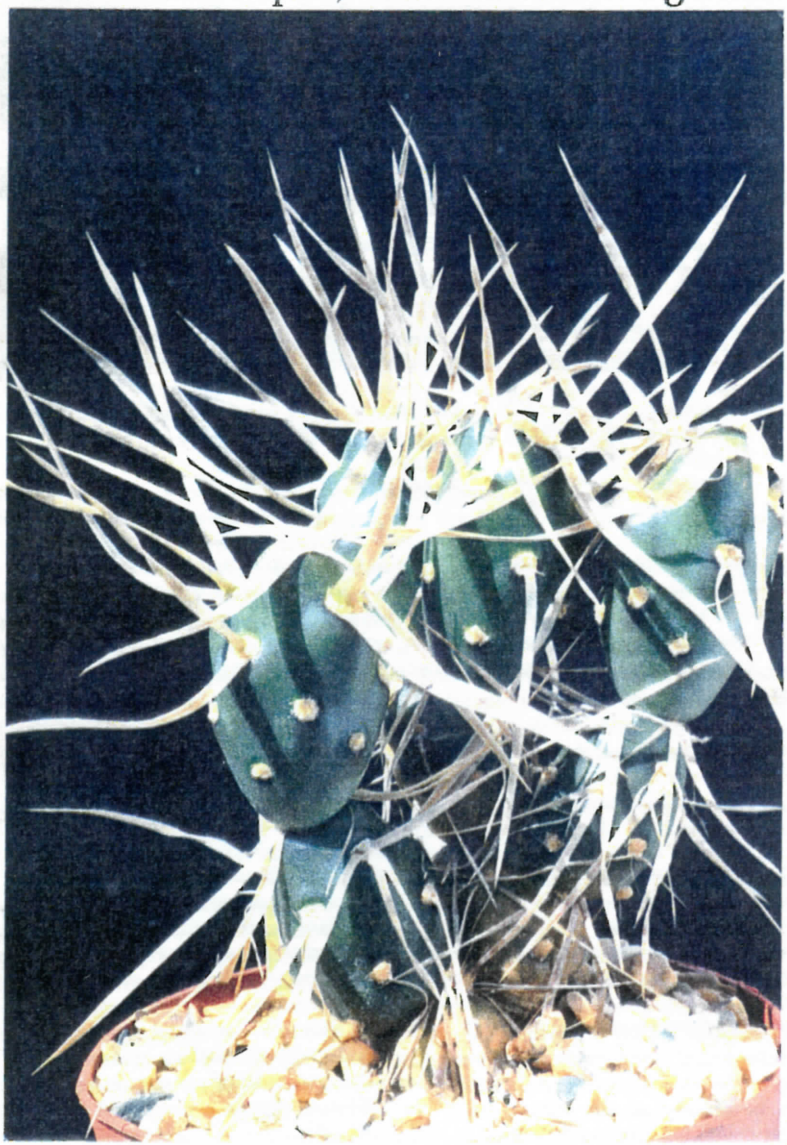
TEPHROCACTUS

Incl. Maihuniopsis, Puna And related genera



STUDY GROUP

Vol. 4 No.1 March 1998

The Secretary's Page

By the time you read this your plants will be thinking of starting into growth and I hope they are all doing well

The past year has been a good year for us and we have made significant progress. Our "One-Day-Meeting" was well attended and we have appointed a very competent editorial Team to make our little journal even better then before. Thanks go to them for their hard work throughout the year.

I can also report that Alan Welsh has now been out of hospital for some time and progressing very well. We all wish him a complete recovery.

Welcome to all those new members that have joined us during last year. Can I just remind those that have forgotten to send in their subs, for 1998, that they are now overdue and this is the last reminder! **Subs for 1998 are now overdue !**

If your name appears below we do not appear to have your Sub. for 1998. Please remember to pay your : *(Cheques should be made out to.- "The Tephrocactus Study Group")*

J. Cassel	D. Edwards	M. Fennel	J.van den Steen
J. Gamesby	K. Grantham	F. Nuis	E. Ward
W. Jackson	A. Letroye	R. Samek	C.Walker
E.Pounder	S. Reynolds	A. Welsh	
H. Walpole	A. Weaden		

Those living in France may send their payment in the equivalent in FF. To: Dawn Nelson Passe Renard, F-32290 Avéron Bergelle. All other to Subs me: W.G.Geissler
Remember, all articles, comments etc. for publication should be addressed to the Sub-Editor: *Don't forget* to *come to* our "*One-Day-Meeting on Sunday the 2nd August 1998 at* Slimbridge !
Please let me know as soon as possible if you are coming so that we can gauge attendance for catering.

I wish you all a very successful "Growing Year"!

René Geissler
Kingstone Road
Slimbridge Glos. GL2 7BW

The editors

welcome Articles, Opinions, Comment, and News about all aspects of cactus cultivation, especially if related to the study of South American Opuntioideae. Contributions may be typed, or on 3.5" disc In either TXT or Word 6 format. Hand written items can be accepted if legible. Photographs are particularly welcome. Prints, or strips of negatives can be processed but single negatives and slides cannot. A stamped, addressed envelope must be enclosed if any material is to be returned.

All contributions should be sent to...

Mr. W.L. Jackson
60 Hardwick Road
Sutton Coldfield
West Midlands
B74 3DL
Tel.0121 3535462

Correspondence received:

I am sure our members will be interested in the letter I have received from Dr. Roberto Kiesling. I took the liberty in sending him the last Number of our TSG Journal and he has made some rather interesting comments. As you will know he has been very active quite some time in the field of Tephrocactus / Maihueniopsis. So here it is!

René

Letter from Dr Roberto Kiesling
(dated 10. December 1997)

Thank you for your letter and the issue of the Tephrocactus (TSG) Bulletin. It looks very nice and there are some very artistic drawings in it. When I started with the study of this group, I never imagined that there would be such great interest in the rest of world for these plants. I expected that my paper would only be considered only by a few people. Thanks also for your concept of me; in fact I am not an authority on the Maihueniopsis, because when I instruct the plants to behave to definite form, size or colours, to coincide with my descriptions they insist in growing and behaving quite differentiy intentionally. Well, I promise to write more seriously now.

Before I started with the study of this group, many years after I began the study of the Argentinian Cacti , I felt it Impossible to understand the "Tephrocactus " classification. Later, when studying Opuntia clavarioides, with the intention to change it to Pterocactus, I was surprised when studying the floral receptacle, fruit and seed, but also the interesting differences in the Spine surfaces in the different genus; then I erected the genus *Puna* for two species (now one more has been published in the USA Cactus Journal).

Now I am beginning to understand the differences between Tephrocactus and Maihueniopsis, basically looking at the fruit and seed characters of the total genus. It was very exiting! Also alter many years a began to understand the variations in the Tephrocactus articulatus, the one with the most variations. During the next trip, I looked at the Tephrocacti with more open eyes. I discovered the big open, low lying sandy deserts, literally covered with Tephrocacti, which are not several species or several varieties or forms, but very uniform populations. These populations are in fact clones, meaning plants which are genetically identical. Tephros, are mainly reproduced, thanks to the fragility of their joints and almost all segments are rooting and producing "new plants". Sometimes two or more clones are growing together in close association, but often just one. This vegetative reproduction is much more frequent then the sexual. The many variations that these other species have, can be described as "variety" or "form", and indicates a very low category with little or no biological importance. It only helps as a way of understanding. In my classification of Darwiniana (1984), it gives only two sub-specific names within the T. articulatus: (with spines and without), there are very intermediates and variations, which could also perhaps be named. In other T. species, the variation is not so extreme, but T. alexanderi, T. geometricus and weberi are also showing some variations, some times related to one area. In my opinion, the taxonomy of the Tephro species (at specific level) are more or less solved in my work. Perhaps if we find intermediates, T halophyllus can he considered a sub-species or var. of T. alexanderi. They share the same sort of spination and general distribution of the spines, etc., only T halophyilus shows extremely long spines. A new locality for this species is now known near San Luis.

Some people are of the opinion that T. geometricus is a form of some other species (T. Aoracanthus, or alexanderi?), but in the last years (also last week), I was in the area of this species and I am convinced it is a quite separate species, (there are also plants with strong spination). I intend to write a note about this, but I can not find the time for many such small projects.

Another part of my 1984 paper is Maihueniopsis. The species taxonomy is not completely satisfactory, because some species, like M. ovata, are not well understood by me. It grows in the middle of the area of M. darwinji and M. glomerata and perhaps has great genetic variation (ingressions of genes perhaps), which is seen as an unexplained variation in the species. Other species are well defined, using a wide concept of species: M. boliviana with very thin spines, mainly yellow and directed upright in the typical form (and many variations around this form), which comes from Bolivia to Mendoza, along the high parts of the Andes and other mountains (mostly more or less in damp or wet places); and the M. glomerata (mentioned later) with a similar distribution, but in the dry and arid places (some overlapping these areas).

T. pentlandil accord with my impression of this species, is more a Bolivian than Argentinlan plant. It grows in flat highlands (punas) of sandy and clay soils, for instance near Iscayachi (S. Bolivia) and in the extreme N of Juyuy (Argentina). The plants are small, with few segments, partially spiny and (on the same plants sometimes) partially without spines. Spines are few and close to the plant. Flowers are variable, from yellow to a nice deep red. It looks a well defined species.

But there are other species (?) Growing in N. Argentina and Bolivia, which disconcert me. Most of the plants cultivated in Europe are clones that have been passed around among growers and people think these are true species, because they see them many times.

The Maihueniopis molfinoi type specimen is kept in the Córdoba herbarium (CORD.Argentina), not in Buenos Aires. It was collected by Claren and studied by Spegazzini. It has some segments compressed to prevent dehydration; superficially it looks as though the stem is not articulated, but in fact there are strangulations between the segments, Spegazzini does not mention them, perhaps having other opuntioidea in mind, as Opuntia with noticeable pads, or Tephrocactus. So Speganini gives the lack of strangulations as the more important character for Maihueniopsis, but Riffer was correct in amending the description, because this character is incorrect. On the other hand Maihueniopsis is a well defined natural group and the level of the genus, in my opinion is correct. All new studies are now showing (DNA) by Bob Wallace and seeds by Stuppi.

The bad growing in Europe of this group of plants may be responsible for the inclusion of Maihueniopsis in Tephrocactus by Backeberg; but now specialised collectors like you can grow them in the natural way (I wish I was [W.G.G.]). I assume you know my paper in Darwna (1984) (yes, you mentioned it in you paper vol.3, No.3, page 189), were the genus are described by several morphological characters. The main dilferences there are the fruits and seeds; some people have the habit of believing that the habit of the plant are more important characters; but this character has more exceptions in Chile and Peru (also in Argentina).
My concept of Tephrocactus includes only a few species of the low sandy deserts of Argentina, the other species mentioned in this genus are all Maihueniopsis, including the ones of Bolivia, Chile and Peru.

The Austrocylindropuntia is recognised provisionally in my paper as a genus, but the table shows the close affinity with Maihueniopsis. In fact I was convinced at that time (even more so now) that the link is in the "floccosa group. Fruit and seed are identical. I am enclosing a draft of a paper, in preparation.

Ritter separates Cumulopuntia from Maihueniopsis. The aril which cover the seeds is very hard and like in apple seed, in Cumulopuntia (and Austrocylindropuntia), but is lens-like and soft in Maihueniopsis. Also Stuppi (according to a letter from D. Hunt) considers it to be a completely different matter, because the vascular bundle of the aril is around the aril and in all the other Opuntoids is enclosed. I know this difference, there is only one difference vrs. many affinities, then I can separate both as genus. I am not sure about DNA conclusions: this is not yet published and also in this case the technique is very young, as to give full weight to this result and to make different groupings. In my simple interpretation, the gene which produces flat spines also produces flat spines.

The identification of Opuntia glomerata (or Maihueniopsis glomerata) is easy; The paper in the KuaS (German Cactus Soc. Journal) this year gave good photos and correct identification. These plants have a flat central spine, often clear with black tips (also black base quite frequently), but relation of the colour is variable and it is possible to find forms from completely white, to completely black. Another character is the acute tip of the segments and dark epidermis. With respect to size, they are also extremely variable. Some plants have segments less than 2 cm long (less than 1 inch), others again almost 6 cm (near 3 inches) long. The same with the spines and the size of the complete specimen. The photo of page 188 (TSG Vol.3, No.3) of your paper definitely does not look to be M. glomerata; perhaps it is a form of M. pentlandii?

Maihueniopsis moffinoi, according to the type specimen, is indeed M. glomerata. According to the rules, the name "glomerata" must be used (it is the oldest), no matter if the name of the type species of the genus drops into synonymy.

I do not have much experience with M. minuta or M. madragora. Some Backeberg photos look like a small form of M. glomerata (this is from memory), but other photos including yours on page 192 (TSG vol.3, No.3) and also plants I find at Salta (Tastil) look different; but I recognise it as a separate species, M. minuta. About your photo on page 191 (TSG vol.3, No.3), I don't want to give an Opinlon, I am not sure.

Coming back to Tephrocactus, T. articulatus, aoracanthus and alexanderi look as if their main reproductive Is vegetative, by broken segments; T . geometricus, weberi and molinensis on the other hand appear to have mainly sexual reproduction, but also asexual. This is important also to understand the taxonomy.

Are you also considering Pterocactus? This is a very interesting genus, but it does not grow well in Buenos Aires; perhaps colder parts it grows better. In the extreme end of the Opuntioideae, the stems can not be considered as stems, but very developed receptacles, which serve the function of stems.

COMMENTS ON VOLUME 3 NUMBER 4.

Tephrocactus berteri
The illustration on page 203 is a copy of the original plate published with the original description of Cactus berteri. The plant shown on page 204 is WG 221 which is listed in Rene's original list as Tephrocactus berteri.

Pterocactus decipiens Gurke. P 208.
Even without a photograph to help with identification the description of the seed pod would have pointed to it being a Pterocactus. The name is based upon the plants having winged seed. I have flowered some of my Pterocacti but Rob is only the second person I know to have had a seed pod. Tony Johnston described to me how the pancake like seeds were stacked up on each other under a "lid" on top of the seed pod. The photograph appears to show that there was a short bit of stem under the seed pod (the plant flowers from the apex of the stem) and therefore the stem would have rooted. However, seed pods of the Opuntia family have been known to root without any stem.

Falling Joints P218
Rene gives some interesting thoughts on the cultivation of T. articulatus forms in order to minimise the dropping of segments. I water into the pots but not over certain Tephrocacti because I have knocked off, with a stream of water, segments in the past from articulatus, minutus and similar growing plants. T. articulatus in the wild apparently propagates mainly by dropping segments which then root down. Thus it is natural for the joints to break. Incidentally some people have difficulty in identifying platyacanthus from articulatus. One difference I have noted is that platyacanthus segments are more firmly attached to each other than are articulatus.

The TSG Set of Photographs P220/2
I am very pleased that someone else has written on these. To try to answer some of the questions:

minuscula = minutus ? Minuscula is not the same as minutus. Both species were erected by Backeberg as Tephrocacti. His "minutus" was based upon plants in Northern Argentina whilst his "minuscula" was based upon plants in Northern Bolivia. Ritter thought that minuscula was a synonym of his Cumulopuntia pentlandii. In Ritter's opinion the species subinermis which Backeberg erected was also a synonym of what Ritter called pentlandli. Thus, according to Ritter, Backeberg's minuscula must be only a small form of Backeberg's subinermis. R.Keisling considers minutus to be another name for mandragora. (please refer to my comments in TSG Vol 3 No.4 P207/8 and the photographs in Vol.3 No.3 P191/2).

I have no copy of a photograph of a WG 380 but have one of WG 360 labelled M. minuscula. As far as WG 360 is concerned if it is an Airampoae, as I believe, then it cannot be either T. minuscula (Backbg) or T. minutus (Backbg) unless Backeberg made the mistake of basing a new Tephrocactus species name on an Airampoae. The WG 360 form illustrated in this Journal is very common in collections labelled as T. minuscula. Perhaps Backeberg was wrong in considering it to be a Tephrocactus but correct in giving a new species name. This is an area where our discussion on Tephrocacti (sensu Backeberg) needs to overlap with some consideration of Airampoae.
It has already been agreed that we are to discuss the pentlandii / bolivianus group at our meeting in August. However, has anyone any comments to make for the next Journal on the above? What do you think about Ritter making minuscula = subinermis = pentlandii? Is WG 360 a Tephrocactus or an Airampoae? What is it's name? How far do you accept minutus = mandragora?

Difference between Austrocylindropuntia and Austrocylindrica? Austrocylindropuntia is a genus erected by Backeberg in his classification of the Cactaceae into various sections. Austrocylindrica on a label might be an aflempt to shorten the genus name by omifling the suffix. Austrocylindrical would be an adjective meaning southern cylindrical.

Aerocanthus / Aoroacanthus? Lemaire erected T. aoracanthus which Backeberg considered to be the same as his T. articulatus v. ovatus (Pfeiff.) Backbg. Thus neither of the spellings on page 221 is correct

WG 216. I regard this as a straight glomerata although , like Martyn, I have obtained a specimen of this as "vaginata". Perhaps we have the same mislabelled clone!

WG 213. The plant has no connection with the name of rossiana as listed. The original number on the Photograph was 218 (stock list rossiana) but was changed to 213 (stock list russellli). Martyn agrees with me that the plant has close connections to the darwinli group. Is this the Briflon and Rose russellil or an ovatus (or both)? Both were reported by Briflon and Rose to come from Mendoza which is an area to the North West of the area where the Darwinijihickeni complex grows. Rose and Russell found a "new species" which was then named "russellii" although Briflon and Rose also listed the older, separate species of oyatus. However, both Rifler and Kiesling make russellii a synonym of ovatus.
Martyn says that he has the plant labelled as Rio Janc. By coincidence I have a plant labelled Riojana. Rio Janc could be a misspelling of Rio Jana which sounds more Spanish.. However, my plant is a kuehnrichianus so it could not come from the same area as WG2 13.1 have tried to locate a River Janc or Jana without success although there is a Rio San Juan in Peru and another in Argentina. It is feasable that the two plants could grow near the respective San Juan rivers. However, can anyone help by giving a location for either a river Janc or Jana?

Madragora / mandragora? The second is the correct spelling.

WG 140.I agree with Martyn that this is the form of plant which is Backeberg's subinermis.

WG 77. Where does M. alboareolatus fit? The plants grow in mountains East of Qicacacha in Dept. Arequipa, Peru. The species is closely related to M. zehnderi. M. alboareolatus, therefore, is at the North Western end of the Boliviana complex which stretches through Bolivia into Peru. As Martyn suggests it can therefore be regarded as a very spiny Boliviana. One cannot, however, trace a geographical paflern of differentiation by spine growth from this as M. mistiensis, another boliviana form, also grows in South Peru and is spineless.

Progression from "no spines" to "very spiny". The presence, absence, quantity, composition and distribution of spines on the segment are all of help in identification and feature in the identification keys which authors have attempted. Placing a number of plants in a series from no spines to very spiny is possible but at the end of the exercise that is probably all
you would have achieved. It would definitely be the case if some of the plants came from each of the four "Tephrocactus countries". I do agree with Martyn that it is helpful when trying to identify the plants to look at similarities. I am finding it best to first look at the body shape which often gives the clue to the geographical area (and also the plant group) from which the plant comes. Speaking in very broad terms there are the smooth ovate segments in the south (darwnii etc), the cylindrical segments as one moves North (glomerata), the segments with protuberances upon which the areoles sit (the boliviana group - note how the body shape of
M. alboareolatus fits into this) and of course the sphaerical shape of the plants down the Western side of the Tephrocactus (sensu Backeberg) area. Variations in actual shape and spination then come into consideration.

Like Martyn I hope someone else will now take the plunge to comment on the set of photographs in general and also on the above.

Status of O.kuehnrichianus P 223. Martyn points out that Illiff and Boyce question the status of kuehnrichianus. At our meeting last August we discussed the status without any reference to the fact the query was also raised by the two authors. We decided it would be helpful to have more knowledge of the distribution of kuehnrichianus and how the area of its distribution in habitat related to that of sphaericus. If anyone has information upon this it would be useful. It should be noted that on P79 of their book, published in 1973, Illiff and Boyce state that Ritter in 1957 called both knehnrichianus and sphaericus varieties of T. berteri. However, in his 1981 publication of Kakteen in Sudamerica, Vol.4 P.1253 Ritter gave the name Cumulopuntia kuehnrichianus (Werd. & Backbg.) Ritt. comb nov.. Thus Ritter changed his mind and gave kuehnrichianus it's own status as a species separating it from sphaericus which he placed under berteri. Of course Ritter could be as mistaken in his final separation of the two as he was about berteri..

Alan Hill.

Comment on "Circumscription of the Study Group"
(Vol.3 No.3, page 187, R.Motram).

A very valid question I believe! I do realise that Maihuenia and Airampoae do not fit into our main group of plants for our study, but I do agree with Alan Hill that we should not keep our study too narrowly based. I also wonder how often you have seen an Airampoa or even a Pterocactus labelled as a Tephrocactus on show benches? Of course our main subjects are Tephrocactus, Maihueniopsis, Puna and some of the tephrocactoid Austrocylindropuntia, that is without question. Our study must also and definitely include propagation and cultivation of these plants. After all that is what most ordinary members of the Cactus Society are primarily interested in, is to take pride in growing them successfully and enjoying their flowers.

