150m between Sucre & Tarabuca.
Fig. 6. *Cumulopuntia rossiana* f. *fauxiana*





Fig.7 *Pterocactus tuberosus*. DJF188 seed. Please note the “wings” around the seed. Photograph by A. James.

Fig. 8. *Pterocactus kuntzei* seedlings. Photograph by E. Roberts.



10th September.

Pterocactus tuberosus. DJF188 has now produced two lots of seed (See Fig 7). The first pod ejected its seeds in mid August and the second in the first week in September. I do not know which plant it has crossed with but the only other plant that is producing a seed pod is a plant labelled *Pterocactus decipiens*. (Not a valid name = *tuberosus* form). Seed has been sent to Eddie Newman to see if we can get any to germinate.

Alan James. Birmingham.

Elton Roberts was asked by Alan for advice on how to germinate the seed. On 12th September he replied.

Pterocactus decipiens may not be a valid name but in my opinion it should be as the flower is different from that of *Pterocactus tuberosus*. All of the seedlings from the seed growing mentioned below are doing fine and are in sale pots. Some have sold and most have bloomed several times.

To get *Pterocactus kuntzei* seed growing I had about an inch of soil in a seed tray and I spread the seed around so it is not over lapping too much. I then covered the seeds with some fine soil that I sifted on to them. It was enough to cover the seed but not too deep - maybe about 3 mm. I then sprinkled some heavy sand on top of the fine soil. The idea of the sand is to give the seedlings something to rest on and be above the damp soil. That way they do not rot off as easily. The seedlings push up the soil and the rock. The seedlings are of different ages as they germinate over a period of about two weeks. While the seed is germinating I keep the soil damp but not wet. Keep the soil at about 70 at germination time and after the seedlings are up let them dry a little between waterings. Do not allow them to dry all the way out but do not keep them too damp either. Once they get the growth like in Fig. 8 then they can go dry between waterings.

Elton Roberts. California.

PTEROCACTUS RETICULATUS Kiesling.

In the last TSG issue (Vol 16 no2 p 28) Elton Roberts of California wrote about his clone of *Pterocactus reticulatus* that he received as FK 209-666.

I have grown this plant for a couple of years having acquired it from an ex-Cornwall nurseryman via David Parker, both of whom kept meticulous habitat records. As the Editor suggested the correct reference is FK 209-664, referring to Franz Kuhas material, collected at Arrequentin in the San Juan province of Argentina.

The plant illustrated in the New Cactus Lexicon is from the Mendoza region of Argentina, north of Uspallata and therefore more than likely to be a different clone of the species. *Pterocactus reticulatus* can be identified by its pronounced geometric pattern on the epidermis.

Elton comments on the growth of his plant – throwing only one good segment a year. My plant (Front cover) has given me no cultural problems in the two years I have grown it. Maybe it is more suited to cultivation in the cooler climate of the UK than the heat of California.

John Betteley. Newark.

HARDY NORTH AMERICAN OPUNTIAS. Part 1.

As we know cacti are remarkable plants. Most people are quite surprised to discover that some species are adapted to cooler climate and will survive temperatures which may fall below - 40C and will tolerate wetter conditions than many of their desert relatives.

First we have to answer the question as to what is hardiness as referred to in the title of this article. It is the capability of plants to survive a particular climate without greenhouse protection. Maps showing the location of different hardiness zones in North America* can be compared to maps showing the location of hardiness zones in Europe*. Where there is a similarity of zone the North American Opuntias of that zone should grow in the equivalent European zone. In the UK we are quite lucky in that the UK hardiness zones mean that we are able to grow far more species than can be grown in continental Europe. However, the problems with the UK climate are that it can be too mild and too wet in winter.

From the Subfamily *Opuntioideae* in North America we can recognize only 3 genera which are hardy in the UK: *Cylindropuntia* with 5 species, *Corynopuntia* (*Grusonia*) with 2 species and *Opuntia* with 19 species. Hardy species can be found all over the United States. However, only 3 species, *O. fragilis*, *O. humifusa* and *O. polyacantha*, have a broad range whilst some others have a very limited range. The data indicates that *Opuntia fragilis* var. *fragilis* is the cactus that reaches the northernmost distribution. It grows particularly well on hillsides and flat areas with sandy and/or clay soils near Peace River, Alberta, Canada.

It is from these 3 species that we can find the most hardy clones. For example some of *O. fragilis* can survive to - 48 C, *O. humifusa* to -25C and *O. polyacantha* to -18C.

What we have to understand is that it is not a species that is hardy: it is a population or even a selected individual of a species. So, for example, we have the species *O. basilaris* which grows in Arizona, California, Nevada, and Utah but the hardy plants will be those which grow in Nevada and Utah or on high altitude elsewhere, for example above 1500m.

Sadly, many of the species are endangered because of habitat fragmentation and destruction, poor grazing practice and increased agriculture, political problems and over collection.

To grow *Opuntias* outside in the UK requires certain conditions. As one might suspected all *Opuntias* require a full sun position in the garden (that can be interpreted as at least about 5 hours per day). They will live and perhaps produce new pads with 2 or 3 hours of sun but don't expect good results.

