

# TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera



*Astrocyliodropuntia verschaffeltii* (Cels ex Weber) Backeberg  
Photograph by David Parker.

## STUDY GROUP

Vol. 10 No. 1 March 2004

## Secretary's Page

For this new year of 2004, we have three new members and they are: Dr George Wolsky from Russia, Albert Hofman from the Netherlands, and Saddi Andre Domingues from Brazil. May I wish them a "hearty welcome" and hope they will enjoy their membership! I would also like to thank our loyal members for renewing their subs. so promptly!

- All articles and comment should be sent to the Co-Editors.
- Subscriptions and any other correspondence must be sent to the Secretary (see address below).

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

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

• Subs for 2004 remain at £10.00 per annum for the U.K and Europe (European members please note: "no Euro-Cheques are accepted by our banks – but you may send £ Notes") Subscriptions for Overseas members is £14.00 or \$25.- (in \$bills only. Please make all cheques payable to: "The Tephrocactus Study Group" (not individuals).

- Members may advertise their "Wants" and "Surplus Plants" free in the Journal, in no more than 30 words

### The Officers of the TSG are:

#### Chairman and Editor:

Alan Hill, 8 Vicarage Road, Grenoside, Sheffield S35 8RG - ☎ 01142 462311

eMail: [alan.hill6@virgin.net](mailto:alan.hill6@virgin.net)

#### Co Editor:

William (Bill) Jackson, 60 Hardwick Road, Sutton Coldfield, West Midlands

B17 3DL ☎ 0121 353 5462 eMail: [wjackson@supanet.co](mailto:wjackson@supanet.co)

#### Secretary:

Rene Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW

☎ 01453 890340 eMail: [geissler.w@virgin.net](mailto:geissler.w@virgin.net)

Back Copies are now available again for the following:

### Back Copies of Volume 1 – 9 (1995 -2003) are still available

Each Volume is obtainable complete, postage paid for

£10.- U.K.

£14.- overseas

\$25.- U.S.A (in \$ notes only)

- Folders for the Journal are also available at £4.60 for U.K. , Overseas & elsewhere £5.60.

All obtainable from Rene Geissler, Kingston Road, Slimbridge, Glos. GL2 7BW - ENGLAND

TSG web page: <http://freespace.virgin.net/geissler.w/tsg.htm>

## THE MEETING ON SUNDAY APRIL 18<sup>th</sup> 2004.

The meeting will be held at the Slimbridge Village Hall, commencing at 10 am. After a short business meeting there will be discussion on Tunilla. Will members, therefore, please bring as wide a range of plants as possible to aid the discussion? Also please bring any other plants you think will be of interest or you would like identified. You are also welcome to bring plants for sale. We ask for 10% of sales to be donated to group funds. There is no charge for the meeting. All members of the TSG are welcome and you can bring guests who are not members. Light refreshments will be available at the meeting. We shall be going to a nearby pub, which supplies good food, for lunch. After lunch we are to have an illustrated talk by Brendan Burke who has visited Chile several times. Please will you inform Rene if you intend to come to the meeting?

### TSG SHOW IN CONJUNCTION WITH BCSS BIRMINGHAM BRANCH SHOW.

This will take place on Sunday 6<sup>th</sup> June at the Birmingham Botanical Gardens. Schedules will be posted to all TSG members in England. If any other member wishes to have a copy please contact Alan Hill. Please note that TSG members can enter plants in any class in the Show and are not restricted to just the Opuntia classes.

### MAIHUENIOPSIS ROSSIANA

The review of the season's flowers by R.K. Hughes, in the last issue, was generally interesting. I would like to comment on just one bit of it. He gives the impression that *M. rossiana* is a bit shy in the flowering department; one flower here, another there, another a lot later and so on. I have two young bits and one quite old plant. I don't expect flowers on the bits but the big plant should have flowered long ago. It didn't, even though most of my other plants seem to be fairly free flowering. But, as Royston says, 2003 was a good year and the plant finally made an enormous effort and produced three flowers, not too productive for a plant which must be at least twenty years old.

I first saw *M. rossiana* about twelve years ago at the National Show. It received a card even though it was labelled *T. pentlandii*. (Nowadays we all know better. There's progress). I liked the look of it. About six years ago a similar, much bigger plant turned up at the Coventry Branch auction. This was labelled *T. blankii*. Not only is this wrong, it is also misspelt (*blancii*). I acquired it and, after about two years of hesitation, relabelled it *M. rossiana*. It grows well but has only flowered once (Fig. 9). It has another defect. The new growth is fine and healthy looking but during the year gradually goes tatty. The new, mid-green skin goes dull and brown marks appear. I have wondered if this is just the way the plant expresses its opinion of our climate, or could there be something wrong with it? It doesn't happen with the other bits. I have another plant that goes tatty in a similar way. This is *T. alexanderi*. I have two clones of this that are very similar in appearance. One clone shows these symptoms. The other doesn't. Cuttings from the affected plant also become disfigured in the same way.

It could be a disease. If it is it would be best to plant it on the compost heap. But I am reluctant to do anything too hasty with such a big, old plant without being a bit more certain. Does anyone know? I wonder, too, whether Royston's 1986 plant also shows these symptoms? It is about the same age as mine. Have we got a diseased clone circulating round the country? Is that why it is so slow to flower?

W.L.Jackson. Jan. 2004 Sutton Coldfield.

## AIRAMPOS. A REVIEW.

The South American native name 'airampu' is the name given to a water soluble red dye, extracted from the fruits of certain opuntias, that was used to colour chicha, a drink made from maize, and other refreshing drinks, and jellies. In earlier times it was also used as a temporary decorative (body?) paint in ceremonials.

Only two opuntias are commonly used for this, namely the ubiquitous *Opuntia dillenii*, native to the Caribbean but widely farmed and naturalized elsewhere in South America for its red fruits, and the creeping opuntia of Argentina and elsewhere known locally as Ayrampo. The almost spineless version *Opuntia stricta*, from mainland America, also has the same property.



Fig. 1: Engraved portrait of Felix de Azara (1746-1811), from the frontispiece to the Atlas volume of his major work *Voyages dans l'Amerique Meridionale, depuis 1781 jusqu' en 1801* (1809).

Oviedo (1526) was the earliest author to describe how the fruits of this species when eaten will colour urine red, causing much consternation amongst the early European navigators who thought that they had some sort of serious medical complaint.

Sceptics have questioned whether this is just an apocryphal tale, but the eighteenth century botanist, Dr. Alexander Garden, carried out tests. He found that this red colouring of urine was a real phenomenon, and that it also coloured mother's breast milk too, like that other very persistent dye, indigo.

Whether airamos have the same effect is not recorded, so presumably they do not. The red colour is carried by the fleshy pulp of the ripe fruits, but as uneaten fruits dry, the red dye concentrates on the surface of the seeds, and it is generally these that are harvested and sold in the local markets. When the dried seeds are placed in water, the dye is immediately released.

The earliest account by a European of ayrampos and the colouring that they yield was that of a Spanish army officer, Felix de Azara (1746-1811). Azara (Fig. 1) was sent to Paraguay in 1781 as part of a commission to map territories in South America, especially the disputed boundary between Spanish Paraguay

and Portuguese Brazil. For twenty years, in addition to his cartographic work, Azara made detailed studies of the society, culture, and natural history of central South America.

His work was eventually partly published between 1802 and 1805 in three volumes in Spanish, and in 1809 in four text volumes in French, together with an atlas containing 25 large folding maps. The text volumes were also embellished with engraved plates of maps, plans, views, and full-page plates of animals and birds, such as the ant-eater, jaguar, and so on. It hardly need be said that these 4 volumes are highly regarded, and today a good set will command a price tag approaching £15,000. It has been translated into Spanish, Italian, German and Swedish, but never into English.

On p. 526 of the second volume, Azara described the object of our attention, calling it *Cactus ayrampo* (Fig. 2). Britton & Rose (1923: 261) supplied the following English translation: "*A species of tunilla (cactus) which is found in the temperate gorges near the Cordillera produces the seed in question. The plant is found in arid and sterile soil where*

( 526 )

§. XXXIX.

*L'ayrampo* ( *cactus ayrampo* ).

Une espèce de tunilla (*cactus*) que l'on trouve dans les gorges tempérées qui avoisinent la Cordillère produit la semence dont il s'agit. On trouve la plante dans des terrains arides et stériles, où croît ordinairement cette famille de plantes qui s'étend en rampant par terre, de manière à étouffer toutes les autres. De cette graine renfermée dans des fruits ronds et épineux, on tire une couleur d'un violet clair, vif et extrêmement agréable à la vue, mais très-superficielle et très-légère, quoiqu'elle acquière un peu de fixité et de durée par le moyen de l'alun, et de quelques autres mordans.

§. XL.

*De la papa* (*patate, pomme de terre*)  
*violette.*

L'Amérique est la patrie des différentes espèces de papas (*solanum tuberosum*), que l'on en a tirées successivement pour les cul-

*ordinarily this family of plants grows and thrives by creeping on the ground in such a way as to stifle all the others. From the seed confined within the round and spiny fruit is derived a colour of a clear violet, brilliant and extremely agreeable to the eye but very superficial and very light, although it acquires a little stability and durability by the means of alum and some other chemicals."*

Britton & Rose had actually overlooked this description at the time of publication of the first volume of their work in 1919, and had raised a new description of *Opuntia soehrensii* typified with a specimen gathered from a naturalized population of the same plant growing in Peru. The Azara description came to light later and was published in their volume 4 Appendix of 24 Dec 1923, with the note that *Cactus ayrampo* Azara was to be included in the synonymy of *Opuntia soehrensii*.

Fig. 2. The first description of *Cactus ayrampo* Azara (1809)

Most people's copies of Britton & Rose, *The Cactaceae*, will be a reprint based on Scott Haselton's edited edition of 1938, in which he incorporated the contents of the Vol.4 appendix into the main text of Vol. 1, thereby creating under *Opuntia soehrensii* the

representing it that was in European cultivation for the first 150 years following its introduction (Fig. 4).

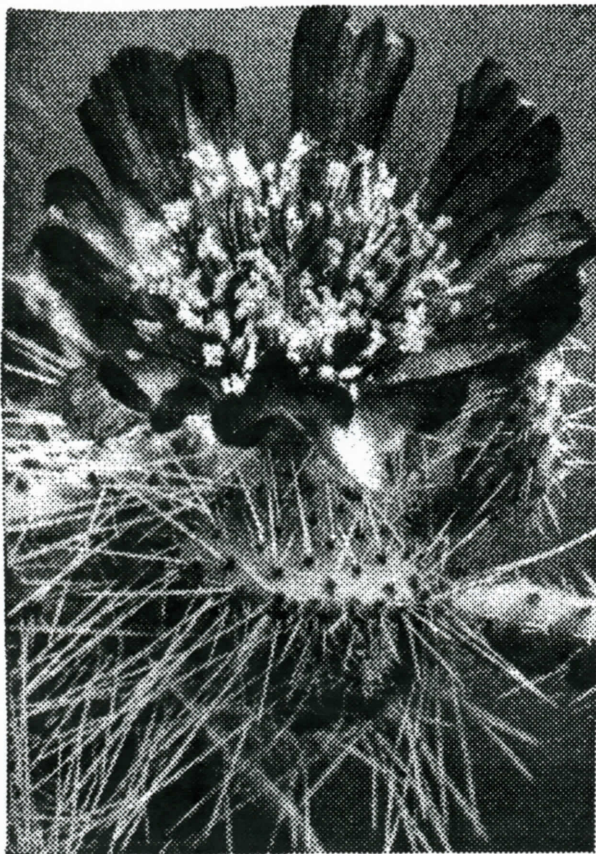
The next taxon to be described was *Opuntia microdisca* Weber in 1898, said to be from Catamarca. We have no information regarding the collector of this plant. With its jaunty scarlet flowers, it proved popular with growers, and the clone is still around today (Fig.5).

Joseph Nelson Rose collected plants at Pampa de Arrieros, Peru, and at Oruro in Bolivia in 1914. This material formed the basis for their description of *Opuntia soehrensii*. The 3 fragmentary cladodes of the type sheet is a quite long-spined form.

The most significant introductions to European cultivation were those made by the Czech grower Fric on his expedition to Argentina in 1928. He collected 32 different clones from the large population of airampoas which grow at the northern end of the long Quebrada del Toro, in Prov. Salta, especially in the vicinity of the town of Puerta Tastil. There they

occur in an infinite variety, with short and long spines, white, yellow and brown spines, flowers red, yellow, and orange. Fric picked out the most diverse clones that he could find, and fully intended to describe all these as distinct species. Only three of these clones actually received names, and of these, only *Airampoia aurata* was validated. He preserved specimens of at least two of them (Figs 6 & 7). His only published photo was of the red-flowered clone 32 (Fig. 3) that appeared in Kreuzinger's catalogue of 1935.

Subsequently, Backeberg named and distributed a number of clones as species and varieties between 1935 and 1962. Ritter then added to these, with more new names. After 1980, trips to South America became fashionable amongst amateur growers, resulting in the collection and introduction of a large number of clones under field numbers and only tentatively suggested



**Nr. 762: Airampoia (Nr. 32) Fric**

weiße Stacheln karmisrote Blüte m. grüner Narbe.

Fig. 3. Fric photo of *Airampoia* sp. nr. 32, from Kreuzinger, *Verzeichnis amerikanischer und anderer Sukkulente mit Revision der Systematik der Kakteen*: 43.1935.

anomalous situation of having an earlier name under the synonymy of a later name – not allowed under the nomenclature code.

Britton & Rose's intentions were not made clear. By listing the name in the synonymy they were giving tacit approval to it. In the rest of *The Cactaceae*, they relegated dubious names of uncertain application to a list following the main description. By not doing that in this case, they appear to have accepted the Azara description. On the other hand, if that were so, they should also have adopted *Cactus ayrampo* as the correct name for the species, which they failed to do explicitly. As this was their last publication concerning this species, we are left to speculate about their real intentions. Perhaps they were too embarrassed to comment further on their original oversight.

Because Britton & Rose had published all this under the name *Opuntia soehrensii*, that name has stuck in the subsequent literature, and the question of validity of the name *Cactus ayrampo* had not been discussed until quite recently.

### Validity of *Cactus ayrampo*.

Prior to 1935, the *Code* only prescribes that a new name has the form of a Latin binomial and that it is accompanied by a diagnosis or a description in any language. Diagnosis is actually more important than description, because it tells us the means by which we separate the taxon from all others. A single word may sometimes be sufficient for that, as for instance in the case of a subspecies distinguished by its white flower. So "white flower" would be a sufficient diagnosis to satisfy the *Code*. The important thing is to be able to identify the taxon in question from the diagnosis or description.

In the case of the description of *Cactus ayrampo*, we are given a general impression of a low, creeping opuntia (tunilla is the Spanish word for any small opuntia, just as tuna is any padded opuntia). The fruit is said to yield the violet coloured seeds [airampu], and only one taxon of creeping habit, native to central South America is known to have this property. *Opuntia sulphurea*, for instance, of similar habit of growth, does not possess this red dye.

Therefore it is a sufficient description to identify it as the plant that we all grow today under the vernacular name airampo.

Britton & Rose probably did accept the name, but having gone to the trouble of describing a new taxon, they left it to others to decide for themselves. In 1995, Mottram accepted the name in the annotated index from *Bradleya* 13, though erroneously thinking that Philippi had made a new combination for it under *Opuntia*. Philippi was in fact describing a quite different plant, namely cultivated *Opuntia stricta*.

In 2002, Prof. Alexander Doweld, who is responsible for compiling the cactus generic names for the new edition of ING (*Index nominum genericorum*), published a paper in the Russian journal *Turczaninowia*, revising the genus *Airampo*, and creating new name combinations for the included species. He also accepted the name *Cactus ayrampo* Azara as validly published, and made the new combination *Airampo ayrampo* (Azara) Doweld.

### Other collections.

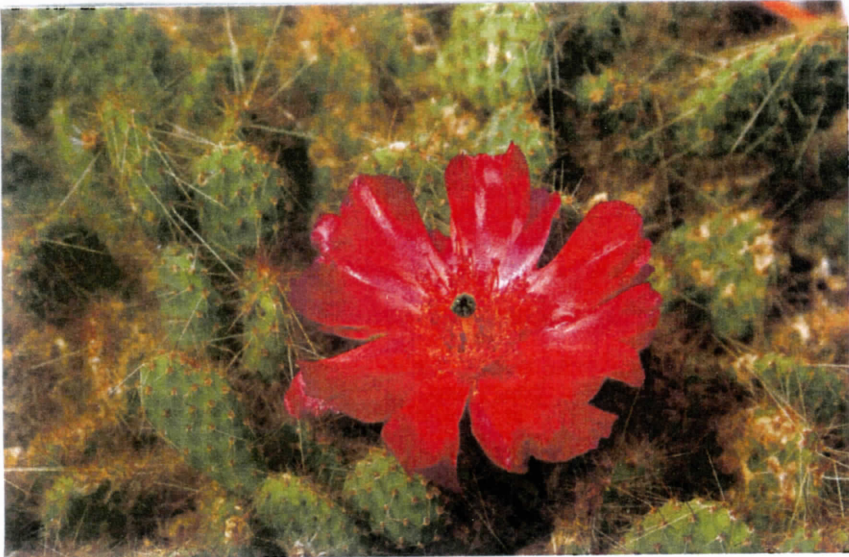
Following Azara, the next name to be erected for an airampo was *Opuntia corrugata*. The name was coined by its collector, John Gillies, in 1824, and it was widely cultivated throughout Europe, before finally being described formally by Salm-Dyck in 1834. Gillies sent a dried flower to Hooker, and it is still preserved at Kew. This Mendoza plant tends to have less flattened joints and whiter spines than most other airampoas, but it is nonetheless very variable, and usually not as white-spined as the single clone



Photos by R. Mottram.

**Fig. 4.**  
*Opuntia corrugata*  
Gillies ex Salm-Dyck,  
flowering at Whitestone in 2003.

**Fig. 5.**  
*Opuntia microdisca* Weber,  
flowering at Whitestone in 2002.







CACTACEAE.

FRONDOSEAE

AIRAMPOA albispinosa Friš gen et sp.n. Friš 1928.

/nemá glochidy/

ARGENTINA: Salta : Valle Tastil.

JARDIN EXPERIMENTAL D'ACCLIMATISATION  
A. V. FRIC, PRAHA

Herbarium sheets  
at Prague of:

Fig. 6.  
*Airampo*  
*albispinosa*  
Fric. nom.nud.



CACTACEAE

FRONDOSEAE

AIRAMPOA rubriflora Friš gen et sp.n. 1928.

/nemá glochidy/

ARGENTINA: Salta : Valle Tastil.

JARDIN EXPERIMENTAL D'ACCLIMATISATION  
A. V. FRIC, PRAHA,  
KLETNY HAN-ROZAR, VILLA BOZENA, TEL. 4490.

Fig. 7.  
*Airampo*  
*rubriflora*  
Fric. nom. nud.

identities. In some cases they are circulating without names or with provisional names only, such as the one shown in figure 8, known as 'O. subcompressa.'

### The genus *Airampo*

The genus *Airampo* Fric is a name accepted by ING (ING Database, Smithsonian Institution), and according to their list it was validated in the supplement to Fric's seed catalogue of 1933, entitled *Akklimatisations und Versuchs-Garten*. The description given there was as follows:

"Kugel-opuntien aus hohen Cordilleren mit widerhakigen Stacheln, aber ohne Glochiden. [Globular opuntias from the high Cordilleras with barbed spines, but without glochids]." The only included species was *Airampo aurata*, published simultaneously with the same description as the genus. Fric was not great on descriptions of his new plants, but he generally left very good herbarium sheets in support of his names (Figs 6 & 7).