I would not be averse to the mention of other Opuntias and Austrocacti growing in association with those listed to which our study is primarily directed, as well as the terrain, aggregate, climatic and other valuable information in which Tephrocacti grow. If for instance, we had a report from some visitors to the habitat of Tephrocacti etc. and they were reporting on the conditions they have found such as the altitude, rainfall, minimum and maximum day and nightime temperatures, average temperature during the year and soil conditions etc., I would be very interested.

Perhaps some of the reasons why Tephrocacti, Maihueniopsis, etc. have previously been shunned were due the fact that the growing requirements for these plants were little understood and not much has been said or reported about this in the past.

I would be very interested in what other members feel about what we should include in our study? whilst not Tephrocacti by any stretch of the imagination, should we leave out Pterocacti also? Many times I have heard it said that explorers in the field are sometimes baffled at first whether certain plants are Maihueniopsis or Pterocactus. I must admit I would draw the line at the large Platyopuntias!

The name of our Study Group is very apt and does not warrant change, I feel. It does still describes the task we have set ourselves.

René Geissler

RHUBATION?

As everyone knows, apart from that leathery pudding, Yorkshire men lived almost entirely on forced rhubarb, to the extent that it became a major factor in their county's internal economy. Many years ago this thriving trade was clobbered by a wicked virus. ft was found that the plant grew faster than the infection so that the actual growing point was free from infection. Techniques were developed to allow propagation from these tiny bits. The industry was saved and the natives were able to persist with their perverted diet. Science has a lot to answer for.

My "Opuntia clavata" / " Tephrocactus clavispina"? had some sort of lurgy as shown in the first photo. Once a new segment had survived its first winter it started developing brown, sunken patches which then rapidly grew together until the thing looked comletely dead. Without knowing whether or not this was a virus I did wonder whether a similar technique would help. Although grotty, the plant does produce new segments. I took two of these while they were very small, < 10mm, and potted them up. They sat for eighteen months looking perfectly healthy and absolutely static. This year I have been able to give just a bit more attention, including an early spray and watering as soon as the warmer weather started and Lo! they have both swelled and one has started a second pad. So far they are both free of the lurgy, as in the second photo, so the rhubarb method (Rhubation?) appears to be working. Only time will tell but, if they do succumb I will write and admit it.

Since then, relying on my list of names, I have bought a plant called Tephrocactus clavispina. You will be astonished to learn that this is identical with 0. clavata, so I needn't have bothered with all that rhubation. W.L.J. July 1997

PS. The reddish - brown dust on the capillary matting is chlorophos , I have had no mealy bugs for 2 years although Mary's neighbour's Echeverias get them. Now that chlorophos is being withdrawn I shall have to try other soil insecticides.

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▲ M. minscula (minor)
WG 360 Aug 95

M. pentlandii ▲
WG140 Aug 95

T. russellii WG 213
▼

M. alboareolatus
WG077 Aug95 ▼

A.Hill

Tephrocactus alexanderii var geometricus is a grey green plant, but if grown in full sun darkens and has a purple sheen, the segments are almost round and 3 - 4 cm Ø with brownish areoles that have very short glochids with three to five dirty white to almost black spines 5mm - 1cm long, The spines are very week and soon drop off of their own accord. The flowers I am told are white. It comes from Catamarca, Argentina.

It is just two years since I managed to obtain this choice Tephrocactus that I have been trying to find for quiet a while now. Then It turned up on Kaakteen Haage's 1996 list. When the plant arrived (31.02.96) It came as a grafted single dull green joint, what spines it had, had all dropped off in the post. It got some strange looks from certain ladies. It was quickly potted up and place with all the other Tephrocactus and given full sun on an open bench. For two months nothing happened it just sat there on it's stick, then it gradually began to darken and began to get a purplish sheen. It was starting to look quite different. A week later the skin split in two places revealing two new joints. These grew on quite fast and after another three months the two round segments were almost the same size as the original.

I give geometricus the same conditions as all my other dwarf Opuntia that is a cold greenhouse with a fan running 24hrs blowing across the plants and dry. The minimum temperature this winter has been -7°C once this winter but last winter it went down to -3°C quite often. In the early spring watering is commenced slowly at first then as the days get warmer watering is increased, only rain water is used and no fertiliser is given at all. Watering is slowed down in the middle of July as most of the Tephrocactus seem to shut down at the hottest part of the year. Which is strange as this is when I get maximum germination of their seed July/August.

One of the joints will be taken off shortly and will hopefully be rooted up, though I have been told that geometricus is not the easiest of tephros to root, we shall see. This should make another short article for the future.

e-mail john.gamesby@AZTEKIUM.octacon.co.uk John Gamesby

New Puna discovered

So far only two Puna have been described when Dr Kiesling originally described the genus Puna in 1982. Then the two transferred were P. clavanoides (Pfeiff.) Kiesling and the other more familiar P. subterrania.
These two species had a checkered history, being shuffled from one genera to another, from Austrocylindropuntia Back., Cumulopuntia Ritter, Cylindropuntia (Engelm.), Tephrocactus (Lem.) and Opuntia Turn. Ex Mill..
Now a new one has been described by D.J. Ferguson & R. Kiesling. The Holotype: R. Kiesling 8710 (collected with by Omar Ferrari and Silvio Meglioli) and it is named *Puna bonnieae spec. nov.*. It appears to have the characteristic long turnip root as P. subterrania. Ferguson and Kiesling describe the close relationship with Pterocactus and Maihueniopsis.

The new description appeared in the American Journal "Cactus and Succulent Journal" vol.69,6, '97 along with line drawings of the plant, flower, fruit and seed, as well as some interesting colour photos to show the plant in flower.

René Geissler

Those of our group who read the Cactus and Succulent Journal (US) will already know that a new species, *Puna bonnieae*, has been published in Vol.69 (1997) No.6 by D.J.Ferguson and R.Kiesling. The plant was discovered in Catamarca, Argentina in 1990. The closest relationship of this species is said to be with *P. subterranea* but the new species has larger flowers, the stems are differently coloured and they are more tuberded with more spines. The article in which the plant name is published gives general information on Puna as well as describing the discovery of the new species and details about it.

The exact location of the collected Holotype (R.Kieshng 8710) was 2,OOOm. Rio Guanchin, near Loro Huasi, Dept Tinogasta, Catamarca. The collection of O.Ferrari 16194b has the same data. Paratypes are S.Hogan 3755 (= D.Ferguson 319) near Loro Huasi, West of Fiambala, Catamarca. Thus a plant labelled " spec " with some of this detail on the label will be the new species. Apparently the new species has already come into cultivation in Europe under the name Puna rugosa (nom. nud.). Does anyone own one or has even seen one?

Alan Hill.

Revision and Transfer of some Austrocylindropuntia
By Dr. Roberto Kiesling

(Submitted in Spanish to the Tephrocactus Study Group in the U.K. by Dr. Roberto Kiesling with permission to publish it in our journal as a draft document)

Transferring some of the Austrocylindropuntia into the Maihueniopsis group

Revising BA herbaria, BAB?, LP, BAF, If, CEFAPRIN
According to the data of chromosomes.!!
verifying validity of each species and synonym

Studies of the cactaceae of South America:
Austrocylindropuntia*, new subgenera of *Maihueniopsis

The *Austrocylindropuntia* genera, as established by Backeberg in 1938, we understand South American species of *Opuntioideae* with cylindrical stems. Therefore the author has taken this as the only characteristics for the species which belong to several genera. On the other hand, in a previous work (Kiesling, 1984) has established the differences and likeness of several austro-South American genera of *Opuntioideas*. Among them, *Austrocylindropuntia* Backeb. has been provisionally accepted as an independent genera, also highlighting their likeness with Maihueniopsis Speg., being based in the species of both genera that live in the Argentina.

Recently, by studying the fruit and seeds of the type species of *Austrocylindropuntia, A. subulata,* as well as other Argentinean species, I am convinced with their similarity of the fruits and seeds to species of *Maihueniopsis*. Therefore these could all be transferred as a subgenera to *Maihueniopsis*, considering that the characters of seeds and fruits which are demonstrably similar. Perhaps the other species of *Austrocylindropuntia* should be examined and transferred, as they also correspond to the new subgenera. The group of species also includes *M. floccosa*, which constitutes an intermediate group between the subgenera *Maihueniopsis* and *Austrocylindropuntia.*

A few species that were included in *Austrocylindropuntia,* can be considered as belonging to the genera *Opuntia,* as the only stem character is not sufficient enough in order to define the subgenera. On the other hand the characters of fruits and seeds are considered more natural and therefore more suitable in order to define the different taxa. In *Opuntia* there are even less defined evolutionary lines and are more representative with cylindrical stems (*O. schickendantzii; O. salmiana, O. colubrina.) Austrocylindropuntia clavarioides* has already been transferred to the genera *Pterocactus* in a previous work was (Kiesling, 1982).

Both subgenera, *Maihueniopsis* and *Austrocylindropuntia,* live together as you walk among them to Ecuador N from Chile and Argentina, whereas *Maihueniopsis* extends more to the south, as far as Patagonia.

In *M. subulata, M. exaltata* and *M. cylindrica*, the large size of the plant and the great development of the stem and the pericarp in the flowers and fruits, as well as the very big seed aril, indicates that they are in the early stage of evolution (basic or primitive), which can also be observed in other kinds of *Opuntioideae (Opuntia brasiliensis* and aff., *Quiabentia verticillata, Consolea*). In *Austrocylindropuntia* another three very defined groups can be observed : similar to each other but one of a smaller plants size (*M. miquelli* and *M. pachypus*), growing in a reduced area; and the other with cylindrical stems of smaller size still, with coloured fruits (red) and of juicy, sweet pulp (*M. Shaferi*, M. verschaffeltii and *M. vestita*). Finally a group of very homogeneous species, with stems from cylindrical to ovoid, growing in compact cushions, often with very long hair, fruit... as for example is the case in the intermediate subgenera *Maihueniopsis.*

Maihueniopsis Speg., amend. F. Ritter, Kakt. Südam. 2: 384. 1980.- Spegazzini, Anales Soc. Cient. Argentina 99:86 (1924) 1925.- *Cumulopuntia* F. Ritter, Lc. 399. 1980.

Subgenera *Austrocylindropuntia* subgen. nov., stat. Nov. *Austrocylindropuntia* Backeb., Blätter Kakteenforsch. 1938, No. 6, p.[3] (in key), p.[21] (diagn. lat.) Small trees or shrubs branching at the base, rarely lateral, with cylindrical branches or cylindroid .Tubercles more or less asymmetrical. Areols with abundant hair and glochids. Many spines, to few or sometimes absent.
Flowers with thick receptacles, fleshy, with defined tubercles, sepals various in colour (rose to red.....)
Fruit thick, green or coloured wall (red, yellow), juicy. Seeds surrounded of a hard aril, woody, flat, with a complete dorsal line, without auricle.
Pollen globose, bulging, with continuous tectum, with espinulas and perforated rings.
Type species: *Austrocylindropuntia subulata* (Mühlenpf.) Backeb. *Pereskia subulata* Mühlenpf.

The affinity between *Austrocylindropuntia* and *Maihueniopsis* is demonstrated by the indehiscent fruit and the compact seed aril, hard, flat, without auricles. They difference is their cylindrical stem and cylindrical, lax and big leaves, which persist constantly all the time. The stems of *M. floccosa* and species show variations from ovoid to cylindrical. According to Wallace & Dicke (1996), *Austrocylindropuntia* occupies a place somewhere between the *Opuntioideae*, while *Maihueniopsis* is, according to these authors, far from the first.

Maihueniopsis cylindrica (Lam.) R.Kiesling, comb. nov.
Cactus cylindricus., Lam Encycl. 1: 559 (0 539??). 1783.
Cereus cylindricus (Lam.) Haw.,. Pl Syn. Succ., 183. 1812.
Cylindropuntia cylindrica (Lam.) F.M.Knuth, in Backbrg. Knuth og, Kaktus- ABC: 120. 1935.
Austrocylindropuntia cylindrica (Lam.) Backebrg., Cactac.; Jahrb. Deutsch Kakt- Ges. 1941 (2): 12. 1942.
Austrocylindropuntia intermedia Rauh& Backebrg., Backebrg. in. Descr. Cact. Nov.: 6. 1957. (Invalid by Art. 9.5, lacking type)
Cylindropuntia intermedia (Rauh& Backebrg.) Rauh& Backebrg., in Rauh, Sitzunberg. Heidelberg Akad. Wiss.: 194. 1958 Type: "Rauh 111 (1954)."

Maihueniopsis exaltata (A. Berger) R. Kiesling, comb. nov.
Opuntia exaltata. A. Berger, Ort. Morto.: 410. 1912.
Austrocylindropuntia exaltata (A. Berger) Backebrg., Cact. Jahrb. Deutsch. Kakt.- Ges. 1941 (2): 12. 1942.
He distinguished *M. subulata* for their globose fruits of 3-4,5 cm diam., with few (1-4) seeds, therefor the characters already signal to other authors (Berger, .c., etc.): the leaves are of minor size: approx. 7 cm long., the major spines: up to 13 cm long, and several forms of tubercles.
M. exaltata occurs very frequently in Bolivia up north to Bolivia, mostly it is cultivated plants forming fences, but it has also entered natural vegetation, it is difficult to establish their origin. In general they are found growing between 3500 and 1500 m.
Material studied: BOLIVIA. Dept. La Paz. Prov. Murillo. zone de Cota Cota 12.05.1987, I. Vargas 324 (LPB). Calacoto, 3300 m, ornamental, 1-4 m tall, 16.09.1986,
Solomon 15580 (LPB). PERU. Dept. Ancash. Prov. Huacarán, Nat. Park, Huaylas, Qda. Sta. Cruz, 17-I-1985, Smith et al. 9346 (USM). Pativilca-Huaraz Road, Km 113, 9.07.1982, buds red, Gentry et al. .37346 (USM). Go. Km 107, 9.09.1982, Gentry et al. 37326 (USM). Dept. Junin. Tarma, road Tarma-San Ramón, fl. Red, 01.10.1982, Smith 2462 (USM). Dept. Lima. 10 NE Km of Suchi, 61 Km NE of Chosica on road to Huanza, 3850-3900 m. Tree cactus 3 m, fl. red, fruit turning yellow, May 6, 78, Gentry et al. 21674 (USM).
R.Kiesling 1997 found to be dubious

Malhueniopsis floccosa (Salm- Dick) R. Kiesling, comb. Nov.
Austrocylindropuntia. floccsa (Salm-Dick) F. Ritter, Kakteen in Südamerika 4: 1244. 1981.

Material studied: BOLIVIA. Dept. la Paz. Prov. Larecaja. Okara, Rio Tipuani, 7500 feet, Apr. 1926, Tate 999 (LPB). PERU. Dept. Ancash. Prov. Yungay, from Yungay to Yauya vicinity of Llaganuco Lagoons, 3500-3800 m, fl. red, Gentry et al. 37412 (USM). Prov. Huascaran, Carahuay, Nat. Park, fl. red fr. ripens yellow, 15.02.1985, Smith et al. 9545 (USM). Prov. Huaylas, Nat. Park, 9.03.1985, Smith et al. 9795 (USM); id. fl. scarlet, 28.02.1985, Smith 11529 (USM). Prov. Recuay, 150 km of route Patavilea-Huaraz, Coricaste. Fruit edible, orange and sweet at madurity, 20.08.1984. Smith 8300 (USM). Dept. Ayacucho, Prov. Lucanas, Nazca-puquio Road, Calera Pampas, 9.09.1957, Hutchinson 1251 (USM). Dept. Cuzco. Prov. Urubamba, summit of Antakillgea??, 4500 m, 20.01.1982," roq'a," "Inca-roq'a", used for bathing sick stomach with egg, drink, etc., Dawis etal. 1700 (USM). Dept.. Junin, La Oroya, puna, 3950 m, 11.08.1948, Ferreira 3943 (USM). Summit between Tarma and La Oroya, 4100 m, puna, (sterile) Gentry and Tredwell 37299 (USM). Dept. The Freedom. Prov. Huamachuco, above Rio Chusgón (Pullac), 42-44 Km, 3700-3760 m, 7.8.1964, Hutchinson et al. 6174 (USM).
Lacking Smith 9258 (USM, If)??

Malhueniopsis lagopus (K.Schum.) R.Kiesling, comb. nov.
Opuntia lagopus K.Schum., Gesamtbeschreibung, Nachträge: 151. 1903.
Austrocylindropuntia lagopus (K. Schum.) F. Ritter, Kakteen in Südamerika, 4: 1242. 1981, without paging of the article (Art. 33.2), but with clear mention of the author and his work.
Austrocylindropuntia lagopus (K.Schum.) F. Ritter f. rauhii (Backebrg.) F. Ritter, Kakteen in Südamerika 4: 1243. 1981.without paging of the article, but with clear mention from the author and work.
Tephrocactus rauhii Backebrg., Descr. Cact. Nov. 7: 1956. (valid??)

Austrocylindropuntia lauliacoana F. Ritter, Kakteen in Südamerika 4: 1247. 1981. Type: "Peru. Llullaillaco, infabius Rimac, dept. Lima. 3600 m and Fortaleza."

Austrocylindropuntia machacana F. Ritter, Kakteen in Südamerika 4: 1246. 1981.
Peru, Dept. Ancash , Cord. Blanca, up to Machac. 3500 m.
Aurocylindropuntia malyana (Rausch) F. Ritter, Kakteen in Südamerika, 4: 1244. 1981.
Tephrocactus malyanus Rausch, KuaS 22: 43. 1971. S. Peru, Macusanio, 4500 m . Photo in succulenta 2 1972

Malhueniopsis miquelii (Monv.) R.Kiesling, comb. nov.
Opuntia miquelii Monv., Hort. Univ. 1: 208. 1940.
Austrocylindropuntia miquelii (Monv.) Backebrg., Kakt. Jahrb. Deutsch. Kakt.- Ges. 1941, Pt. 2, 13. 1942.

CHILE. III Region. Prov. Huasco, Mpio. Freirina, Qda. Chañaral, 6.12.1994, Leuenberger. (If)

Malhueniopsis pachypus (K. Schum.) R.Kiesling, comb.. nov.
Opuntia pachypus K. Schum., Mon. Kakteenk. 14: 26. 1904. "Peru, above Chosica, Lima, in the Valley of Sta. Eulalia." According to Leuenberger (1979), Weberbauer 1677, B, is the type).
Austrocylindropuntia pachypus (K. Schum.) Backebrg. Kakt. Jahrb. Deutsch. Kakt.- Ges. 1941, Pt. 2, 13. 1942.
Obs. In accordance with his observations in Sta. Rosa of Quives (Dept. Lima) in March of 1997, the reproduction is largely vegetative: the fruits, of is a green colour, they fall from the plants and root, producing new individuals. Upon cutting several fruits he has observed a basal juicy zone, turgent and a somewhat dry, where the ovarian cavity is, without seeds in the observed specimen.
Material studied: PERU. Dept. Lima, between Lima and Canta, 1300 m, fl. red, 2.04.1953, Ferreira 9012 (USM). Dept. Lima, Sta. Rosa de Quives, 03.1997, R.Kiesling ....(If).

Mathueniopsis shaferii var. shaferi (Britton& Rose) R.Kiesling, comb. nov.
Opuntia shaferi Britton & Rose, The Cactaceae 1: 72. 1919. Type: "Argentina. Jujuy. Dept. Tumbaya, between Purmamarca and Tumbaya,6.02.1917, Shafer 90" (holotip: US, isotip K!, NY!).
Austrocylindropuntia vestita (Salm-Dick) Backebrg. var. shaferi (Britton & Rose) F. Ritter, Kakteen in Südamerika 2: 360. 1980.
Opuntia weingartiana Backebrg., Blätter f. Kakteen. 1935-8.
Type: not mentioned. (valid?)
Cylindropuntia shaferi (Britton& Rose) Backebrg., in Backbrg. Knuth og, Kaktus-ABC: 119. 1935.
Austrocylindropuntia weingartiana (Backebrg.) Backebrg. Cact. & Succ. Journ. USA) 23: 14. 1951.
Austrocylindropuntia shaferi (.Britton& Rose) Backebrg., Cact. & Succ. Journ. (USA) 23: 14. 1951.

BOLIVIA. Dept. Potosi. Prov. Nord Chichas, 3400 m s.m., 12.1946, red flowers. M. Cardenas 5043 (LIL).