The most essential for growing hardy *Opuntias* is the composition of the soil. It should be very very porous to provide perfect drainage and good circulation of air to the roots. To achieve this, gravel and coarse sand should be incorporated into the soil. From 50-75% of the soil should consist of the two materials. The remaining portion should consist of a good loam and a small percentage of organic material (e.g. well rotted compost, bone meal etc.). *Opuntias* generally prefer slightly acid soil. As we know the pH of the soil plays an important role in the uptake of plant nutrients. On top of the soil a top dressing is required. I have good results

with a 5-10 cm deep top dressing of pea gravel on my cactus beds. It serves to retain warmth and discourage weed seed germination.

The next very important factor is air movement. Humid conditions may provide environments suitable for the proliferation of moulds, fungi, and bacteria as well as many numbers of insects which may spread pathogens from plant to plant. Watering will depend upon the season of the year, the weather conditions, soil, position, stage of plant, size of plant etc.

I recommend the use of a fertilizer which contains comparatively low concentration of nitrogen. Nitrogen promotes rapid growth but such rapid growth in cacti produces plants which look unnatural and are weak and sensitive to frost damage. Good results can be achieved with Chempak for succulent plants, NPK ratio 8:34:32. I apply it 3-5 times a year at half the strength of the recommended application rate.

There are only a few tasks which are worse than weeding a cactus bed, so anything which can be done to prevent the spread of weeds into the bed should be considered. Mentioned is made above that I have good results with a 5-10 cm deep top dressing of pea gravel on my cactus beds. Some growers try to use weed mats but unfortunately they trap moisture and aren't suitable for cacti. Of course some weed killers can be used but personally I prefer prevention: hygiene, top dressing and hand-weeding or hoeing.

Pests are another concern of gardeners but cacti outside are not attacked very often. Remarkably slugs seem to be attracted to the soft new growth and I think that they do the most damage. Cold or damp conditions may lead to rotting of stems, often just around the soil level where damp soil may be in prolonged contact with the plant's stem. To prevent fungal infections good drainage and air circulation are essential and of course one can use some fungicide like Captan or Rovral but I don't think that they are commercially available. In Poland I achieved good results using Chitosan (Biochicol) – a natural biocontrol with the active ingredient chitin/chitosan found in the shells of crustaceans, such as lobsters, crabs, and shrimp. It increases the natural defence responses within plants to resist against insects, pathogens, and soil borne diseases when applied to foliage or the soil. Similar results can be achieved with Biosept – a mixture of grapefruit oil, natural plant extracts and other essential oils which activates plants' natural defences.

*A map of North American Hardiness Zones and details of the average annual minimum temperature by Zone can be found on the Internet – www.veggiegardener.com/get-in-the-usda-zone.

A map of European Hardiness Zones can be found in *European Garden Flora* Vol. 2 (1984)

Andrew Gdaniec. Kew.

Andrew is at present studying at Kew and specialising in growing hardy North American *Opuntias*. The above is based on part of the presentation that Andrew gave to the TSG May meeting at Birmingham this year. Whilst his comments are based on North American *Opuntias* much of the comments must be able to apply to growing those from South America. Figs 9 and 10 show examples of *Opuntias* growing outside without protection.

Andrew provided a bibliography of eighteen books. Anderson, NCL, etc are included but the following are ones whose titles specifically relate to winter hardy plants.

Brethauer B. 2000. *Cactus in the Snow. A guide to Growing Hardy Cacti in the wet and Frozen North.*

Dopp H. 2000. *Winterharte Kakteen fur drinnen und draussen.*

Kummel F. & Klugling K. 2005. *Winterharte Kakteen*

Richter I. 2004. *Freezehardy Opuntia from the USA. Kaktusy Special 2004.*

Sierer D. 1999. *Where the Hardy Cactus grow. A Hardy Succulent Handbook.*

Spain J.N. 1997. *Growing Winter Hardy Cacti in Cold/Wet Climate Conditions.*

To be continued.

Ed.

OPUNTIA FRAGILIS QUERY.

I have several clones of *Opuntia fragilis* but have found great difficulty in rooting the cuttings and growing them on. Instead of growing new pads the original cutting just sits in the pot or at best is very slow to produce a new pad in two years. The worst performing one is *Opuntia fragilis* from Peace River in Canada. I lost my original cutting and now my new one is just sitting there. Has anyone else had this problem or, if not, what is the special way of dealing with the cuttings? I have no problem with my other *Opuntia* cuttings. Andrew has suggested that I am not providing enough top gravel in the pot.

A. Hill, Sheffield.

CUMULOPUNTIA ROSSIANA

Many of the Andean *Opuntias* demonstrate significant variability especially in spination, segment size and shape and flower colour. This is especially true in relation to *Cumulopuntia boliviiana* and *Maihueniopsis glomerata*. This variation, however, occurs to a lesser extent in *Cumulopuntia rossiana*. The genus *Cumulopuntia* was erected by Ritter in 1980 to cover a small group of mound-forming plants with globular or ovoid segments. The flowers are strictly diurnal (closing in the dark) and are yellow through to red. The seeds are contained in a dry fruit (unlike *Maihueniopsis* which has juicy fruit). A further distinguishing feature is the areoles, which are more crowded and spinier towards the upper part of the stem segment.