When discussing this description, both Byles (1955: 73) and Hunt & Iliff (2000: 9) mistranslated the German word "widerhakigen" as "barbed-hooked." According to my German dictionary, "widerhakigen" translates as either "barbed" or "glochidiate," not hooked.

According to Zázvorka, J. & Šedivý, V. (1993: 11, 86) in *Aztekie* 14, there is an earlier use of the generic name in a publication about Fric's expedition of 1928/29. Not having seen this, the writer is unable to confirm if there is any sort of description there (Hunt & Iliff stated that there is), but it is not essential because there is already enough material in the 1933 publication to validate the name.

### Tunilla

The generic name *Tunilla* Hunt & Iliff was proposed by Hunt & Iliff (2000: 8-12) on the grounds that Fric's description could not be identified. However, they appear to have overlooked the specimens left by Fric and the illustration in Kreuzinger (1935: 43) (Fig. 3), which made the Fric concept very clear. He might even have a specimen of *Airampo aurata* in one of his three herbaria (we only know of the limited one at Prague, which has only 300 Fric specimens, compared with the 1000 specimens in his private herbarium – still in private hands. Fric was preparing duplicates for Prague, until they defaulted on payment).

So *Airampo* is validly published, and identifiable as the group of plants we know today. It is also typifiable from original material, since in the absence of a specimen labelled *A. aurata*, one of the other two sheets are available for reelectotypification.

The genus *Tunilla* would therefore seem to be superfluous and illegitimate under Art. 52.1.

### Current treatment

Not everyone is sold on the idea that the genus *Opuntia* ought to be broken up, including the present writer. The genus is readily characterized by having uniform reproductive parts, i.e. flower, fruit and seed, throughout. The molecular data so far available only deals with differences between taxa, not their importance, and all the segregates are just as acceptable as subgenera or sections, as they are at generic level.

Moreover, airampoas are exceedingly variable within their respective populations, and the justification for having more than one specific name for them all is very thin indeed. It needs to be born in mind that this is a species that has had a lot of prehistoric human

interest, and has been transplanted in many disparate places. It has been said that the populations in Peru and Bolivia are not native, but introduced from Argentina some time during the last millennium.

It is therefore proposed to treat them here as a single variable species, under the oldest name *Cactus ayrampo*, for which a new combination under *Opuntia* is now required, as follows:

*Opuntia ayrampo* (Azara) Mottram comb. nov.

*Bas: Cactus ayrampo* Azara, *Voyages dans l'Amérique Méridionale, depuis 1781 jusqu'en 1801* 2: 526. 1809.

It has no type, and requires neotypification with a good specimen of Bolivian origin, since Azara did not travel far enough south to reach most of the Argentinian populations.

The other species names in general use already have name combinations under *Opuntia*, for those who wish to use them, but basically they are little more than selected cultivars, and often just single clones. A proper assessment of which of these names justifies recognition at subspecies level has never been made, and is a matter for future investigation. So *Opuntia corrugata* becomes *Opuntia ayrampo* 'Corrugata' etc.'

### Literature.

Azara, F. de (1809) *Voyages dans l'Amérique Méridionale, depuis 1781 jusqu'en 1801*; contenant la description géographique, politique et civile du Paraguay et de la rivière de la Plata; l'histoire de la découverte et de la conquête de ces contrées; des détails nombreux sur leur histoire naturelle, et sur les peuples sauvages qui les habitent; le récit des moyens employés par les Jésuites pour assujétir et civiliser les indigènes, etc. Publiés..., par C. A. Walckenaer; enrichis en notes par G. Cuvier Suivis de l'histoire naturelle des oiseaux du Paraguay et de La Plata, par le même auteur, traduite, d'après l'original espagnol, et augmentée..., par M Sonnini; accompagnés d'un atlas de vingt-cinq planches. Dentu, Paris.

Britton, N. L. & Rose, J. N. (1919) *The Cactaceae* 1. Carnegie Institution, Washington.

Cárdenas, M. (1969) *Manual de plantas economicas de Bolivia. Cactaceae: 223-237.* Imprenta Ichthus, Cochabamba.

Doweld, A. B. (2002) On the genus *Airampoa* Fric (*Opuntioideae* – *Cactaceae*), *Turczaninowia* 5(2): 26-31.

Fric, A. V. (1933) *Akklimatisations und Versuchs-Garten (Bestellzettel): [1].* Privately published, Prague.

Hunt, D. R. & Iliff, J. (2000) *Tunilla*: a new generic name for the "Airampo group," *Cactaceae Systematics Initiatives. Bulletin of the International Cactaceae Systematics Group* 9: 8-12. David Hunt, Milborne Port.

Kreuzinger, K. (1935) *Verzeichnis amerikanischer und anderer Sukkulenten mit Revision der Systematik der Kakteen.* Firma K. Kreuzinger, Eger.

Zázvorka, J. & Šedivý, V. (1993) *Jména kaktusu A. V. Fric, Aztekia* 14 (1991). Prague.

Roy Mottram, Sutton-under-Whitstonecliffe, Thirsk. Jan. 2004

## LEARNING FROM EXPERIENCE.

Having grown Tephrocacti and its related genera now for almost fifteen years, I have come to amend my ways of growing and looking after them considerably. Those who have been members since the beginning of our TSG will remember that I may have given the impression in some of my earlier articles that all plants in this group are totally hardy down to -12°C or lower. Whilst this is true for most plants, experience over these last years has taught me that is not strictly true for all the species.

So I will try to bring things a little more up-to-date! It is true that, in the first couple of years of growing, all plants were kept in my 1.40m x 3.50m Access frame all the year round and most of them survived -12°C of frost for some time in the very first year and I was convinced that they would also do so in the future. Well, admittedly some of them did not look too well after they have had gone through a winter with a lot of frost. Some of the *Austrocylindropuntia* had black joints and most of the Tephrocacti lost many or most of the top growth and were not able to flower, but they recovered gradually and I was fooled into a false sense of security.

After losing some plants in the following years too I had to amend my thinking! Soon I found out that the "true" Tephrocacti (i.e. Tephrocacti sensu Kiesling Ed.) do not really like it that cold and I had to bring them into the greenhouse where the temperature hardly ever drop below +2°C and they really seem to enjoy that. *Austrocylindropuntia* too do not like to be more than 2 or 3°C below zero for too long, but these two genera can happily survive quite a few degrees of frost as long as the temperature rises again in the morning to one or two degrees above zero (this may well happen in habitat too). There is no need to worry if it goes on two or three days even. The optimum I feel, is to keep them around +2 - +3°. *Austrocylindropuntia* are winter growers and should therefore not be allowed to dry out completely but be kept moist all winter until approximately end of March or April depending on the season. After that, just keep them ticking over. (I regard *clavarioides* as a Puna, but if you think it is an *Austrocylindropuntia*, you must treat it like *Maihueniopsis* and keep it absolutely dry in winter because the large tap root is apt to rot). Tephrocacti on the other hand must be allowed to dry out completely from mid September till the end of April. If they shrivel a little do not worry, they may drop the odd joint and shrivel but they will come to no harm. Over wintered this way they will give a good display of flowers in the following late summer or autumn.

The only plant that does not mind too much if the temperature drops to -4 or -6°C in my experience even for most of the winter is *Austrocylindropuntia verschaffeltii*. In fact it seems to benefit from this and flowers much more profusely afterwards. So I keep them in my unheated greenhouse all winter and they flower their heads off.

On the other hand *Maihueniopsis*, *Cumulopuntia*, *Tunilla*, *Puna* and *Tunilla* (*Airampoa*), all get the same treatment. They are kept in the garden frame absolutely dry from the end of September right until mid April and all can take as much frost as we are going to get in this country in the winter months. During this time ventilation is of the utmost importance.

### A word about Cultivation

*Austrocylindropuntia* and Tephrocacti are relatively shallow rooted plants and are quite happy in normal sized pot (BEF square pots will do) and I keep them in these because they retain a little more moisture rather than clay pots that seem to draw roots towards the edges and dry out more quickly than plastic ones as a consequence. Of course *Tunilla* are quite content in larger shallow pans.

On the other hand *Maihueniopsis*, *Puna* and *Cumulopuntia* (except the *sphaerica* group that does not have taproots) do all have long taproots and require the deepest pots you can find. This becomes a problem as they grow larger and the tap roots longer. In which

case "Long Tom" pots are the answer! In fact for *Austrocyindropuntia (Puna) clavarioides*, even "Long Toms" are not deep enough because as they grow larger the taproot tends to curl round at the bottom of the pot.

The potting compost I use is J.L3 with the same amount of horticultural grit added. This provides for an open medium and very good drainage. Re-potting takes place just before the growing period starts and I am careful not to disturb the roots too much in the process. In fact potting on is not really necessary until the plant is too large for the pot or, in the case of tap-rooted types, when the roots have reached the bottom of the pot. This is quite important because it will affect the willingness to flower. All pots are top-dressed with a lime-free grit of some sort to prevent any growth of algae or moss.

Watering of all the plants (except *Austrocyindropuntia*) starts at the beginning of May until mid September. I found it best to wake the plants up with a light overhead watering, but as soon as the temperature warms up they can take as much water as you like, but they must never be waterlogged. From about the end of May all plants get a very weak feed of a low Nitrogen (high in potash) fertilizer with every watering. In fact all my *Opuntia* receive an overhead watering with the watering can and they seem to enjoy it and it keeps them clean. When you water, water well and then let them rest until they have dried out.

I don't really have to emphasise that we hardly get enough sunshine (despite the hot summer of the last year), so it is important to put the plants into the sunniest spot we can find and, if it has to be in the greenhouse, then it should be high up on the top shelf. After which they will amply repay by their willingness to give a good display of flowers.

Ventilation is of prime importance as it is for all our Cacti (not only *Opuntia*). Visitors will have noticed that my garden frame has at least a 3-4cm gap in the glass at all four corners even in winter. The plants enjoy moving air at all times and do not mind if the fog and snow blows right through. Ventilation in summer is important so that the plants don't cook but in winter it is vital! Here I will refer to Martyn Collinson's little problem (page 598) where he complains of black mould at the tips. One of the first instruments I acquired when I started to grow Cacti (apart from a thermometer) was a "hygrometer" for measuring the humidity in the air of the greenhouse. In winter when the humidity rises to 80% it reaches the danger point. That is when moving air and ventilation are desperately needed. Although Martyn talks about the plants being grown under an "open" window, does this mean in winter too? At this time ventilation is vital to stop mould forming. For years, my greenhouse has two fans running day and night, summer and winter. The only way to test this theory would be to grow one of Martyn's plants for a year or two to see whether the problem continues.

So far I have not mentioned seed raising. Although we all know that *Tephrocacti* are supposed to be notoriously difficult to raise from seed, this is not necessarily the case. I prefer to put my seed in a small glass tube or clear glass bottle and leave them on the highest shelf right under the glass to ripen, (not in water, as Roger Moreton erroneously mentioned on page 583 vol.9) I feel this is mirroring the condition that they would be exposed to in habitat until the time that conditions are right to germinate as the rains come. *T. geometricus* is supposed to be the most difficult, but I have a feeling there are also other reasons. How often do travellers collect seed of these I wonder? By the time we get the seed it is likely to be old and then more reluctant to germinate. This may well apply to other types of *Tephrocacti* too. The seed is then sown end of May to June on top of well drained compost in deep pots, then covered with 1-1½ cm of grit and soaked thoroughly, and put on the highest shelf under the glass. They should never be allowed to dry out. The first should germinate in a fortnight with others following over a period of weeks. Then I transplant as soon as the seedlings are large enough to handle. Don't discard the rest, as some will continue to show over a matter of months or even two years.

Finally when your plants are growing well you will want to share your success with others and pass on some cuttings. You can of course take cuttings at any time of the year and some continental growers advocate taking them in the autumn but I prefer to do so in the spring (May to June) when they root within ten days. Plant in an open compost with plenty of grit and spray for the first few days. Then you can dip the trays until soaked through, but in any case they should never be left to dry out.

I am sure you know when we try and grow cacti, we all make mistakes (I have had my fair share of them and I still do) but if we can get something right in the end through experience it can give us an awful lot of pleasure and satisfaction.

A few days ago a copy of the last issue of Scandinavian Cactus and Succulent Journal No.4 October 2003 arrived with an *Opuntia* on the front cover and a rather interesting article on growing *Opuntia* and *Echinocereus* in a raised bed in the garden outside. The *Opuntia* grown are mainly *Tunilla* and *Opuntia fragilis*. They seemed to grow well with a profusion of flowers.

René Geissler. Slimbridge.

### WATER FOR TEPHROCACTI

Most of Birmingham gets soft water from Wales. We don't. Ours is hard, from Staffordshire. A friend of mine visited South Staffs' marvellous, new, automatic, pumping station. "Brilliant" he said, "but you should see the stuff they put in it." I can't supply a list but as well as the usual calcium carbonate it would also include aluminium sulphate and chlorine. I have to tell Martyn Collinson (Vol. 9 No. 4. p598) that, after six years, my *Tephrocacti* still seem to be thriving in spite of this. (Setting up a rain water supply remains just a good intention.) They fall to bits with irritating frequency but I don't have the other problems he mentioned. I did damage a very nice *strobiliformis* by accident. The glazing slipped, I didn't notice and it rained and snowed on it all winter. The plant is alive and growing but the segments are discoloured and some have dried up at the ends. If that is similar then the enemy is cold and wet. The conditions that produce sooty mould could be relevant. Ed Fletcher wrote describing his cold frame which was raised from the ground and had a slatted base. (Volumes 3 No. 4 p216 & 4 No. 4 p294) This would cut off the supply of water from the soil and provide excellent ventilation, which helps to dry the plants out. Martyn could also try searching M. Keisling's book, which describes many diseases in gruesome detail. But I suspect that the real truth is that none of us really know what is best. If we get good results we don't investigate. If not we grow something else.

W.L.Jackson. Jan. 2004. Sutton Coldfield.

### PAGE NUMBERS.

Discerning readers will have noticed that the last page number of the last volume was 601 but this volume starts at page 1. This is because when I took over as Editor I continued the established practice of simply continuing the page numbers. I am grateful to Roy Mottram for drawing to my attention that this form of pagination is most unusual. It is usual practice to start each volume with new numbers, hence the change.

Ed.

FIELD COLLECTION NUMBERS OF THE OPUNTIOIDEAE

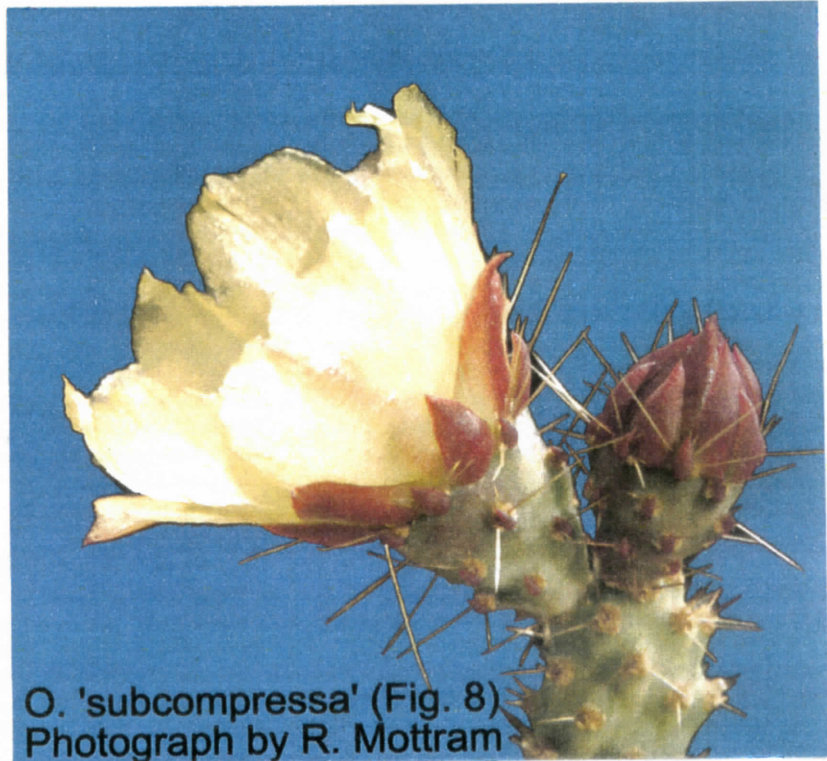
LAU

L 100	Tephrocactus pseudo-udonis	Cordillera Raura
152	“ rauhii	Ocongate
157	Austrocyl.op pachypus	Eulalia valley
176	Tephrocactus sp.	Huagel
190	“ sp.	Catac
191	“ sp.	Machac 3200M
198	“ floccosus	Oroya
200	Austrocyl.op pachypus	Eulalia valley 2800M
205	Tephrocactus floccosus f.	Andahuaylas
230	“ sp	Huallas 4200M
233	“ yanganucensis	Lago Yanganyuco
239	“ multiareolatus	Caraveli 1100M
241	“ alboareolatus	Chala to Incuio 2400M
244	“ sp	Pampa de Arrieros
246	“ sphaericus	Mouth of Rio Tacna 100M
247	“ sphaericus v.	Torata
248	“ sphaericus (spineless)	Torata
251	“ aff floccosus	Puno 4000M
253	“ malyanus	Pass to Sandia & Macusani 4000M
255	“ floccosus v	Cuyocuyo, pass to Sandia 4200M
256	“ sp	Paruro
429	“ glomeratus v.longispinus	El Aguilar
434	“ glomeratus v.atrospinus	El Aguilar
435	“ flexispinus	El Aguilar
506	“ articulatus	Sierra Mazan 800M
507	“ articulatus v.	Sierra Mazan 800M
514	“ articulatus	Tinogasta
534	“ glomeratus	Quebrada del Toro
579	“ articulatus	Chumbicha- Mazan

Knoll & Klein (WO)

WO 5	Opuntia sp.	Colonia Baranda 60m
7	“	“
12	“	Tafi del Valle 2600m
17	“	Cafayate 2400m
33	Cylindropuntia sp	Piedra de Molinos 3500m
65	“ sp	Nono 1000m
65a	“ sp	Salsacate
65b	“ sp	Bialet Masse
81	Opuntia sp	Teniente Encisco 450m
95	Tephrocactus sp	Serrezuela 300m
108	“ sp	Famatina 1200m

With thanks to H. Middleditch for permission to use the Chilean's Compendium.  
R. Moreton. Birmingham.