Mathueniopsis shaferi var. humahuacana (Backebrg.) R.Kiesling, comb. nov.
Cylindropuntia humahuacana Backebrg., in Backbrg. Knuth. Kaktus-ABC: 119. 411. 1935.
Austrocylindropuntia humahuacana (Backebrg.) Backebrg. In Cact. & Succ. Journ. USA) 23: 13. 1951.
Austrocylidropuntia shaferi (Britton& Rose) Backebrg. var. *humahuacana* (Backebrg.) R. Kiesling, Cact. Succ, J. Gr. Brit. 42 (4): 110. 1980.
Bolivia. Dept. The Peace. Prov. Murillo, La Florida, ca. 17 Km rio Abajo, Huajchilla, 3100 m, 15.05.1986, Beck et al. 12525 (LPB). Go. 3000 m, 30.01.1983, Solomon 9459 (LPB). At 0.4 km High Irpavi, ca. 3500 m, fruit red, fleshy, 23.08.1981. Solomon 6096 (LPB). Rio Abajo ,below Huajchilla, 2900 m, 5.01.1991, Beck 17951 (LPB). La Paz, S of Los Pinos suburb, 10.03.1982, Solomon 7172 (LPB). Chinchaya, 3600 m, 9.05.1987, Valenzuela 1029 (LPB).
ARGENTINA. Prov. Jujuy. Dept. Tumbaya, Subida al Abra de Tiraxi, 2400 m s.m. 31.12.1952, H. Sleumer 3162 (LIL).
Austrocylindropuntia steinmaniana Backebrg. Descr. Cact. Nov.: 6.1957. Type:
Opuntia steiniana (Backbrg.) Rowley, Natl. Cact. Succ. J. 13 (1): 4. 1958.

Mathueniopsis subulata (Muehlenpf.) R.Kiesling, comb. nov.
Pereskia subulata Muehlenpf. , All. Gartztg. 13: 347. 1845.
Opuntia subulata (Muehlenpf.) Engelmann, Gard. Chron. 19: 629. 1883.
Austrocylindropuntia subulata (Muehlenpf.) Backebrg. In Cactaceae Jahrb. Deutsch. Kakt. Ges. 1939, Teil 2 (Okt.), 12, in obs.
Cylindropuntia subulata (Muehlenpf.) F.M.Knuth, in Backbrg. & Knuth, Kaktus-ABC: 121. 1935.
SEE *Opuntia segettii* Phil., Bot. Zeitung 26: 861. 1868.
SEE *Opuntia ellemetiana* Miq., Ned. Kruidk Arch. 4: 337. 1868.

S-Peru: Cordillera Negra. Pass Conochocha, 4150 m. According to Navarrese Gonzalo (1996), they grow in the proximity of Lake Titicaca (Bolivia). According to Backebrg. 1: 139. 1959 S-Peru.
Material studied: ARGENTINA. Prov. Mendoza. Prov. Mendoza. Cultivated, 12.1996, L. Bonifacich 1 (lf, fruits).

Although it is similar to *M. exaltata*, it is recognisable the cylindrical-claviforme fruit, of 10-13 cm long. and 4-6 cm dia., with lengthened tubercular, small areols: ... cm dia. The vegetative characters already signal for other authors in order to differentiate that *M. exaltata* have more longer leaves: up to 12 cm long., shorter spines: 8 cm long and the form of the spines on the stems. See observation re. *A. exaltata*.

Austrocylindropuntia tephrocactoides Rauh & Backebrg. Backebrg. Descr. Cact. Nov.: 6. 1957. Peru. .austr. (valid?) S-Peru, La Raya-Sicuani, 3500 m.

Maihuenlopsis verschaffeltii (Cels ex. A. Weber) R.Kiesling, comb. nov.
Opuntia verschaffeltii. Cels ex. A. Weber, in Bois, Dict. Hort.: 898. 1898.
Opuntia hypsophila Speg., An. Mus. Nac. Buenos Aires (4): 509. 1905.
Cylindropuntia haematacantha Backebrg., in Backbrg. Knuth og, Kaktus-ABC: 118 410 (latin dignosis). 1935.
Austrocylindropuntia verscheffeltii (Cels ex. A. Weber) Backebrg., in Cactaceae Jahrb. Deutsch. Kaktus. 1939, Teil 2 (Okt.), 10, in obs.
Austrocylindropuntia haematacantha (Backebrg.) Backebrg., Cact. & Succ. Journ. USA). 23: 13, 1951. See Backbg: V: 3577
Austrocylindropuntia hypsophila (Speg.) Backebrg., Cact. & Succ. Journ. USA) 23: .13. 1951.
Austrocylindropuntia inarmata Backeb. Cactus, Paris, Not. 73-74: 5??. 1962. (Descript. Cactacearum. II.3: 5.1962) (invalid by Art. 9.5).
See O. digitalis
ARGENTINA. Prov. Catamarca. Dept. Belen, Londres, 3300 m s.m. 18-I-1947. D. de Droghetti s.n. (LIL 247400). Prov. Tucumán. Dept.. Tafí, Tafí del Valle, 2000 m s.m., 19.11.1945, J. Araque and F. Barkley s.n. (LIL 288874). Los Cardones, Qda. from Amaicha fl. red sanguin, 12.1931. Schreiter 7213 (LIL).

Maihuenlopsis vestita (Salm-Dick) R.Kiesling, comb. nov.
Opuntia vestita Salm-Dick, Allg. Gartenztg. 13: 388. 1845.
Austrocylindropuntia vestita (Salm-Dick) Backebrg. Cacteceae Jahrb. Deutsch. Kakt. Ges. 1939, Teil 2 (Okt.), 15, in obs.
Opuntia chuquisacana Cardenas, Lilloa 23: 20. 1950. Type: Cardenas 4390 (US 1989859 isotipo; LIL, holotipo??).
Opuntia vestita var. chuquisacana (Cárd.) Rowley, Natl. Succ cactus. Journ. 13: 25. 1958.
Austrocylindropuntia chuquisacana (Card.) F. Ritter, Kakteen in Sudamerika 2: 485. 1980.
Austrocylindropuntia teres (Cels) Backebg., J DKG.: 39. 1944. (without basonym, but seemingly for that year is said!!, or before (???) valid mention for this combination: Backeberg, Die Cactacea1: 150. 1958). Consult Index Kewensis and Gray Herb Card..."
Opuntia teres Cels ex A.F.C.Weber, in Bois, Dict. Hort.: 898. 1898.

ARGENTINA Jujuy Dept. Tilcara, Tilcara, Alfarcito. 3000 m s.m., 26.12.1952, H. Sleumer 3099 (LIL).
Seemingly there are four groups in this subgenera:

A. Plants with defined trunk, old of 1 m tall:
B. Large tubercles separate aureoles ca. cm. Plants of 2 or more m tall.
M. subulata, M. cylindrica, M. exaltata.....
B. smaller tubercles, areols separate ca. . cm. Smaller plants of 1.5 m tall.
M. pachypus, M. miquelii

A. Plants without trunk, ramified at the base.
C. Lax Plants, with separate branches, up to 40 (-50) cm tall.
M. vestita, M. verschafeltii, M.shaferi
C. Cushion forming Plant more or less compact, up to 1 m of high and dia.????, with many branches
O. *floccosa*-Salm-Dick (1845), *O. lagopus* K.Schum. (1903), *Tephro. rauhi* Backbrg (1956), *A. tephrocactoides*: Rauh and Back. (1957), *Tephro. malayanus* Rausch (1957), *A. leuliacoana* Ritt. (1981), *A. machacana* Ritt. (1981)

Taxons excluded from *Austrocylindropuntia* (in alphabetical order):

Austrocylindropuntia albiflora (K. Schum.) Backebrg., Cactac.; Jahrb. Deutsch. Kakt.- Ges. 1941, Pt. 2, 13. 1942.
Opuntia albiflora K. Schum., Gesamtbeschreibung Kakteen, Nachtrag: 152. 1903.
Opuntia salmiana **(see A. salmiana).**

Austrocylindropuntia clavarioides (Pfeiff.) Backebrg., Cactac.; Jahrb. Deutsch. Kakt.- Ges. 1941, Pt. 2, 13. 1942.
Opuntia clavarioides Pfeiff., Enum. Diag. Cact.: 173. .1837.
Puna clavarioides (Pfeiff.) R.Kiesling, Hickenia 1 (55): 291. 1962.

Austrocylindropuntia colubrina (A. Cast.) Backebrg., Cactac. Handb. Kakteenk.1: 56. 1958.
Opuntia colubrina Castilian, Lilloa 27: 81. 1953.

Austrocylindropuntia ipatiana (Cardenas) Backebrg., Cactac. Handb. Kakteenk. 1: 153. 1958.
Opuntia ipatiana Cardenas, Cactus 34 7: 127. 1952
Opuntia salmiana (see A. salmiana).

Austrocylindropuntia maldonadensis (Arechav) Backebrg. Cact.& Succ. Journ. USA 23: 13. 1951.
Opuntia maldonadensis Arechav. Anal. Mus. Nec. Montevideo 53 266. 1905. (1907???).
Opuntia aurantiaca Lindley, Bot. Reg. 19: [pl]. 1606. 1846.

Austrocylindropuntia salmiana (Parm. ex Pfeiff.) Backebrg., Cactac.; Jahrb. Deutsch. Kakt.- Ges. 1941, Pt. 2, 13. 1942; cf. Gray Herb. Card Cat.
Opuntia salmiana. Parm ex Pfeiff., In. Diag. Cact.: 172. 1837.

Austrocylindropuntia schickendentzii (A. Weber) Backebrg. Cact.& Succ Journ. USA 23:14, 1951.
Opuntia schickendantzii A. Weber, ex K. Schumann, Gesambt. Kakteen: 688. 1898.
Austrocylindropuntia spegezzinii (A. Weber) Backebrg., Cact. & Succ. Journ. USA) 23: 14. 1951.
Opuntia spegazzinii A. Weber, in Bois, Dict. Hort.: 898. 1896.
Opuntia salmiana **(see A. salmiana)**

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Leuenberger, B. E. 1979. Typen Cactaceae in der Nasspräparate-Samlung des Berliner Herbars. Willdenowia 8: 625-635.

Navarrese. G. 1996. Catálogo ecológico de les Cactáceas de Bolivia Lazaroa 17: 33 84.

Stuppy, W. & Huber, H. 1991. Samenmerkmale und Gattungsgliderung der Opuntioideae. Kakt. Sukk. 42: 122-126; 144-144, 165-167 & 208-211.

Wallace R.& Dicke, S.L. 1996. Molecular Systamatics Phylogeny of the Subfamily Opuntioideae (Cactaceae). IOS Bulletin 6 (2): 65.

▲ Puna clavarioides on it's own roots WGG

▼ Tephrocactus paediophyllus WG 039 WGG

TEPHROCACTUS

Incl. Maihuniopsis, Puna And related genera

STUDY GROUP

Vol. 4 No. 2 July 1998

Secretary's Page

Now is the time when all the plants are in full growth and the flowers this year are so numerous that I have already used two films to photograph them. Unfortunately, the first film was completely useless, because in my hurry to make sure I had captured all plants in bloom, I did not take sufficient care to ensure it was loaded properly and the film was blank!

The past year saw our membership rise to a dizzy height of 40 members, mostly due to Tony's effort, setting such a high standard with the production of our Journal. Our thanks are due to him for his hard work.

We were fortunate to have the letter and "Revision and Transfer of some Austrocylindropuntia" by Dr. Roberto Kiesling in our last issue and there are other articles promised by one of our members who has visited habitat recently. So we have something to look forward to.

We also now have a new acting Treasurer Mrs. Dorothy Minors and I would like to thank her for taking over at short notice when Alan Welsh had his serious accident. I am pleased to report, he is now making a good recovery.

Also I would like to extend a "Warm Welcome" to all our new members who have joined us during the past year! I hope they will enjoy taking part in our task !

May I remind you to send all articles and comments to William Jackson, 60 Hardwick Road, Sutton Coldfield, West Midlands B74 3DL

Deadline for next issue is 15th August

If you would like to write for the Journal and have a computer, it would be very helpful if you could format the page layout based on the same page size as the Journal and the same margins. The type is "Times New Roman 8 point". This would help enormously with production and you can send it in on disc or print. If this is not possible, don't let this deter you! Send it in any way you can.

Photographs should preferably be postcard size (and if you would like them back please enclose an S.A.E. for this purpose.

One Day Meeting –Sunday 2nd August 1998

This will take place here at the Slimbridge Village Hall at 10 am

Starting with tea or coffee on arrival followed by a brief A.G.M

Followed by a prominent Speaker

Lunch at the nearest Pub

Study Session in the afternoon and Plant Exchange

Closing at about 4.30 pm

To facilitate catering, please advise me if you are able to come by 15th July '98

Write to René Geissler, "Winsford", Kingston Road Slimbridge GL2 7BW – Tel: 01453 890340

John Gamesby

I have been in contact with David Ferguson about some seed of his that I germinated. They came from Mesa Gardens in 1996, T. alexanderi v. geometricus DJF319 and 320. He has given permission for TSG to publish his comments...

I'm glad my seed grew. I think you'll find, amongst the seedlings, a few totally spineless and a few nearly as spiny as as typical T. alexanderi. The plants are variable in nature and, though the seeds were from nearly spineless "geometricus", I'm sure that there are genes for spiny plants there.

Roberto Kiesling does not favour geometricus being a variety of T. alexanderi because they look very different. But looks can be deceiving. There can be no doubt that the two are the same species when one visits them in habitat.

The population of geometricus I know occupies a small, desert valley where it is very distinctive. However, as one moves Eastwards, the plants get spinier and spinier. All possible intermediates can be found between the extremes. Plants of geometricus are simply a local pocket of T. alexanderi plants which are nearly spineless and have almost flat tubercles. There are other extremes of this species as well. On the East side of Cuidad San Juan there are plants with large stems and long, flexible, slender spines. This is T. halophilus. There are all sorts of intermediates to typical T. alexanderi near here too.

A similar case would be Pterocactus auracanus. This is simply a spineless or short, few spined variant of P. hickenii. P. skottsbergii is this too. There are often populations made up of one or two clones of this O.fragilis like plant. Sometimes all of the plants in a population are of the weakly spined type. However, nearby and more commonly, one will find populations in which there is every combination in length, number and colour of spines present. In this case I don't think the plants even deserve varietal distinction as they are part of the normal gene pool of the species throughout its distribution.

Another case is Echinocereus "inermis". This is similar to the Pterocactus. It is merely a spineless, or weakly spined, variant of E.triglochidiatus v. mojavensis. It is found as a normal variant variety and deserves no more than, perhaps, 'forma' recognition. (There are bald examples within the gene pool of Colorado Plateau Humans. Are they to be considered 'forma inermis' ? It is much the same.) There are many others. Some may be good varieties but most are normal, albeit extreme, variants occurring within populations. A few are simply clones propagated in cultivation and should be considered cultivars. For example, Opuntia cacanapa 'Ellisiana', O.ficus indica 'Burbanks Spineless', O.fragilis 'Denudata', Echinopsis oxygona 'Eyriesii' etc.

COMMENTS ON VOLUME 4 NUMBER 1.

Rhubation? P 232.

Someone has said to me that Bill appears rather scathing on Yorkshire people. Actually, being a Yorkshire tyke myself I thought, falsely, on reading what Bill wrote that he was also a tyke. One Yorkshire motto that Bill could have quoted is "throw now't away as tha never knows when tha'll need it". Bill shows that whilst there is any life in plant material it shouldn't be thrown away as rhubation might create a good plant. The motto is also apt because just as I was thinking of disposing of some Austrocylindropuntia I discover they might be Maihueniopsis! What Bill didn't tell you is that his "Opuntia clavata" is also known as Corynopuntia clavata (Eng.) Knuth being the Type species of Corynoputias which come from North America. However, there is a school of thought that no matter if the plants come from North or South America, have pads or cylindrical stems, are two metres or two centimetres tall, if they belong to the Sub-Family Opuntiodeae then the name Opuntia is all that is required. The species name "clavispina" does not exist. In relation to the circumscription of the Study Group it was a good idea to publish a photograph of a Corynopuntia because they are often mistaken for a Tephrocactus (sensu Backeberg).

New Puna P 236.

The new Puna is in circulation in Britain. A TSG member has already shown me one he bought and another has told me he has two clones.

Letter from Dr R. Kiesling P.226. Revision and Transfer of some Austrocylindrpuntia. P237.

I am pleased to read that Dr Kiesling confirms the fact that the Tephrocacti (sensu Kiesling) populations in habitat tend to grow in groups of clones. This reinforces some of the information and conclusions we have had in previous issues of the Journal.

We are very fortunate to have the benefit of reading the draft document by Dr R. Kiesling on the revision of some Austrocylindropuntia. The bibliography supplied on page 242 will be a great help in directing members to the relevant literature. Between the issue Vol. 4 No. 1 and No. 2 there has been little time to make a considered opinion and contribute comments on Dr Kiesling's new work but I hope there will be a good response from our members in No. 3.

For some of our newer members perhaps the following outline will help to put the Revision and Transfer into context. Opuntia is one of the largest genera of the Cactaceae. The plants cover a very large geographical area and have a wide range of shapes and sizes. Lemaire in 1868 divided Opuntia into five genera, one of which was Tephrocactus. This was a new name invented by Lemaire and he assigned eight species to the genus. Backeberg in 1956 published his own description of the genus. Tephrocactus (sensu Backeberg) in the Cactus Lexicon, 1977, consists of ninety two species and fifty six varieties listed in Series 1. Elongata and Series 2. Globulares. This was a very useful work but it contains a very mixed range of plants. We can now realise that some of the names are synonyms whilst some of the plants do not fit very easily together as a group. Dr Kiesling has introduced a new classification with Tephrocactus (sensu Kiesling), Maihueniopsis (extending Spegazzini's concept) and Puna. Although I have invited discussion on this classification no one has made any contribution. However, the genus names have become of common usage in our group. Also most of us (?) have come to accept flocossa and its near relatives as small Austrocylindropuntia and when I mentioned that I sometimes wondered if weberi fitted into Tephrocacti (Vol. 3 No. 2 P.173) Roy Mottram in the

following issue (P.187) agreed that the species is best considered as a member of the Austrocylindropuntia group.

A. Hill.

Congratulations to Rene.

Most of you will know that about two years ago Rene had his Tephrocactus collection accepted as a Reference Collection under the National Council for the Conservation of Plants & Gardens scheme of National Collection Holders. Now he has had his collection of Pterocactus registered. More than one collection of a genus can be registered so if you wish to have your collection registered then Rene can can give you details on the procedure. There are very few cacti collections registered at present.

Current membership of the TSG for 1998

(Updated: 1st. June 1998)

The following is a complete list of members at present and I would be very grateful if you would check your address for any mistakes and/or changes, also advise me of the current Telephone Number so that I can complete this list and keep it fully up-to-date.Any future additions to our membership will be made with each issue and when necessary a full list will be published again.

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Amendments and alterations to: W. G. Geissler

Please remember that if every member will contribute just one page (or more), what a wealth of experience we will have to draw on!
Please do make an effort!

My Way of Cultivation (by René Geissler)

Propagation from Seed

Growing Tephrocacti and the Opuntia group in general has not always been popular and even now many collectors and even growers shy away from them for various reasons. Firstly, perhaps they have not been very popular because they *are all Opuntias* and tarred with the same brush as the large platoid monsters one sees at the French Riviera and other places. When someone tries to grow these plants, they soon end up under the staging and that is just about the worst place for Tephrocacti.

Having now grown Tephrocacti, Maihueniopsis and Pterocacti for quite a number of years with some modest success, it may be worth sharing some of my methods with others just starting to grow them. I must stress that what I have to say is purely from my experience and others may well have their own methods of growing them and I for one am always willing to learn a trick or two.

First I would like to begin with seed raising which is just one basic step to the propagation of plants that I have always enjoyed. Until three years ago, I too was sceptical as to whether it is really worthwhile to propagate from seed . Everyone I had spoken to in the past had told me how difficult it was to germinate Tephrocacti from seed. After all I did not have much incentive until then as many friends here and on the continent were very generous and kept me supplied with cuttings and the collection grew like fury. Sooner or later though there comes a time to try something else.

One or two of our members mentioned that they have been able to raise some seedlings, so I just had to try my hand. My Maihueniopsis were flowering and some even produced some seed and so I planted them and to my surprise they germinated quite well. That was the beginning. Last year I became a little more ambitious and tried a number of Maihueniopsis, Tephrocacti and Maihuenias from seed. Now there are quite a lot of seedlings of good size ready potted up and I am amazed at the variation in the spination and even in the plants. This is really the bonus of raising plants from seed!

Belonging also to the German Study Group, I have found that very many methods have been tried to increase germination rates, which for the Opuntia group are relatively poor right down to zero. Some prefer to chip the seed and others sand-paper the seed. Both methods seem somewhat fiddly and time consuming. First I tried chipping the seed, but was never quite sure how much to chip and nearly wore a finger away in the process. One way however seemed the most sensible and comes close to the natural conditions that may occur in habitat. When the seed is received, it is put in individual polythene bags with about an equal amount of damp sand, sealed and labelled and put in the refrigerator at 3-5° C (not freezer) for 5to 6 weeks before sowing.

Sowing should be done in half compost and half grit. Pots or pans are suitable, but I prefer deep pots, as this holds the moisture better. The seed can be inserted in the medium up to ½ inch and well watered. I fill the pots to 1 cm from the top, place the seed on this and fill up with grit. The next steps I regard as the most crucial. Firstly the compost must never be allowed to dry out and secondly, it should be placed in the lightest and hottest place, preferably on the top shelf, or propagator. For the seed to germinate it needs a temperature of 30 to 35° C. The first seedlings should show in about 10 – 14 days, but some may take up to two years. Strangely enough, even when the seedlings appear , they do not mind the fierce hot sunshine at all. It is important not to forget to spray or water the pots almost daily while seed is germinating.