The New Cactus Lexicon recognizes only four species – *C. boliviiana*, *C. chichensis*, *C. rossiana* and *C. sphaerica*. *Cumulopuntia rossiana* forms dense, low cushions with many segments which often have prominent tubercles. The one to three spines per areole, which are generally straw-coloured, only occur in the top half of the segment. Flower colour varies from yellow through to red.

In cultivation, roots are long and fleshy and the plants are best grown in a deep pot, utilizing an open, gravelly medium with little or no peat. All species of *Cumulopuntia* appear quite hardy in winter, given a dry environment.

A vigorous form of *Cumulopuntia rossiana*, with the subspecific name of "*fauxiana*" has been in cultivation for some years and appears more freely

available than the true species. It has smaller joints and offsets more quickly. It generally has yellow flowers and again appears more floriferous than the species. Sadly it has not been recognized in the New Cactus Lexicon despite being rediscovered in Bolivia.

Fig. 3 represents a most typical form collected by George Piltz but with no habitat data. Fig. 4 is a spinier form from the Camargo region of Bolivia, previously distributed by the ex-nurseryman Bill Greenaway. Fig. 5 is a red flowered form propagated from habitat material collected at 3150m between Sucre – Tarabuco. Finally Fig. 6 shows a typical plant of the small-headed form “fauxiana” with unknown habitat data.

John Betteley. Newark.

ANOTHER ATTEMPT AT A CACTUS LEXICON?

We are all acutely aware of the many names that have been given to cacti over the years due to deliberate “splitting” based on some perceived difference or someone finding a plant and giving it a name not realizing that the taxon has already been found and a name attributed. It should come as no surprise that the same activity has occurred with other plants.

The UK newspaper, *The Guardian*, recently gave a report that at the 2002 Convention on Biological Diversity a request was made for a comprehensive survey of plant species names. Kew Gardens three years ago joined up with the USA Missouri Botanical gardensto work on what was said to be “two of the biggest and most valuable plant families: legumes or peas and beans, and *compositae*, which includes asters, daisies and sunflowers”. The intention is to search existing lists for each plant species, find an “accepted” name for each species, and then list all known variations. The results of this work so far are expected to be published at the end of this year. Mention was made that the work will continue and assess smaller plant groups. Apparently there are over one million flowering plant species names, including duplicates, and it is expected that that the study team will eventually announce the real number of species around the world is closer to 400,000. The project is not just an academic exercise but is said to be vital for conservationists, and for researchers looking at economically important plants, to be able to examine all references to a species by looking at details under the “accepted” name and also under any pseudonyms.

One must sympathize with the problems that will be encountered by the researchers under such a wide task and wonder, in view of how the New Cactus Lexicon has been received by certain people, how a much wider project on plant species names will be received. It will be interesting to see how the names of the Cactaceae are treated and one wonders whether any cactus “expert” is involved. How far will the team rely on the treatment in the New Cactus Lexicon or will the team go back to basics and produce for us another lexicon?

A. Hill. Sheffield.



Fig. 9. Hardy *Opuntia* etc. garden. Please note the raised bed.

Fig. 10. Hardy *Opuntia* etc rockery.

Both pictures by A. Gdaniec.



TEPHROCACTUS

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



Maihueniopsis clavarioides (Pf) Andn .
Photograph by J. Betteley.

STUDY GROUP

Vol. 16

No. 4 December 2010

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.

Subs for 2011 remain at £10.00 per annum for the U.K and Europe (European members please note that no Euro-Cheques are accepted by our banks – but you may send £ Notes). The subscriptions for Overseas Members is £14.00 or \$25 (in \$bills only). Please make all cheques payable to: “The Tephrocactus Study Group” (not individuals).

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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TSG web page: [http:// www.cactus-mall.com/tsg/index.html](http://www.cactus-mall.com/tsg/index.html)

THE 2011 TSG MEETING.

This 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. 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.

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. 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. Brian Bates will also be present with slides of *Opuntias* he has encountered. Brian is bringing fresh *Opuntia* seed that he has collected in habitat.

Attendance is free and not restricted to members and their guests. Please will TSG members promote the meeting at local BCSS branches etc.? Ed.

MAIHUENIOPSIS CLAVARIOIDES – FRONT COVER.

This is a low growing spreading plant, formerly assigned to the genus *Puna* which was erected by Roberto Kiesling. The species has a large tuberous root. Arising from the rootstock are obconical joints, occasionally with finger-like extensions. The spines are pectinate and appressed to the segments. The plants can be found in the Mendoza and San Juan regions of Argentina.

The illustrated plant is probably the finest example in the United Kingdom and has won first prize in the last two BCSS National Shows that have been held in the U.K. The plant belongs to Bridlington BCSS Branch member David Briggs, who acquired it twenty years ago from George Howell. At the time it was in an eight and a half inch pot having probably been grafted some thirty years ago. The grafting stock has, no doubt, long since disintegrated and the plant now overhangs a twenty four inch pot. Cuttings are generously given away by the owner and root down over time. The author has found that a cutting can take several years to form a tuber before new top growth is evident.