O. 'subcompressa' (Fig. 8)  
Photograph by R. Mottram

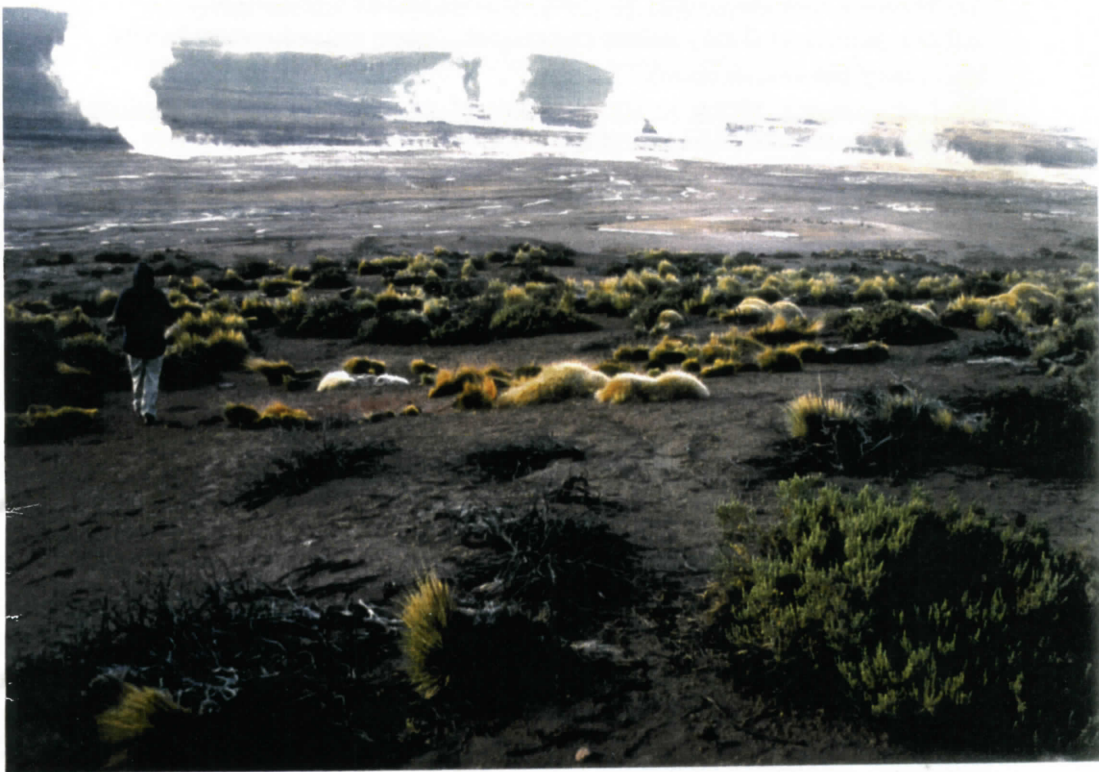
Fig. 8. *Opuntia subcompressa* hort. nom. nud. Photo by R. Mottram.  
Fig. 9. *Maiuheniopsis rossiana*. Photo by W. L. Jackson.





# TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera



The geysers at El Tatio, Chile, 4,300m.  
*Cumulopuntia ignescens* (Vaupel) Ritter in foreground.  
Photograph by Brendan Burke.

## STUDY GROUP

Vol. 10 No. 2 June 2004

## Secretary's Page

I have just looked through the membership index for the first issue of our journal and found that four of our founder members are indeed still members today. They are: Alan Hill, our Chairman, John Bettely, Geraldene Dyson, and myself. Not bad going since there were only six founder members in the first place and sadly, two of them have passed away in recent years.

- All articles and comment should be sent to the Co-Editors.
- Subscriptions and any other correspondence must be sent to the Secretary (see address below).

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

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

• Subs for 2004 remain at £10.00 per annum for the U.K and Europe (European members please note: "no Euro-Cheques are accepted by our banks – but you may send £ Notes") Subscriptions for Overseas members is £14.00 or \$25.- (in \$bills only. **Please make all cheques payable to: "The Tephrocactus Study Group" (not individuals).**)

- Members may advertise their "Wants" and "Surplus Plants" free in the Journal, in no more than 30 words

### The Officers of the TSG are:

#### Chairman and Editor:

Alan Hill, 8 Vicarage Road, Grenoside, Sheffield S35 8RG - ☎ 01142 462311  
eMail: [alan.hill6@virgin.net](mailto:alan.hill6@virgin.net)

#### Co Editor:

William (Bill) Jackson, 60 Hardwick Road, Sutton Coldfield, West Midlands  
B74 3DL ☎ 0121 353 5462 eMail: [wjackson@supanet.com](mailto:wjackson@supanet.com)

#### Secretary:

Rene Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW  
☎ 01453 890340 eMail: [geissler.w@virgin.net](mailto:geissler.w@virgin.net)

Back Copies are now available again for the following:

### **Back Copies of Volume 1 – 10 (1995 -2003) are still available**

Each Volume is obtainable complete, postage paid for  
£10.- U.K.  
£14.- overseas  
\$25.- U.S.A (in \$ notes only)

- Folders for the Journal are also available at £4.60 for U.K. ,  
Overseas & elsewhere £5.60.

All obtainable from Rene Geissler, Kingston Road, Slimbridge, Glos. GL2 7BW - ENGLAND  
TSG web page: <http://freespace.virgin.net/geissler.w/tsg.htm>

## REPORT ON THE TSG MEETING OF 18<sup>TH</sup> APRIL 2004.

All the Officers of the group were re-elected. It was pointed out that there has been no response to the request for someone to come forward to help the present editorial team. It is important that some one comes forward in case the present team find difficulty in continuing. (To put it bluntly we are both getting on in years). The Chairman reported that a member had suggested that the name of the group should be altered due to the various taxonomic changes that had occurred since the group's inception. However, the members present at the meeting were all in favour of retaining the name. Cactophiles easily recognise the subjects of our study.

Discussion took place on the coming Show at Birmingham. The Show will have been held by the time of the publication of this journal). As a result of this discussion it was agreed that an insert should be posted out with the schedules giving extra information. It was suggested that the pot sizes in some of the classes were too restrictive as some members' plants were in much bigger pots than those specified in classes where genera were listed. Nothing could be done for the forthcoming Show as the schedule had been printed. However, it is not intended to hold a show next year so the matter can be discussed for the expected 2006 show schedule. Any views will be welcome.

The Editor reported that a member had commented upon difficulty in reading the Journal because of the small size of the print. It had been suggested that a larger size should be used. However, this would mean less content on the existing pages. One solution could be to try to increase the number of pages, which, in turn would produce some complications. None of the members present had any real problem with the present text although some voiced suggested helpful alterations. As a result the print in this issue is Arial, not Times New Roman. The Editor will appreciate any feed back on the topic. It was confirmed that photographic prints are the easiest to use to illustrate articles. However, slides are welcome as they can be changed to print. It is appreciated that sometimes a black background is most effective for a photograph. It was stated some time ago that pictures are preferred not to have a black background but such pictures can be used. The Editor, when preparing the layout, will set up a white border "run-in". It was stated at the meeting that light blue is a good background colour.

The topic for discussion was the *Airamboa/Tunilla* group. Many plants had been brought and were laid out on the floor in what appeared to be groups of similar plants as we concentrated on similarities rather than differences. Two problems about identification were obvious. Some names on labels were not valid whilst where several plants had the same name on the label there was no indication of the source of the plant. We could therefore be looking at the same plant, from the same original source, in different pots with different present owners. It was suggested that when obtaining a plant the source of a plant should be queried and the resultant information be placed on the label. Some plants with field numbers helped to give a location for a particular group. Five groups of similar looking plants were eventually arranged and given names. These were Bolivian, Chilean, "*ireiss*"/*corrugata* forms, *tilcaensis* and *erectoclada* forms.

The Bolivian forms had field numbers and were therefore easy to group. There appeared to be an affinity with *soehrensii*. It would now appear that we possibly had some confusion about some plants labelled "leoni" that formed our "Chilean" group. It is planned to have a small article on this in the next issue of our Journal. Unfortunately no one brought an *O. alcerrecensis* Iliff (*Opuntia chilensis* Ritter) so we had no definite Chilean plants.

Some plants at the meeting were labelled "ireiss" which is an invalid name by Borg. Plants in cultivation bearing this name are said to belong to the *corrugata* group (R. Crook & R. Mottram *Opuntia* Index, *Bradleya* 17/1999, P117) and this is where they were placed.

The Piltz P162 from Belen - Hualfin, although with some differences, fitted alongside *tilcarensis*. The two were group together. However, the possibility of *tilcarensis* being a hybrid with *soehrensii* was voiced. There were similarities between *erectoclada*, "*procumbens*" and Preston-Maffam's PM311 "*longispina*" from the Cuesta del Obispo. However, plants of the species correctly named *Opuntia procumbens* Englemann & Bigelow are North American and thus the plants at the meeting were obviously misnamed. "*Longispina*" is a name that is in the literature but is the subject of much discussion and dispute resulting in no certain identification. *Picardoi* also appeared to have affinities with the plants put together in this group at the meeting although *picardoi* was said to be a possible hybrid.

*Hintonii* looked as if it could be an extreme form of *corrugata* or it could be a cultivar.

Brendan Burke gave the illustrated lecture. Brendan showed slides of the *Opuntia* plants that he had seen on several visits to northern Chile. The most common species he saw was *Cumulopuntia sphaerica* (Forster) Anderson, which grows on all the types of soil. The plants across the wide area he travelled appeared to be basically the same although there was some difference in condition depending upon the amount of moisture available to them. Some supposed difference in flower colour is due to what age one sees the flower rather than inherent different colours of flowers. The buds tend to be red but open to yellow flowers with the reddish pigment showing slightly as the flowers fade. *Maihueiopsis camachoii* (Espinosa) Ritter was shown growing in rings as the centre of the plant dies out and the outer segments root down. The spination of the plants becomes stronger as one goes up to higher altitude. Pictures of *Maihueiopsis echinacea* Ritter were also shown growing 6 Km. west of Putre. Seed from these plants was available for sale at the meeting and is offered in this Journal. Spectacular slides were shown of *Cumulopuntia ignescens* (Vaupel) Ritter, growing at El Tatio. (See front cover). The geysers are at 4,300m above sea level and very low temperatures, well below freezing, occur at night. The plants freeze at night but the geysers keep the soil warm and the plants thaw out in the morning (See Fig. 5).

On behalf of the members who attended I thank Rene for arranging the meeting and lunch at the local pub. I also thank his wife for providing the welcome refreshments in the hall. I also wish to thank all those who attended the meeting. Personally I enjoyed attending the meeting. My one regret is that it was soon over and there was too little time to talk to individual members. If anyone has any ideas on the format of future meetings I will be pleased to hear them. It was agreed that the 2005 meeting will be held at Slimbridge on Sunday 17<sup>th</sup> April. The plants to be discussed are those in the *Pterocactus* group. If anyone has suggestions for a speaker to give the lecture I will be most grateful to hear them

A. Hill. Chairman..

#### **OPUNTIA HINTONII**

This plant looks to be a *Tunilla* but there appears to be no mention of the name in the literature, The plant is used to illustrate Bill Jackson's article and therefore is shown as Fig 1 in this issue. Please will members send me any information they have about the plant or make comments?

A. Hill. Ed.

## REPORTER SERIES NO 2. ALAN JAMES

My second visit was to Mr Alan James of Great Barr in Birmingham. Alan, 63 years young has been interested in cacti for some ten years. For the last six years he has developed an interest in Tephrocacti and other small Opuntias, especially the Pterocactus group. He has been a TSG member for six years and attends the AGM meetings at Slimbridge.

Alan has two eight x six foot greenhouses and an outside cold frame, full of interesting and fine plants, and so clean: he admits to using his wife's vacuum cleaner! (See Fig 6). He has recently constructed an outside bed for hardy plants. The large trough is constructed using patio decking. The base is filled with various sizes of stone and grit to create good drainage. The top compost is approximately 80% drainage material and will be covered with plastic in winter with the ends left open for good ventilation. A mixture of hardy Echinocereus and Opuntias has been planted in the trough. In the greenhouse he grows his collection in 50% clay granules and 50% John Innes 3, plus a few pellets of slow acting fertilizer and finds most Opuntias do well in this. His only pest is mealy bug, which seems to come in from a neighbour's privet hedge. Alan uses armillatox if the need is urgent but prefers not to use chemicals if possible. He tries to deal with the mealy bug by hand using a magnifying glass and brush with some spirit.

The collection is mostly Opuntia but there are a few other succulents. Alan is drawn to the South American plants in general and is fascinated by their ability to grow in such extremes of weather, altitude etc. He wants to learn more about seed growing, as he believes that it is lack of knowledge on our part as to why they are hard to germinate. Even the correct time of year to sow some seed is in question. He has no interest in showing plants but just wants to grow them at home and enjoy the collection. He follows Clive Innes publications and the recent "Studies in the Opuntioideae" by D. Hunt and N. Taylor to cover the taxonomy questions.

Alan keeps records of the plant data on computer. He is one of several members who are keen to have the TSG Journal publish lists of collectors' number data. He says that he has many of his plants with CH, GH, WG etc numbers but no source or other data given and he would like to know the origins of material for his records.

David Parker, Birmingham

The trough containing the outside bed is shown in Fig. 6 on the path side of the greenhouse. Ed

### ERRATA AND APOLOGY.

An error in the layout in the last issue resulted in the text of pages 5 and 6 being transposed. In other words the text on page 6 should have been printed on page 5 and the present text on page 5 should be on page 6. Profuse apologies are given to Roy Mottram for the error in the presentation of his valuable article.

Alan Hill. Ed.

## COMMENTS ON "AIRAMPOS – A REVIEW."

This was a fascinating article: interesting, entertaining and informative. One bit of information was especially relevant for me. In the overgrown patch at the back of our house we have this small tree. In Spring it is covered with small balls of orange stamens. They show up well against the evergreen, serrated foliage. We bought it with the label *Azara serrata*. I have often wondered where the name came from. Was it the name of some exotic Mexican dancer? Or perhaps a Brazilian swear word? Now we know. The genus is named after Don Felix. I am delighted and grateful, to have this bit of extra provenance, if that is the right word. (Serrata is good too. It tells you something about the leaf shape.)

The article was also coherent and convincing. But I do have this uneasy feeling that his conclusion was not right for us. By "us" I mean "We Cactophiles". As a retired tyre technologist I would look pretty stupid trying to comment on the actual taxonomy but even as a novice, I am entitled to an opinion about the result.

It seems to me that the Collectors Creed should be something along the lines....  
**"IF IT LOOKS DIFFERENT IT NEEDS A DIFFERENT NAME."**

Perhaps, there might be a corollary: something like ...

**" ANY RECOGNISABLE GROUP OF PLANTS SHOULD HAVE A NAME."**

The article lumps all the *Tunilla/Airampos* together as one species and argues that they are not distinct from other *Opuntias*, apparently defying our wishes. I took up my angry pen but when I read it again I realised that it does leave loopholes for our benefit. We could continue to use the same names (if we ever find which plants should have which names) but treat them as cultivars rather than different species. Moreover, we could continue to recognise different groups by treating them as sections or subgenera.

This ought to be enough but I still have lingering doubts. I like the genus "*Tephrocactus*". It is very different from other *Opuntias*. As far as I know it does not cross breed with any of the others. The group is recognisably distinct. Perhaps the boundaries are a bit vague but the classification is realistic enough to be useful. Similar arguments might be applied to *Tunilla/Airampos*. One part of the reasons given for rejecting the group as a separate genus is the uniformity of *Opuntia* reproductive parts, but J. Iliff states that plants in his "*Corrugata*" group are different from other "platyopuntias" in that they have tectate pollen. Overall this feature is associated with non-platyopuntoids so, he argues, the *Tunillas* are distinct. ("Studies in the Opuntioideae", Ed D. Hunt & N. Taylor. P133). I do not know whether this is a relevant distinction. I am not even sure that I have got it right. I quote it because it supports a view that I would like to see prevail. I want "*Tunilla/Airampos*" to be a different "something" and "Genus" would be nice.

If the group is to be a different genus it will have to include some species, and it will be more easily justified if there are found to be more than one of these. Roy Mottram gives strong reasons for claiming that they are all the same. They are extremely variable. Plants growing together in the same area show this variability. They interbreed freely. Our knowledge is based on relatively few selections imported for mainly horticultural reasons and so on. Even my tiny collection gives some support to this. I have two very similar plants labelled "*Laetevirens*" which means, "Light green". One does have light green cladodes. The other is a sort of mucky brownish green. They are variable enough to spoil the name.

However, there are very substantial differences between some of the specimens.

Figure 1 shows a plant with a very dark coloured body, nothing that looks like a spine, masses of pale coloured mini-spines that look like glochids and very thin, flat cladodes. My first acquisition of this was labelled "*Opuntia* sp. Aquas Negras". My second bore the label "*Tunilla hintonii*".

The plant shown in Figure 2 is very different. This is one of the "*laetevirens*" but could easily be *Tunilla corrugata*. The cladodes are noticeably flattened but remain quite chunky. They grow matted together, completely covering the surface of the ground. The body is green. It has many long, thin, white spines.

Figure 3 shows a plant labelled *Tunilla alcerrecensis*. I do not know whether this is right but, if it is a *Tunilla*, it is very different. The cladodes are only slightly flattened. The new growth emerges from a point fairly high on the preceding segment so that it forms a relatively erect shrub. The spines are stout, not too long and strongly coloured, reddish brown.

Figure 4 shows one of a type that I think of as the "Strike Force". It produces a few chains of segments at ground level and these rush to the edge of the pot so as to root down in their neighbours' territory. The cladodes are very thin and erect and have odd, angular profiles. They come in varying shades of green but not in brown or red.

I do not know whether these are conservative characters and the individuals of each type may vary a lot but the differences are substantial and very noticeable in a collection. I would like them to be reflected in the names. Then I could set out to get some of each type instead of different labels only to find out, when I get the plants home, that I have them under a different name.

So, although Roy Mottram's article is convincing, I find myself hoping that someone will find a way to save *Tunilla* and even find a few distinct species to go in there.

W.L. Jackson. Sutton Coldfield.

### OPUNTIA – FISSION OR FUSION?

By Gordon Rowley

This is by way of a belated response to earlier pleas for enlightenment on the confusion of generic names and rival classifications (Hill 2000). Anderson (2001) recognises 15 genera within Opuntioideae, as compared to 7 in Britton & Rose (1919-1923) and 15 (different) genera in Backeberg (1976). Griffith (2003) adds 2 more. By contrast, Mottram (1990), Barthlott & Hunt (1993) and Hunt (1999 & 2002) doggedly defend the single overall genus *Opuntia*. The matter needs airing because I am attempting to compile a compendium of all genera of succulent plants, and the Opuntioideae remain one of the most controversial areas. Since my comment in 2000 we have had "*Studies in Opuntioideae*" (Ed. Hunt & Taylor 2002) with new data and a new cladogram from Wallace and Dickie providing the basis for the present inquiry.

Until recently, intuition and experience have shaped genera in the absence of hard-and-fast rules, mixed with not a little personal bigotry (how can you possibly love a name like *Austrocylindropuntia* that is too long to go on a plant label?). Serious collectors followed one authority or another, usually depending upon which book they could afford. With the coming of DNA sequencing (Wallace 1995) at least a part of the classifying process can be put to the test and treated scientifically. Affinities can be interpreted in terms of percentages of shared characteristics, and the results of what should be repeatable tests are expressed in the form of a cladogram or phylogenetic tree.