Tephrocactus malyanus Rene

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Pterocactus kuntzei W.G.462 Rene

Tephrocactus alexanderi W.G.297 Rene

This way I have had very good results and even if I lift all the seedlings and pot them up, more seem to appear all the time. In the Autumn the pot or pans may be allowed to dry out and restarted again the following year, when more will germinate when the weather heats up.

I have found that particular with Maihuenia, they can continue to germinate and I have had an equal number the second year as in the first year and still some come the following year as well. Some Tephrocacti are easier to germinate than others, although this may be due to the age of the seed. T. alexanderi and it's varieties are one of the easiest to raise although T. geometricus, which is now regarded as a variety or form of T. Alexanderi, is difficult. It also seems certain to me now that the age of the seed has a bearing on germination. For instance my own seed seems to germinate almost 100% the following year, particular that of Maihueniopsis. In general seed of Tephrocactus takes longer to germinate than Maihueniopsis, but Maihuenia takes even longer.

Next, I will try to go into other methods of propagation and general cultivation and management of the plants. This will include taking cuttings potting, watering, feeding, housing and all other requirements.

(to be continued

Don't forget our "One Day Meeting – 2nd August

We will be discussing the pentlandii/boliviana group of plants

Comments on Volume 4 number 1

Alan mentions on page 229 that there is a considerable difference between T. articulatus and platyacanthus. He is quite correct that the segments of platyacanthus are more firmly attached to each other than in the case of articulatus, but I strongly suspect Kiesling is right in saying that T. plantyacanthus should be regarded under Maihueniopsis. In "Darwinia 1984" he suspects it to be a synonym of O. darwinii v. hickenii. This may become a little clearer when "Schumannia" (the German equivalent of our "Bradleya"), is issued later this year.

In the same Volume on page 235 John Gamesby tells us about his T. alexanderi v. geometricus and I think it clearly shows that it is in the "alexanderi" group, with the dark, down-pointing spines, but there are indeed quite a lot of variations. Incidentally, the spines are most prominent on the new growth and tend to drop off with age.
I think I would get a little worried having mine in a cold greenhouse though, as in general, the Tephrocacti sesu Kiesling (as opposed to Maihueniopsis), do not like prolonged frost and certainly not below
2 to 3° C . I tend to keep mine on the top shelf in the greenhouse. Plenty of ventilation is certainly an asset and almost imperative for good healthy plants. Quite contrary to general belief, they have a very short growing period of about four months and it is during this period (June to beginning of August), that they should receive liberal quantities of water and feeding. If watering starts too early, or continues till late in summer, weak growth results.
Incidentally, mine is about to burst into bloom any day now (1st June) and with some luck we will be able to show a photo in the next issue.
So take heart John, your's will be there soon!

An Article written by Chris Holland

(written for the TSG when it was still a Round Robin, but well worth recalling,[W.G.G.])

I have been interested in Tephrocacti for about ten years now, and I suppose it was Doug Rowland who first introduced me to these plants. I had not come across anything quite like them before in the cactaceae. So my first acquisition was something of an eye-opener! Since then my interest has grown, only blunted occasionally by the unpopularity of these plants in cultivation and the resultant difficulties encountered in trying to increase the number of different types in my collection. This lack of material in cultivation is exacerbated by the few collectors from this country, who have travelled through the habitats of these plants frequently over the past decade who, through their lack of interest, have shown little inclination to collect any plants or seeds. Indeed, I am often amazed by the wealth of interesting looking material depicted in the literature which no longer seems to be represented in collections- in this country at least. The other big problem in trying to obtain new material is the confusion which surrounds the "genus" Tephrocactus". René has already touched upon this and I myself have received many Corynopuntia and many more Airampoas over the years, masquerading as Tephrocacti. The Corynopuntias are easily recognised, eg. clavata, grahamii, invicta, moelleri, parishii, schottii etc. Once you have seen one, you've seen them all – almost!

Airampoas, are more of a problem as many more growers seem to recognise them as Tephrocacti, albeit incorrectly. Even in Leighton- Boyce and Iliff "The Subgenus Tephrocactus" an Airampoa has sneaked-in in fig. 70. One of the most wide spread impersonators is Opuntia (Airampoa) longispina var. flavidispina, more often encountered in collections as Tephrocactus multiareolatus. The latter is in fact one of the sphaericus/kuehnrichianus group. So how can we recognise an Airampoa from a Tephrocactus and what do I mean by Tephrocactus? Tephrocactus segments come in many shapes and sizes, globular, conical, cylindrical, egg-shaped, and always circular in cross-section. They form small irregular bushes or low spreading clumps or hummocks. New segments arise predominantly from the upper areoles of the previous growth, though in age some species produce segments from the lower areoles also. The floccosus group is exceptional, new segments seem to be produced from anywhere, but usually these arise from the base of existing segments. The segments of Airampoas are mostly kidney-shaped to elliptical, or even pear-shaped, but the most significant point is that they are flat in cross-section. They grow in long chains, creeping along the ground and rooting on the underside. New segments mostly arise from the edge of existing segments and not from the flat face. Older segments, or those of poorly grown plants can tend towards a spherical shape, and it is this tendency which makes them so deceptive in my view. More subjective points are that Airampoas are faster growing and flower more readily than true Tephrocacti. No doubt subsequent readers will wish to add to this list of differences; in particular I expect Airampoa seed is quite different.

But what do I mean by a Tephrocactus? The references I have made so far are to the genus as defined by Backeberg in Die Cactaceae". Within the genus the plants fall into five broad groups, floccosus, pentlandii, glomeratus, articulatus and sphaericus. These are much the same as those recognised by Iliffe and Leighton-Boyce. Some plants though, appear anomalous, eg. weberi , subterranius and nigrispinus.

Recent revisions of Backeberg's genus by Ritter and Kiesling have added further to the confusion surrounding Tephrocacti. Ritter was the first to have a serious go at dissecting Backeberg's genus into more logical parts. Basically, what he did was to transfer the floccosus group to Austrocylindropuntia, the glomeratus groups to an amended version of Spegazzini's genus Maihueniopsis, the pentlandii and sphaericus groups to Ritter's new genus, Cumulopuntia, leaving the articulatus group in Tephrocactus. I have mixed feelings on this treatment. The reclassification of the floccosus group as Austrocylindropuntias seems entirely correct. From my own experience of

these plants, I can see the similarity in the mode and habit of growth and the stem morphology. also the segments have a definite growing point and continue to grow from one season to another – not unlike cereus. This is not a characteristic shared by the other groups, except at the seedling stage or when untypical growth is produced. Certainly in the articulatus group, for example, once a new segment has grown to full size, that's it! It will not continue to grow the next season. All it can now do is sprout new segments or flowers. The other great similarity that I have noted, between the floccosus group and other Austrocylindropuntia, is their seed. Hence the seeds floccosus rauhii, verticosus, udonis, atroviridis and crispicrinitus are little different (if at all) to seed of Austrocylindropuntia haematacantha, humahuacana, shaferi, steinmannii or weingartiana – these being the sorts that I have come across. The shape of the seed is roughly that of a pear drop, and the aril or ring which divides the two halves of the hard outer coat is greatly reduced compared to the other groups (except the Sphaericus group – see later). – The seed of Austrocylindropuntia weingartiana is a good example. Also, if you are lucky enough to get the seed to germinate, the seedlings of the floccosus group plants are just about identical to the Austrocylindropuntia species which I mentioned above, but they are quite unlike the seedlings of say articulatus or glomeratus groups.

The floccosus group are indigenous to Peru, but before I consider Ritters treatment of the remaining groups, I think it is time to mention the work Roberto Kiesling has done on this subject. His studies have been restricted to Argentinean material and since the articulatus, glomeratus and pentlandii groups are represented there, his work on these overlap with that of Ritter. Like Ritter, Kiesling has restricted the genus Tephrocactus to the articulatus group. The remaining Argentinean species, which fall into the pentlandii ar glomeratus groups, are re-classified as Maihueniopsis spp., with Ritters Cumulopuntia included here. The details of Kiesling's treatment were first published in "Darwinia, 25 (1-4), 1984. Prior to this, in "Hickenia, 1 (55) 1982", Kiesling described the genus Puna. Based on the morphology, spination, flower, fruit and seed characteristics, two species are assigned to the new genus. Puna clavarioides, previously in Austrocylindropuntia and Puna subterrania, previously Tephrocactus subterranius (Fries) Backeberg. Ritter included the later in Cumulopuntia.

On the genus Tephrocactus itself, the two authors are more or less agreed, Kiesling includes articulatus and its numerous varieties, molinensis, weberi, geometricus, aoracanthus (with paediophyllus and hossei as synonyms), alexanderi and it's variety bruchii, and halophylus. Of these, I am not familiar with geometricus and halophylus. Kiesling describes the following characteristics, "lax shrubs, with crypt-shaped areoles, red glochids; spines of scaly epidermal cells orientated towards the apex (contrary to what is normal in the Opuntioideae), dry and dehiscent fruit, seed with ouriculated, soft aerenchymatic aril". It appears also from Kieslings work, that the areole is set deep within the epidermis relative to Maihueniopsis. I have some observations of my own. Unlike plants of glomeratus and pentlandii groups, the seedling stage of the articulatus group resembles the adult plant. The seeds, which look rather like pop-corn, often have glochids attached and these are present within the seed cavity of the intact fruit. Vestigial leaves on new growth are generally absent or so reduced as to not be visible to the naked eye, even at the seedling stage. T. weberi is exceptional though . I am not familiar with seed or seedlings of this plant, but vestigial leaves are readily apparent on new growth and the elongated slit-like areole (which extends from about half way right up to the top of the tubercle, whereas in other species it arises from the centre of the tubercle), does not extend significantly below the epidermis. The ovarium of a T. weberi flower is also quite different. In articulatus, molinensis, aoracanthus etc. the ovarium is roughly cylindrical, sometimes twice as long as wide. With weberi, however, the ovarium is cup-shaped and wider than it is long. Hence in Kiesling's Tephrocactus we have the articulatus group covering aoracanthus alexanderi, molinensis etc., and sticking out like a sore thumb, T. weberi which seems not to fit in with the

others. At present I have several clones of T. weberi, but none have yet flowered simultaneously. Perhaps if they do I will have something to add regarding the fruit and seed of this anomalous plant compared with the more apparently related articulatus group.

The pentlandii and glomeratus group are less easily separated. Both from low hummocks or bushes arising from a napiform root. The seedling stages are also quite similar and bear little resemblance to adult plants, eg. Leighton-Boyce and Iliff fig. 75. The fruit and seeds, however are quite different. In the glomeratus group the fruit is full of fleshy pulp. The seeds have an outer coat and prominent aril, but they are soft enough to be removed with tweezers. In northern Chile, some species produce hairy seeds, and colorea is reputed to have seeds resembling small balls of cotton wool! This greater genetic variation that appears to exist between the Chilean and Argentinean representatives of the glomeratus group relative to that existing within either population is as might be suspected from geographical separation. Unlike the fruit of the glomeratus group, those of pentlandii group are dry inside. This difference is one of the most significant characteristics that Ritter attributed to Cumulopuntiain justifying its separation. Pentlandii group seed also has a prominent aril, but both this and the two halves of the outer coat are rock-hard. The surface of the outer coat is usually wrinkled to some degree – this varies from species to species and may be extreme in some cases.

So perhaps the glomeratus group could be assigned to Maihueniopsis. However, I am less certain about the pentlandii or Ritter's Cumulopuntia. If Cumulopuntia were to be used to segregate the pentlandii group alone, this would not be a good idea. But Ritter chooses to include the sphaericus group here also and I cannot agree with this. Although the fruit of pentlandii and sphaericus group are both dry inside, there are many significant differences. Whereas the pentlandii group form low dense clumps, the sphaericus group form open lax bushes, similar to the articulatus group, and fall to pieces just as easily. The root system on the pentlandii group is napiform, whereas it is fibrous in the sphaericus group. The seed which I have come across of sphaericus, kuehnrichiannus and mirus resemble more closely Austrocylindropuntia than anything in the pentlandii group.

To summarise then, the recent revision of Backeberg's Tephrocactus have given us these situations:

1) Kiesling	**-**	**Puna subterrania**
	-	**Tephrocacus (species covered previously)**
	-	**Maihueniopsis darwinii (including hickenii and platycanthus)**
-		**" glomerata (including andicola)**
-		**" minuta (including mandragora)**
-		**" ovata (including russellii)**
-		**" nigrispina**
-		**" pentlandii**
-		**" boliviana (including flexispinus)**
2) Ritter	**-Tephrocactus**	**(as for Kiesling, some different names and hickenii included in error (?))**
	- Maihueniopsis	**ovata (including russellii)**
	"	**archiconoidea**
	"	**camachoi**
	"	**ovallei**
	"	**hypogea (= glomerata, andicola etc.)**
	"	**darwinii**
	"	**mandragora**
	"	**neuquensis**
	Cumulopuntia	**subterrania**
	"	**rossiana**

"	pentlandii (including subinermis, minor,
- Cumulopuntia	pentlandii v. dactilifera (including cylindrarticulatus, nottiae)
"	boliviana (including ferocior)
"	ignescens
"	berteri (including dimorphus, pseudorauppianus)
"	alboareolata
"	kuehnrichianus (including mirus)
"	zehnderi

This is indeed to show how some of the more widely known species in cultivation have been reclassified. For a full list of synonyms, refer to the literature.

Now I have said my piece on the nomenclature nonsense, it's time to look at some important topics like cultivation and flowering! I grow my Tephro's (etc.) in an unheated greenhouse, which is kept well ventilated throughout the year, even in the winter. I use a compost of at least 50% grit with plenty of water during the growing season. The plants are allowed to go completely dry and shrivel considerably from October till the following March. However, last winter I had a tray of kuenrichianus cuttings in a cold frame growing in sand/perlite, which had remained soaking wet. New segments had been produced in the late October and these were still growing in late November when I recorded –7° C. Both the plants and their compost were frozen solid, however most survived and the new segments continued to grow as the weather improved. I don't advocate this treatment though as I lost a couple of sphaericus types kept dry in the greenhouse during the same cold spell.. Otherwise I have had no problems with these plants, the majority of which were in my collection where they experienced –9°C two years ago. The two sphaericus types lost had only just been received from Peru about 6 weeks earlier. The insufficient time available for them to become established under my conditions was probably the reason for their loss.

The plants get plenty of light so spination is good and they stay compact. Even so, flowering is usually disappointing. I have articulatus v. oligacanthus (as shown in Leighton-Boyce and Iliff fig. 41) and large plants of weberi and mandragorus which flower every year. Others I found to be very erratic flowerer. 3 years ago I had nigrispinus covered in reddish-purple flowers, but nothing at all last year and just one flower this year. A plant from Abbey Brook Cactus Nursery, ABCN 1708, purported as T. russellii, but probably really darwinii, produced a single orange flower 4 years of age and another one the following year, but nothing since. I'm sure that light intensity alone isn't the only reason why flowering in cultivation is so poor. Another factor may be that the plants receive much less UV light. There are two reasons for this. Firstly, the glass we grow our plants under cuts out a lot of UV. Secondly, in habitat the plants grow at high altitudes where they receive more UV. To test out this theory. I placed a UV tube over the plants last December and this year I have flowered molinensis and two large plants of glomeratus for the first time, and a plant of hickenii (?) with just 5 segments! Hopefully a few more different sorts will oblige next year, perhaps even some of the pentlandii group, which seem to be such shy flowerers (rossiana v.fuauxiana excluded).

I have had mixed results so far in trying to grow these plants from seed and am convinced that one of the problems is that a lot of seed is just too old. The articulatus and glomeratus group are by far the easiest to germinate, even so the percentage germination is only about 5 – 10% on average. So far I've yet to germinate anything from the sphaericus group. I have tried various methods, eg. soaking, chipping, freeze-thaw, which other people have reported success with, but I had no success. However, the only instances where I have heard of success using these methods were with articulatus and glomeratus seeds that were relatively fresh.

TSG Reference Plants

The intention here is to establish enough plant material in member's collections, that will serve as reference material within the group for further study.

The system we have agreed to follow is:

- **A Any member can distribute cuttings, once he/she has propagated enough material to enable each member present at one of our Annual Meetings to receive a cutting.**
- **B The plant will be given a TSG number and the donor as well. Members receiving cuttings should also make sure that this number always stays on the plant label.**
- **C Every member of the TSG shall be entitled to receive a cutting at the Annual Meeting.**
- **D A register of all plants with a TSG number will be kept by the Secretary, who will periodically publish the up-dated list in our Journal.**
- **E The following information should be supplied with each plant by the donor, as far as known:**
  - **Name of the plant**
  - **Name of the donor/keeper of the plant**
  - **The name under which the plant was originally obtained**
  - **The source, e.g. Nursery, or individual from whom obtained**
- **F Even unnamed plants may be contributed as long as they are significantly different from those already established as |Ref. Plants and that they are within the scope of the TSG scheme.**

Plants already distributed are:

TSG.1 Maihueniopsis dactilifera
W.G.Geissler
Maihueniopsis dactiliferea
T. pentlandii, Rudolph Lippitch 1987
Ex M. Kiessling

TSG.2 Maihueniopsis boliviana
W.G. Geissler
T. bolicianus WG.086
Source unknown

TSG.3 Maihueniopsis glomerata
Alan Hill
Maihueniopsis glomerata
Ex. Whitestone (spec. from Abrapampa

TSG.4 Maihueniopsis glomerata v. fulvispina
Alan Hill
Maihueniopsis glomerata v. fulvispina
Ex. Horis Keniwell

TSG.5 Tephrocactus nigrispinus
Alan Welsh
Maihueniopsis nigrispina W.G. 237

TSG.9 Puna subterrania
W.G. Geissler
T. subterrania
WG.233 Ex. Brian Makin

TSG. 10 Tephroc. Articulatus v oligacanthus
W.G.Geissler
T. oligacanthus
W.G. 160a (ex. Tony Mace)

TSG.11 Maihueniopsis neuquensis
W.G. Geissler
T. neuquensis
WG.115 (Origin unknown)

TSG.12 Maihueniopsis cylindriarticulata
W.G.Geissler
T. cylindriarticulatus
WG.087 (origin unknown)

TSG.13 M. glomerata v longispina
Alan Hill
M. glomerata v. longispina

TSG.6	**Tephrocactus weberi** **Martin Colinson** **T. weberi** **Ex. Lakerveld, Holland**	**TSG.14**	**Maihueniopsis subinermis** **Alan Hill** **M. subinermis** **M. subinermis, (Or. unknown)**
TSG.7	**Maih. Glomerata v. longispina** **Alan Welsh** **M. glomerata v. longispina** **Origin not known**	**TSG.15**	**Maiueniopsis darwinii** **Alan Hill** **M. darwinii** **origin not known**
TSG.8	**Tephrocactus articulatus v. inermis** **W.G.Geissler** **T. articulatus v. inermis** **WG.082 (Origin not known)**	**TSG.16**	**Tephrocactus berteri** **Alan Hill** **T. berteri** **TJ.16 Minchas 300m**

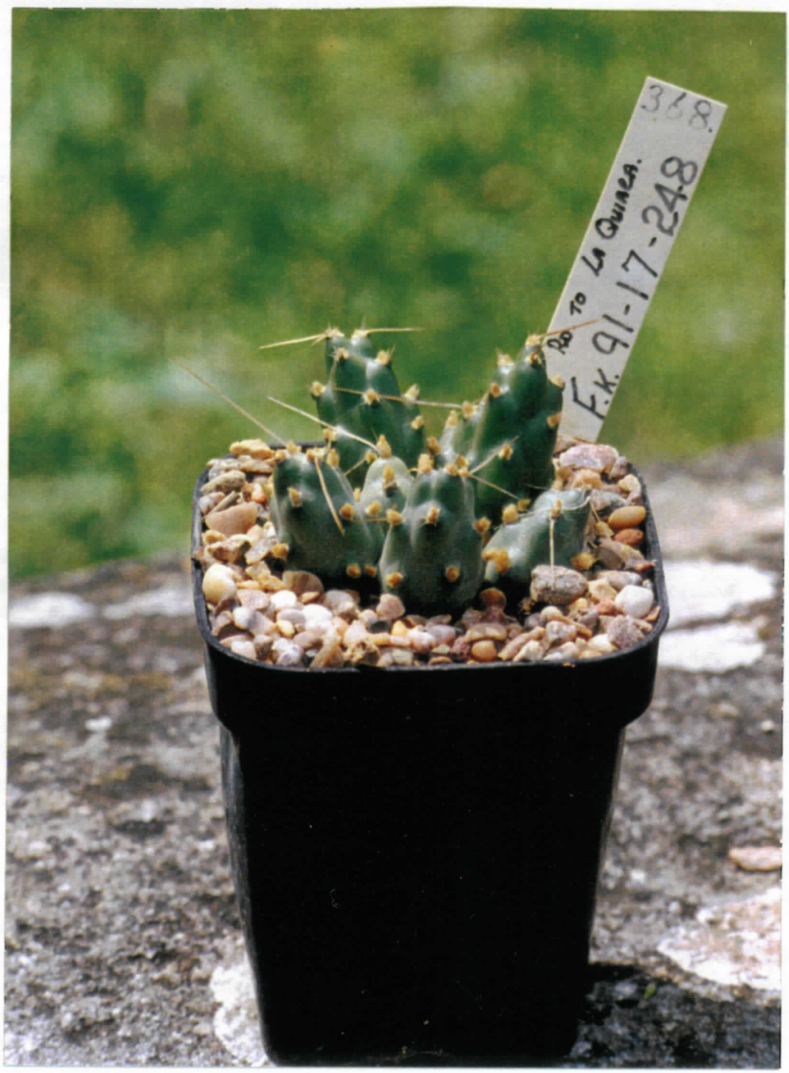
If any one wishes to obtain a cutting of the above it is best to contact the original member who has donated the cuttings.