John Betteley. Newark.

Please see Figs 8 & 9 for comparison with habitat growth.

Ed.

COMMENTS ON THE VIGOUR OF OPUNTIA FRAGILIS.

Following my comments on trying to grow *Opuntia fragilis* TSG Vol. 16 No 3 P43 I have received the following comments. It would appear the problem lies with me, not the cuttings! Ed.

I have a plant *Opuntia fragilis* from the Peace River, Northern Alberta, Canada that came to me as a cutting via David Parker from Roy Mottram which I grow outside in a pot over summer in a lean-to. It grows well in my standard cacti mix. (This is the plant I have been trying to grow. Ed.)

Just to update you on my Pt. Tuberosus x DJF188 seeds. I have had two germinate and they appear to be doing well.

Alan James. Birmingham

I obtained a plant of *Opuntia fragilis* from John Cox about ten years ago. I have had it in the garden all year round. In winter I put a cover over it. A few years ago I caught it with the lawnmower and two pads fell off. About eight weeks later the pads had rooted down into the top soil.
Garry Walkington. Huddersfield.

SURVIVAL OF PLANTS.

The recent exceptionally cold weather will have tested members overwintering techniques to the limit. Members who have normally been able to over winter their plants without heat, relying on the natural resilience of the plants, might have found the experienced minimum temperatures to have been too low for some plants to survive. Members who rely on equipment providing a little heat might have found that the normal greenhouse winter minimum heat has not been maintained and this might have caused problems for the plants. We therefore have a unique opportunity to share information as to the reaction of our plants to the cold. How have any *Opuntias* outside reacted and exactly what protection do you give them? Please will you write in now to give your experience as to how your *Opuntias* have reacted to this winter so far? Have you noticed a difference, what plants appear to have come through OK and which plants have already succumbed? I phrase my questions in that manner because it might be that only in spring will we know the full story when plants which normally start into growth reveal some damage that has been done.
Ed.

A FEW COMMENTS ON TSG Bull. 16(3)

Comments by Royston Hughes.

There are certainly two Quebradas del Toro (Valley of the Bull river), the most common one to the west of Salta (I've visited it at least 8 times), the other in Dept. Las Heras in Mendoza.

FK or KF is Franz Kühhas (note spelling and accent) from Bruckbach in Austria. A specialist in "Patagonian" cactaceae. He's travelled extensively in Argentina, Chile, Bolivia and Peru. He is married to a Peruvian lady. He was with Walter Rausch in Argentina when Walter had his unfortunate accident. 15th November will be Walter's 82nd birthday. Royston's *T. articulatus* that fell apart was probably "self pruning" due to lack of water.

Royston says that "An *Airampoa* I collected, flowered for the first time. This was collected in 1982, almost 18 years ago and should have been flowering years ago and should now be filling a dustbin lid". Royston is well known for his "broken brick mineral compost" and pruning. Whilst his compost, pruning routine and method of cultivation suits his purpose it appears there is a downside to it for some species although he does obtain flowers on other taxa.

Calva means bald, hairless, glabrous (cf *Etymological Dictionary of Succulent Plant Names*), so the population SHOULD be all bald plants or else a separate name is not worthy of publication.

Pterocactus reticulatus by John Betteley.

"The plant in the NCL...." Even if the plant in the NCL had been from Arrequentin, the odds are it would still have been a different clone. I think John meant to say "from a different population".

Growing hardy Opuntias by Andrew Gdaniec.

Chitin, the active ingredient of his fungicide, is also found in human nails, so maybe we should save our nail parings and make them into fungicide.

Cumulopuntia rossiana by John Betteley.

In habitat the dominant flower colour is red, with more rarely yellow. The yellow flowered plants were sometimes identified as *C. pentlandii* (not *C. boliviana*), by people who thought *pentlandii* and *boliviana* were different. When next I travel to Tarabuco, I must check the altimeter to see if I can pinpoint the locality for John's Sucre - Tarabuco plant. There are quite a few *C. rossiana* just past Yamparaez near where the railway tracks are parallel to the road. These are all red flowered. In nature *C. rossiana* is not mound forming but is always flat to the ground and sometimes almost subterranean, often quite difficult to find. The clumps grow to about 10 cm diameter.

The subspecific name should be "*fuauxiana*" after Les Fuaux who was active in the 1940s to 1960s. I'm not sure it is a *rossiana*. It was always labelled as *pentlandii* var. *fuauxiana* whenever I saw it. I can't remember seeing anything like it in the wild.

Fig. 3. George Pilt is named Jörg Piltz (pronounced yerg with a hard "G").

Fig. 4. Camargo itself is too low for *C. rossiana*. The plant probably comes from near Culpina, a couple of hour's drive to the east past San Pedro.

Another attempt at a Cactus Lexicon? by Alan Hill.

My personal view is that the "savage" lumping in the NCL will be rectified over time to a more sensible taxonomy. I'm not against lumping, but not to the extent of the NCL. Already a few taxa have been split off from the taxonomy of NCL.