Figure 1. *hintonii*

**Fig. 1. *O. hintonii*. Details??? Ed.**

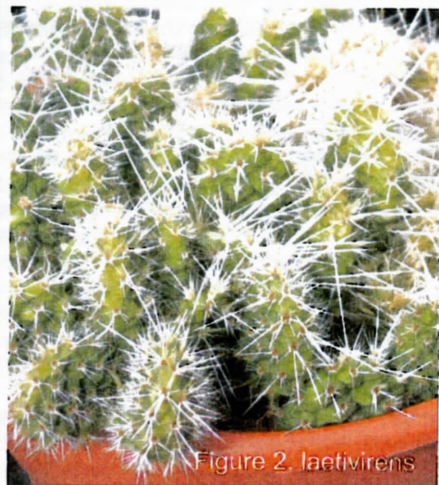


Figure 2. *laetivirens*

**Fig. 2. *O. laetivirens* Backeberg.  
Nom. Inval. (Art. 8.4)  
*O. corrugata* group states Iliff**



Figure 3. *alcerrecensis*

**Fig. 3. *O. alcerrecensis* Iliff.  
*Platyop. chilensis* Ritter.  
Nom. Incorr. (Art. 11.3).  
Non *O. chilensis* (Bkbg) Rowley.**

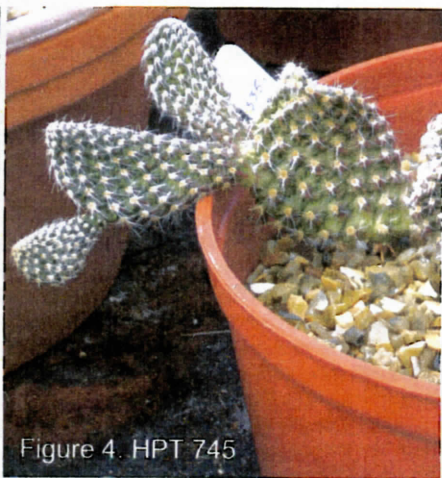


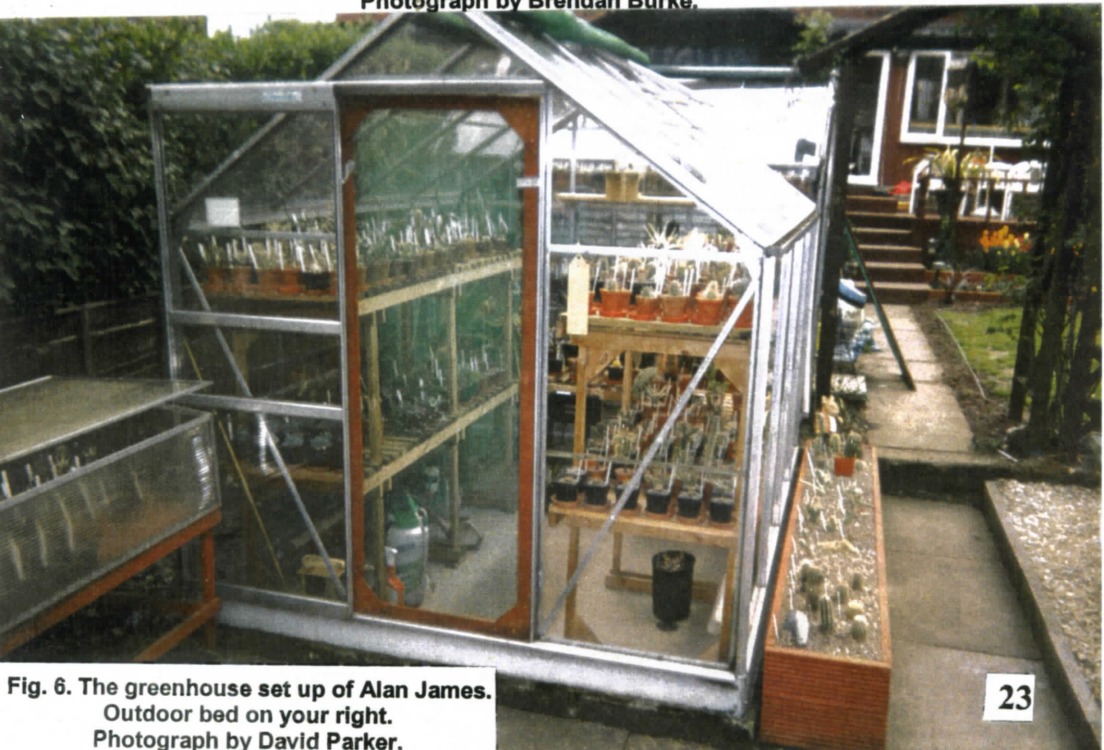
Figure 4. HPT 745

**Fig. 4. Any suggestions for a name? Ed.  
Presumably in *O. corrugata* group.**



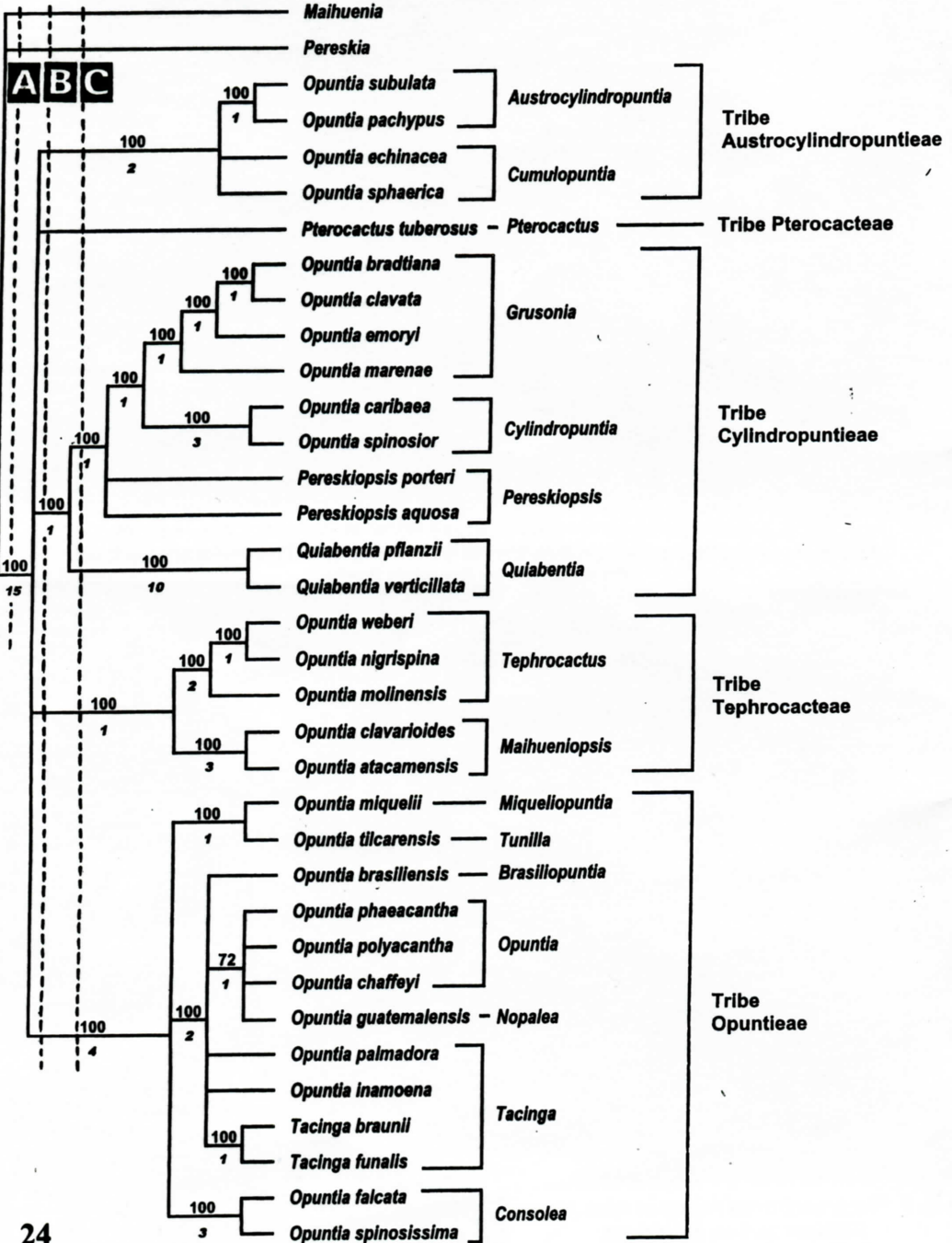


**Fig. 5. *Cumulopuntia ignescens* (Vaupel) Ritter at El Tatio, Chile. 4,300m. The plant is starting to thaw out in the early morning sun. The white area is frost. Photograph by Brendan Burke.**



**Fig. 6. The greenhouse set up of Alan James. Outdoor bed on your right. Photograph by David Parker.**

Wallace & Dickies's cladogram of Opuntioideae of 2002, with added vertical lines A, B & C to show different levels of divergence.



In Wallace & Dickie's cladogram of 2002, 35 samples representing selected species have been plotted to show what may or may not mirror their course of evolution, increasing similarity being towards the right. This they have used to recognise 18 monophyletic groups at the generic level. But there are many other ways of interpreting the same data. To illustrate this I have added to their diagram the 3 vertical dotted lines labelled A, B and C. Forget, for the moment, the names and ranks which in any case are liable to change. Each vertical dotted line represents a level of congruity, dependent upon all the characters studied – the actual percentage is unimportant but it will be the same for each horizontal line intersected. Herein lies the means to equate groupings.

Line A, for conservatives, takes us back to Schumann (1897-1903) with just 3 genera: *Pereskia*, *Maihuenia* and *Opuntia* (Schumann also had *Nopalea* and *Pterocactus*). How this might look, translated into modern guise, is shown below, retaining old names as far as possible and observing priority within each rank as required by the Nomenclature Code. Loss of *Pterocactus* as a genus is surprising: it is so distinctive in many of its characteristics. *Peresklopsis* and *Quiabentia*, however, are just shrubby cylindrical-stemmed opuntias with flat leaves, and one recalls a parallel case in stapeliads where the leafy genus *Frerea* has been sunk in *Caralluma*.

#### Line A deflationary classification

#### GENERA

1 PERESKIA (= *Rhodocactus*)

2 MAIHUENIA

3 OPUNTIA

#### Subgenera

i *Pterocactus*, re-ranked as a new Subgenus

ii *Austrocylindropuntia*, re-ranked as a new Subgenus

Series a *Subulatae* Br. & R. (= *Austrocylindropuntia*)

b *Pentlandianae* Br. & R. (= *Cumulopuntia*)

iii *Cylindropuntia* Eng.

Series c *Imbricatae* Br. & R. (= *Cylindropuntia*)

d *Clavatae* (Eng.) Schum. (= *Corynopuntia*,

*Grusonia*, *Marenopuntia*, *Micropuntia*)

e *Perskiopsis*, re-ranked as a new Series

f *Quiabentia*, re-ranked as a new Series

iv *Tephrocactus* (Lem) Vaup.

Series g *Weberianae* Br. & R. (= *Tephrocactus*)

h *Glomeratae* Br. & R.

(= *Maihueniopsis*, *Puna*, *Tunilla*)

v *Opuntia*

Series i *Ficus-Indicae* Br. & R. (= *Nopalea*, *Opuntia*,  
*Platyopuntia*)

j *Brasilienses* Br. & R. (= *Brasiliopuntia*)

k *Miqueliana* Br. & R. (= *Miqueliopuntia*)

l *Inamoena* Br. & R. or

*Palmadorae* Br. & R. (= *Tacinga*)

m *Cruciformes* Schum. (= *Consolea*)

Ideally, sections would be preferable to the lower-ranking Series, but the choice of available validated names is limited: only 11 Sections as against 76 Series names (Mottram 1990).

Line B represents the level at which Wallace & Dickie differentiate their tribes. Curbing inflation would lead to these being accepted as separate genera, with a resultant scheme looking something like this:

**GENERA**

**1 PERESKIA** (= *Rhodocactus*)

**2 MAIHUENIA**

**3 AUSTROCYLINDROPUNTIA** Back.

Subgenera

i *Austrocylindropuntia*

ii *Cumulopuntia*, re-ranked as a new Subgenus

**4 PTEROCACTUS**

**5 CYLINDROPUNTIA** (Eng) Knuth

Subgenera

i *Cylindropuntia*

ii *Grusonia* (Br. & R.) Hollis

(= *Corynopuntia*, *Marenopuntia*, *Micropuntia*)

iii *Peresklopsis*, re-ranked as a new subgenus

iv *Quiabentia*, re-ranked as a new Subgenus

**6 TEPHROCACTUS** LEM.

Subgenera

i *Tephrocactus*

ii *Maihueniopsis*, re-ranked as a new Subgenus

(= *Puna*, *Tunilla*)

**7 OPUNTIA**

Subgenera

i *Miqueliopuntia*, re-ranked as a new Subgenus

ii *Opuntia*

Series a *Ficus-Indicae* Br. & R.

(= *Nopalea*, *Opuntia*, *Platyopuntia*)

b *Brasilienses* Br. & R. (= *Brasiliopuntia*)

c *Inamoenae* Br. & R. or

*Palmadorae* Br. & R. (= *Tacinga*)

iii *Consolea* (Lem.) Bgr.

All the above is a pipe-dream, not intended as a formal publication, but really to see what might be the outcome if the currently favoured over-splitting were to be challenged.

Line C moves a step onward, increasing the number of genera by one. Ultimately each species would end up as having a genus to itself. Axiom: if you look for differences, you can always find them, however small or cryptic; similarities require broader perception. Note that the accuracy of the workmanship is not in doubt: the unresolved question is just what percentage of differences decides that one genus becomes two or more. In the absence of a rulebook we can only invent our own criteria, listed in descending order of importance:

- 1) Seek uniformity across the board.
- 2) Equate the size of the taxa to that of their near allies,  
e.g. in Cactoideae
- 3) Be practical: a classification has to be useful for field identification, laying out a herbarium, labelling, conservation, compiling floras and much else.
- 4) Preserve continuity with the past and avoid needless upsetting of nomenclature.

In respect of 1) and 2) I feel that the multi-generic approach conflicts with that elsewhere in Cactaceae (Anderson 2001), as in the broadly conceived genus *Mammillaria*, and the still broader *Disocactus*, swallowing up *Aporocactus*, *Chiapasia*, *Heliocereus*, *Nopalxochia* and more. A prime example of generic inflation is seen in Griffith (2003) where an excuse is made for exhuming two more "buried" micro-genera: *Corynopuntia* and *Micropuntia*. Reference to his cladogram confirms that a simple shift of a vertical dotted line one pace to the left provides a more convincing case for the union of *Grusonia* and *Cylindropuntia*!

Unless presented with very convincing evidence to do otherwise, my compendium will follow the line B scheme, although of course paying due respect to the alternatives. *Opuntia* is suffering runaway inflation, and my campaign against it of 46 years ago needs revival.

#### REFERENCES

- Anderson, E.F. (2001). The Cactus family. Timber Press.  
Backeberg, C. (1976). The Cactus Lexicon. Poole.  
Barthlott, W. & Hunt, D.R. (1993). Cactaceae in Kubitzki, K. (Ed.)  
The Families and Genera of Vascular Plants 2: 161-197.  
Britton, N.L. & Rose, J.N. (1919-1923). The Cactaceae.  
4 Vols. Carnegie Inst. Washington.  
Griffith, M.P. (2003) *Grusonia pulchella* classification ...  
Haseltonia 9: 86-93.  
Hill, A. (2000) Name changes. (With comment by Gordon Rowley).  
Tephrocactus Study Group 6 (2): 387-388.  
Hunt, D. (1991), CITES Cactaceae Checklist Edn. 2. RBG Kew & IOS  
Hunt, D. & Taylor, N. (2002). Studies in the Opuntioideae (Cactaceae).  
Succ. Pl. Res. 6.  
Mottram, R. (1990) A contribution to a new classification of the Cactus  
Family... Whitestone Gardens.  
Rowley, G.D. (1958). Reunion of the Genus *Opuntia* Mill.  
Nat. Cact.Succ. J. 13: 3-6, 25.  
Schumann, K. (1897-1903) Gesamtbeschreibung der Kakteen. Neudamm.  
Wallace, R.S. (1995). Molecular systematic study of the Cactaceae...  
Bradleya 13: 1-12.  
Wallace, R.S. & Dickie, S.L. (2002). Systematic implications of  
Chloroplast DNA sequence variation in ... Opuntioideae...  
In Hunt & Taylor (q.v.) 9-24.

#### THE BCSS NATIONAL SHOW.

This will be held on Saturday 21<sup>st</sup> August and at this event we are to have a display stand. David Hutchinson and Ray Weeks have kindly volunteered to be in charge of the stand. If anyone attending the show is able to spend some time on the stand please inform Ray, David or any TSG official.

### CULTIVATION.

In TSG Vol. 9 No. 4, page 598 Alan Hill made a plea on my behalf for suggestions as to why the *Tephrocactus* (sensu Kiesling) should behave as they do for me. I should point out that my letter to Alan was private correspondence and therefore not intended for publication. However, I would like to correct some apparent misconceptions.

95% of my small *Opuntias* grow without problem; indeed the problem is keeping them in check and finding the space! Half of my collection is grown in a large unheated cold frame, the rest in a greenhouse which is kept at a few degrees above freezing. Lights and panels are opened as much as possible during winter, except in the coldest weather. On balance I would say that the plants in the frame do better than the ones in the greenhouse, probably due to better winter cold/summer heat contrast, and the lower condensation.

I water until mid October and recommence in early March, depending on the weather. I do not water any plant during the winter as Sod's Law dictates that a freezing spell will immediately follow any watering of succulent plants. My *Austrocylindropuntia* have not been told they are "winter growers" and therefore behave as the others, growing in summer.

I was not talking about sooty mould. This was dealt with thoroughly in earlier TSG magazines and, whilst unsightly, can be easily controlled with a brush and water. In my collection just a few *Maihueniopsis* are affected, the *russellii/ovatus* types that produce a sticky substance at the end of the growing season. This, I agree with Rene, is worsened by excess moisture in the air in winter, but fans are not an option in my set-up. I am pretty sure that the problems I mentioned to Alan are due to a virus, as Bill Jackson says, one of the ones mentioned in M. Keisling's very useful book. I will try to bring some affected plants to the one-day meeting, in quarantine of course!

Martyn Collinson, Chichester

### SEED FOR SALE.

The following seed can be obtained from Mr R. Moreton, 91, Umberslade Rd, Selly Oak, Birmingham, B29 7SB

*Maihueniopsis echinacea*. Brendan Burke, 0402. 6 Km west of Putre. Chile.  
*Austrocylindropuntia floccosa*. Brian Bates. 1151.02. North of Quillacolla,  
Bolivia.

Price per packet 50p plus 20p postage.

### SEED RAISING ERRATA REMINDER.

On page 583 Vol. 9. No. 3 Sept 2003 it was reported that Rene Geissler sealed seeds in a phial full of water and kept this for a year, high up in the greenhouse. On page 12 of the last issue, Vol. 10 No. 1 March 2004 Rene confirmed that he placed seed, in a sealed glass container, right under the glass to ripen. However, he does not put any water in the container. No one can explain how water came to be mentioned as being in the container. However, it has been suggested that this note should be published to emphasize the fact that the seed should be ripened in a dry condition. Ed.