Front cover M. Spec W.G.361 Rene

Back cover Pterocactus Hickenii v. monstrosus Rene

TEPHROCACTUS

Incl. Maihuniopsis, Puna and related genera



STUDY GROUP

Vol. 4 Number 3

Secretary's Page

Our meeting here in Slimbridge was well attended and our Chairman Alan Hill had everything organised to the finest detail beforehand so that it went off like clockwork. We started with the A.G.M., followed by the first half of the talk by Graham Hole, lunch at the pub and in the afternoon Graham continued with his talk. A discussion on the "Pentlandii and Bolivianus" group followed, lead by Alan Hill. A big "thank you" is due to Alan who worked so hard all day to keep us on the straight and narrow! Graham enjoyed and liked it so much, he bought the Company! No, not quite, but he joined as a member!
Thank you to all the officers for their hard work, Chairman Alan Hill, Editors Tony Higuera, Bill Ward and Dorothy Minors as Treasurer.

If you have not been to one of our "One-Day-Meetings" here in Slimbridge, you should really make an effort next year. All those present have already decided that it will be on Sunday 1st August 1999, so do make a note in your diary now. Hopefully the same venue again.

Now I must say a "Warm Welcome" to all the new members who have joined us recently, some of whom took part in our meeting for the first time.

We have decided on some new innovations for the first time:

1 – A Seed List is to be organised by Roger Morton (more details later).
2 – We are shortly having a Home Page on the Internet.
3 – Next year we are having a "Plant-Sale" and members will be able to bring plants and cuttings for sale to the meeting for a small commission to the TSG

We urgently need your articles and comments for forthcoming issues! Don't wait until the Editors chase you!
They should be sent to:

Bill Jackson, 60 Hardwick Road, Sutton Coldfield
West Midlands, B74 3DL

Deadline for the next Issue is 15th November!

(Refer to the last Journal how to format the page if you have a computer.)

René Geissler, Hon. Sec

Wanted: Plants or cuttings of Tephro's, Malhueniopsis, etc. - for her new Greenhouse by Dawn Nelson, "Passe Renard", F-32290 Averron-Bergelle France.

Plants or cuttings of Tephrocactus molinensis.- For a comparison study of the variations within the species, required by Jules Bouquette, ru Auguste Dupont 38, Ensival, B-4800 Verviers, Belgium.

THE AUGUST 1998 ONE DAY MEETING.

Last year we had an increase in the number attending the meeting and in anticipation of a further increase this year Rene had booked the Slimbridge Church Hall for us which proved to be a good idea as seventeen people attended the meeting this year. Perhaps we might have had more if we had publicised the fact that members are welcome to bring non members with them. We started with a short AGM and one of the main topics discussed was the production of the Journal and its future development. Due to a number of commitments Tony is not able to continue as Editor although he is prepared to continue to help as part of the editorial team. Thus if any one is prepared to act as Editor please will you contact Rene or me? Also Tony can no longer have the Journal printed so we are seeking a new printer. If any one can obtain a reasonable quotation for printing a back to back coloured centre page, a one sided colour cover and three back to back printed sheets then please let us know. Various suggestions were made as to how we might try to obtain material for inclusion in the Journal .It was recognised that as a Study Group the input from as many members as possible is important and members must be encouraged to contribute articles, letters, queries and comments. What plants we, as a group, should cover was discussed and it was felt that our present statement of "Tephrocactus and related genera" was adequate.

It was agreed to extend our activities by selling seed and to accept the kind offer of Tony Mace to publicise, on the internet, our existence. It was suggested that we should have a starter pack for new members to give them information on the group activities so far e.g. details of the TSG Reference Plants and that visitors are welcome at our meetings. Five people present would like copies of the set of photos we produced several years ago but at present we have no further spare copies.

Our new Treasurer, Dorothy Minors produced a Balance Sheet showing a total income of £755.61 and expenditure of £352.10 giving a balance of £403.51 in our Bank Account. This was formally accepted at the meeting. All the present officials were re-elected with Tony Higuera still on the Editorial Team but not as Editor. Roger Moreton was elected Seeds Distributor.

Graham Hoole gave us a very interesting illustrated talk on Tephrocacti sensu Backeberg which was continued after lunch. We then, as planned, began a discussion on the pentlandii/bolivianus group using a summary of the relevant authorities' views and placing plants on the floor in the pattern they appear in habitat. A separate account of the background history of the pentlandii problem is included in this Journal and an article on the plants discussed at the meeting is scheduled to appear in the next issue. We only had time to discuss "pentlandii" in any depth so it was agreed to discuss "bolivianus" at next year's meeting which will be held at the same venue on Sunday

August 1st. In the meantime it is hoped that members will do some studying of the literature and the plants in order to contribute to the debate either at the meeting or through the Journal.

On behalf of the members who attended the meeting I would like to thank Rene and his wife for arranging the meeting and providing the refreshments at the Hall. As Chairman I also thank all those who attended the meeting and made it such a success. Also I thank all of you who have helped the group in any way this year.

Alan Hill.

BACK COPIES OF VOLUME 3.

Back copies of the 1997 edition of Volume 3 are now available. The whole Volume i.e. Numbers 1, 2, 3, & 4 can be obtained for £10, post free, from Mr R.Geissler, "Winsford", Kingston Road, Slimbridge, Glos., GL2 7BW., England.

Cold and Damp

An earlier issue of TSGJ. (Eg. page 34, V1. No. 2) discusses a problem most easily described as 'Sooty Mould'. When starting out, along the collector's spiny road, Mary wanted a hot box. I read the instructions, made a box, half filled it with wet sand, buried the expensive cable, finished filling it and then constructed a rectangular enclosure of transparent plastic, (5 thou polyester) to keep out the cold. It was beautiful (as well as heavy). The sides slid up wires to allow access to the plants, the thermostat clicked on and off and the air temperature stayed exactly as set. This is a few years ago now but I'm reasonably certain that it was only three days, certainly less than a week, later that I noticed the mould; not sooty, more hairy. It was spectacular. Anything that remotely resembled fungus food was fur coated. This included bits of peat above the gravel, dead leaves, dead flowers, drops of nectar, scar tissue, absolutely everything. So, whether or not I had made a good environment for the plants I had certainly made the fungus happy. We opened the sides for ventilation and things improved. Later I took the top off the enclosure and allowed the sand to dry out. There has been no problem since. It works just as well with dry sand. It might work with nothing but it's too late now, the space is full of plants.

The point of this lies in recognising the obvious cause, high humidity. Above heated wet sand this must have been climbing towards 100%. The new RHS dictionary of gardening has something to say about this. It says that the whole subject is poorly understood. Then it goes on to say that, except for the extremes, that's us and water plants, most species grow best between 65% and 80%. Above 80% problems with fungi and bacteria get worse. Above 90% the plants start to have difficulty with transpiration and the movement of nutrients. If a plant has breathing and circulation problems I guess the fungi are likely to see it as an easy meal. It then goes on to discuss various, expensive, ways of changing humidity. It might be helpful to dig just a bit deeper into this subject in the hope of finding less expensive methods. For example, what is the meaning of these figures, 80%, 90% etc? Some of these questions may have useful answers. Perhaps it is possible to get some advantage without spending too much. Eg...

Percentage of what? Of the maximum the air can hold.

What sort of an answer is that? How much can it hold? Well, er, it varies.

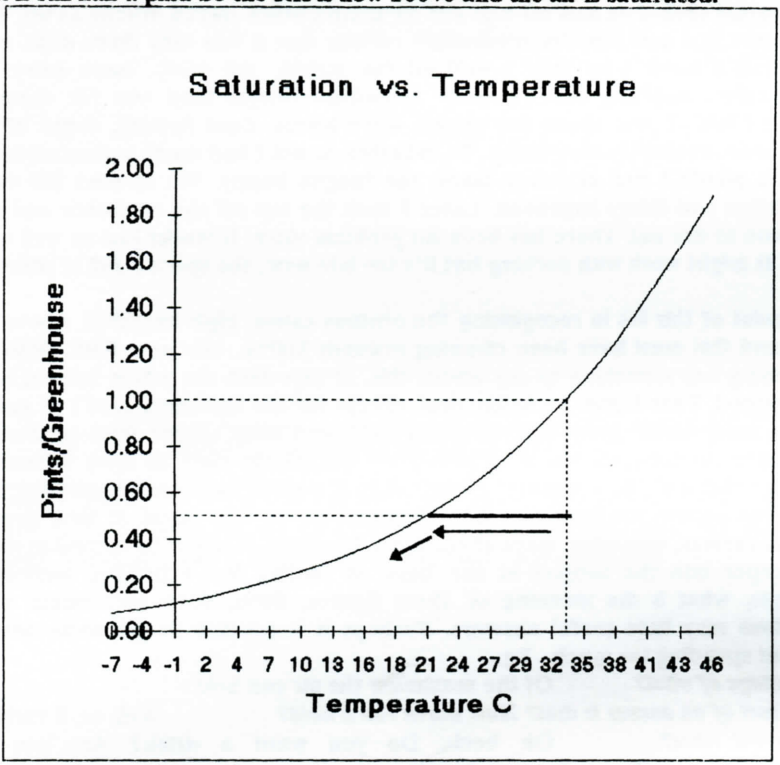
Varies with what? Oh heck. Do you want a drink? Are you sitting comfortably? We'll have to use a graph.

This shows Saturation Water Content, in a 10x8ft green house, plotted against Temperature.

(You may think 'pints/greenhouse' is a bit Un-European. You should have seen the graph I started with; grains per cubic foot, Fahrenheit and all like that.) Start by noting the vertical, dotted line from 33 °C. It cuts the graph at 1 pint per greenhouse. Ie. the atmosphere in a 10x8 greenhouse at that temperature could hold one pint of water, as vapour. That is the maximum. With this one pint it would be 100% saturated. Suppose that, in fact, there is less than that actually present; say half as much. Then the Relative Humidity is 50%; relative to saturation. (In order to save paper the initials, RH, will be used from now on) This is the important parameter. It

is not the actual amount of water vapour but the RH which governs all water vapour exchanges, including fungal growth. In particular liquid water will evaporate if the RH is less than 100%, slowly if close to 100% but it will still dry up.

Suppose now that the sun sinks slowly in the West and the temperature begins to fall. As it cools the state of the atmosphere in the greenhouse will follow the solid line, in the direction of the arrow, until it meets the graph, around 21 °C. The graph is the boundary. The maximum water vapour is now half a pint and the actual amount present is still half a pint. So the RH is now 100% and the air is saturated.



So RH can change, increasing as the temperature falls, even though there is no change in the actual amount of water vapour present. At temperatures below 21 °C the atmosphere can no longer hold half a pint and dew forms. If the cooling continues then condensation continues and the atmosphere follows the curve downwards. Some of this condensate will be absorbed by compost or run away so that, if the sun rises again, (fat chance in this country) there will now be less than half a pint of vapour in the atmosphere. If the temperature reaches 33 °C again the RH will be lower. The atmosphere will be drier. This is quite interesting. In arid areas the night time temperature can fall to low values. So most atmospheric water will be lost by condensation. During the day the temperature reaches very high values. All the

condensate has soaked into the ground so the RH will be very low. Ie. the RH is determined by the range of temperature. This is difficult to reproduce here. We use thermostats to prevent the temperature dropping too low while we are not looking. Thermostats reduce the range of temperature and, therefore, increase RH. Perhaps thermostats should be programmed to maintain a low temperature at night and a higher one during the day?

I do have one observation which fits in fairly well with the graph. West Meters supply a small, cheap RH meter. I did check the readings one summer. The day time temperatures were around 35 °C and the RH about 30% (0.30 pints on this graph). At night the temperature fell to about 12 °C and the RH rose to over 65%. If you draw a horizontal line on the graph (on your copy) through 0.30 pints you will see that it gets close to the limit curve at around 12 °C. The interesting bit was that, after watering, these figures were much higher but that they fell back to similar values after three or four days. The range of RH values moved back fairly quickly to match the range of temperatures.

Ventilation

Imagine a thin flat box separating warm air from cold. The air in the box will have an intermediate temperature. If air leaks from the warm side into the box it will be cooled down. Its RH will increase. It might reach 100%. Condensation is possible. If it leaks from the cold side into the box it becomes warmer. The RH falls. Therefore it is always below 100%. Condensation is impossible. Excess moisture in the box will gradually dry up.

When cold air moves into a greenhouse it is warmed up. So the RH falls. Ventilation dries the greenhouse out, even when it is raining outside, provided that the greenhouse is warmer inside. It is the change of temperature that matters.

This applies in all sorts of other areas. If the space under the floor boards is sealed off (to prevent the rain getting in) it will, in fact, get damp. Water soaks through the soil under the foundations and wicks to the surface. The humidity rises, just like my hot box. But, for most of the year, this space is warmer than outside. So, if the space is ventilated, air coming in will always be warmed up and will always have a lower RH. than outside. The space under the floorboards will dry out. Never cover your air bricks.

Ideally, when painting woodwork, the inside should be sealed with gloss paint but the outside should be coated with porous paint. Air soaking into the wood will then always be drier inside the wood than it was outside. Otherwise, if warm indoor air soaks into the wood and cools down, the wood will be damp. In hot weather it may blister. Of course, if the painting is perfect, (like mine), there is no question of air leaking into the wood and none of this happens.

Double glazing always aims for a perfect seal but, if there should just happen to be a tiny leak, it is vital that this be mostly to the outside rather than the inside. Cold air leaking into the cavity is then warmed up and is always drier than 100%. The space

never gets condensation. Otherwise warm air leaks out to the cavity and cools. This raises RH and can cause condensation. (I have seen examples which gradually filled up with water.) I've exploited this in three greenhouses, going as far as drilling holes in the woodwork to ventilate the cavity to outside. Until spiders block these holes there is never any condensation inside. (They get drilled then).

Circulation

In cactus greenhouses warm air rises. When it meets the glass it cools and runs down the inside of the walls. Then it floods across the benches and the floor. This circulation evens out the temperature but if the benches are close to the glass, the plants at the back get full benefit of the coldest air. Because it is colder it has a higher RH. So, at the back of the bench it is cold and damp. If the space can be spared it is a good idea to leave a gap between bench and glass so that cold air runs down to the floor.

This circulation is slow because the temperature differences are small, except perhaps in very cold weather in a heated greenhouse. It is also easily interrupted and diverted. How about behind that big Fero in the corner? The air could be still and the temperature very low. So, the RH can get very high. There could easily be condensation at the back of that plant. The answer is to help the air circulation. In one greenhouse we have a very old 'VentAxia' fan designed for a kitchen extractor. It has been running, off and on, for forty years. For the last ten this has been continuous. In another greenhouse we installed a modern, large, punkah type fan. This packed up after two years. (Ah well, another job.)

So, both ventilation and circulation help to prevent the greenhouse atmosphere rising towards the 80% level at which fungi and bacteria start licking their chops and getting ready for dinner. Ventilation dries out the whole greenhouse. Circulation limits the incidence of cold, damp places. For the cost of a small fan you can make sure that your RH never reaches 100% in any part of the greenhouse.

Sooty Mould

Having used the earlier discussion as an excuse to ride my hobby horse I should now attempt to return to the original subject. Sooty mould disfigures plants which exude sugary liquid near each areole. Sugar solution has water and food so that, quite independently of any atmospheric control, fungi can grow. In the desert the liquid probably dries out quite quickly. Here it hangs about for ages. So, as well as a dry atmosphere, I guess the best solution is to wash it off. Someone has already suggested weak washing up liquid. Most insecticides contain detergents which do the same job. The catch is that, if left too long between cleanings, the mould developes and cannot be completely removed. I have washed plants quite hard and got most of it off but you could still see that the areoles were dingy.

Recently we haven't had this problem. One greenhouse is infested with ants. Mary thinks that they eat the liquid before the mould gets at it. I haven't actually seen this but, if you want to try it, I can let you have a can full. (Best Before End 1999).

W.L.J. June 1998

Initial Results for Seed Sowing of Maihuenias patagonica and poeppigii

M. poeppigii

Seed sown September 1997 in half trays using a very gritty mix. Trays placed outside and in a cold frame. The tray in the frame was sprayed when the surface showed signs of drying. The other, outside was exposed to all weather conditions. It was enclosed in chicken wire as protection against mice and birds. Germination started mid April 1998 and continued over several weeks. The seedlings were left in the trays but placed outside during the day and in the greenhouse at night. Slug and earwig protection was provided.

Germination was 100% but two seedlings damped off, their stems withered. The rest are now up to 1.5' (38mm) high some being stronger than others. (Survival of the fittest.) Stems are, at present, deep red. They are still kept damp and have regular feeding with Miracle-Gro.

M. patagonica

Seed sown 7th. January 1998. using the same techniques as above. Germination started early May. Continued for 3 weeks giving 100% eventually. Seedlings are smaller than poeppigii and the stems are a hot straw colour. Now watering and feeding as described above.

For both species the cold frame and outdoors gave equally good results.

Comments
on this evidence Maihuenia can be treated as an alpine.

Tephrocactus seed sown in April/May after fridge treatment has given poor germination. Other members have also talked of bad results. I shall, therefore, try this 'Alpine' method with these and see what happens in Spring 1999.

In Autumn will change to Chempak 0: 10: 10 for the last two feeds. This should reduce any tendency to excessive top growth, from the nitrogen in Miracle Gro, while still maintaining sturdy roots and stems.

E.Fletcher Aug. 1998

Comments on Vol. 4 Nr.1

Revision by Dr R. Kiesling of some of the Austrocylindropuntia. P.237

There must have been a few raised eyebrows when members read the revision. Whilst some of the species seem natural candidates and fit into the Maihueniopsis quite naturally like M. floccosa, (K. Schumann) R. Kiesling, M. lagopus and even M. verschaffeltii and M. vestita, there are others, like M. pachypus (K. Schumann) R. Kiesling, which seem a little more difficult to accept.

Kieling argues the similarity of the seed of these Austrocylindropuntia to Maihueniopsis and no doubt this may be confirmed by DNA studies when they are completed. However one could wonder why he has not included the sphaericus/ kuehnrichianus groups. These to me would appear to be equal candidates for inclusion into Maihueniopsis, although none seem to display the characteristic Tap-root of the Maihueniopsis sensu R.Kiesling, but neither do any of those transferred by him in this current revision. I do on the other hand accept that one such feature alone does not confirm that they belong to one group or other.

Can anyone throw any light on this Series 2 Globularis group (Backbg.) and where they fit in? They seem to be in limbo at presemt. This includes Tephrocactus kuehnrichianus (Werd. & Backbg.) Backeberg, T. sphaericus, etc. etc., which do not sensibly fit under Tephrocactus or Maihueniopsis.

During our discussion at our "One-Day-Meeting on the 2nd. August, Graham H. seemed to imply that the two "pentlandii and "bolivianus" should be regarded as separate groupings from the Maihueniopsis. It is true they were previously Tephrocactus pentlandii (S.-D.) Backbg. and T. bolivanus (S.-D.) Backbg. and then regarded as Cumulopuntia by Ritter in Kakteen in Südamerica, but I find the basis for this somewhat dubious. They seem to have much more affinity to Maihueniopsis, rather then to Tephrocactus. Kiesling transferred them to Maihueniopsis in 1984 and I have difficulty in drawing the line between Maihueniopsis and the Cumulopuntia (S.-D.) Ritter, apart from the fact that Maihueniopsis may grow further south and Cumulopuntia in the more northern regions of Argentina and Bolivia.

Of course it depends which authority we should follow. Backeberg, although perhaps more comprehensive in his approach, has gone a little overboard and there are some flaws in his system. Ritter, although travelling extensively in the field wanted to make his mark and established the Cumulopuntia as a separate group. Kiesling on the other hand limited his study only to the plants growing in Argentina until recently and therefore the picture is incomplete. What is however quite certain, between them they have managed to confuse things even further.

Tephrocactus weberi (Spegazzini) Backbg.

The other puzzle is the one mentioned by Alan Hill in Vol. 4 No.2 where he quotes Roy Mottram (P.187) saying that Tephrocactus weberi might fit better into Austrocylindropuntia rather then Tephrocactus. In my opinion T. weberi could not really be regarded as an Austrocylindropuntia because it does not display the typical characteristics of that group. Although most members of the Opuntia group have initial leaves, they are minute and not as pronounced as in those of Austrocylindropuntia. T. weberi develops distinct joints each year and continues to grow new segments in each successive year that grow at random from the previous years joints, as other Tephrocacti do. Austrocylindropuntia on the other hand usually continues to grow the same upright stem of the previous year. Again DNA examination may give us the answer eventually.

René Geissler

Tephrocactus geometricus (Cast.) Backeberg and *Puna bonnieae* Ferguson & Kiesling

I would like to give a short comment on *Tephrocactus geometricus* (Cast.) Backeberg, one of my most favourite plants. It can be considered to be a form of (*T. alexanderi*). There are some differences, e.g. the joints never fall off easily (mainly sexual reproduction, as R. Kiesling have mentioned).