Best wishes to all, Brian Bates, Bolivia.

HARDY NORTH AMERICAN OPUNTIAS PART 2. OPUNTIA FRAGILIS.

Opuntia fragilis (Nuttall) Haworth forms low growing mats 2 -10 cm high with branch segments that, according to the NCL, can be subglobose to subcylindrical, to flattened and elliptic-obovate. It is therefore a very variable species in appearance (see Figs 3 - 5) with a very wide spread range (see map) in the USA and spreading into Canada. It flowers infrequently but easily propagates itself due to its easily detached stem segments. The latter are dispersed by animals and possibly water. The American Cactus and Succulent Journal has recently contained articles on the species in various districts of the USA. Habitats range from barren areas in grasslands, woodlands, sandy or gravelly soils, on outcrops of granite, limestone or quartzite. The taxon also hybridises with other *Opuntias* (see plant top right

Fig. 5) which adds more confusion when trying to identify the plants.

Ed.

Andrew Gdaniec's comments on the taxon at the 2010 Birmingham meeting presentation included the following:

O. fragilis

This is a small species typically grows in dense mats. The stems are usually quite small and quite thick. The stems are very loosely attached to one another. Spination is incredibly diverse. Flowers are usually yellow but can be orange, red and magenta.

This is possible the most cold hardy cactus of all as it is most northerly species of cactus known.

It has been suggested that the migrations of the American Bison which once shared greater portions of this species range may account for the remarkable wide distribution of *Opuntia fragilis*. Migrating Bison might have snagged pads which clung to their legs and thus were carried great distances.

As we can see the range is enormous. The taxon should be grown where it will not be disturbed as the pads are quite easily detached. The species is very cold tolerant but the soil has to be very porous.

Geographical range of *Opuntia fragilis*.

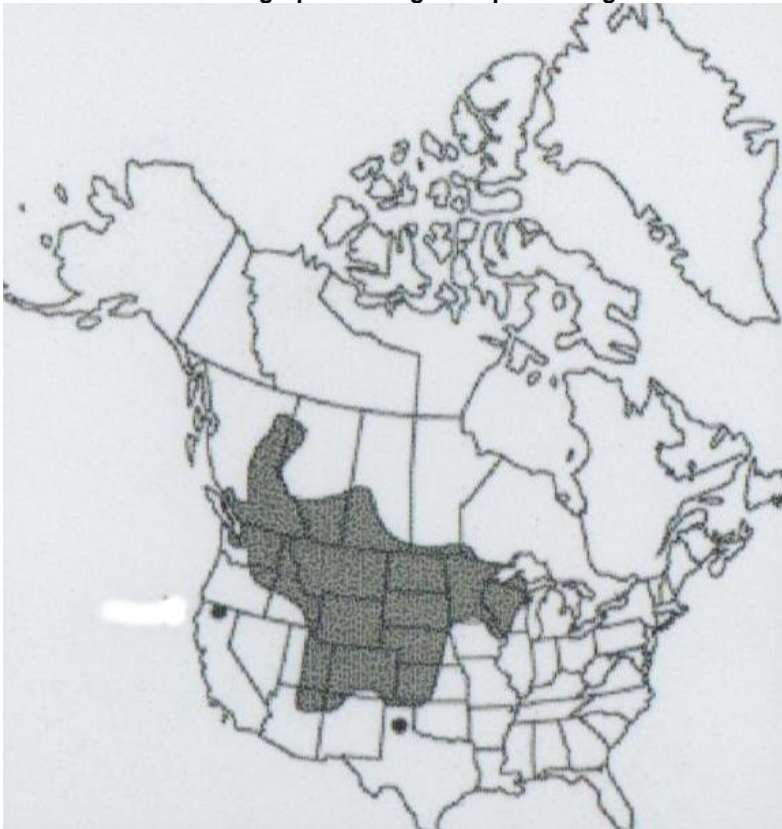




Fig. 1. *Austrocyllindropuntia verschaffeltii* RMF arg03 0017. Tafi de Valley.
Fig. 2. *Austrocyllindropuntia verschaffeltii* RMF arg03 0004. Tafi de Valley.
Both photographs by R. Ferryman.