**FIELD COLLECTION NUMBERS OF THE OPUNTIOIDEAE**

**Mats Nilsson (Winberg)**

MN002	<i>Austrocyl.op</i> <i>verschaffeltii</i>	Tafi del Vale 2500M
013	“ <i>salmiana</i>	Alemania 1200M
025	<i>Tephrocactus bolivianus</i>	Humahuaca 2950M
037	“ <i>pentlandii</i>	Purmamarca 2650M
043	<i>Austrocyl.op</i> <i>vestita</i>	Volcan 2250M
051	<i>Tephrocactus nigrispinus</i>	La Quiaca 3450M
052	“ <i>subterraneous</i>	La Quiaca 3450M
068	<i>Opuntia sulphuria</i>	Cruz del Eje 470M
083	<i>Austrocyl.op</i> <i>verschaffeltii</i>	Piedra del Molino 3750M
086	<i>Opuntia soehrensii</i>	Piedra del Molino 3750M
087	<i>Austrocyl.op</i> <i>shaferi?</i>	El Maray 2150M
092	<i>Opuntia</i> sp.	Canpo Alegre 1450M
143	<i>Austrocyl.op</i> <i>verschaffeltii</i>	Santa Ana 3400M
145	<i>Tephrocactus</i> sp.	Santa Ana 3700M
164	“ sp.	Iturbe 3400M
165	<i>Austrocyl.op</i> <i>weingartiana</i>	Iturbe 3400M
166	<i>Opuntia soehrensii</i>	Iturbe 3400M
176	<i>Tephrocactus</i> sp.	Iturbe 3400M
182	<i>Austrocyl/op</i> <i>vestita</i>	Iruya 2800M
183	<i>Tephrocactus</i> sp.	La Quiaca 3450M
192	“ sp	Purmamarca 3800M
206	“ <i>weberi</i>	Cachi 2450M
207	<i>Opuntia sulphurea</i>	Pucara- Tilcara 2500M
209	<i>Austrocyl.op</i> <i>weingartiana</i>	Tilcara 3200M
218	<i>Tephrocactus</i> sp.	Alfarcito 2900M
219	<i>Opuntia</i> aff. <i>microdisca</i>	Alfarcito 2900M

**Piltz**

P1	<i>Opuntia</i> sp	Sierra Grande 600M
2	<i>Austrocyl.op</i> <i>salmiana</i>	El Hongo 600M
11	“ “	Sarmiento 600M
19	“ “	Salinas Grandes 400M
19a	“ “	Villa de Soto, Cordoba 600M
20	<i>Tephrocactus articulatus</i>	Catamarca Km 1008
33	“ “ <i>syringacanthus</i>	Aimogasta
33a	“ “	Mazan – Aimagasta
35	“ <i>alexanderi bruchii</i>	Mazan 1000M
41	“ sp	Tafi del Valle 2900M
47	“ <i>weberi</i>	N of Tolombon 1600M
50	“ “ (white)	Sierra de Quilmes 2500M
50a	“ “ (yellow)	“ “ “
52	<i>Opuntia longispina</i> v.	Capillitas 2800M
52a	“ “ v.	Abra de Infernillo 3000M
102	<i>Tephrocactus hickenii</i>	Choele Choele 300M
107	<i>Opuntia</i> sp.	La Toma 1000M
111	“	Cuesta Cura Brochero 1100M
112	“	“ “ “ “
162	<i>Tephrocactus</i> sp.	Belen – Hualfin 2000M
163	“	S of Hualfin 2000M
164	“	S of Tinagasta
407	<i>Opuntia</i> sp.	Paraguari

With thanks to H. Middleditch for permission to use the Chilean's Compendium.  
R. Moreton. Birmingham.



**Figs 7 & 8. *Maihueiniopsis camachoi* (Espinosa) Ritter.  
Photograph by Brendan Burke.**





# TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera



***Cumulopuntia ignescens* (Vaupel) Ritter at El Tatio, Chile, 4,300m.**

**Note frost on ground and steam.**

**See front cover of last issue for general scene.**

**Photograph by Brendan Burke.**

## STUDY GROUP

Vol. 10

No. 3 September 2004

## Secretary's Page

We have had a very good display at the recent BCSS National Show and as a result we have gained two new members they are: Roger Mackie and Leslie Parkin. I wish them well and hope they will enjoy being one of our members and join in our activities soon. Unfortunately, we have also just lost one of our members: Rob Seward who passed away very suddenly. Our sympathy goes to his wife!

- All articles and comment should be sent to the Co-Editors.
- Subscriptions and any other correspondence must be sent to the Secretary (see address below).

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

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

• Subs for 2004 remain at £10.00 per annum for the U.K and Europe (European members please note: "no Euro-Cheques are accepted by our banks – but you may send £ Notes") Subscriptions for Overseas members is £14.00 or \$25.- (in \$ills only). Please make all cheques payable to: "The Tephrocactus Study Group" (not individuals).

- Members may advertise their "Wants" and "Surplus Plants" free in the Journal, in no more than 30 words

### The Officers of the TSG are:

#### Chairman and Editor:

Alan Hill, 8 Vicarage Road, Grenoside, Sheffield S35 8RG - ☎ 01142 462311  
eMail: [alan.hill6@virgin.net](mailto:alan.hill6@virgin.net)

#### Co Editor:

William (Bill) Jackson, 60 Hardwick Road, Sutton Coldfield, West Midlands  
B74 3DL ☎ 0121 353 5462 eMail: [wjackson@supanet.com](mailto:wjackson@supanet.com)

#### Secretary:

Rene Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW  
☎ 01453 890340 eMail: [geissler.w@virgin.net](mailto:geissler.w@virgin.net)

Back Copies are now available again for the following:

### Back Copies of Volume 1 – 10 (1995 -2004) are still available

Each Volume is obtainable complete, postage paid for  
£10.- U.K.  
£14.- overseas  
\$25.- U.S.A (in \$ notes only)

- A few Folders for the Journal are also still available at £4.60 for U.K. , Overseas & elsewhere £5.60.

All obtainable from Rene Geissler, Kingston Road, Slimbridge, Glos. GL2 7BW - ENGLAND  
TSG web page: <http://freespace.virgin.net/geissler.w/tsg.htm>

## HANGING BASKET OPUNTIAS.

In a recent email Elton Roberts sent two photographs of plants in hanging pots. One was *T. picardoi*. The other is shown in Fig. 3 in this issue. Elton comments that they do make a very nice hanging plant and that way you will not get tangled in them on the bench. They are in 10-inch diameter pots and Elton recommends trying these plants in such pots. He says that it helps to keep the bench from becoming a glochids trap for your hands. This method will certainly help to save bench space. It will also help prevent the plants growing into each other and resulting in many unwanted cuttings if you have to move the plant. I have not tried using hanging pots for Opuntias although I have various cacti in hanging pots. I am, however, halfway there because there are several Opuntias growing towards the front of my shelving and hanging over. Obviously some Opuntias are more suitable for this treatment. My "hanging over" plants include *Ptero. tuberosus* (Pfeiff.) Br. & R., Tunilla "longispina" Piltz P52, *Maihueiopsis darwini* P102 (which is a sprawling form) and *Austrocylindropuntia weberi*. The latter grows back over the shelf as well as forward. A hanging pot would give it room to spread in all directions. I also have *A. floccosa* plants with long stems hanging down from the shelf but turning up at the tips. These plants are definitely not growing in the shape that they should. However, if that is the way they grow in one's greenhouse then they could be hanging pot plants.

There are problems with a hanging pot. The most obvious is where to hang them. If one is growing Opuntias in them then be sure to have them where they cannot be hit with your head. The resultant contact can cause lasting damage - to you as well as the plant. Several years ago I bent down and somehow detached, with my head, several *Cumolopuntia sphaerica* segments from a plant at the front of the staging. There are areas on my head where the spines are still under the skin.

Alan Hill, Sheffield.

### OPUNTIA - FISSION OR FUSION? -WISE AFTER THE EVENT.

By Gordon Rowley.

Even for a pipe-dream classification, my checking of names and dates should be more thorough, and David Hunt has pointed out to me that, at the generic level, *Grusonia* Br. & R. has 16 years of priority over *Cylindropuntia* (Eng.) Knuth. Hence on p. 26 my line B classification should read:-

5 GRUSONIA Br. & R.

Subgenera

i *Cylindropuntia* Eng.

ii *Grusonia* (= *Corynopuntia*,  
*Marenopuntia*, *Micropuntia*)

with no authority after *Grusonia* as it is an autonym.

Two misprints on p.25: e Pereskiopsis and

f Quiabentia

have lost a vowel each (vowel play?).

Now who can spot some more errors?

### THE BCSS NATIONAL SHOW.

The BCSS National Show was held on Saturday 21<sup>ST</sup> of August at Spalding. The TSG was able to have two six foot tables for a stand. We erected our six foot backing frame for a display, used three foot of table on one side to display more plants and used the three foot area on the other side for information material. Fig. 9 shows the display stand and Fig. 10 shows the extra area. I thank all those members who helped in any way with the stand. In particular I thank John Betteley, Rene Geissler, David Hutchinson, and Ray Weeks for providing the plants. Ray also did much extra work.

A. Hill, Chairman.

## THE SEARCH FOR INFORMATION ON OPUNTIA/TUNILLA HINTONII.

In the last issue of the Journal (Page 18) I asked for any information on *Opuntia hintonii*. This is a name for which I can find no reference in the literature. However, there is an easily recognised distinctive plant bearing this name now in collections. The two obvious sets of questions related to the origins of the plant and to the name it carries.

I had a plant, labelled *O. hintonii*, in my collection when, two years ago, I saw a similar plant in the TSG Oxford show. The label contained the following information, *O. tuvelock*, 35 Km San Juan, 29112, Negras, Florei, GC 95. Bill Darbon, who owned the plant, said that he had obtained it from Graham Charles. Graham recently told me that the plant came to him from the USA from Woody Minich who received it from Victor Turesek.

As a result of my query in the Journal Cesare Serra, an Italian member of the TSG, kindly sent me the following information. He has two similar plants to the one illustrated in the last Journal (P22 Fig.1). The first, SSCN 1083, (See Fig. 4) came to him from a friend who received it from John Donald. It was reported to have been collected from near Aquas Negras by Roberto Kiesling. Cesare and his friend have found that this clone dislikes full sun preferring a light shade. He comments that burnings due to sun can be seen on the segments. The second clone, SSCN 1082, (Fig. 5) came from Ian Robinson's nursery labelled Op. Sp. Aquas Negras GH5757. This plant has segments a little bigger than the first clone and the glochids are longer. Alan James, of Birmingham, also reports that he has a plant supplied by R. Newton of Birmingham, which is labelled Tunilla Aquas Negras and carries the references GH5757 and WW334. As at least four of our members have GH 5757 there is a plant in circulation that looks like *O. hintonii* and apparently originated from Graham Hole (GH). Graham says that the number is too high to be accurate but confirms that he did have such a plant from John Donald who had a friend, Victor Turesek, in the USA.

The information, so far, therefore indicated that the plant came from Agua Negra in Argentina, was possibly collected by Roberto Kiesling and had come to England via Victor Turesek in the USA. If one travels from San Juan to Agua Negra, (North West) after 176 Km there is the town of Las Flores. A road then goes 94 km to Paso Agua Negra. Could the "Florei" on Bill Darbon's label be a misprint? Could it be an indication that the plant was collected between Las Flores and Agua Negra in San Juan province? (However, note that Bill Darbon's label states 35 Km San Juan.) The obvious next step was to ask Roberto Kiesling.

Roberto Kiesling has stated that he did not find a Tunilla at Agua Negra but many years ago found a new Tunilla 20 km North West from Calingasta (travelling by horse as there was no road to the site). Calingasta is 135 km North West of San Juan. However, Roberto Kiesling says that he did not find his plant on the Agua Negra route. He also confirmed that it is very plausible that Victor Turesek took some cuttings of the plant to the USA many years ago. Looking at the picture of SSCN 1082, GH5757, Fig. 5, however, Roberto Kiesling says that his impression is that the picture is not the same species as the one he found North West of Calingasta as the glochids are too long.

It would therefore appear that there are two Tunillas to investigate: the original *hintonii/tuvelock* presumably from Agua Negra (but not found by Roberto Kiesling) and now the one found by Roberto Kiesling near Calingasta. The latter plant is illustrated in "The Flora of San Juan, Republica Argentina." Buenos Aires. 2003. Ed. R. Kiesling Vol. 2, page 164 labelled "Tunilla species". This, therefore, is an interim report. I have still some leads to follow but I would be

grateful if members can assist with any comment or more information on the source of the plants and the names attributed to them. It is very enheartening that the response so far for information is bigger than we have had for any previous query to the group.

Information has also been sent in by Elton Roberts, a member in California. He has supplied the picture in Fig. 3. He has had the plant for years. The name on the plant is *Opuntia brevispina* v. *longispina*. It is in a 10" pot and has several flushes of flowers with a flower appearing every so often between the flushes. The name is obviously a reference to *O. longispina* Haw. v. *brevispina* Backbg. The Cactus Lexicon by C. Backeberg 1977, page 366 gives a description of "Areoles without more numerous outer radial spines at first; glochids later in large clusters, thin, with fine bristly subsidiary spines, sometimes 1-2 which are longer, light horn-coloured, older ones to 1 cm long." The plant might be the Backeberg plant bearing the Backeberg name. (It should be noted that J. Iliff, p207/89, "The Andean opuntias" in "Studies in the Opuntioideae (Cactaceae)". Ed D. Hunt & N. Taylor) argues that the name *O. longispina* is "too problematic to allow for the treatment of the name as that of a distinct taxon within" the *corrugata* group "with any confidence"). However there is an alternative possibility for the use of the name on Elton's plant. One can assume that someone has tried to find a name for the plant in Fig 3 and extrapolated some of the information in the Lexicon to fit some aspects of the plant thus giving it a (false) name. The plant illustrate in Fig. 3 looks as though it could be *O. hintonii*. Elton starts his email by greeting from "sunny California". That might explain his success in flowering what could be *O. hintonii*. What success, if any, have other members had with flowering the plant? Incidentally, Roberto Kiesling says that he cultivated his plant from near Calingasta for many years but never had a flower.

Alan James has pointed out that there is some similarity between his "Tunilla Aquas Negras" and a Tunilla species from Cachi, collected by F. Kuhhas. The latter carries the number BB 91273 and presumably should carry the Kuhhas number 31.286 or 31.287 as the Kuhhas field list contains only these numbers for *Opuntia/Airampoa* at "Cachipampa" with no *Opuntia* from "Cachi". There is no suggestion that BB91273 is *O. hintonii*. The similarities simply add to the view that many, if not all, of the *Airampoa/Tunilla* are the same species with different forms. Thus one can regard this article according to one's particular preference: a search for information about a species or a form.

Alan Hill, Sheffield.

Please note that in the above article there is a variation in the spelling of *Aqua/s/Agua Negras/Negra*. This is because the spelling used is the one written by the source of the information quoting from a label. Roberto Kiesling, an Argentinean, uses "Agua Negra".

Ed.

### IT IS OPUNTIA LAGOPUS NOT OPUNTIA LAGOPA.

As Editor of this Journal I have found the need to try to learn some of the rules of nomenclature. I thought that I had found that a species name should always end, if possible, with a similar ending to the genus. In the *Opuntia* Index of R. Crook and R. Mottram Bradleya 15/1997 p.106, *Opuntia floccosa* Salm-Dyck is shown as becoming *Tephrocactus floccosus* (Salm-Dyck) Knuth and eventually *Austrocylindropuntia floccosa* (Salm-Dyck) Ritter. The species name endings change, as I would expect, to match the genus. However, *Opuntia lagopus* Schumann, Bradleya 17/1999, p120 does not conform to this pattern and the disparity of endings is repeated in the new classification in Bradleya 21/2003

p87-92 of *Austrocylindropuntia lagopus* (Schumann) I. Crook, J. Arnold & M. Lowry. Recently I have been receiving comments from some people referring to *A. lagopa*. This ending is obviously wrong according to the literature but I did not understand why. I therefore asked Roy Mottram if he would please kind enough to explain why the species name ending remains "us" rather than "a". Roy very kindly gave the following explanation. Ed.

The reason that the termination does not change is quite simple. *Lagopus* is a noun in apposition, not an adjective as the -us might suggest. It means foot of a hare - foot being a noun not an adjective. So the name means hare-foot opuntia, not hare-footed opuntia.

There are numerous other examples of nouns in apposition, but not many that end in -us. A common one that springs to mind is *Epiphyllum phyllanthus*. If *phyllanthus* was an adjective, as it normally is, then it would have to agree with the neuter *Epiphyllum*. However it was originally named for its resemblance to members of the genus *Phyllanthus* - a substantive name in the Euphorbiaceae. So it means *phyllanthus Epiphyllum*, not flowering-leaf *Epiphyllum*.

*Floccosus* is an adjective and has to be declined, as with most specific epithets, to agree with the gender of the genus. To convert *lagopus* into an adjective, it requires the addition of an adjectival suffix, such as -anus, thus *lagopusanus*.

Roy Mottram. Sutton-Under-Whitstonecliffe.

#### AIRAMPOA/TUNILLA "LEONI".

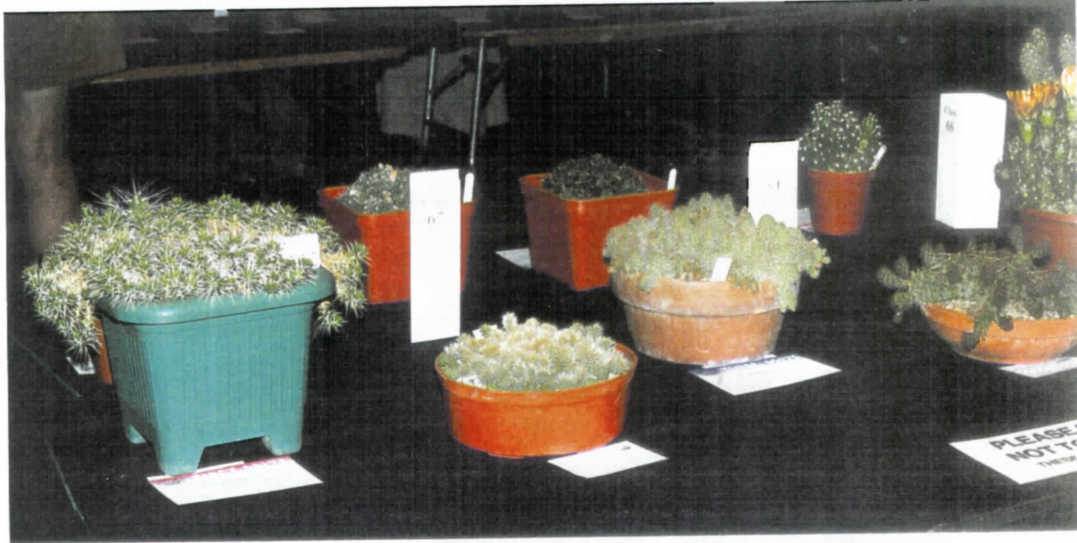
In the last issue of the Journal, Vol. 10, No. 2, p17, it was mentioned that it was planned to have a small article on plants at the April 2004 TSG meeting that had the name "leoni" on their label. The plants with this name were of the same species/form. However, it would appear that in the discussion on the plants we possibly had some confusion. There is no indication, which I can find, in the literature of this name. The name is presumably a mislabelling of *O. leonina* Hort. that, according to J. Iliff (Studies in the Opuntioideae, Ed. D. Hunt & N. Taylor. p206) is in the *corrugata* group. At the meeting it was stated that the plants were probably from a mislabelled "*leonina*", were in the *corrugata* group and the origin of plant material of this name was possibly from Chile. Therefore, the plants formed our "Chilean" group. There is a village in Chile named leoni. However, my reading of Iliff p206, after the meeting, indicates that whilst *O. leonina* Haage & Schmidt ex. Regal is said to have been imported from Chile there was no type indicated and J. Iliff states the plant "would seem to be beyond typification". Reference by him to a possible link to *O. boliviana* or *O. sphaerica* groups would suggest the plant was not, in any case, a *Tunilla*. The plants of "leoni" at our meeting were *Tunilla*, thus were presumably *O. leonina* Hort and thus have no definite known links with Chile. We therefore had no definite Chilean plants at the meeting. Unfortunately no one brought an *O. alcerrecensis* Iliff (*Platyopuntia chilensis* Ritter Nom. Incorr, Art. 11.3.). A photograph of a plant of the latter species was shown in the last issue of the Journal, Fig. 3..