The older descriptions (Castellanos, Backeberg) mention light green or even yellowish green bodies of the title plant. The same characteristic was provided by Roberto Kiesling in his article (Darwiniana, 1984) with a closing remark that the skin is completely reddish or violet. On the location near Loro Huasí I have observed only the plants with a violet, or somewhat cinereous skin (no yellowish green-skinned plants). According to my observation, in culture they loose their deep color and turn green (or reddish green) even in full direct sunny place. In my experience (**ZJ 074**), stem segments are depressed-globose up to 6 cm in diameter. The flowers are larger than in the description (not 3 cm, but 5 - 6 cm in diameter), white or often pinkish white. Seeds are about 6 - 8 cm long.

I found very interesting plants in the region east of Fiambala (Termas Fiambala, 1800 m altitude) in January 1998. They were designated as *Tephrocactus alexanderi "fiambalensis"* **ZJ 191** in my seed list. At first sight they are very closely related to *T. geometricus* (appearence and location). Thus I can confirm Roberto Kiesling's opinion about diversity of *T. geometricus* complex (there are also plants with very strong spination). They form large bunches (0.5 m), their bodies are larger (up to 10 cm in diameter and 6 - 8 cm tall) than those of *T. geometricus* type, and they are strongly spined (up to 16 - 17 curved spines, upper ones black and up to 4 cm long, lower ones brownish to whitish and shorter, some of them bristle like; difficult to distinguish the radial and central ones), flowers are white to pinkish white (7 cm), pistil and stamens are creamy white. Also seed is larger (about 1 cm in diameter).

There were a lot of seeds (which have germinated already in my collection) on the Fiambala location and even a great number of seedlings. They grow in granite gravel. All complex of *T. geometricus* is very easy to grow and the plants flower every year.

Puna bonnieae Ferguson & Kiesling

A few words now to deal with *Puna bonnieae* Ferguson & Kiesling, a small geophytic plant from the same area as *T. geometricus*. The location (close to Loro Huasí, west of Fiambala, Catamarca) of this species seems to be quite restricted and it is really difficult to say more about its population. It is a matter of good luck in fact to find these small plants when they are dried out.

I visited the locality in 1994 with Dave Ferguson. The area seemed to be very dry. There were neither flowers nor seeds, but we managed to find enough plants and got them in Czech Republic. On the other hand there were enormous quantities of *T. geometricus* seeds (**ZJ 074**). I visited this region again in January 1996. To my disappointment I found no plants of *Puna* at all!!

The name for the plant was originally intended to be *Puna rugosa*, but there was a problem. There is already *Opuntia rugosa* from southern California, and if anyone decides to call this plant an *Opuntia*, it would need a new name. So Dave Ferguson decided to name it after Bonnie Brunkow, who found the first plant.

There are no problems in cultivation, just the growth is slow. They have never flowered in my collection (the imported *T. geometricus* plants flower every year!). According to Dave Ferguson's experience the species is not an abundant flower maker and it is hard to get seeds. It seems that grafting will be the best way to propagate it. Otherwise, they like cool nights and enough water during hot summer following a long, very dry and relatively cold winter.

Fig. 1 *T. geometricus* **ZJ 074** in cultivation
Fig. 2 Flower of *T. geometricus*
Fig. 3 *T. spec. "fiambalensis"* **ZJ 191** east of Fiambala

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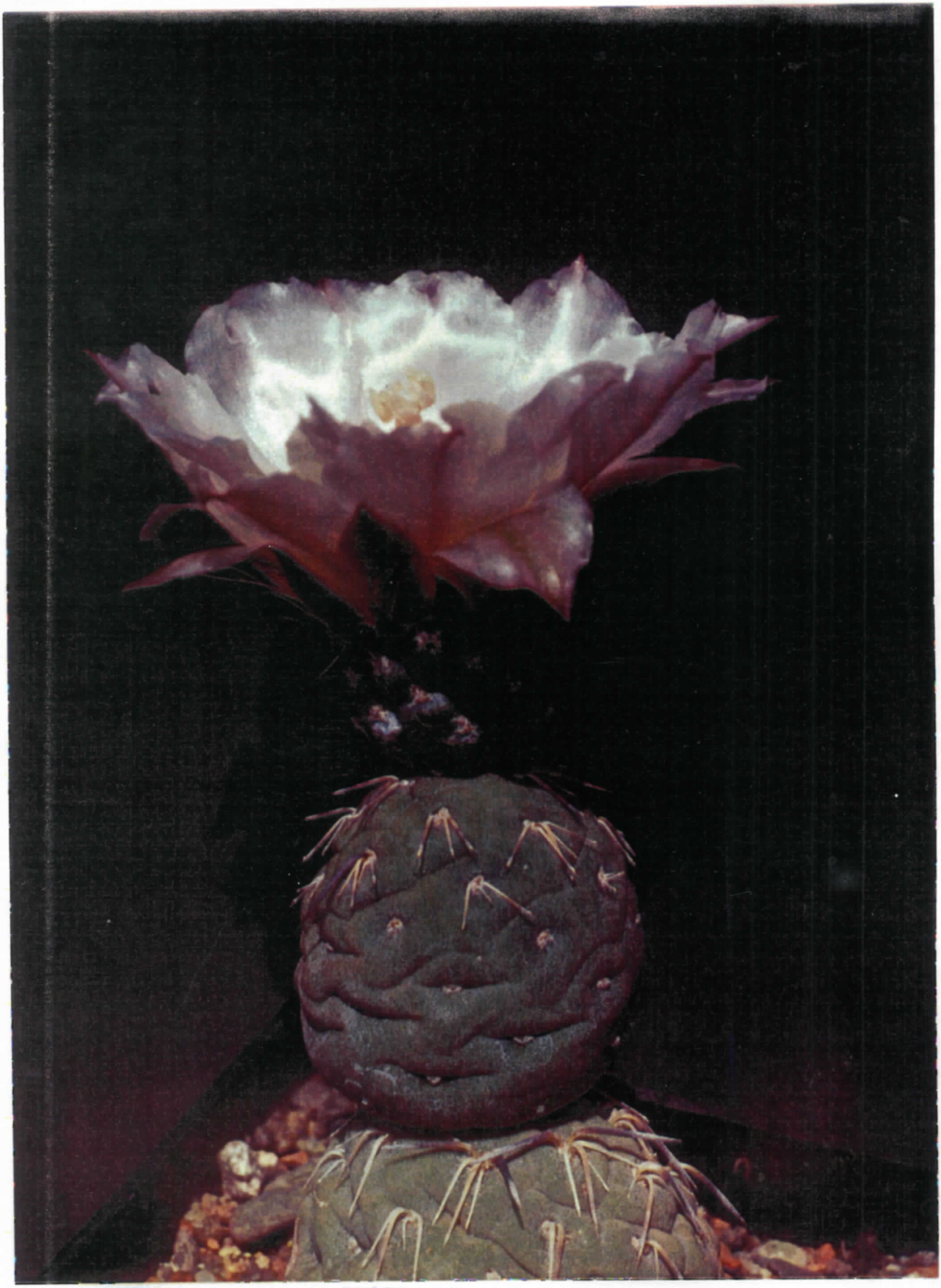

fig 1

fig 2

fig 3


WG173


WG326


WG228


WG092

New Puna P.236 and P-245

The plant shown above was received as a cutting from Pascal Femenia in France last September. It did not produce roots until late spring this year and has only started to plump up in the last few weeks. I assume it will be next year now before I can expect any offsets.

I took this plant to the one-day meeting and Ed. Fletcher also had a plant, grafted with offsets which I believe he said had come from Austria. The photo, above is for the benefit of those who did not attend.

I have it named as Puna rugosa WR KFH. It will be noticed that my plant bears a striking resemblance to the round heads on Rene's Puna clavaroides shown on the back of vol.4 no. 1. Could someone explain why we appear to have two names - rugosa and bonnieae ?

Martyn Collinson

SEE PAGE 273 FOR ARTICLE

Tephrocactus geometricus (Cast.) Backbg.)

It is probably safe to says that this is one of the most popular forms of Tephrocactus apart from possibly Tephrocactus alexanderi. I am using the word "form", because most collectors are now regarding it as a form or variety of alexanderi, rather then a separate species although it has never been officially described as such so far. Both Backbg. and Kiesling regard it as a separate species. T. geometricus is certainly an attractive plant and not all that frequently available. Even seed is only occasionally obtainable.

It is reputed to grow in Catamarca, near Tinogasta Angostura de Guanchin according to Backbg., at somewhat higher altitudes where it is considerably cooler (around 1500 to 2500 m) than the habitat of other Tephrocacti. The segments tend to be appreciably larger and in most cases the spines are almost absent in extreme cases, but certainly less numerous, shorter and lying against the body. The segments are a blue-green and have a violet sheen if grown in full light, making the plant look very attractive.

The segments detach very easily, although they are not shed so frequently as by Tephrocactus articulatus, perhaps because the plants never grow as tall in the first place. T. geometricus will flower quite easily if grown in full light and the flower can be up to 6 cm across. This is true of the T. alexanderi group. The flower colour can range from quite pink at the beginning to almost white when fully open. Seed is sometimes available, but like all Tephrocactus seed is slow to germinate over a period of three years and considerable patience is required.

One of my own plants is now three years old from a cutting and has flowered for the first time this year (see photograph). Unfortunately, the flower lasted only about four days once it had fully opened, but it was nevertheless very exciting to see it flower for the first time.

René Geissler

OPUNTIA PENTLANDII, BOLIVIANA AND RELATED PLANTS.

Origin of names.

In 1845 an article by Salm-Dyck was published in the magazine Allgemeine Gartenzeitung (13). In this article Salm-Dyck published, and thus established, the names of O. pentlandii (Page 387) and O. boliviana (Page 388). Thus the name O. pentlandii has precedence over O. boliviana if there is any attempt to equate the two taxon. In 1850 Salm-Dyck published more information on the plants in Cactae in Horto Dyckensi Cultae (ed 2:245-6). Although descriptions were given there were no illustrations nor, if any attempt was ever made to preserve it as herbarium material, has the described plant material survived as such.

The descriptions from the 1850 source.

O. pentlandii

"An Opuntia with a low, articulate-ramose bright green stem, the segments elongated, narrowed at each end, plano-tuberculate; the tubercles spaced out, bearing a grain-shaped leaflet soon falling off and a smallish areole woolly above and spine-bearing below, with 4-6 divergently deflexed spines, thin, stiffish, whitish.

"In age the stem of this anomalous plant has extended 15cm and more, and has erect segments 2.5 - 5 cm long. Spines thin, almost bristle- like, 6 - 8 mm long. diverging from out of the yellowish-tan coloured wool gathered in the upper pert of the areole. Habitat: the highest parts of Bolivia. Has not yet flowered."

Illif and Boyce note that the 1845 description differs in that it states the segments are "2-3 zoll. lang" (5-7.5 cm) and wool is" dirty yellow".

O. boliviana.

An Opuntia with more or less erect articulate loosely ramose stem, with smooth very pale green ovoid-oblong segments becoming yellowish when older, the rather well spaced areoles supported by a minute erect pointed leaflet, with 1-4 erect -divergent very long flexible spines, stretching outwards, the lower part horny translucent white, the tip sharp and ? dark speckled tawny / withered tawny." (Choice of which alternative description depends on translation choice).

"The plant in full age reaches 30 cm and more, loosely articulate-ramose. Stem-segments ovoid-oblong, tapered, 5-6.75 cm long, the younger a very bright green strewn with whitish dots under the lens, the older a dirty yellowish tan, very smooth, lacking tubercles, with sunken areoles. Areoles round, equipped when young (as well as with tawny greyish woolly felt) with some short rather curly wool which disappears. Spines properly 4, but very often, by aborting, only 1, 2 or 3, very long (7.5 -10 cm),

supplely stiff, erect and close-set at the base, divergent above, straight or flexuous, pointed and sharp at the tip."

One of the problems with descriptions of new plant material is whether the author is looking at fresh habitat material or cultivated material. We are all aware of the difference there can be between such material. In this case, as Salm-Dyck published in 1845 and in 1850, we can assume that he was looking at cultivated growth of at least five years although there might have been some of the original habitat growth at the base. Thus to seek pentlandii and boliviana by comparing plant material (ignoring any name label) in our greenhouses to the above descriptions is not a futile exercise.

<u>The location of the first plants.</u>

The material which was used to erect the two names was found by Joseph Barclay Pentland although I can find no date for the discovery. He started his career in South America in 1827 as Secretary to the Consul-General in Peru In 1826 and 1827 he surveyed a large portion of the Bolivian Andes which had rarely been visited by Europeans, measuring the heights of Gualtieri, Arequipa, Chirquibamba, Illimani and Sorata mountains i.e.: areas to the South West and North East of Lake Titicaca. Royston Hughes believes, because of the similar quoted heights, that the "Arequipa mountain" is El Misti. In his 1833 report to the Royal Geographical Society on the above expedition Pentland stated that he had determined the longitude of Cochabamba and what is present day Sucre. Thus he also travelled South of La Paz to what is now Sucre. In the Chileans magazine H. Middleditch states that "this would involve using the old established route from La Paz to Oruro and on to Potosi." In 1838 Pentland made a second tour this time in the Southern province of ancient Peru and visited Cusco. From 1836 to 1839 he was the British Consul-General in Bolivia stationed at La Paz. The route into Bolivia at that time was from the Pacific Ocean and Bolivia had a coastline as it's territory stretched through what is now Northern Chile and a little of Southern Peru. Pentland would be familiar with routes across the above areas and the area round La Paz. Thus although there is no exact location given for the plants the statement "The highest parts of Bolivia" suggests the original plant(s) of O. pentlandii came from somewhere in the above mentioned areas of Bolivia (as it was then constituted). The name "boliviana" indicates the second taxon came from Bolivia (as it was then constituted) and thus would again originate from the area indicated above but not necessarily from the same exact location as pentlandii. Nor is it certain that the plants were collected at roughly the same date or which one was collected first.

If one is to adopt the Britton and Rose approach and go out to find the plants in the field then the area to search is indicated above. Although most of us are not sufficiently fortunate to be able to do this we do have the benefit of plant material/information

brought back from the region by recent expeditions. However, before you assume that the identification of the plants is thus easily solved, one must remember the Britton and Rose as a result of this method came to the conclusion that there was only one taxon and made O. boliviana Salm-Dyck a synonym of O. pentlandii Salm-Dyck. This might be true but is it? Later authorities thought not. Were the latter correct?

Interpretation by "Authorities".

As an Addendum to this article I give an outline of the various views of three of our "Reference Authorities". The summary on Illif and Boyce shows how they (at that time) saw a relationship of names into a group and gives reference to habitats. The outline on Ritter and Kiesling shows their views on synonyms. It will be noted that Ritter rejects Backeberg's interpretation of Pentlandii Salm-Dyck and boliviana Salm-dyck (Nb 1 and Nb 2) although Kiesling accepts them both (Nb 3) whilst at the same time accepting Ritter's version (Nb 4)! Although not given in my outline Ritter states T. pentlandii sensu Backeberg is in fact a synonym of Cumlopuntia rossiana (Heinr. & Backbg) Ritter comb. nov.. In the outline Ritter makes flexuosus Backbg a synonym of two of Ritter's recognised names (Nb 5)! Kiesling puts melanacanthus Backbg as a different synonym to Ritter (Nb 6).

The way forward?

At our one day meeting we had some discussion on "pentlandii" and an article on that is scheduled to appear in the next Journal. I trust that the present article has introduced the basic history and background to the questions of what do O. pentlandii Salm-Dyck and O.boliviana Salm-dyck look like. There are two basic lines of approach for us at home.. One is to study discussion in the relevant literature. Various authors, as listed in the bibliography, have given their views. Are Backeberg, Ritter and Kiesling talking about the same plants when they use the same species name? Could any difference noted be due to normal variation in habitat, geographical distance between populations or be due to fundamental error? A broad concept of boliviana covers populations of plants growing in South Peru, through Bolivia down into the Argentine. How far do you accept synonymy? Is it based on a wide concept of a species or a belief that there has been misidentification and thus erection of "new species"? Illif and Boyce present a discussion on the plants whilst the Chileans presents a further one discussing identification of the plants, possible different interpretations and possible errors in the original descriptions together with comments from people who have visited the relevant areas. The other approach (and the two are not completely separate) is to study the plants either in illustration, or in the greenhouses. Ignoring the labels how far do the plants look similar and different from each other and the descriptions? Then look at the labels. Do the labels carry a name which has any connection to the

Pentlandii/boliviana group or is the name now manifestly wrong? Does a plant bearing the name "mistiensis" look to have any relationship with one labelled "minor" or with "boliviana"?. Have you plants which match any of the descriptions in this article? Write in and say what you have found and what you think. If possible please send in some photographs of plants in this group either identified or for identification. This is a chance for we, as a group to interact and each make a contribution to the Journal as well as fulfilling our function of acting as a Study Group.

As part of the study any information we can glean from people who have visited the habitats or study of habitat material from known locations is , of course, very useful.

The photographs of the WG plants and on the cover of this issue show plants in the pentlandii/boliviana group. Other plants in the same group have alredy been illustrated in previous Journals: Vol. 2 No 4 WG 422, 297 & 321, Vol 3 No. 1 WG 251, Vol. 4 No 1 WG 140. Remember that it has never been claimed that names originally given to WG numbers are accurate. What names would you attribute to plants in this Journal and the previous ones? Please do write in with some suggestions.

Other original descriptions for plants in the group.

O. pyrrhacantha. K.Schumann, Gesamtbeschreibung der Kakteenn, ed. 1 :694 (1899)

"Shrubby, ramose, low, yellow-green; with small oviform or ellipsoid, stem-segments; with 5-8 sturdy reddish-yellow spines; flowers golden yellow; ovary naked below.
"Shrubby, ramifying, low. Stem- segments ovoid or ellipsoid, small; upto 2 cm long and 1 cm thick, tuberculate, yellow=green, glossy. Areoles round, upto 3 mm across, those lower down on the stem segment clad only with white, flock-like wool, those above furnished with 5-8 exceedingly stiff, sharp, shiny, yellowish- red spines upto 4 cm long. Glochids small, golden yellow. Flowers lateral; overall length 3-3.5 cm. Ovary top shaped, naked below, furnished with areoles above which bear a brownish tuft of wool and yellow glochids upto 1 cm long. Perianth 3 cm across. Outer perianth-segments elliptical, obtuse, reddish yellow; inner segments obovate, golden yellow. Stamens half the length of the perianth. Filaments and anthers yellow. the very stout style outreaches them with 8 short, erect, red lobes.
"In Peru, on the Cerro Tornarape and near Tacora, 4,400m above sea level: Stubel No. 98c and 111b."

Illif and Boyce state that Backeberg in Die Cact. 1 : 338 (1958) published a photograph of a herbarium specimen collected in 1920 by Asplund and which Backeberg considered to be the above species. This is worthy of note but cannot be taken into consideration with the description other than it is Backeberg's opinion. Stubel collected his plant in

Peru. Asplund collected his in Bolivia, Dept. La Paz, Calvario, at 4,000m. Thus any connection will be of plants of the same species but at different locations. Incidentally Pentland in his lecture to the Royal Geographical Society in 1835 was reporting on his travels in 1826/7 and stated that he had been at the village of Tacora. This is one of the locations where Stubel found O. pyrrhacantha.

O. dactylifera Vaupel in Botanische Jahrbucher, 50 (1914), Beiblatt 111 : 29-30 (1913).

"A low, articulate, densely ramose plant. Stem-segments globose or ovoid-oblong, more or less overlappingly furrowed. Areoles distant at the base of the segments, rather close towards the tip, small when young, later growing larger, covered with short woolly felt and some glochids. Spines in the lower areoles 0, in the upper areoles ca. 7, erect, sturdy, dark brown. Flowers solitary from the middle part of the segments; ovary and also tube broadly funnel-shaped, longitudinally lightly furrowed, on the upper margin covered in small scales bearing short glochids and some longer spines on the axils, the rest almost bear; outer perinth segments scale like, inner increasingly broadly obtuse wedge shaped, almost as long as the tube; stamens very numerous, inserted all over the wall of the tube, included, very dense, almost of equal length,, far shorter than the perianth-segments; Filaments thread- like, anthers small; style very thick, gradually tapering towards the tip, bare. Seeds large, obovoid, covered with short woolly felt.

"A cushion-forming plant; low, thickly ramifying. Stem-segments globular to a pointed ovoid shape up to 7 cm long, 2-4 cm thick, the older more smooth, the younger with overlapping furrows, especially in the upper part. Areoles in the lower part fairly distant, towards the tip rather more closely set, according to age 1-4mm across, provided with a squab of wool upto 4mm high and with not so very many glochids. Spines on the upper areoles, ca. 7, strong, red-brown or yellow-brown, erect, the longest upto 3.5 cm long. Flowers solitary at the half way point of the segment, 3 cm long overall." (More details of the flowers and seeds expanding on the above description). "Flower yellow, often suffused reddish.

"S. Peru; Azarango (Dep. Puno), on stony patches at 3600m; Weberbauer, no. 1357, Aug. 1902. ... Close to O. pyrrhacantha."