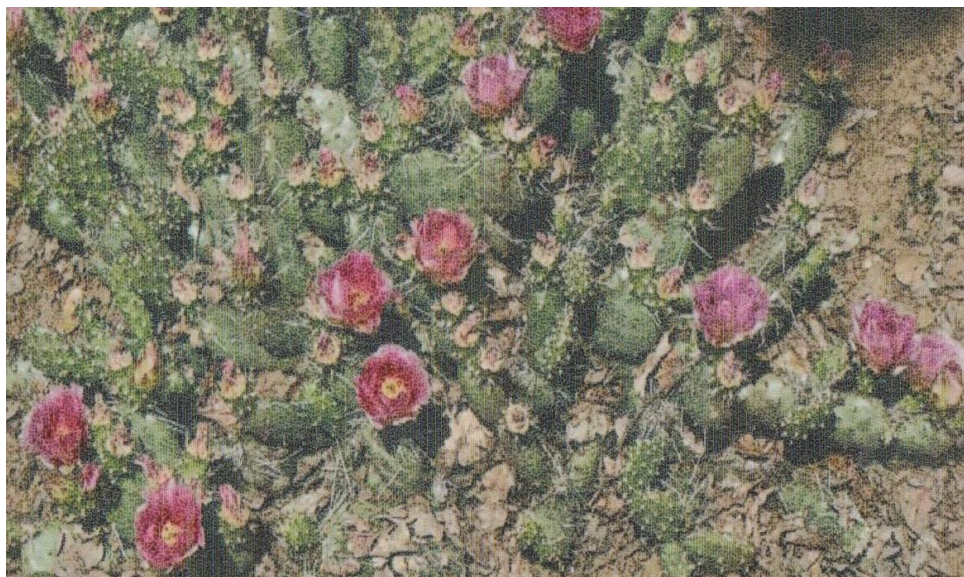




Fig. 3. *Opuntia fragilis* form.

Fig. 4. *Opuntia fragilis* form.

All *Opuntia fragilis* photographs supplied by A. Gdaniec.



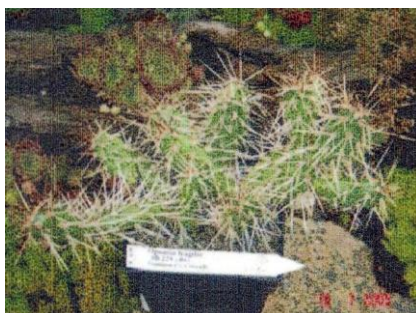
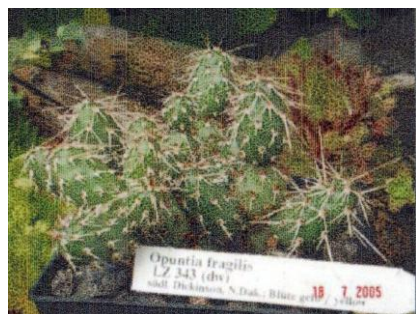
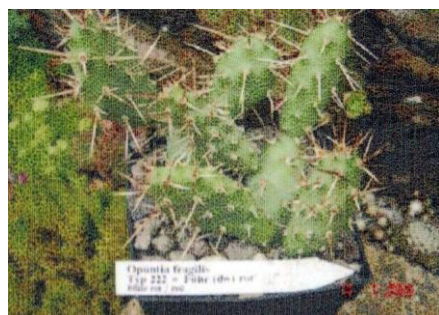
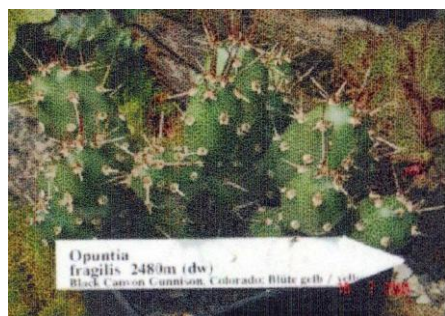


FIG. 5. Various forms of *Opuntia fragilis*. Second top is a natural hybrid.



Fig. 6.Habitat site in San Juan, Argentina of *Pterocactus gonjianii*.
Photograph number RMF arg05-0169.

Fig. 7. *Pterocactus gonjianii* RMF ar05-0159 San Juan.
Both photographs by R. Ferryman.



AUSTROCYLINDROPUNTIA VERSCHAFELTII (WEB) BACKEBERG.

Has anyone found a way of growing this plant successfully? In cultivation the norm appears to be thin long segmented plants that tend to droop easily due to lack of water or short segmented plants that easily fall to pieces. Roger Ferryman's pictures (Figs 1 & 2) show how attractive the taxon can look in habitat and it produces very attractive flowers. I have found that in cultivation the growing points (which therefore must be very succulent) can be very attractive to mealy bug with some trying to take up home there when no other taxa in the area is affected.

In May 2006 when Roger was talking at our annual TSG meeting about the plant in the photograph he commented that at Tafi de Valley, which he had visited in 2005, he encountered freezing cold even in summer. I assume this was at night. Roger commented that if the plant was dry it could be grown outside in winter. It obviously is therefore a plant suited to cold greenhouse/frame conditions but has any one tried growing it outside with winter overhead protection?
Ed.

PTEROCACTUS GONJIANII KIESLING.

Kiesling published this name in 1982 [CSJGB 44(3)] citing the type locality as being at Iglesia at 2000m, in province San Juan, on the way to the Quebrada of the Agua Negra. Roger Ferryman records the photographs in Figs 6 & 7 as being taken in San Juan province but gives no precise location. I understand that this taxon is cold hardy in a greenhouse/cold frame. Has anyone tried growing this or other *Pterocacti* outside with overhead protection in winter?
Ed.

FURTHER COMMENTS ON CUMULOPUNTIA ROSSIANA.