Fig. 1, opposite, shows a photograph of a plant that carries the label "leonus". It looks to be the same as those plants at the April TSG meeting carrying a similar name on the label. It is possible therefore that this is an example of *O. leonina* Hort. The plant was "hard grown" for several years resulting in the areoles (and therefore radial spines) being closer together. This gave the plant a much more brown lace-like appearance over the green segments. The older segments can be seen on your left. A problem is that it now looks very different to what it did. The photograph shows what can happen if the plant is put in a container with more room, new compost and watered. A. Hill. Sheffield



**Fig. 1. *Opuntia* "leon?" = *Opuntia leonina* Hort.?  
Photograph by A. Hill**

**Fig. 2. *Maihuenia patagonica* (Philippi) Spegazzini.  
Best plant in TSG Show.  
Photograph by David Parker.**





↑ Fig. 3. "*O. longispina* Haw.  
v. *brevispina* Backbg"  
/ *Tunilla hintonii*?  
Photograph by Elton Roberts.



Fig. 4. SSCN 1083  
*Tunilla hintonii*?  
Photograph by Cesare Serra.



Fig. 5. SSCN 1082.  
"GH 5757"  
Circulating in England  
as *Tunilla hintonii*  
Photograph by Cesare Serra.





Fig. 6. An unusual coloured *Puna subterranea* (Fries) Kiesling.



Fig. 7. A very tight compact *Puna bonnieae*.

Fig. 8. A compact *Austrocylindropuntia lagopus* (Schumann)  
I. Crook, J. Arnold & M. Lowry,  
on its own roots



National Show plants.  
Photographs by A. Hill.

# Tephrocactus Study Group



Fig. 9. The TSG display stand at the National Show.

Fig. 10. The extra side display.  
Photographs by A. Hill.



## VIRUS IN TEPHROCACTI.

This seems to be a continuing problem for many TSG members, including more recently myself. The principal virus affecting, in particular, plants of the alexanderi/geometricus complex manifests itself as a developing black epidermal blister. In time the blister can spread and quickly destroy a segment. If the blister is punctured a dark fluid of water-like consistency issues forth. Many growers seem to have experienced the problem, including Michael Keisling (author of "Tephrocactus") who is a prolific grower of all Opuntias.

Currently there are at least four theories as to the cause of this debilitating virus.

The first of these concerns lack of ventilation, particularly in the summer. If plants are grown in conditions that are too hot they exude a small globule of nectar from the areole; this may be a possible reaction to heat stress. The nectar is perceived to be a magnet for viral attention, similar to the sooty mould appearing on the areoles of Ferocacti.

The second possible cause, and closely related to the first, is the lack of suitable ventilation in late autumn/early winter, when there is more dampness around.

A third opinion suggests that some clones of Tephrocacti display an inherent predisposition to viral attack; I understand that the virus even attacks some plants in habitat.

Finally it was Michael Keisling who put forward the idea that black mottling of the epidermis of Tephrocacti, Maihueniopsis and Punas could be caused by excessive nitrogen, when administered as a feed.

So there we have it: four possible theories. I have been growing Tephrocacti for over thirty years and I think that I can dismiss three of the afore mentioned theories.

Many of my Tephrocacti are grown outside on a conservatory window ledge. Conditions are cooler than in a greenhouse and there is adequate ventilation. The same situation applies in autumn /early winter - when conditions are even more cool and ventilation still applies. I therefore feel sure that nectar weeping from the areoles, occurring in a fully ventilated environment, is not the cause; I think that Rene would concur.

I also have my doubts whether certain clones are particularly prone to viral disorders. A few years ago, TSG member, Graham Hole, collected, propagated and distributed a particularly attractive clone of Tephrocactus geometricus that I featured in a fairly recent TSG Journal (Vol. 9 No. 2. Front cover. Ed.). I know that several people who received this clone from Graham experienced problems with black blistering of the segments, in some cases leading to the loss of the entire plant. I never had a problem when growing it outside. The compost I grew it in was a mixture of Seramis, John Innes no.1 and Akadama (a Japanese volcanic larva favoured by Bonsai growers). To this mix I added a small handful of Fish, Blood and Bone mix - containing 4% nitrogen. Until June of this year I had never experienced any viral problems with Tephrocacti. In early June, however, for the first time in many years I fed the plants with a half strength solution of Miracle grow (15% nitrogen). Low and behold, in late June I experienced several black blisters on Tephrocactus alexanderi and Tephrocactus geometricus. I mentioned, earlier in this article, that Michael Keisling thought that the reason for the black viral attacks could be excessive nitrogen. Whilst I initially dismissed this theory, I now believe that Michael could be close to the true cause.

Continued on page 43

COMPARATIVE TABLE OF AUSTROCYLINDROPUNTIA NAMES.

Other	Backeberg	Ritter 1981	Anderson 2001
Opuntia cylindrica (Lamarck)De Candolle (1828)	Austrocyliindropuntia cylindrica (1942) Austrocyliindropuntia intermedia (1957) Cylindropuntia intermedia (1958)		cylindrica
Opuntia floccosa Salm-Dyck (1845) Opuntia crispicrinata Rowley (1958) Opuntia cylindrolanata Rowley (1958) Opuntia pseudo-udonis Rowley (1958) Opuntia rauhii Rowley (1958) Opuntia tephrocactoides Rowley (1958) Opuntia udonis Weingart (1933) Opuntia verticosa Weingart (1933)	Opuntia atroviridis (1931) Tephrocactus atroviridis (1935) Tephrocactus floccosus (1935) Tephrocactus verticosus (1935) Austrocyliindrop. tephrocactoides (1956) Tephrocactus crispicrinatus (1956) Tephrocactus cylindrolantus (1957) Tephrocactus pseudo-udonis (1957) Tephrocactus rauhii (1957) Tephrocactus udonis (1935) Tephrocactus hirschi (1956)	Floccosa machacana sp. nov. laulicoana sp. nov.	floccosa
Opuntia hirschii (Backebg.)Rowley (1958)	Tephrocactus lagopus (1936)	Unsure	hirschii
Opuntia lagopus Schumann (1903) Tephrocactus malyanus Rausch (1971)		lagopus lagopus fm rauhii malyana	lagopus
Opuntia pachypus Schumann (1904)	Cylindropuntia pachypus (1936) Austrocyliindropuntia pachypus (1942) Tephrocactus punta-caillan (1957)	pachypus	pachypus
Opuntia punta-caillan (Rauh and Backeberg)Rowley (1958)		Unsure	punta-caillan
Opuntia shaferi Britton and Rose (1919)	Cylindropuntia shaferi (1936) Austrocyliindropuntia shaferi (1951) Opuntia weingartiana (1935) Cylindropuntia weingartiana (1935) Austrocyliindropuntia weingartiana (1951) Cylindropuntia humahuacana (1936) Austrocyliindrop. humahuacana (1951)	vestita var. shaferi weingartiana	shaferi

Other	Backeberg	Ritter 1981	Anderson 2001
<p><u>Opuntia subulata</u> (Muehlenfordt)Engelmann (1883) Opuntia exaltada Berger (1912)</p>	<p>Cylindropuntia subulata (1936) Austrocylindropuntia subulata (1939) Cylindropuntia exaltada (1935) Austrocylindropuntia exaltada (1938)</p>	<p>exaltada</p>	<p>subulata</p>
<p>Opuntia verschaffeltii Cels ex Weber (1898) Opuntia posnanskyana Cardenas (1950) Opuntia steiniana Rowley (1958)</p>	<p>Cylindropuntia verschaffeltii (1936) Austrocylindropuntia hyposphila (1951) Cylindropuntia haematacantha (1935) Austrocylindrop. haematacantha (1951) Austrocylindropuntia steiniana (1957) Austrocylindropuntia inarmata (1962)</p>	<p>Verschaffeltii verschaffeltii var digitalis verschaffeltii var longispina Vestita vestita var. maior vestita var. intermedia chuisacana teres</p>	<p>verschaffeltii</p>
<p>Opuntia vestita Salm-Dyck (1845) Opuntia chuquisacana Cardenas (1950)</p>	<p>Cylindropuntia vestita (1936) Austrocylindropuntia vestita (1942) Austrocylindropuntia vestita v. maior (1951) Austrocylindropuntia vestita v. intermedia (1962) Cylindropuntia teres (1935) Austrocylindropuntia teres (1944)</p>	<p>vestita vestita var. maior vestita var. intermedia chuisacana teres Unsure</p>	<p>vestita yanganucensis</p>

NOTES.

1. Generic name = Austrocylindropuntia when none is given.
2. Backeberg column also includes entries where Backeberg was a co-author.
3. Ritter's lagopus and form rauhii may represent A. floccosa forms
4. Names in horizontal blocks correspond but not necessarily on the same line.

BIBLIOGRAPHY.

- Anderson, E.F. (2001) The Cactus Family. Timber Press.  
 Backeberg, C. (1976). The Cactus Lexicon.  
 Crook, R. & Mottram R. (1995 - present) Opuntia Index. Bradleya.  
 Hunt, D.R. (1999). CITES Cactaceae Check List.  
 Ritter, F. (1981). Kakteen in Sudamerika.

Ivor Crook (Manchester) & Alan Hill (Sheffield).

Continued from page 40.

If you are faced with a viral attack you have three options:

- (1) Remove the entire affected segment.
- (2) Spray with a fungicide and hope that the virus isolates itself.
- (3) Cut out the affected area back to clean tissue and dust the cut with flowers of sulphur.

John Betteley. Newark.

### THE TSG SHOW

The second TSG show was held on 6<sup>th</sup> June at Birmingham Botanical Gardens. The show is held every two years and on this occasion it ran alongside the Birmingham BCSS Branch summer show. I judged the previous TSG show at Oxford and had the privilege once again.

Minor amendments to this year's schedule gave members the opportunity to enter plants in pots that were more consistent with their maturity in cultivation.

From memory, there appeared to be about the same number of entrants as two years ago and several classes lacked competitive entries. On average there were two or three entries per class. Class 65 for one plant of *Austrocylindropuntia verschaffeltii* or *vestita* contained only one entry; surely there must be more of these common plants in collections of TSG members. Class 72 contained several well-grown examples of *Tephrocactus alexanderi* and its forms - but no sign of a *T. geometricus*.

There were several good examples of *Tephrocactus weberi* in its many forms, exhibited in class 73, most of which had flowered in the current season. There was also a competitive entry in the class for one Tunilla/Airampo - those sickle-jointed, ground-hugging dwarf plants from South America

The best plant in the show was entered in class 77 - a sparkling *Maihuenia patagonica* exhibited in a large square pot by David Parker. (See Fig. 2 Ed.) An award of merit was also given in class 82 to a fine plant of a North American cylindropuntia with striking straw-coloured sheathed spines; this was exhibited by Bill Jackson. (See Fig. 11. Any ideas for a name? Ed.)

On the sales table Rene Geissler brought along plenty of propagations and there was additional material from other members.

The next TSG show will, hopefully, be held in 2006 at a venue yet to be decided. If another qualified judge would like to take on the task of judging the 2006 show I might manage to make an entry or two.

John Betteley. Newark.

Eight members entered plants in the show, which resulted in fifty-three entries. David Hutchinson is congratulated for winning the most points in the show with a total of fifty one points. Bill Jackson is congratulated for coming second with forty points.

Ed.

#### FOR SALE

Complete set (Bands 1-4) of "Kakteen in Sudamerika" by Friedrich Ritter in "as new" condition. Classic reference source including many Opuntias. Text in German. GPB 40.00 or near offer.

Martyn Collinson Tel. (01243) 785356.

Email [martyn.collinson@talk21.com](mailto:martyn.collinson@talk21.com)

FIELD COLLECTION NUMBERS OF THE OPUNTIODEAE.

PRESTON-MAFHAM

PM67	Opuntia sp.	Chosica
72	"	Huarez
78	Tephrocactus sp.	Cordillera Blanca
231	Tephrocactus colorea	Copiapo Valley 9500ft.
241	" archiconoideus	Rio Transito 8000ft

RAUSCH

R7	Tephrocactus mandragora	Quebrada del Toro
68	" boliviensis	Sucre
94	" glomeratus	Qbda Humahuaca
113	" articulatus	Sierra San Luis
123	" weberi v. setiger	Famatina
143	" alexanderi.v.bruchii	Sierra Velasco-Mazan
241	" weberi v.deminutus	Cachipampa- Cachi
386	" lagopus	Churin- Oyon
399	" floccosus White	La Mejorada
400	" " Yellow	"
401	" " few hairs	"
427	" rauhii	Marcusani
428	" malyanus	"
504	" nigrispinus	La Quiaca
505	" subterraneus	"
532	Opuntia sulphurea	Famatina- Milagro
534	Tephrocactus platyacanthus	Neuquen-Zapala
536	Pterocactus araucanus	" "
537	" fischeri	" "
538	Maihuenia patagonica	" "
540	Pterocactus tuberosus v.	Lihuel Cale
544	Tephrocactus diadematus	Qbda del Toro- Cachueta
545	" " v.inermis	" "
546	" sp small yellow Flo.	" "
551	" sp.almost spineless orange flower	" "
552	Opuntia clavaroides	" "
553	Tephrocactus sp	" "
558	" ovatus	San Juan- Penasquito
561	Pterocactus reticulatus	" "
562	Tephrocactus glomeratus	" "
627	" sp small body	Camargo- Culpina

With thanks to H. Middleditch for permission to use the Chileans' compendium. R. Moreton. Birmingham.

PLANTS FOR SALE

Bill Greenaway earlier in the year advertised field numbered plants for sale. I have recently bought some of the Opuntias. Bill is one of our members but has not asked me to write this. However, I recommend that if you want some field numbered, documented, Opuntias then send a stamp to him asking for his sale list. He is a very good grower and the plants are excellent. His address is:

West Halabezack Farm, Porkellis, Helston, TR13 0LD, Cornwall.

Ed.



Fig. 11. Bill Jackson's North American *Cylindropuntia* in the TSG Show. Any ideas for the name?  
 Photograph by David Parker.

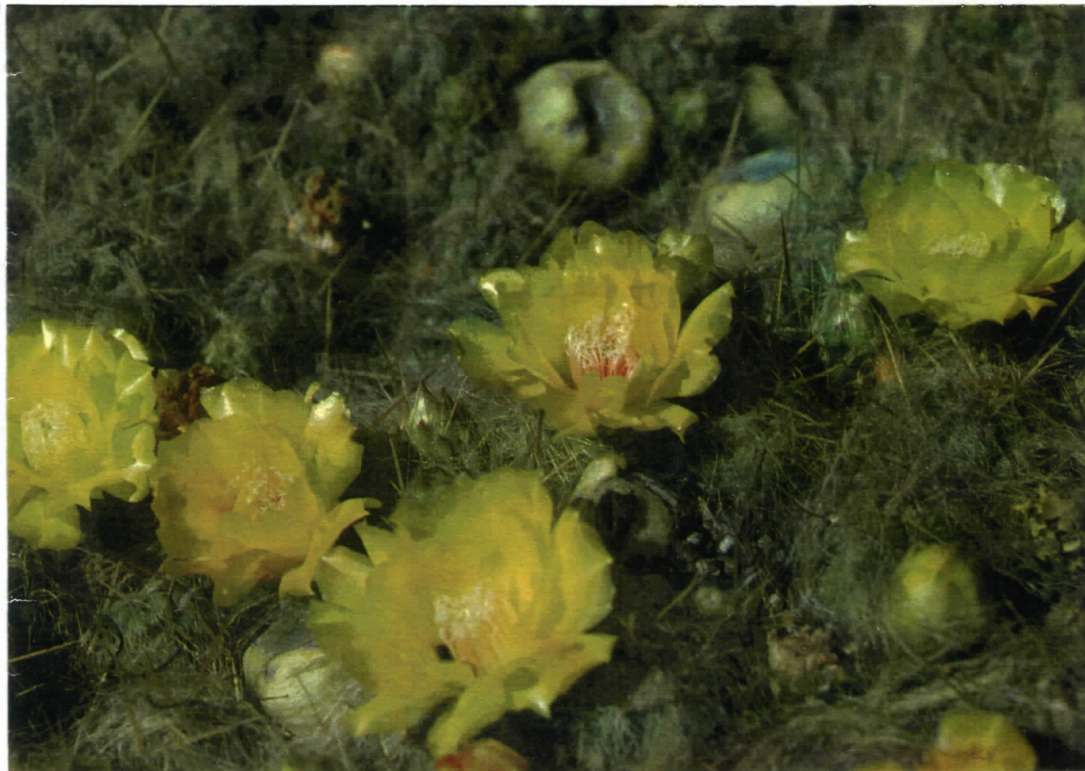
Fig. 12. *Tephrocactus paediophilus* Ritt. → on TSG display stand at the National Show. A *Tephrocactus articulatus* (Pfeiffer) Backb. that size would not have stayed in one piece when travelling. Photograph by A. Hill.





# TEPHROCACTUS

Incl. *Maihueniopsis*, *Puna* and related genera



*Austrocylindropuntia floccosa* (Salm-Dyke) Ritter.  
ACL 476. 37 km south east of Ayacucho at 3,964m.  
Photograph by John Arnold.

## STUDY GROUP

Vol. 10

No. 4 December 2004

## SECRETARY'S PAGE.

We have three new members, they are: Jean-Didier Hary from Spain, Aymeric de Barmon of France and Paolo Piantoni of Italy. I wish them well and hope they will enjoy being members of our group and soon join in our activities.

- All articles and comment should be sent to the Co-Editors.
- Subscriptions for 2005 are now due on the 1<sup>st</sup> January.
- Subscriptions and any other correspondence must be sent to the Secretary (see address below).

May I remind you please to let me know of any changes to your address, telephone number or email address!

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

- Subs for 2005 remain at £10.00 per annum for the U.K and Europe (European members please note: no Euro-Cheques are accepted by our banks – but you may send £ Notes) Subscriptions for Overseas members are £14.00 or \$25.- (in \$bills only). Please make all cheques payable to: "The Tephrocactus Study Group" (not individuals).

- Members may advertise their "Wants" and "Surplus Plants" free in the Journal, in no more than 30 words

### The Officers of the TSG are:

#### Chairman and Editor:

Alan Hill, 8 Vicarage Road, Grenoside, Sheffield S35 8RG - ☎ 01142 462311  
email: [alan.hill6@virgin.net](mailto:alan.hill6@virgin.net)

#### Co Editor:

William (Bill) Jackson, 60 Hardwick Road, Sutton Coldfield, West Midlands B74 3DL ☎ 0121 353 5462 email: [wjackson@supanet.co](mailto:wjackson@supanet.co)

#### Secretary:

Rene Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW  
☎ 01453 890340 email: [geissler.w@virgin.net](mailto:geissler.w@virgin.net)

Back Copies are now available again for the following:

### Back Copies of Volume 1 – 10 (1995 -2004) are still available

Each Volume is obtainable complete, postage paid for  
£10. - U.K.  
£14. - Overseas  
\$25. - U.S.A (in \$ notes only)

- A few Folders for the Journal are also still available at £4.60 for the U.K. Overseas & elsewhere £5.60.