Illus.: Vaupel in Monat. f. Kakt., 24;175 (1914) drawing, reproduced in Die Cact.. Backbg, 1:328; & 1:329, fig. 322 (1958), photograph.

O. ignescens Vaupel in Botanishe Jahrbucher. 50 (1914), Beiblatt 111 : 30-31 (1913).

"A low, articulate, ramose plant. Stem-segments narrowed at the tip, with slightly overlapping furrows in the upper half. Areoles sparse, exceedingly distant in the lower

part of the segments, round, large in proportion, covered with woolly felt and numerous erect glochids. Spines on the older areoles 0, on the younger areoles upto 15 or more, erect, some more slender, shorter, supple, others sturdy, longer, almost as long as the segments. Flowers for the most part solitary, bursting from the upper half of the segments, moderate in size; the ovary and the tube broadly funnel- shaped on the outside, with overlapping furrows, covered on the upper rim with small lanceolate scales, the rest bare; the scales bearing glochids and rather numerous spines topping the perianth-segments. Perianth a little shorter than the ovary with the tube, the outer segments small, scale shaped, the inner broadly wedge-shaped or obvate, obtuse; the stamens very numerous, included, springing from all the wall of the tube, almost of equal length; the filaments thread like, the anthers small; the style thick, very slightly narrowed beneath the 7 erect stigma-lobes and scarcely outreaching the stamens. Fruit umbilicate at the tip, with overlapping furrows, topped by numerous long spines.

"A densely ramifying hemispherical to globe-shaped plant forming cushions upto 0.5m high. Stem- segments fairly hefty, generally a pointed ovoid shape upto 8 cm long and 5 cm in diameter, the upper part with overlapping furrows. Areoles, particularly on the lower part of the segment, not numerous, round, fairly large, upto 5mm across, provided with a certain amount of wool and numerous erect glochids. Spines only on the younger areoles but here very numerous, upto 15 or more, erect, far outreaching the top of the stem-segments, unequal, some thinner, flexible, shorter and yellowish, the greater number stiff, sturdy, red-brown, upto 8 cm long." (More detail of the flowers are given.)" Flower colour fiery red. South Peru, near Sumbay, by the Arequipa-Puno railway, 3830m, Weberbaurer, No 1370, Aug. 1902."

Illustration: Britton and Rose, The Cact. 1:98 (1919), drawing and photo.: Backbg Die Cact. 1:336-7 (1958).

ADDENDUM

Pentlandii/boliviana Group - Iliff and Boyce

pentlandii Salm-Dyck 1845 Diagnosis gives habitat as highest parts of Bolivia.

boliviana Salm-Dyck 1845 Diagnosis gives no habitat details.

pyrrhacantha K.Schumann 1899 Description gives habitat as Peru, on the Cerro Tornarape and near Tacora, 4400m above sea level.

dactylifera Vaupel 1914 Description gives habitat as Peru Azarango (Dept Puno) at 3600m. "Close to O. pyrrhacantha".

ignescens Vaupel 1914 Description gives habitat as S. Peru near Sumbay, by the Arequipa - Puno railway. 3830m.

"More recent names which appear to belong here"

1935 flexuosa Backbg. N. Bolivia (Near the Comanche Mine)
mistiensis Backbg. S. Peru. (Misti Volcano).
rarissima Backbg. N. Bolivia (Between Lake Titicaca and La Paz)
subinermis Backbg. N. Bolivia (high plateaux 4,000m)
wilkeana Backbg. N. Bolivia (Viacha)

1952 chichensis Card. Bolivia (Potosi, between Tres Palcas and Escoriani)
chichensis v. colchana Card. Bolivia (Potosi, above Colcha)
cylindrarticulata Card. Bolivia (Between Tres Palcas and Escoriani)

1953 Backbergii Rowl. Reun. = T. minor Backbg. N. Bolivia 4,000m
ferocior Backbg Bolivia (Tres Palcas, pampas N. of Tupiza) to N. Argentina (La Quiaca, according to Frau Muhr)
pentlandii S-D v. fuauxiana Backbg. Bolivia
pentlandii S-D v. rossianus. Heinrich & Backbg. Bolivia

1956 asplundii Backbg. Bolivia (Near Ulloma)
fulvicoma Rauh & Backbg. S. Peru (Challa Valley).
fulvicoma v. bicolor Rauh & Backbg. Peru Nazca-Puquio)
ignescens (Vaupel) v. steiniana Backbg. (= flaviscoparius Ritt). N. Chile.
noodtiae Backbg. & Jacobs. Peru. (Lake Titicaca 3,900m).
pyrrhacantha K.Sch. v. leucollutea Backeb. Bolivia (Murillo, Calvario, 4,000m)
zehnderi Rauh & Backbg. S. Peru (Sarasassa Volcano, near Incuio on lava ash, 3,500m).

.....All plants to here are listed by Backeberg in his Pentlandiani (Br & R.) Backbg. section. Only T. atacamensis (Phil.) Backbg and its v. chilensis (Backbg.) Backbg. from this particular section are not listed above .....

1962 Albiscoparius Backbg * Bolivia

1963 flexispinus Backbg. N. Argentina (Jujuy, in Mountains)
longarticulatus Backbg. Origin?

1964 multiareolatus Ritt.* Peru (Dept Arequipa, Convento).
echinaceus Ritt.* Chile (Road from Arica to Portezuelo Chapiquina, 2,900m on watershed between Azapa and Lluta gorges)

1966 pentlandii (S-D) v. adpressus Backbg. Bolivia

* = Mentioned in Addendum of Die Cactaceae by Backeberg

Pentlandii/boliviana Group - F. Ritter

Cumulopuntia pentlandii (Salm-Dyck) Ritter comb nova.
Syn. O. pentlandii Salm-Dyck 1845. Non T. pentlandii sensu Backbg. **Nb 1**
syn. T. subinermis Backbg. 1935
syn. T. silvestris Backbg. 1935
syn. T. minusculus Backbg. 1935
syn. T. rarissimus Backbg. 1935
syn. T. bolivianus sensu Backbg. 1950 non Opuntia boliviana Salm-Dyck 1845 **Nb 2**
Syn. T. minor Backbg. 1953.

Cumulopuntia boliviana (Salm-Dyck) Ritter comb nova
Syn O. boliviana (Salm-dyck) 1845. Non T. bolivianus sensu Backbg. **Nb 2**
Syn. T. flexuosus Backgb. 1935 **Nb 5**
Syn. T. chichensis Card. 1952, exclus. v. colchana Card 1952.
Syn. T. ferocior Backbg. 1953.
Syn. T. albiscoparius Backbg. 1962.

Cumulopuntia pyrrhacantha (K. Sch.) Ritter comb nova.
Syn. O. pyrrhacantha K. Sch. 1898.
Syn. T. pyrrhacanthus Backbg. 1958.

Cumulopuntia pentlandii (S.-D.) Ritt. v. dactylifera (Vpl) Ritter comb nova.
Syn. O. dactylifera Vpl. 1913
Syn. T. dactyliferus Backbg. 1935.
Syn. T. duvaloides Backbg. 1935.
Syn. T. flexuosus Backbg. 1935. **Nb 5**
Syn. T. cylindrarticulatus Card. 1952.
Syn. T. asplundiii Backbg. 1956.
Syn. T. noodtiae Backbgeb & Jacobs 1956.
Syn. T. pyrrhacanthus (K. Sch.) Backeb. v. leucoluteus Backeb.
Syn. T. melanacanthus Backbg. 1963 **Nb 6**

Cumulopuntia ignescens (Vpl.) Ritter comb. nova. Type plant.
Syn. O. ignescens Vaupel 1913.
Syn. T ignescens (Vpl) Backbg. 1935
Syn. T. ignescens (Vpl) Backbg. v. steinianus Backbg. 1956.
Syn. T. flaviscoparius Ritt. nom. nud.

Pentlandii/boliviana Group - R. Kiesling

Maihueniopsis pentlandii (Salm-Dyck) nov comb.
Syn. O. pentlandii Salm-Dyck. 1845.
Syn. T. pentlandii (Salm-Dyck) Backbg 1935. Nb 3
Syn. C. pentlandii Salm-Dyck) Ritter. 1980. Nb 4

Maihueniopsis boliviana (Salm-Dyck) nov. comb.
Syn. O. boliviana Salm-Dyck 1845.
Syn. T. bolivianus (Salm-Dyck) Backbg. 1950. Nb 3
Syn. C. boliviana Ritter 1980. Nb 4
Syn. T. melanacanthus Backbg. 1963. Nb 6
Syn. T. curvispinus Backbg. 1963 Ritter not mention
Syn. T. flexispinus Backbg. 1963 Ritter not mention.

Nb pyrrhacantha, dactilifera and ignescens not mentioned - not in Argentina.

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Ritter, F. Kakteen in Sudamerika Vol 2 P486, 488/92, Vol 3 P881, Vol 4 P1249. 1981
The Chileans. Vol 14 Number 46 P46/28 & Vol 17 Number 55 P2/9.
See also Vol 13 Number 45 P173/178 & Vol 15 Number 51 P144/7.

A. Hill


V.P. F. Kuhl.
Bolivia 1986.
9-95.

TEPHROCACTUS

Incl. Maihueniopsis, Puna and related genera

STUDY GROUP

Vol. 4 No. 4 December 1998

Secretary's Page

This year we have been fortunate enough to have a number of interesting articles, so much so that the No.3 issue had to be increased by an extra four pages and I hope this trend will continue with more members reaching for their pens, or computer.

I can also report that my Tephrocactus malyanus, shown on page 249, is doing extremely well on it's Pterocactus stock. This plant has never been reported on it's own roots previously, but some one has intimated to me that he has succeeded in rooting a cutting. I await progress with baited breath!

Membership has also increased this year and with our "Home Page" on the Internet this could well increase still further during 1999. Thanks go to Dr Tony Mace who is maintaining the Homepage for us. May I also wish all the new members a hearty Welcome!

Please note that the Subs. for 1999 will be due by the1st January 1999!!!

Send all subs. to: René Geissler, "Winsford" Kingston Road, Slimbridge, Glos GL2 7BW

Please ensure they are received promptly as our finances are stretched tightly and we can ill afford sending out reminders. We will have to cease sending out further issues to defaulters!
Members in France may send their subs. in FF to Mrs. Dawn Nelson, Passe Renard, F-32290 Averon-Bergelle, France - **Send your Subs. now!!!**

All articles and comment should be send to the Sub-Editor:
William Jackson, 60,HardwickRoad, Sutton Coldfield, W. Midlands B74 3DL

Tony Higuera, our editor up until now has taken on a new job and is finding it impossible to carry on which means that the burden will fall on our Sub-Editor and Alan Hill has agreed to put this current issue together. Thank you Tony for all your work and putting us on the right path!

May I also remind you that our editor will be pleased to receive small adverts for publication in the Journal for "plants, cuttings or seed", or any surplus plants or cuttings you can offer either for sale or exchange. Adverts of 30 words or less are free to members!

It just remains for me to wish you:

A Very Prosperous New Year for 1999

MORE PENTLANDII

Having discussed the Pentlandii group at our meeting in August and following the article by Alan Hill in the last issue, I would like to add a few more thoughts on the subject.

R. Kiesling, in Darwiniana 1984 p.211 described Maihueniopsis pentlandii as a single species, rather than a series of varieties and I assume that his thinking was, that there is so much variation that a breakdown into further species and varieties would be meaningless. It would be interesting to know if that is indeed his view. It may be interesting to give his description of the species consideration sometime in the future and then see how many plants we can recognise in our collections that will correspond to it, taking the description fairly liberally.

I have always been of the opinion, that it is most important to grow as many variations of a species which, when established and well grown, may give us a better understanding of variations within the species. It is within the nature of all collectors (or should I say growers), that each plant must have a label. It is probably worth saying however, that labels simply help to refer to a particular clone only and do not and can not, represent a species within which considerable differences will occur over enormous distances within its habitat. Nor can anyone with any certainty define the borders in its habitat. Natural variation must surely always occur.

We must also consider that early in this century it was normal practice to ship field collected specimens back in bulk to Europe for later identification. Plants were presumably sent back by the sea , which would have taken months to arrive and by then they were desiccated and would have had to be revived. The practice was, we must assume, that the plant material had to be first established and grown on for some considerable time, before examination and describing could begin. We can not be sure whether more than one plant was available for comparison at that time. Even if there were, plants grown here in Europe would have lost enough of their original characteristics compared to those in habitat, to be accepted as a true species or variety. It is not surprising that a proliferation of synonyms soon arose.

It may therefore be interesting to see how Friderich Ritter saw the situation during his relentless treks through South America. Indeed he expressed the flaws he found in Backeberg's earlier work.

For interest I am attempting to translate some of his comments, if you will bear with me, - on his "Cumulopuntia pentlandii" as he called it.

He states....."Cumulopontia pentlandii, in its habitat has an extremely rich variety of forms, because of the wide area in which they occur without any barrier or isolation. Backeberg has tried to bring some order through the erection of a number of specific names and varieties which of course is impossible because the many forms overlap so

much that divisions become random and meaningless. Therefore Backeberg's diagnosis and system becomes impossible. In addition to this confusion it became apparent that young forms as well as badly grown forms of Cumulopuntia pentlandii are totally different from normally developed plants and Backeberg took these as typical fully grown plants. Further it is possible that some plants can retain this juvenile state for quite some time because of unfavourable conditions. This condition can also be inherited, so that the typical adult stage never manifests itself as for instance in the var. dactilifera although it may have been passed on in the genes. The confusion with Backeberg is so extensive, that he has raised forms and varieties of pentlandii to species status in his Sub. Group "Pentlandii" (in his table 2: "Globulares" Tephrocactus p.1). He does not only put them together with other typical types of Cumulopuntia, but also with others of Maihueniopsis (atacamensis, grata) and with the questionable Tephrocactus wilkeanus Backebg., as well as Tephrocactus mistiensis Backbg., whereas the former, according to the brief description, could be a rounded Platyopuntia. The latter is possibly a shortened Austrocylindropuntia, because the description is far too sparse to be sure....

.....The two relatives of his last (6.) Sub-group (minusculus and silvestris) are possibly starved forms of Cumulopuntia pentlandii (of his 4. Sub. Group), collected by Backberg himself in 1931; it seems only one sample each was taken, in an area which is often visited by other collectors and apparently was never found again; the proper research and erection of this variety is also missing.

Salm-Dyck's original description of the Opuntia pentlandii, - and here Ritter cites the description as already described by A. Hill on page 274 of Vol. 4 .... and goes on to say.....

.....According to this description, Opuntia pentlandii can only refer to those forms with fine spiration that went under the name of this form. Backeberg fell for the error and thought that he must assign this name to another type, which I described as Cumulopuntia rossiana. The quotation by Salm-Dyck of 5 cm long joints with flat tubercles contradicts Backeberg's thoughts, if the spines are only 6 – 10 mm long, as S.-D. asserts. This short length must be regarded as cultural influence, then the plant is without question a pentlandii sensu Br. & R. not pentlandii sensu Backbg.. Additionally it must be remembered, that this plant was one of the first Cacti from Bolivia to be described and they come from the most remote parts between La Paz and lake Titicaca. Cacti from the Cumulopuntia rossiana area, were discovered much later by Europeans.

The description by Salm-Dyck was made from single specimen plants; we will consider this as a more detailed expansion as the type-variety of pentlandii. The hummocks can be very tight or loose and the joints arise more from the side than from the top. The thickness of the tubercles of the joints is very variable, more rounded than elongated. The joints are usually somewhat thinner towards the top than at the base. About half to three quarters of the joint is spineless. The spines are 1 cm or more long, normally not flattened. The thinner they are, the more they tend to bend downward, which is usually the case with juvenile specimens; they have thinner spines. Quite often the spines are missing entirely, but instead the glochids develop more strongly. One can find many

transitions from strongly spined to those completely without. Those in Backeberg's Handbuch vol.1 under various named mentioned species I would regard as synonyms under Cumulopuntia pentlandii var. pentlandii, var. dactilifera and var. colchana. The forms needed 27 photos to show the enormous variations of the species.....

.....Also the regional variation of Cumulopuntia pentlandii var. dactilifera shows great diversity and very often hybridises with var. pentlandii, so that Backeberg mentioned an additional number species and one from Cardenas that belong here. Although a very characteristic cactus of the high mountains of South Peru Bolivia and North Argentina, this variety was later in 1913 described as a single species dactylifera, because it was mentioned without any varietal separation by Salm Dyck in 1845 as Opuntia pentlandii. The plant was also described by Britton & Rose, who made no mention of varieties in "The Cactaceae" This is a pity as it is particularly important with regard to micro-evolutionary developments and deserves mention..... and so on....."

Interesting to see how different F. Ritter saw the situation after Backeberg. Backeberg the more theoretical one and Ritter the practical one with endless treks for years to study the plants in habitat in their natural surroundings although I suspect not even he could see the complete overall picture. Erecting the group Cumulopuntia has added even further confusion. I find it most difficult to find the borderline where Cumulopuntia end and Maihueniopsis begin and would be most interested to hear from those who have travelled in South America if they could enlighten me. But I think I am correct, R. Kiesling regards them all as Maihueniopsis, which seems a more pragmatic approach and pentlandii fits in here quite well. For me it is not easy to recognise the subtle differences between Maihueniopsis and Cumulopuntia, apart from where they grow perhaps.

To add to this is the argument whether Tephrocactus and Maihueniopsis should all be united under the name Opuntia, but the genus Opuntia is far to unwieldy and for our purposes they are best regarded as subgroups.

It is quite obvious that nature, in its diversity, does not intend to make it easy to pigeonhole plants into specific categories. Nor is it possible for Botanists to do so, no matter how hard they have tried in the past or even now. All classifications so far have been very useful, but they remain only someone's best opinion of the situation as he/she sees it at the time. All the Botanists and avid travellers have made tremendous contributions in the past, but in modern days, there are not many who would be willing to give a lifetime to the study of Cacti like Briton & Rose, C. Backeberg, F. Ritter, W. Rausch, yes and even A. Lau. Now the baton has been handed to Genealogists to carry on the good work and we must look to them to show the way forward.

The two plants illustrated on page 269, vol. 4 would seem to fit the description of pentlandii well. Although I am not too sure about the plants on the opposite page where the spines seem much stronger pointing in all directions, even from the lower areoles, which does not fit the original description.

Reading Alan's question "Are Backeberg, Ritter and Kiesling talking about the same plant when they use the same species name", I would have thought the answer would have to be "no". From what Ritter has said about the rich varieties and forms alone it would have been very unlikely all three were looking the same plant! Probable not even at plants from the same locality either. The only way this could be done, they would have had to see the Holotyp if indeed one was deposited.

Plants were not usually identified in the field at the time they were collected. So they had collected their own specimen, which would have been sent back to be established and grown on and they could have looked considerably different, because of the variability from locality to locality over great distances. This is not even considering possible description errors.

In my collection I may well have plants that would match almost either description, but this does not mean that they are correct. Incidentally, I find plants that I would regard as being in the pentlandii/boliviana group as extremely difficult to flower in this country. I wonder if someone has managed to get one to flower? I would love to see a photograph, if anyone has.

Rene Geissler.

Wanted:

Plants or cuttings of Tephro's Maihueniopsis, etc. still wanted by Dawn Nelson, "Passe Renard", F-32290 Averon-Bergelle, France.

Plants or cuttings of Tephrocactus mollinensis for comparitive studies Of variation within the species. Jules Bougette, rue Auguste Dupont 38, Ensival, B-4800 Verviers, Belgium.

Any cuttings or plants with "Habitat Data" of Tephro's or Maihueniopsis wanted for Reference Collection. René Geissler, Kingston Road, Slimbridge, Glos. GL2 7BW.

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from: René Geissler, "Winsford" Kingston Road, Slimbridge, Glos. GL2 &BW

Important Habitat News

Dr. Roberto Kiesling writes from Argentina.- Thanks for sending me vol 4, Nr.3 of the Tephrocactus magazine. It is interesting and I will collaborate with some slides (or photos, as you have told me that is best for you) from my recent trips.

In fact a week ago I was at San Juan, over 3000m to 5000m (9000 to 15000ft). At 3150m near San Juan pre-cordillera, there are thousands of Maihueniopsis glomerata; mainly with the typical spines with black tips (or better half black, half white), to completely yellow spination. The fruit was juicy and stays on the plants, but as it is now spring there are only very few flowers. The fruit are probably from the last warm season, maybe from the flowers of the previous March.

The Plants are looking healthy, although temperatures drop to less than 0^0 C (freezing point) every night, even now at springtime. But it is important to say that in daylight hours the sun is bright and strong, although temperatures do not rise more than 15^0 C. The area was dry, very dry, because the last rains fell in March or April and there was no snow this winter.

In other parts of San Juan, towards the north, near Chile, at 4000m, Maihueniopsis glomerata can be found , but it is rare. Here is the upper limit of its distribution, a place surrounded by permanent snow and it is very cold. The temperature at 10pm was 2^0 C, and the river had floating ice until 10pm more or less. The wind was strong and the maximum temperature was 9^0 C at 4pm. Plants were scarce and partially dead. The central parts had died and some made new lateral joints. The process is easy to imagine, during an extremely cold season, perhaps now and again over several years, plants will die completely, but some protected branches at the side may survive. I have seen this many times at the upper limit of the Maihueniopsis distribution. There are also grasses where this happens also. The central part dies and new, healthy growth is forming at the sides, thus forming circles or semicircles. The action of snow contributes to create these shapes.