I read with interest John Betteley's article on *Cumulopuntia rossiana*. He makes the point that it would appear that this species has much less variation than that of *Cumulopuntia boliviiana* or *Maihueiopsis glomerata*. I would agree that this would appear to be the case when considering the plants of this species, from various sources, commonly found in our collections. However I suspect that this may not be the case when considering some of the plants that I found in Bolivia. I would suggest there are reasons for this. First most of cactophiles who venture into habitat are interested in genera such as *Echinopsis*, *Lobivia*, *Rebutia*, *Sulcorebutia*, *Weingartia*, *Gymnocalycium*, *Parodia*, etc. They consider the dwarf *Opuntias* to be rather viciously spined plants, with some justification, that should be steered clear of and are of no particular interest to them. However the description of *Cumulopuntia rossiana* as having small spherical segments with a single spine, which is short and dagger-like from no more than the top 5 areoles, is not considered vicious. It is therefore worthy of being collected for their friends with an interest in such plants. Any found with ovoid segments and more than one spine per areole would be taken to be one of the many forms of the variable *Cumulopuntia boliviiana* and therefore of no interest.

On my trips in Bolivia with Brian Bates and Peter Down we travelled from La Paz south to Oruro and on to Challapata along the Altiplano, typical *Cumulopuntia boliviiana* habitat. From Allapata towards Potosi the road first climbs northwards in a U-shape over a high Pampa to then continues on slightly east of due south among the mountains. Here we stopped to search a ridge of rock that outcropped above the flat Pampa. We found some *Lobivia pentlandii* and a number of clumps of *Cumulopuntia boliviiana* on this outcrop which became our B.D.H.3 at 4,036 metres. This was the last we were to see of this species until we arrived back on to the Altiplano. Further along the road in the late afternoon sunshine we made another stop on seeing low columns of *Oreocereus celsianus* on the gentle sloping land at the roadside. At this B.D.H.5 site 3,555 metres we found some *Lobivias*, *Parodias* (*maassii* type), *Austrocylindropuntia*, *Weingartianas* and *Cumulopuntia rossianas*, with mixed flower colours. The latter were easily recognised as typical *Cumulopuntia rossiana* as it was in December before the rains had started. Back home the spherical segments became up to 1" in diameter, produced up to 5 spines per areole from up to 6 areoles per segment, the longest spines reaching 7/8" in length. Quite a bit different to the commonly cultivated forms illustrated in John Betteley's write up. Later on we retraced our route after visiting Tarija. A little way beyond Iscayachi we made a stop B.D.H.19 at 3,400 metres where we had seen *Oreocereus trollii* but had to pass by when travelling in the opposite direction. The ground was fairly level on our left before then rising up into the mountains some distance away. Alongside the *Oreocereus* were some *Lobivias*, *Airampoa Opuntias* and *Cumulopuntia rossianas*. These plants were hardly above the soil surface but were readily spotted by their flowers in mixed colours. Closer examination showed that their segments were ovoid not spherical. In cultivation they produce up to 3 or 4 spines per areole on the upper 3 to 5 areoles per segment some spines being longer than the segments height. Scraping away the earth around a plant revealed a turnip-shaped root beneath the small clump of segments above the ground. The root may have seemed larger than the clump above ground but remember the rains hadn't started at that time. I tended to refer to those plants as *Tephrocactus pentlandii* in those days as they didn't conform to the recognised descriptions of either *Tephrocactus rossianus* or *Tephrocactus bolivianus*.

Later along our route, having made a side trip to Culpina, we took the road north from Camargo. The road eventually curves west to Cuchu Ingenio but we wanted the turn off to Puna (Villa Talavera). Some way before this turn off we unexpectedly found ourselves crossing a wind swept level high altitude area. We were attracted to this spot, B.D.H.26 3500 metres, probably more from the long shadows cast by the low humps of cacti in the late afternoon sun than the cacti themselves. There were *Lobivia cinnabarinas*, *Weingartias* and *Parodias*. They were so desiccated that it was difficult to tell to which genus each one belonged. Also there were a couple of *Tephrocactus* group *Opuntias* that I hadn't encountered on the trip or back home in cultivation. The desiccated segments could hardly be seen below an armament of long stout spines. In cultivation my plant has ovoid segments 1 1/4" tall x 1" dia, up to 6 spines per areole from up to 7 areoles per segment, the longest spines to 13/8" in length. Not as fierce as

the plants in habitat but a lot different to the commonly recognised *Cumulopuntia rossiana*. However its mode of growth is just the same as all the other *Cumulopuntia rossiana* forms that I grow.

In looking at the variation of this species I have listed below all those *Cumulopuntia rossiana* that I have that are reasonably mature plants with provenance. For each I have then given the four main features we recognise: segment size and shape, number of main spines per areole, spine bearing areoles per segment and the maximum length of those spines. Whilst plants from B.D H.5 and 26 show the greater deviation from the commonly cultivated *Cumulopuntia rossiana* a number of others also vary from it. As lists don't readily show the differences I have separated the spherical and ovoid shaped joints and drawn them full size, side by side for comparison I have also include the number of spines per areole although only the longest one is to scale. (Apologies that I have had to reduce the size due to space on the page but roughly kept the ratio. Ed.)