All obtainable from Rene Geissler, Kingston Road, Slimbridge, Glos. GL2 7BW - ENGLAND

TSG web page: <http://freespace.virgin.net/geissler.w/tsg.htm>

## THE MEETING ON SUNDAY APRIL 17<sup>th</sup> 2005.

This notice is in this Journal because there will be only few weeks between the next Journal appearing and the meeting. The meeting will be held as usual at the Slimbridge Village Hall, commencing at 10 am. After a short business meeting there will be discussion on Pterocacti. Will members, therefore, please bring as wide a range of these plants as possible to aid the discussion? Also please bring any other plants you think will be of interest or you would like identified. You are also welcome to bring plants for sale. There is no charge for the meeting. All members of the TSG are welcome and you can bring guests who are not members. Light refreshments will be available at the meeting. We shall be going to a nearby pub, which supplies good food, for lunch. After lunch we are to have an illustrated talk by Ian Robinson on his recent visit to Argentina. Please will you inform Rene if you intend to come to the meeting?

### GROWING CACTI THE HARD WAY.

While visiting David Parker last Autumn the talk got around to growing cacti outside. So, with this idea in my mind, and some of David's spare *Echinocerei* in the boot of the car, I returned home.

In front of my heated greenhouse there was a North/South facing piece of land, approximately eight feet by one foot two inches, which had always looked untidy. This would do nicely.

After a visit to the sawmills I returned home with some treated 'decking' planks and constructed an open bottom box about one foot deep as shown in Fig. 10. This was put in place and allowed to overwinter. So were the *Echinocerei* which were kept in the unheated greenhouse.

Then, in February this year, I began to fill the box. I started with a 5" layer of 20mm gravel and then a 2" layer of potting gravel, 5mm. The growing layer, about 5" deep, was a mixture of; three parts alpine gravel, one part John Innes and one part clay granules. In the second week of April I started planting out: *Maihuenia patagonica*, various *Echinocerei*, small *Opuntias*, including *T. articulatus*, *darwinii* and *weberi*, some *Pterocacti* and *Tunilla ireiss*. (All the *Opuntias* had overwintered in a cold frame.) Once these were planted, the whole was finished off with a top dressing of potting grit as shown in Fig. 11. (Please excuse Roland). During the next couple of weeks the heavens opened and it turned cold. The drainage worked well and all forty-three plants survived. Now, at the end of May, I have two *Echinocerei* in flower and another six in bud. The *Opuntias* all seem to be Ok and are offsetting. At the end of September I will put a stout, open-ended cover over them. (Having noted Bill Jackson's problems.)(See Vol. 9 No. 2 June 2003 p569. Ed.)

I have started a monthly progress chart. After next winter I will be able to write a report detailing the successes and failures of the project.

(Alan has recently sent in some extra information as follows. Ed.)

I have now built a second, larger bed that contains only plants belonging to the *Opuntia* family. Now that Autumn/Winter is upon us I have constructed open-ended plastic covered hoods over both beds and, after a number of frosts, all the plants appear to be doing all right. The open ends of the covers have plastic mesh over them to allow the airflow across the plants but keeps out the cats and squirrels.

Alan James. Birmingham.

## SOME OF THE COMMENTS ON THE CONTENTS OF THE LAST ISSUE.

I am very pleased to report that several members have sent in comments. Some are as follows:

### Brian Bates. (Bolivia)

Brian has sent various comments. The first is the suggestion that "In the search for information on *Opuntia /Tunilla hintonii*" could Tuvelock be a misinterpretation of Tureçek (note spelling)?" I am grateful to Brian for this opinion because it is something that had crossed my mind. One can see how an "open" r could be read as a "v" and the following letters misread. Roy Mottram's comments on page 56 of this issue show that the above interpretation is most probable. Brian also states correctly that the BB91273 mentioned on p34 is his accession number because I acquired this plant from Brian who obtained it from Kuhhas.

Brian correctly identifies the plant in Fig. 6 p.38, entitled "An unusual coloured *Puna subterranea* (Fries) Kiesling" as Martin Lowry's plant of BLMT 69.02 found three km. E. Culpina, Bolivia, at 2995m. Brian also notes that there has been a name change for this type of red flowered *Puna subterranea*. The new name being *Tephrocactus pulcherrimus*. Please see the following article by Martin Lowry for further information on this plant.

Brian's final comment relates to the comparative table of *Austrocylindropuntia* names on p.41. He comments that "Under Ritter 1981, *lagopus fma. rauhii* is surely misplaced and should be alongside *rauhii* under *floccosa*. The photo No. 77 in Rauh's book clearly shows a *floccosa*, not a *lagopus* (or *malyanus*)". Brian is correct about the photograph in Rauh's book: *rauhii* is a "form" of *floccosa* and the Anderson column shows that Anderson views it as a synonym. Brian has a valid point of approach. Due to lack of space in the last Journal it was not possible to explain the thinking behind the table. The table was drawn up in response to a comment by a TSG member that he would like to know how the various names related to each other, as rearrangement took place by various authorities. The logic behind the fourth section of the table, commented upon by Brian, was that on p1242 Ritter lists *Austro. lagopus* (K. Sch.) Ritt. comb. nov. with *Op. lagopus* K. Sch., *Teph. lagopus* (K. Sch.) Backbg and *Teph. Rauhii* Backbg as synonyms. On p.1243 is listed *Austro. lagopus* (K. Sch.) Ritt. *forma rauhii* (Backbg.) Ritt. comb nov. with *T. rauhii* Backbg and *T. floccosus* (S-D) *forma rauhii* (Backbg.) Ritt. as synonyms. Finally on p1244 there is listed *Austro. malyana* (Rausch) Ritt. comb. nov. with *Tephro. malyanus* Rausch as a synonym. To move *lagopus fm rauhii* up into the second section to be alongside *floccosa* would take it away from the relevant details in the other columns. One can accept Brian's point of what the plants actually were. The table simply tried to show the linkage of names as viewed by the listed authors. Thus Ritter is shown introducing the name *lagopus fm rauhii* in that section of the table. One can argue that Ritter complicated things by erroneously linking *rauhii* with *lagopus*. If one looks at the photograph in Ritter's book, "Kakteen in Sudamerika" Vol. 4 P.1524 abb 1096, the plant entitled there as "*Austrocylindropuntia lagopus, forma rauhii*" looks like a very woolly *A. floccosa* and definitely not a *lagopus* (*malyana*). The same comment applies to Abb 1095 : Ritter's version of *A. lagopus*. Note 3 below the table on p42 briefly refers to this problem. Please see Ivor's comments in the following subsection for a fuller discussion. We are grateful to Brian for drawing attention to the problem of making a neat table of names.

Ivor Crook. Manchester.

I am happy some one has pointed out this anomaly. The table is unfortunately misleading because it is not possible to slot in these names without significant explanation.

The confusion appears to start in 1936 when Backeberg transfers *Opuntia lagopus* Schumann to *Tephrocactus lagopus* Backeberg. He appears to do this without seeing *Opuntia lagopus* Schumann and makes the assumption that it was a form of *floccosa*. Rausch then rediscovers *Opuntia lagopus* Schumann and redescribes it as *Tephrocactus malyanus* in 1971, presumably unaware of Schumann's original description. Ritter, also presumably unaware of Schumann's original description, fails to realise that *Opuntia lagopus* Schumann and *Tephrocactus malyanus* Rausch are one and the same plant. He thus perpetuates Backeberg's error of assuming that the species name *lagopus* to be close to *floccosa* and gives Backeberg's *rauhii* form status under *lagopus*. Unfortunately, in transferring the oldest and therefore correct name *Opuntia lagopus* Schumann to *Austrocylindropuntia* Ritter failed to quote the page number of the basionym and thus on a technicality his transfer is invalid (ICBM Art. 33.2).

Anderson nearly clarifies the situation. He returns *Tephrocactus rauhii* Backeberg to synonymy with *Austrocylindropuntia floccosa*. However, his treatment of *lagopus* contains errors. Anderson uses the correct description except for the fruit colour, which is pink, not yellow. He then gives the geographical distribution area of *floccosa*, not *lagopus*, and uses Ritter's invalid combination for the taxon. Thus Anderson's treatment is invalid.

The table was intended to show the nomenclature position in 2001. However, it appears appropriate in this outline to mention the recent attempt in *Bradleya* 2003 Vol. 21. pp 87 - 92 to clarify the nomenclature of *Austrocylindropuntia lagopus*. Also in the article is published the valid name of *Austrocylindropuntia lagopus* (Schumann) I. Crook, J. Arnold & M. Lowry comb. nov.

*Tephrocactus floccosus* var. *cardenasii* Marnier-Lapostolle 1961 should also appear in column 1 "Other" on the "lagopus" row, as this is a synonym of *Opuntia lagopus* (Schumann). However, Brian is correct in that Ritter's *lagopus* and *lagopus* fm *rauhii* plus Backeberg's *Tephrocactus lagopus* should have appeared in the *floccosa* rows!

Ian Robinson. ( Wrexham)

Ian responded to the article on "*Tunilla Hintonii*" p33. Cesare obtained one of his plants from Ian. Ian confirms that he believes the plant to be *hintonii* following comparison with others at the TSG meeting in April. The WW334 reference is a Warren Withers accession number. Ian thinks the "Aguas Negras is a transcription error and should be Aguas Negras. The plant is a particularly nicely "glochidiated" plant. Ian has not yet flowered it.

Hakan Sonnermo. Sweden says:

"I have a similar plant as on the last page in the Journal and for me it is a *Cylindropuntia molestal* But names....."

Elton Roberts, (California) says:

"As to the name for the plant of Bill Jackson's wonderful North American *Cylindropuntia* shown on page 45 of the Sept. 2004 TSG, there are two choices. I am going to go for *Cylindropuntia leptocaulis* (Candolle) Knuth. The other is *Cylindropuntia ramosissima* (Englemann) Knuth. Now both could be wrong, as it is quite hard to tell from the photograph how big the stems are. The spines make

it look like either of the above names. TSG member Eddie Newman and I have stood by very impressive plants of both. In Shadow Valley, south east of Kingston Mountain and a bit northwest of Clark Mountain, there are large plants of *ramosissima*. Some have yellow spines and some darker spines. The plants are 1.25 to 1.50 metres tall and two metres across. The description of *Cylindropuntia leptocaulis* (in E.F. Anderson's book, The Cactus Family) says that the plant has numerous spineless stems. I am not sure where they saw that plant for all that I have seen are armed on every stem. They are plants you never ever want to land in if pushed from an aeroplane or bucked off a horse." Elton has very kindly sent a photo of a small *C. leptocaulis*. Ed.

"Opuntia hintonii."

I am very grateful to those members who have sent in information and photographs to further the search for information about the plant. Please will members continue to do so? It appears that the question as to what the plant actually is and where it was found has been solved (See Roy Mottram's comments on p 56 and Figs 1 & 2. However, there is no information so far as to how the plant became labelled "hintonii". Who is/ was Hinton? It also appears that there are various clones that have appeared under the name. Any further comments will be very welcome. It would be very useful if members can inform me when they first saw the name. One could take the view that if we are to bury the name it is not important as to the illegitimate (in nomenclature terms) source. However, if one is to reject a name then it would appear only fair to know its origin. Ed.

PHOTOGRAPHS WANTED.

Photographs of plants in habitat or plants in cultivation with habitat source documentation details are always wanted for the journal. In particular for the next issue the following are required:

*Cumulopuntia dactylifera* (Vaupel) Anderson.

*Cumulopuntia corotilla* (Schumann ex Vaupel) Anderson.

*Cumulopuntia galerasensis* Ritter.

Ed.

AWARD.

In October we were informed that our display at the BCSS National Show had won the award for the best display by a Society. This means that we will be given free space in the BCSS Journal to advertise our Society. Photographs of our display were shown in the last issue of the TSG Journal and on p. 32 I thanked all the members who had helped in any way with the stand. I wish, on behalf of the group, to repeat those thanks.

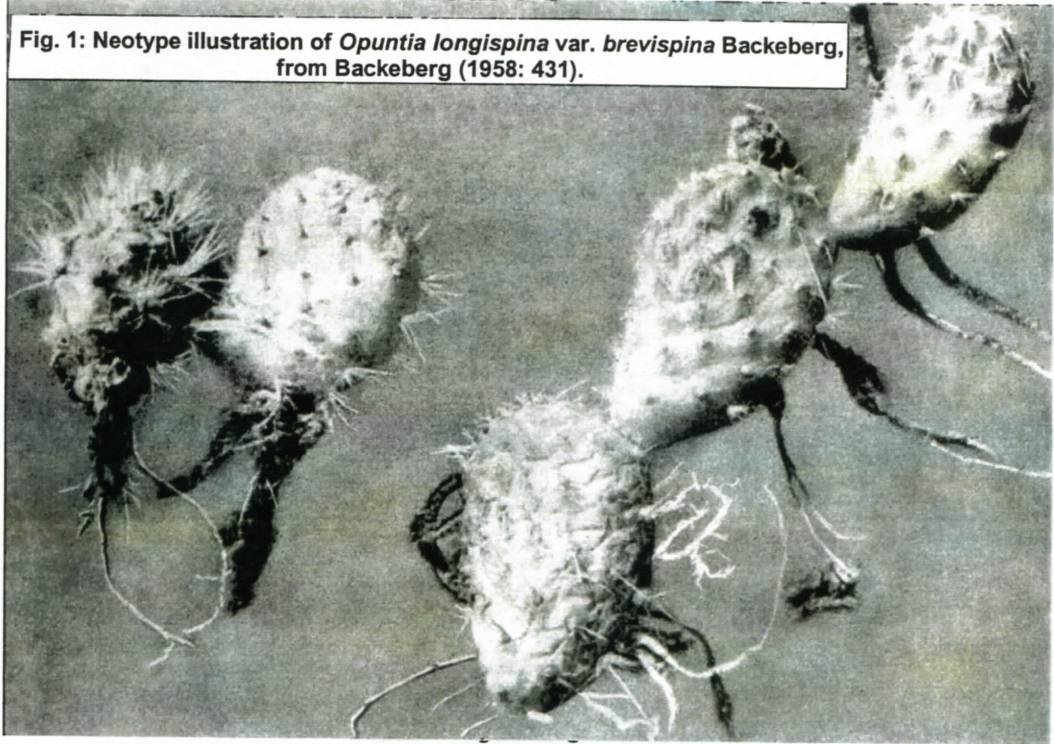
A. Hill. Chairman. TSG

WANTED.

Someone to take on a "National Collection" of *Cumulopuntia*. I have lots of specimen plants at £1 each to start the lucky recipient off, together with further assistance.

☎01453 890340 René Geissler

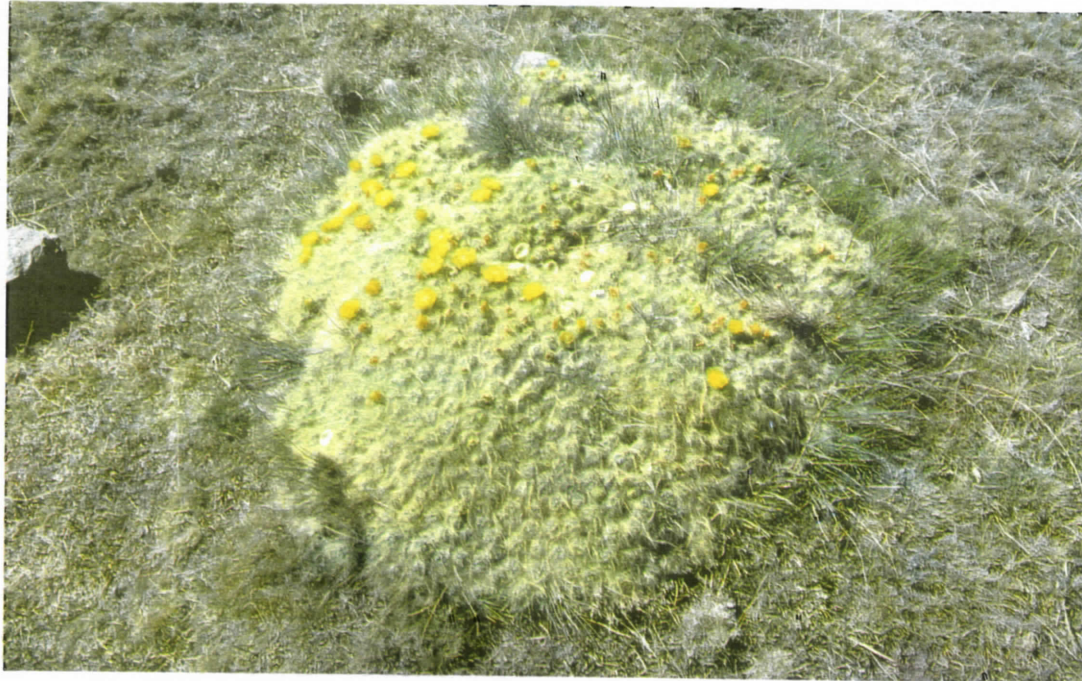
Fig. 1: Neotype illustration of *Opuntia longispina* var. *brevispina* Backeberg, from Backeberg (1958: 431).



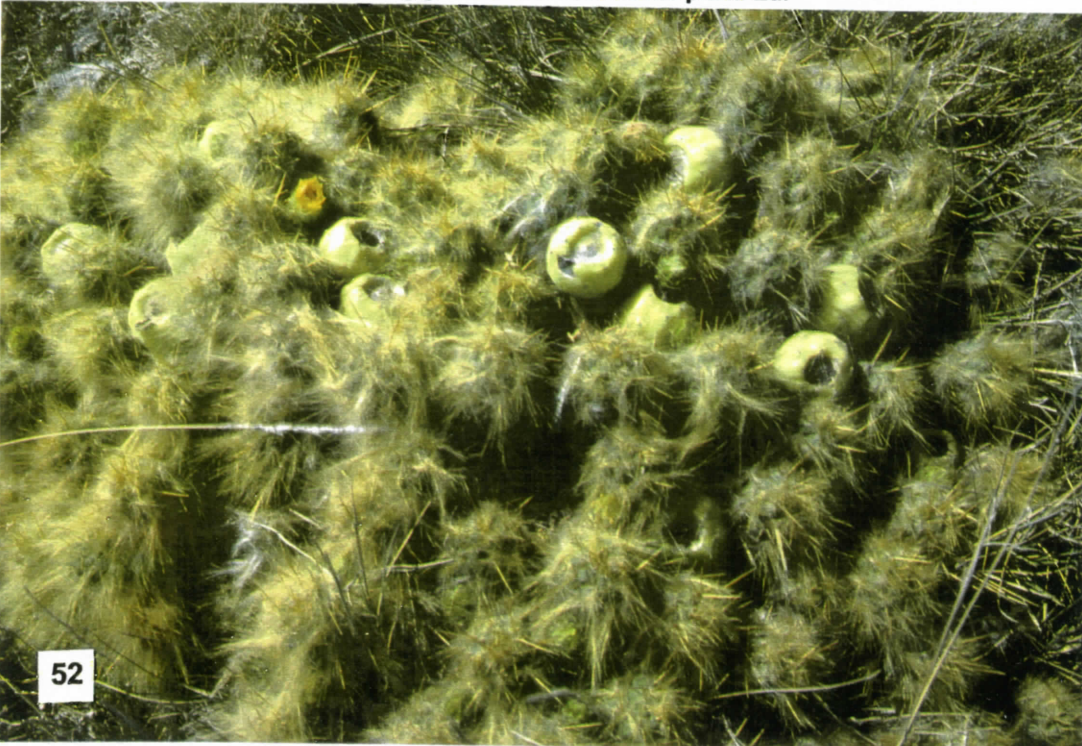
Photographs by Roy Mottram

Fig. 2: ISI 2001-4, the spineless but strongly glochidiate form of *Opuntia corrugata* subsp. *brevispina* originally collected by Victor TURAČEK in 1973 at Aguas Negras.