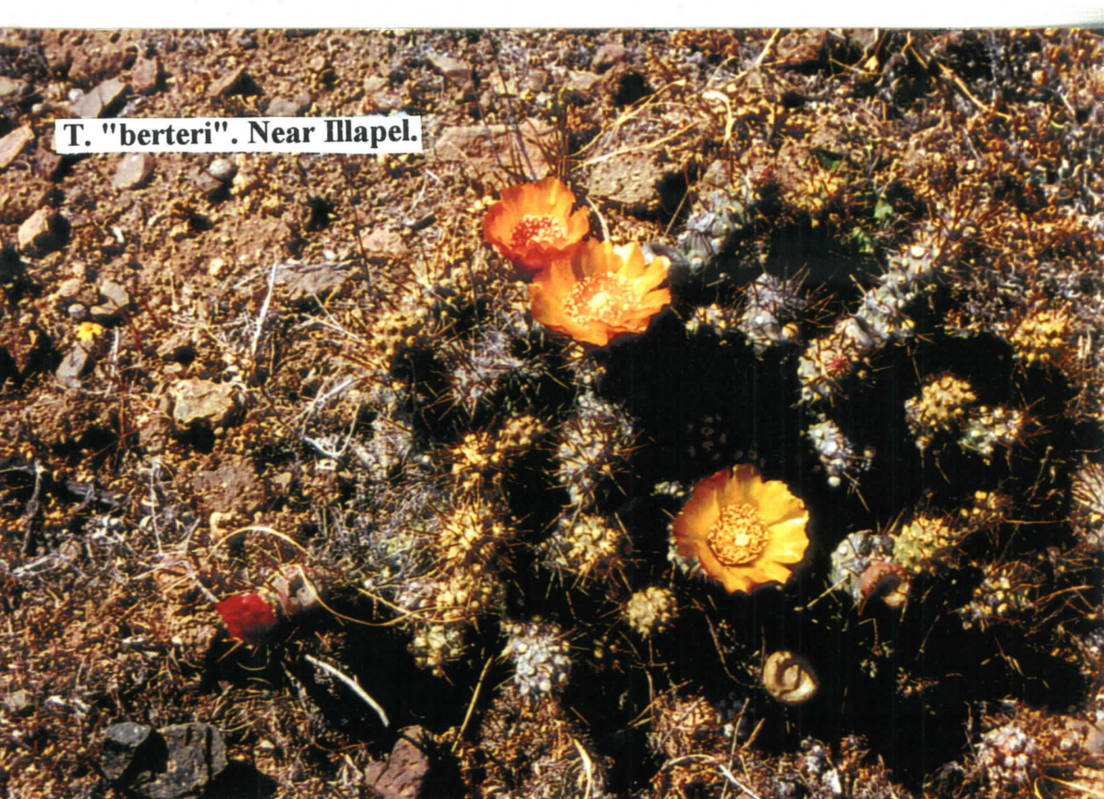
Perhaps I can make some comments later about the M. pentlandii group. It is a complicated group indeed and the limits of the species are not clear, but it is certainly worse with cultivated material. In the field I can show you my concept clearly of this species and its variation, but I am feeling unsure with photos of cultivated material.

M. pentlandii form small cushion of a few segments, rarely more than 10cm in diam. (4") and no more than 1" in height; segments are dark and spines are sparse; almost parallel with to soil, or completely absent. I have seen specimen having spines on half of a segment and the other half is completely without spines.

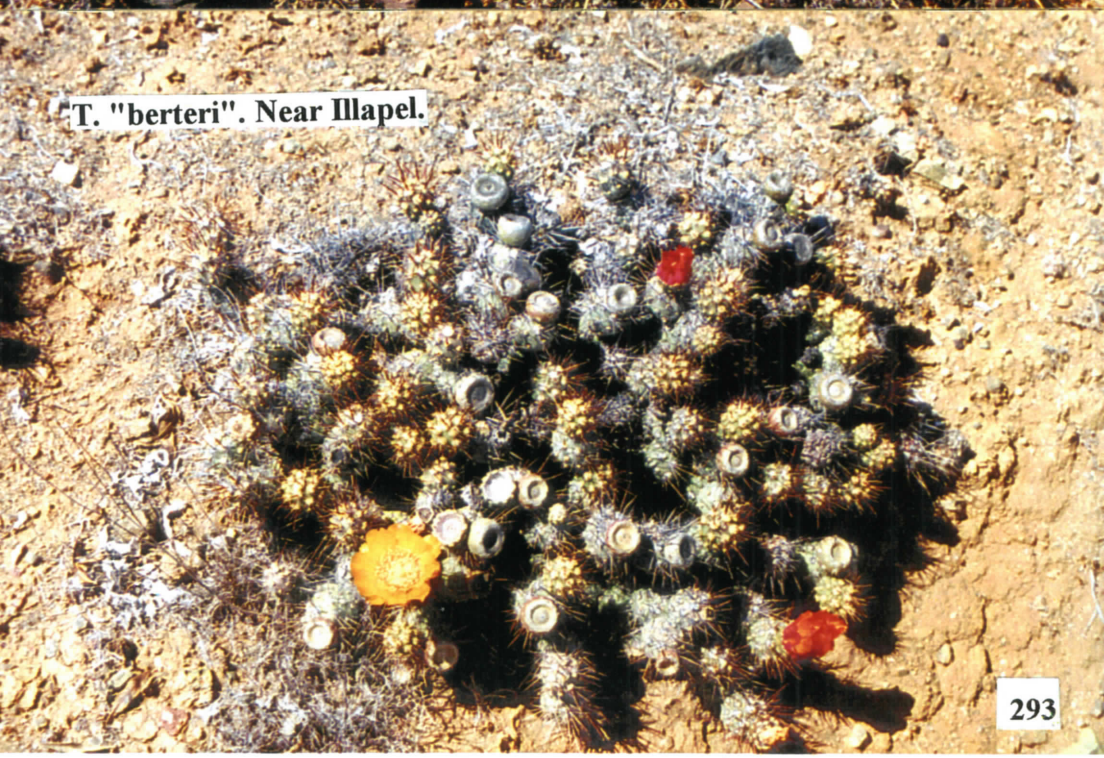
Other species near Jujuy, perhaps also at Salta, have bigger segments and the plants are larger in seize, up to 10" in diam. and height, bright green, with yellow, spines, curved at the base and more or less 2" long as illustrated on the cover of the last "Tephrocactus" No.3. In my last paper (1984) I did not mention this species at all, but I don't remember the reason why I did not.

T. "berteri". North of Ovalle.

T."berteri". Near Illapel.



T. "berteri". Near Illapel.



T. "berteri". Near Illapel.

The photo' of WG.326 looks like M. boliviana and the numbers173, 228 and 092 are perhaps variations of the same.

I have noticed that the title page of the magazine had a little mistake the word "Maihueniopsis", it was spelled Maihuniopsis (vol.4 no.2)

Perhaps you know the publication by David Hunt "Cactus Consensus Initiatives"? In the last number he declared that it would be acceptable to segregate the big genus of Opuntia into several smaller ones, based on the DNA studies by Wallace. David never accepted the segregation of Opuntia before and tried to convince us all to use the lumping system. Now he tells us that the distance between some members of the genus is bigger than in many of those accepted within the Cereiodeae! That is a big change of mind!

Note: We are indeed very grateful for the comments by Dr Roberto Kiesling.

Rene Geissler.

PLEASE GIVE INFORMATION.

The two previous articles give an opinion, as requested, on the identity of the plants featured in photographs in the last Journal. Please will other members give their opinions? Even if you are not sure of a name if you grow a similar looking plant what is on your label?

Acting Ed.

Puna bonnieae/rugosa

This plant was discovered in 1990 in the state of Catamarca. The name 'bonnieae' originated from the finder, Bonnie Brunkow. In mainland Europe it is grown under the name, 'rugosa' which refers to the body colour, dark red / purple. My plant was grown from seed collected by Franz Kuehhas of Austria. I have it grafted on an Echinopsis stock. So far the main body has produced eight offsets. I grow it in 100% grit and use only rainwater. Winter quarters are indoors on a windowsill, minimum temperature 50°F. In summer it is moved to the coldframe. There is a good photograph of the plant, in flower, on the internet on the South American Cacti page.

http://privat.schlund.de/fkuehhas/opuntia.htm
All lower case.

There is an article in the American Journal.
Ferguson, David J. & Kiesling, Roberto.
Puna bonnieae (Cactaceae), A New Species from Argentina.
C&SJ (US) Vol. 69 (1997) No.6 pp 287-293

E. Fletcher Nov. 1998

A VISIT TO PERU AND CHILE.

In October and November of 1994 together with three companions I made a visit to Peru and Chile. We explored only one habitat in Peru before going on to Chile but stopped at three more on our return journey.

Our first encounter with Tephrocacti was at Chosica, near Lima, only a small height above sea level A species which would generally be called T. kuehnrichianus was widespread on the hillside. Unfortunately none were in flower. Later on in our trip we had the chance to see something of the Chillon Valley and the Tinajas valley. T. kuehnrichianus was also present at these sites but again was not in flower. In all the sites the plants formed discrete clusters consisting of, maybe, fifty heads at most, with segments about 2cm diameter. Nowhere did they form the great mats, which we saw later, of T. "berteri" in Chile.

In Chile our journey started in Santiago and headed North, ending just north of Taltal. We did not find any Tephros until we got near Illapel, where we found an open area of ground about the size of a football pitch (altitude 320m) dotted with clumps of T. "berteri", many in flower. They appeared to be what we know as the small form . It is strange that they appeared in such vast quantities, but only in that limited area. They were composed of many individual plants. Although, as we went further North, the species was seen to be a frequent inhabitant of many of the sites where we stopped it was seen as only small individual plants, with the one exception mentioned later.

Our next encounter was with Opuntia miquelii, just North of Ovalle where it was present in considerable numbers. On the way North the plants were not in flower, but on the way back South we called again and managed to catch the flower. The plants were growing about a metre tall.

Further North from Ovalle we came across a hillside composed of solid slabs of rock, across which were growing huge mats of T. "berteri", but again not one in flower. For the rest of our journey North there was nothing of note for Tephro fans, but on the way South we called in at Domeyko and found what is, presumably, Ritter's Maihueniopsis domeykoensis. The one plant I found was in very poor condition, with large parts of it dying back. It formed a clump about a metre across and the segments were around 10 cm. long and extremely spiny.

On the last lap of our trip, between Punitaqui and Combarbala we found the other type of T. "berteri", the so called large form. It had been in flower as we were able to collect seeds but no flowers were to be seen.
What conclusions do we come to? Not very many, but a further trip to Chile from Taltal to the Peruvian border which I, with some of the original party, plan to make shortly may fill in a few of the gaps.

R. Morton

Graham Charles' Field List for Chile 1994.

In 1994 Graham went with Roger Morton and two other companions to Chile. The following are extracts of notes from his Field List, showing the sites where they found "Tephrocactus berteri", plus a few comments he has made. He stopped listing the plants as "berteri", and simply referred to them as "Tephrocacti" as, apart from one location where Maihueniopsis domeykoensis was found, all the Tephrocacti appeared to be the same species. Material of "Tephrocactus Berteri" was found at twenty three out of eighty six sites.

Chilean site numbers start at 71.

80. Past summit of pass to Illapel in isolated locality at 320m. Rockier than nearby hillsides. Found on slopes facing north which were covered in cacti (including Eulychnia and Trichocereus chilensis) compared to the very sparse covering of cacti on the north side of the valley.

81a. Near the Illapel rubbish tip and on the road towards Salamanca.

83. Puente Coiron 850. On steep rocky hillside on the south side of the river. Plants in rock cracks and pockets between rocks.

84. North west of Quelen in rock cracks near to the road on the south side of the valley.

86. 13km before Canela Baja on a slope near the road with crumbly rock.

87. Road to Frai Jorge National Park.

88. East of Ovalle, just outside the town on rocks near the road.

89. Gravelly slope overlooking La Paloma resevoir.

90. Rocks on both sides of the river, 12km from Ovalle on road to La Serena. Near Recolata.

91. South side of the Elqui valley, 15km east of La Serena on a steep hillside. Growing with Opuntia miqueli (in bud) and the first to be seen Copiapoa (wagenknechti in flower and fruit).

92. South side of Elqui valley at Vicuna. Steep slope of disintegrating granite, gravel and sand.

93. 14km up the valley from Vicuna. Sharp disintegrating rocks on steep slope.

96a. Next to Pan Am highway, just north of the climb up Cerros de San Juan, near El Chiroposa. No Tephrocacti but Opuntia miquelii.

99 2km south of Vallenar overlooking the city. Very dry sloping site with very desiccated plants. Near the airport.

100. By the site of the construction of a dam up the Transito Valley before La Laja. Very dry area with desiccated plants.

101. Sloping site next to the road at km38. Very dusty.

102. Valley narrows between large cliffs at km39. No Tephrocacti but Opuntia miquelii.

103. At 950m near to El Teron, km53.

104. Gently sloping site overlooking El Transito, 1150m. Tephrocactus "berteri" in fruit with one seed in each.

109.5km east of Huasco. No Tephrocacti but Opuntia miquelii.

111. 16km north of Huasco Bajo. Rocky slope near the sea. No Tephrocacti but Opuntia miquelii.

118. West of Totoral. Tephrocactus "berteri" with seed and Opuntia miquelii. Incredibly hot.

119 30 km east of Totoral. Very dry slope with many dead Copiapoas and very dehydrated Tephrocactus.

120a. 11.5 km north of Caldera next to the Pan Am highway.

TURN BACK SOUTH at 133.

141. 18km south west of Domeyco in hills. Tephrocactus "berteri" with Tephrocactus domeycoensis.

146. East of Ovalle on the road to Punitaqui. El Hinojo, 8km before Punitaqui.

147. 14km from Punitaqui on the road to Combarbala and a slope by the road.

148. 50km from Punitaqui on the road to Combarbala at 850m.

Chilean Field numbers end at 155.

A.H.

COMMENT ON THE ABOVE.

In Vol. 3 No. 4 Dec. 1997 P. 201-202 I outlined the reasons for not accepting the species name of "berteri" for any Opuntia and queried whether the plants so labelled in recent years should be referred to as "dimorphus" or "sphaericus. Comment on the queries raised in my article will be very welcome. The expedition to Chile in 1994 only found Tephrocacti of the "berteri" type except for the one site of T. domeykoensis. The apparent reason for this is the party travelled in the relative lowland part of Chile. Adrianna E. Hoffman J. in Cactaceas En la flora silvestre de Chile P. 244 1989 states that the species stretches from Montenegro (lat. 33) to north of Arequipa in Peru (lat. 16) and is found from sea level to 3,500m in the mountains. One must assume that the maximum altitude it can survive will have some relation to the latitude i.e. the further north then the higher the possible maximum altitude due to being nearer the equator. In the hinterland there are other forms of Tephrocacti than the Sphaericus group. Ritter has erected a number of names under Maihueniopsis for these plants. Examples are M. atacamensis (Phil) syn. T.chilensis Bkbg, M.camachoi (Espinosa), M.conoidea (Bkbg) syn T.schaeferi Bkbg, M. tarapacana (Phil), M. rahmeri (Phil), colorea , M. leoncito (Werd), M. ovallei (Remy), M.archiconoide, M.grandiflora, M. wagenknechtii, M. domeykoensis and M. crassispina. Can anyone comment upon any of these plants and if possible provide an illustration?

A.Hill

MY COLLECTION.

I have always been a keen gardener and get a great kick out of growing plants. When I had the chance to have a greenhouse in a secure garden the possibility of growing exotic plants widened my horticultural horizons. I soon decided that tomatoes was a too transient crop and at the same time I came across an Echinopsis at a jumble sale. There was then no holding me and I sought various places I could acquire further plants.

It was at a Radio Humberside Garden Quiz in Cleethorpes that I met Tom Lavender and learnt about a National Cactus Society. The collecting bug then took off, but my main criteria when buying a plant was that I must like the look of it, or had seen it in a book or someone's collection.

Inevitably I came across Opuntias but most were big evil devils. The smaller ones really gained my attention but they were not easy to acquire. Visiting Rene some years ago, about the time the TSG magazine started, I was amazed at the many and varied plants to be seen. Needless to say a trayfull was bought and my collection increased from various sources.

In one issue of the TSG bulletin Spencer Reynolds was parting with part of his collection which, when I saw it, I bought on sight (about seventy plants). I repotted the lot in a few days and also acquired a new greenhouse. This would be a house for cold hardy plants which includes a 2' 6" Aloe polyphylla. I now have about two hundred plants which would come within the objects of our study group.

I like them all but some are more favourites than others:
Tephrocactus weberi of which I have five different plants and is the species which I have most success at flowering
Tephrocactus articulatus v. inermis is a very neat looking plant with its short spines and neat body which I find most attractive.
Tephrocactus zehnderi has lovely woolly areoles and green body which catches the eye.
Tephrocactus subterraneus is a neat plant which seems to be well rated on the show bench.
Tephrocactus glomeratus has lovely long spines. I have more than one plant of this species and there are noticeable differences between them. I have another plant which is similar to glomeratus. It has nice curly spines and may be a variant.
Tephrocactus darwinii v. hickenii has a lovely dark body (at least mine has).

I like the variability of the plants and genera such as Pterocactus, Maihueniopsis, Puna and other dwarf Opuntias. Being a member of the Tephrocactus Study Group, the BCSS and the "Chileans" helps me to meet fellow enthusiasts and also one can learn from each other. One learns that Tephrocactus malyanus and Opuntia tesajo from Peru and Baja California are not for the cold greenhouse.

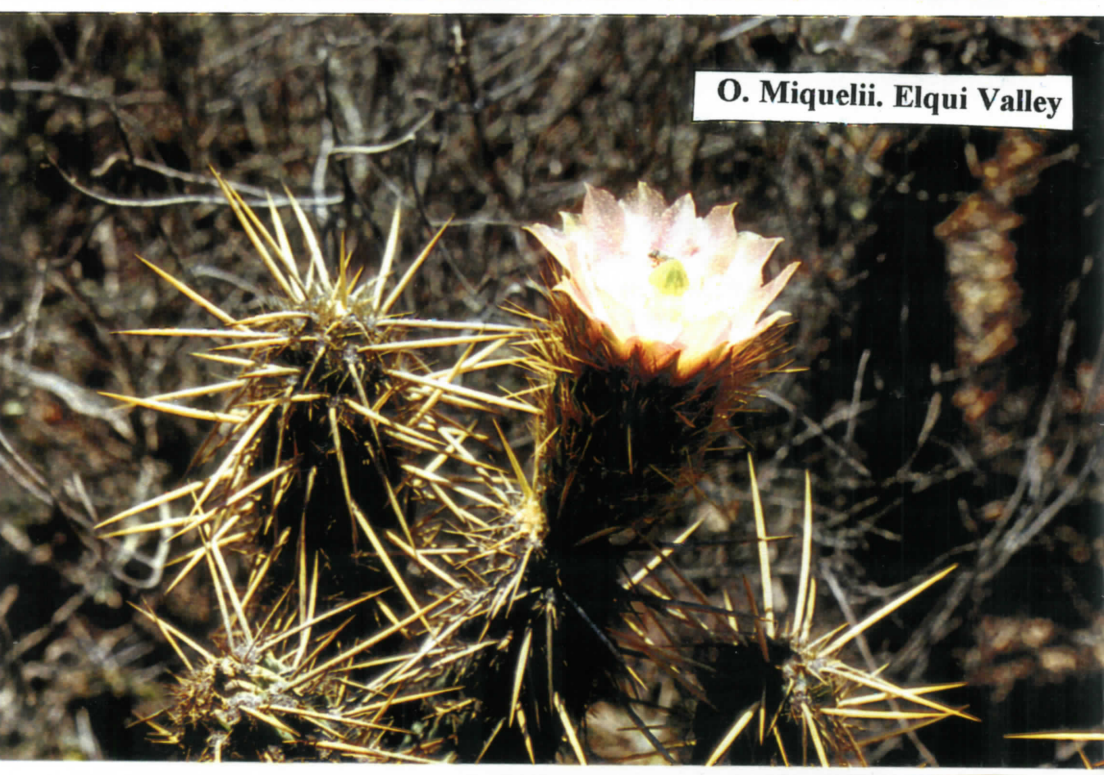
I grow my plants in a mixture of grit and grit sand and feed in a balanced, as well as a high potash fertiliser. When repotting I make sure that I am wide awake. A lot of these plants justify the remark:: Tephrocactus growers do it very, very carefully.

David Edwards.

When we first began the Group communication was in the form of a Round Robin with every one being encouraged to write something before sending on the Robin to the next member. We have moved on from this with the publication of the Magazine. In some ways we have gained by this but in other ways we have lost out. Some members, for a variety of reasons, do not now contribute. One aspect of the old format which I do miss is the information we used to have on each others collections. I therefore asked Dave to write the above article on his collection and hope that other members will be encouraged to write something on their collection and their method of cultivation. Anything forthcoming will be very welcome.

A.Hill, Acting Editor.

O. Miquelii. Elqui Valley



O. Miquelii. Elqui Valley