Because of the confused state of the whole Tephrocactus group in Britain Leighton-Boyce and Iliff wrote their book, "*The subgenus Tephrocactus*" in 1972. Their method was to translate all the earliest original descriptions into English so that growers could place their plants under the correct species name. Plants conforming to the *boliviana* description were readily recognised. However the much shorter *pentlandii* description has caused problems. Described as having ovoid rather than spherical segments it seemed to rule out *rossiana* as a possible synonym. Therefore it has been assumed its identity must be a form of the variable *boliviana*. The rather long, to their diameter, segments on older plants sound to me like untypical growth that we know can easily occur when these plants are not grown hard under our conditions. This aside, Pentland, with his botanical training, would surely be aware of the variability of *boliviana* and would have considered that the two plants he sent to Europe to be described were quite distinct from each other.

It can be seen from the review of my plants above, that half of the *rossianas* have ovoid segments. They tend to have more spines per areole, from more areoles per segment that tend to remain upwardly direct. Quite similar to forms of *boliviana*.

We can never really know if the original *pentlandii* described was a form of *boliviana* or a *rossiana* but no doubt those in favour of the former will continue to argue with those in favour of the later.

Royston Hughes. Liverpool.

NOTES ON THE FOLLOWING DIAGRAMS.

The measurements were taken in late 2010 so some plants would not have been watered for a considerable time.

The size was measured to the nearest 1/8".

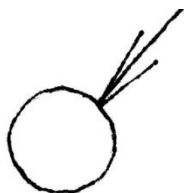
KG 1591 originated from a German nursery but is similar to the Graham Charles plants.

Most plants have flowered except the last three listed, RKH red and RKH 204. All the flowers were yellow except for an orange one on one of the B/K13/1 plants.

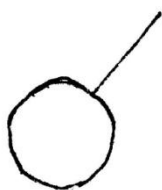
RKH red has been reluctant to produce spines until recently. Instead it produced tufts of many long glochids from most of its areoles.

PLANT	SEGMENT SHAPE & MAX SIZE	MAX SPINES PER AREOLE	MAX SPINEY AREOLE PER SEGMENT	MAX SPINE LENGTH	HABITAT
RKH 161	spherical 1" dia	5	6	7/8"	Challapata to Potosi. 3,555m
RKH 167	spherical 3/4" dia	3	2	1"	10 km before Cuchu Ingenio. 3,950m
RKH 193 Red Fl.	ovoid 1"x 3/4" dia	4	3	5/8"	9.3 km N of Iscayachi 3,400m
RKH 193 Yellow Flower	ovoid 5/8" x 1/2" dia	3	5	7/8"	9.3 km N of Iscayachi 3,400m
RKH 5/8" dia	spherical	1	2	5/8" Salitre	2 km below 204
RKH 211	ovoid 1 1/4" x 1"	6	7	1 3/8"	5 km N. of Padcoya 3,520m
KG 1591	ovoid 1 1/8" x 3/4"	5	4	1	
B/K seed. 13/1A	spherical 7/8" dia	4	3	7/8"	S of Cieneguillas 3,511m
B/K seed. 13/1B	spherical 1" dia	4	6	1 1/8"	S of Cieneguillas 3,511m
FK 91- 13-283	ovoid 1 1/4" x 5/8"	5	5	1 1/4"	
FK 93- 562 (GEH 499)	spherical 5/8" dia	3	4	3/4"	Abra de Pives 163- 3,300m
FK 93- 163-562 (GEH 550)	spherical 3/4" dia	3	6	1/4"	Abra de Pives 3,300m
GC 180-09 (8217)	ovoid 1 1/4" x 5/8"	3	7	1"	W. of Iturbe 3,415m
GC 180-09 (8218)	ovoid 1 1/4" x 7/8"	4	5	1"	W. of Iturbe 3,415m

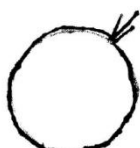
SPHERICAL



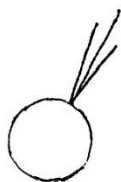
GEH 499. 5/8"



RKH 204. 5/8"



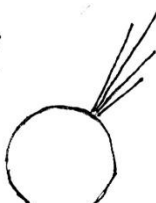
GEH 550. 3/4"



RKH 167
3/4"



B/K 13/1A
7/8"

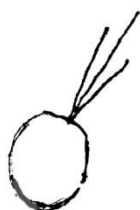


BKH 13/1B
1"

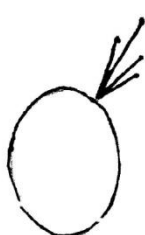


RKH 161
1"

OVOID



RKH 193.
Yellow flower
5/8" x 1/2"



RKH 193 .
Red flower
1" x 3/4"



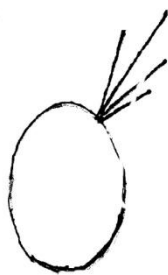
KG 1591
1 1/8" x 3/4"



FK91-13-283.
1 1/4" x 5/8"



GC180-09 (8217).
1 1/4" x 5/8"



GC180-09 (8218).
1 1/4" x 7/8"



RKH 211
1 1/4" x 1"

R. Hughes.



Fig. 8 *Maihueniopsis clavarioides* (Pf) Andn. Mendoza. Argentina.
RMF arg05 1162 & Fig.9 RMF arg05 1186. Both photos by Roger Ferryman.