**Figs. 3 & 4 *Austrocylindropuntia floccosa* (Salm-Dyke) Ritter. ACL476. 37 km south east of Ayacucho at 3,964m. Photographs by John Arnold. Note the long grass in and around the plant. Ed.**







**Fig. 5** *Cumulopuntia ignescens* (Vaupel) Ritter. Nr Chasquipampa, south of Lake Titicaca, Arequipa province, Peru. 4300m.

**Fig. 6** *Cumulopuntia sphaerica* ssp *kuehnrchianus* (Werd. & Backbg) Ritt. 25 km east of Cienguilla, Lima province in the Tinjas canyon, 1425m.

Photographs by I. Crook.



Fig 7 *Tephrocactus pulcherrimus* Halda & Horacek

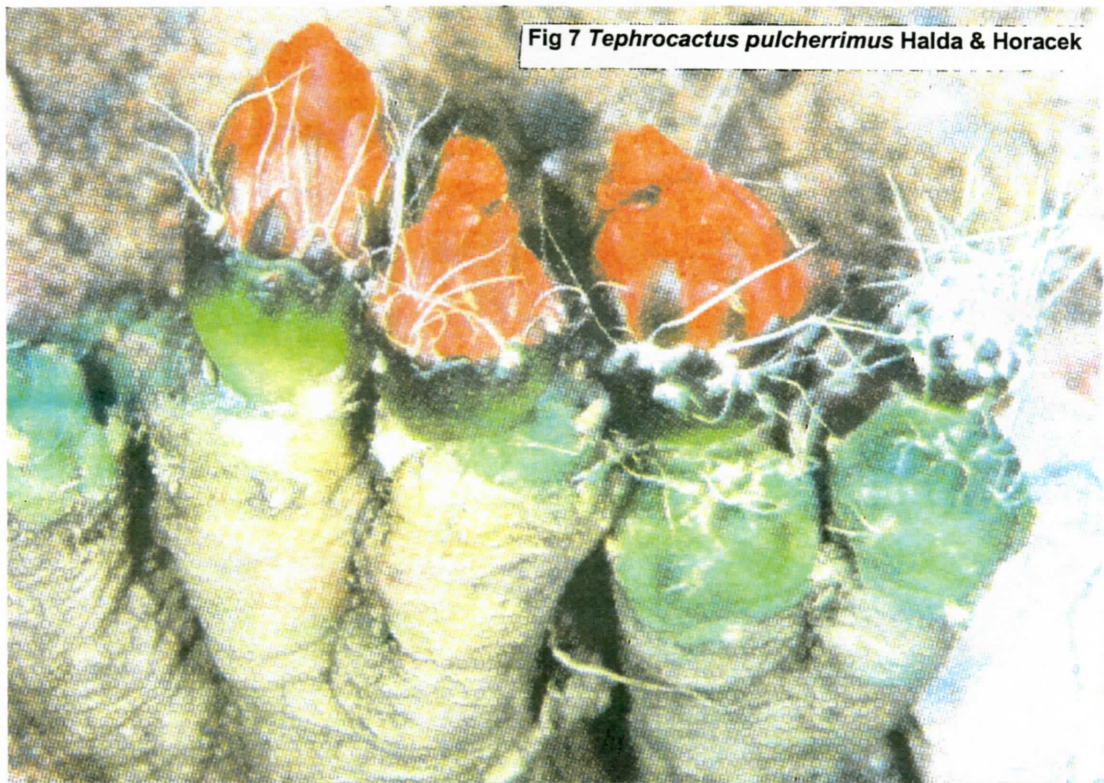


Fig 8 "Puna incahuasi"  
Photo M. Lowry



TEPHROCACTUS PULCHERRIMUS  
TO  
MAIHUENIOPSIS SUBTERRANEA SSP. PULCHERRIMUS.

The name *Tephrocactus pulcherrimus* was published by the Czechs Halda & Horacek in an obscure journal in 2000 (1). They subsequently published an additional illustration of the plant in 2003 (2). (See Fig. 7). We (myself, Brian Bates, Tim Marshal and Ralph Tomlinson) found the same taxon at three locations near Culpina, Bolivia, in January 1997. At the first location, BLMT066 near Salitre, about 6km south of Culpina, the plants were in flower and easily found in the flat stony ground alongside the road. At the second location, BLMT 067 near Chunchillas about 10km north of Inca Huasi, they were growing on gentle slopes amongst short grasses and much more difficult to see. The final location, BLMT069 is where the plant illustrated in the last TSG issue came from, on flat stony ground alongside the road from Culpina to Inca Huasi. Here it was growing within feet of *Cumulopuntia boliviana* (Salm-Dyck) Ritter and *Cumulopuntia rossiana* (Heinrich & Backbg) Ritter. It had also been found previously by Frank Vandenbroek many years earlier and pictured in the Chileans magazine. Grafted plants, presumably originating from the type collection are now circulating in Europe under the unpublished name "Puna incahuasi". (See Fig. 8). In my opinion the Czechs are probably right to name it as distinct but I'm not happy it deserves species status. Halda & Horacek are obviously using the genus *Tephrocactus* in the sense of Backeberg, a view now overturned with the advent of knowledge from molecular taxonomy. In the currently accepted classification of *Opuntia* it would be better to consider *T. pulcherrimus* as a form of *Maihueniopsis subterranea* (Fries) Anderson, hence I make the following combination:

*Maihueniopsis subterranea* ssp. *pulcherrimus* (Halda & Horacek) Lowry comb. et stat. nov.

Basionym: *Tephrocactus pulcherrimus* Halda & Horacek in Acta Mus. Richnov. Sect. Nat. 7(2) : 75. 2000 (1).

Type: "Carmargo: vicinity of Incahuasi, 3200 m, Bolivia", Halda & Horacek 0011528 stored at the National Museum in Prague.

It is easily distinguished from the type subspecies by its more glaucous epidermis, fewer areoles per segment, fewer adpressed white (as opposed to erect red-brown) glochids and bright red flowers. Its distribution in Bolivia lies well north of any other population of *Maihueniopsis subterranea* ssp. *subterranea*, all of which are in Argentina and, as far as I am aware, no interconnecting populations have been discovered.

#### Bibliography.

1. Halda, J. J. & Horacek, L. in Halda, Horacek & Kupcap, "Miscellanea. New descriptions." Acta musei Richnovensis, sect. Nature. 7 (2) ; 75. 2000.
2. Halda, J.J., "Notes on the descriptions, published as "Short communications" in Acta Musei Richnovensis Sect. natur." Acta musei Richnovensis, Sect. natur. 9(1) : t.7-43. 2002 (publ. Mar 2003).

Acknowledgements. Thanks to Roy Mottram for providing access to the literature and for help with checking some of this article. Also to Colin Norton for allowing me to photograph his young grafted plant of "Puna incahuasi".

Martin Lowry. Hull

## FURTHER NOTES ON THE AIRAMPOS.

### The oldest available specific epithet.

My combination *Opuntia ayrampo* (Azara) Mottram, in TSG 10(1): 10. (Mar) 2004, did not take into account *Opuntia airampo* Philippi (1894), which can be considered as a prior homonym. A ruling is needed on this, but the balance of probability is that homonymy is likely to make my combination illegitimate under Art. 53.1.

The next available epithet following that of Azara in 1809 is the sometimes-adopted *Opuntia longispina* Haworth (1830). However, this is very unlikely to be an airampo, because Haworth himself indicated that his plant was not the same as the undescribed name *Opuntia longispina* from Mendoza that had been in cultivation in the Berlin botanic garden. He also used the epithet *longispina* advisedly, because his description calls for spines 7-8 cm. long, and nothing approaching this is known for an airampo.

We should therefore set aside *Opuntia longispina* as of unknown identity.

The next available name is *Opuntia corrugata* Gillies ex Salm-Dyck (1834), which is sometimes questioned because the dimensions of the segments in the Salm-Dyck are odd, and probably erroneous. However, there is a type at Kew comprising unfortunately only a flower, but this is not at odds with the plants in cultivation to which this name has always been applied.

*Opuntia corrugata* is accepted by modern taxonomists including Iliff and Kiesling. Therefore I am happy to settle on that name as the oldest available for the airampo group.

### *Opuntia hintonii*

As far as I am aware there is no such name, and it may well be a corruption of some other name.

The plant in question is more generally known as *Opuntia longispina* var. *brevispina* Backeberg (1953), described from a plant at the botanic garden at Les Cèdres, originating from northern Argentina, but without a precise locality.

The type of this name, designated by me in 1999, is the photo of several sterile segments in fig. 439 of Backeberg, *Die Cactaceae* (1958) (fig. 1). The plant is characterized by the lack of spines, but strong development of the glochids. In Backeberg's clone, these glochids were only up to 3 mm. long, and the name *brevispina* reflects this condition.

In 2001, *International Succulent Introductions* at Huntington botanic garden, distributed a clone identified as *Opuntia longispina* var. *brevispina* (ISI 2001-4, HBG 66371) (fig. 2). This was the clone collected in Prov. San Juan, at Aguas Negras, in 1973, by Victor TURACER. My example of this in fig. 2 has segments up to 4.0 cm. long, 2.5 cm. broad, and 1.65 cm. thick. The glochids in this clone are up to 8mm. long.

The description given by Kiesling in *Flora de San Juan* 2: 164 of *Tunilla* sp. growing on the road between Calingasta and the Quebrada de las Burras seems to agree well with Backeberg's plant, and also implies that this spineless airampo is a sufficiently distinct and stable population to justify recognition at some rank.

I therefore make the following new combination:

*Opuntia corrugata* Salm-Dyck subsp. *brevispina* (Backeberg) Mottram *comb. et stat. nov.*

*Basionym:* *Opuntia longispina* var. *brevispina* Backeberg, Notes du Jardin Botaniques des Cèdres, *Cactus* (Paris) 8(38): 250. 1953.

The clone collected by Victor TURAČEK was probably selected for the extreme length of the glochids and might possibly be worthy of a cultivar name. However, not knowing the extent to which this character varies in nature, I refrain from creating a new cultivar name at this time.

Roy Mottram, Sutton-under-Whitstonecliffe. 1 Oct 2004

### CULTIVATION OF AUSTROCYLINDROPUNTIA FLOCCOSA

Plants of this species have been available from many sources, mainly of habitat origin, for many years. For those of us who have been fortunate enough to have seen them in the wild they are strikingly beautiful, particularly the very hairy forms. They are generally, however, far from being striking when grown in cultivation.

The plants very readily become long and lank in cultivation and lose their hair growth and their spines. They then look nothing like their wild compatriots. They vary considerably in the wild from those that look like groups of miniature *Oreocereus*, up to ten inches high by three inches across, to mats of heads that are under two inches long at most. They can be variable at the same site. Those in the Puquio valley with red flowers are, however, invariably small flat mats of short heads indicating a drier habitat. In this valley they grow with *Oreocereus ritteri* and *O. leucotricious*, *Matucana haynei* and *Lobivia tiegleriana*. Elsewhere they grow with *Oroyas* and other things and at Macusani with *Austrocylindropuntia lagopus*. Generally they are found around 4,000m altitude often in places that looked like the North Yorkshire moors. In fact they were found from 3,674m as at ACL498 to 4,686m at ACL 494 (the *A. lagopus* site).

Before my visit to Peru, in 2002, plants of *A. floccosa* had languished in the greenhouse in summer and often succumbed to the wet and cold conditions outside in winter. Neither of these extremes suited them. I then read Klaus Gilmer's and others' suggestions that they were winter growers. This was new and different information from that available before and it seemed to conflict with what I had seen in Peru. We went there in October and November, which is springtime, although for the most part it was still fairly dry. The plants were in growth, bud and flower and from the number of buds present flowering would continue for some months into early summer.

This being the case they seem to behave as the other cacti do i.e. grow and flower from late winter/early spring and not be winter growers. I returned from Peru with some cuttings and to these I did give some water over the winter to prevent them drying up. They did produce some leaves but made little growth.

The following spring it soon became evident that the plants wanted to grow and responded to water. However, it also became apparent that greenhouse temperatures were too high for them. Placing them outside seemed to have the desired effect of promoting growth and good colour but also suppressing too much upward growth. They were treated as any other cactus but with greater ventilation being outside and cooler temperatures. The result was that they looked more natural and better than anything I have obtained before. In the winter of 2003/4 they were kept cool and dry.

Thus I am pleased with the progress of the plants. However, I will not be entirely satisfied until I also get them to flower.

John Arnold. Lincoln

Please see front page and Figs 3 & 4 for three illustrations of *A. floccosa* (Salm-Dyck) Ritter, ACL. 476 in habitat.

Ed.

### SOUTH PERU OPUNTIA Log Part 3.

#### High altitude members of the genus Cumulopuntia.

##### 1. *Cumulopuntia dactylifera*. (Vaupel) Ritter. Altitude range 3854 to 4308 metres.

As we continued to travel southeast from Cuzco towards the banks of Lake Titicaca we approached the highest point of this road, the Abra del Reya at 4312 metres. Having recently been made famous by the Michael Palin TV series 'Full Circle', it was fitting that our arrival at the summit was greeted by the presence of a train travelling from La Paz towards Puno. We stopped at a lay-by next to a rocky outcrop and an adjoining area of flat ground to its side. The flat area was littered with blobs of white, which, on closer inspection, were bulbs from the Genus *Zephranthes*. Our first glimpse of *Cumulopuntia* of high altitudes was here. The rocky outcrops were home to hemispherical mounds of *Opuntia* plants up to 40cm in diameter. Most plants were in flower and also contained young fruits, similar in section to *Austrocylindropuntia floccosa* fruits with up to twenty, tightly packed seeds per fruit.

A few days later, we came across these plants as we approached Puno from the northeast. Nearer to Lake Titicaca the land was generally flatter, a little lower in altitude and in agricultural use. Between fields, the rocky outcrops were a safe haven for cacti, often only a few yards from a main road. Both *Lobivia maximiliana* and *Lobivia pentlandii* accompanied the *Opuntia* species on these rocks. Not all the land was currently used for growing crops. We passed several fields that had been left fallow and deserted for many years. Here, the *Opuntia* found its natural home on the low rocky walls marking the boundary between the fields and the roads. Interestingly, we also found the plants amongst the shrubby weeds within the deserted fields on the flat ground.

##### 2. *Cumulopuntia ignescens*. (Vaupel) Ritter. Altitude range 3794 to 4400 metres.

Travelling round the western edge of Lake Titicaca into Puno we looked for the road south and down towards the coast. After several false starts we eventually found the road southwest to Moquegua. Along this road we crossed three, high altitude mountain passes before we eventually started to descend towards Moquegua and then on to the coast. Our first sighting of *Cumulopuntia* was 50km south of Puno on steep rocks at the side of the road. The plant had already changed and is generally thought to be *Cumulopuntia ignescens* at this point. (Fig. 5). The change is due to lengthening of the spines and their greater number. We then travelled over two further passes. The first of truly spectacular scenery, table mountains with hard rocky caps, then a geyser and an area of geothermal activity with hot sulphur laden springs emerging from the ground and finally a true sandy desert at 4600m altitude. This desert is the climatic barrier between Atlantic and Pacific weather; too far from the Pacific for the sea mists to drift inland and too far from the Amazon for the Atlantic weather fronts to reach. Beyond the final desert-like pass the road again descended to allow us two further glimpses of *Cumulopuntia ignescens* en-route to Moquegua. Here, the plants were on flatter, stony ground often with little other vegetation. It was here that they form the true *C. ignescens* that most of us imagine, hemispherical mounds on flat stony ground with dense long spines that give a halo effect to the clumps when back lit by the evening sun.

To me, this brief taste of the high altitude *Cumulopuntia* plants between Abra del Reya and Moquegua poses more questions than it answers. Is there really a line

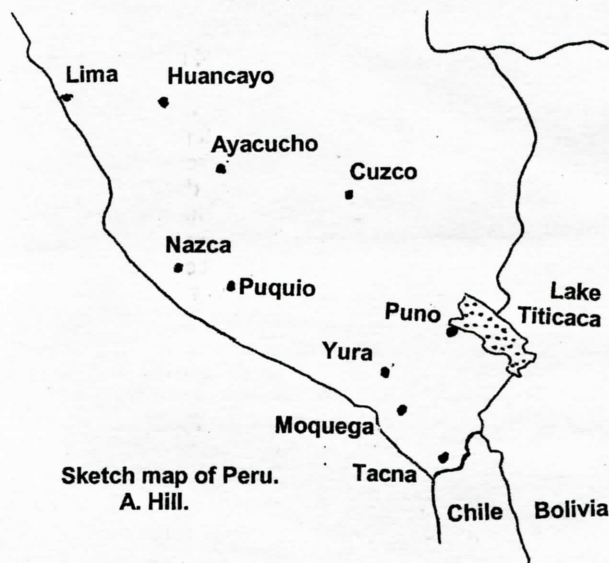
where we can say north of this line the plants are sufficiently different from plants to the south to give them both different species names? I remain unsure. I think there is greater differences in spine length and density between the northern and southern most *ignescens* than between *dactylifera* and the northern populations of *ignescens*. Secondly, if we accept these plants as two separate species then why is the first pass between Puno and Moquegua more important in determining a difference between species than the third, which is the climatic continental divide? For now, my inclination is to consider this whole complex a cline of variation of one species.

Low altitude members of the genus *Cumulopuntia*.

3. *Cumulopuntia sphaerica*. (Forster) Anderson. Altitude range 842 to 3386 m.

This species is known to have an enormous range, from over 100km north of Lima as far south as Santiago in Chile. The return leg of our trip along the coastal plain from the Chilean border back to Lima afforded ample opportunity to see many variations of this species.

Above Tacna, at over 3000 metres, near the Chilean border was a gently sloping site with some quite large plants with heavy, thick spines. Here, Martin Lowry found the only cristate *Opuntia* we found on the whole trip, a single segment of *C sphaerica* about 30cm long! At these higher altitudes plants were often in quite good condition. At lower altitudes, the plants were often found on steep slopes and were much smaller in both segment size and number of segments per plant. (Fig. 9) Natural drainage channels formed on the steep sides of the valley walls and the plants were found in the bottom of these channels where presumably they could extract the maximum amount of moisture from their environment.



Near Lima, in Tinajas canyon, Carlos Ostelaza took us to a site with a relatively wide and flat valley bottom and steep-sided rocky walls. Again clumps of *Opuntia* were to be seen on the valley floor. Here the plants are generally referred to as subsp. or var *kuehnrichianus*. (Fig. 6) The plants look different to the typical *sphaerica* forms having more spherical bodies than the typically slightly elongated *sphaerica* found elsewhere in Peru.

I. Crook. Manchester



**Fig. 9** *Cumulopuntia sphaerica* (Forster) Anderson.  
 Nr Yura, Arequipa. 2650m. Photograph by I. Crook.



**Figs 10 & 11.**  
 Outdoor box.  
 Photo A. James.  
 Note corner and centre  
 strengthening struts. Ed.

