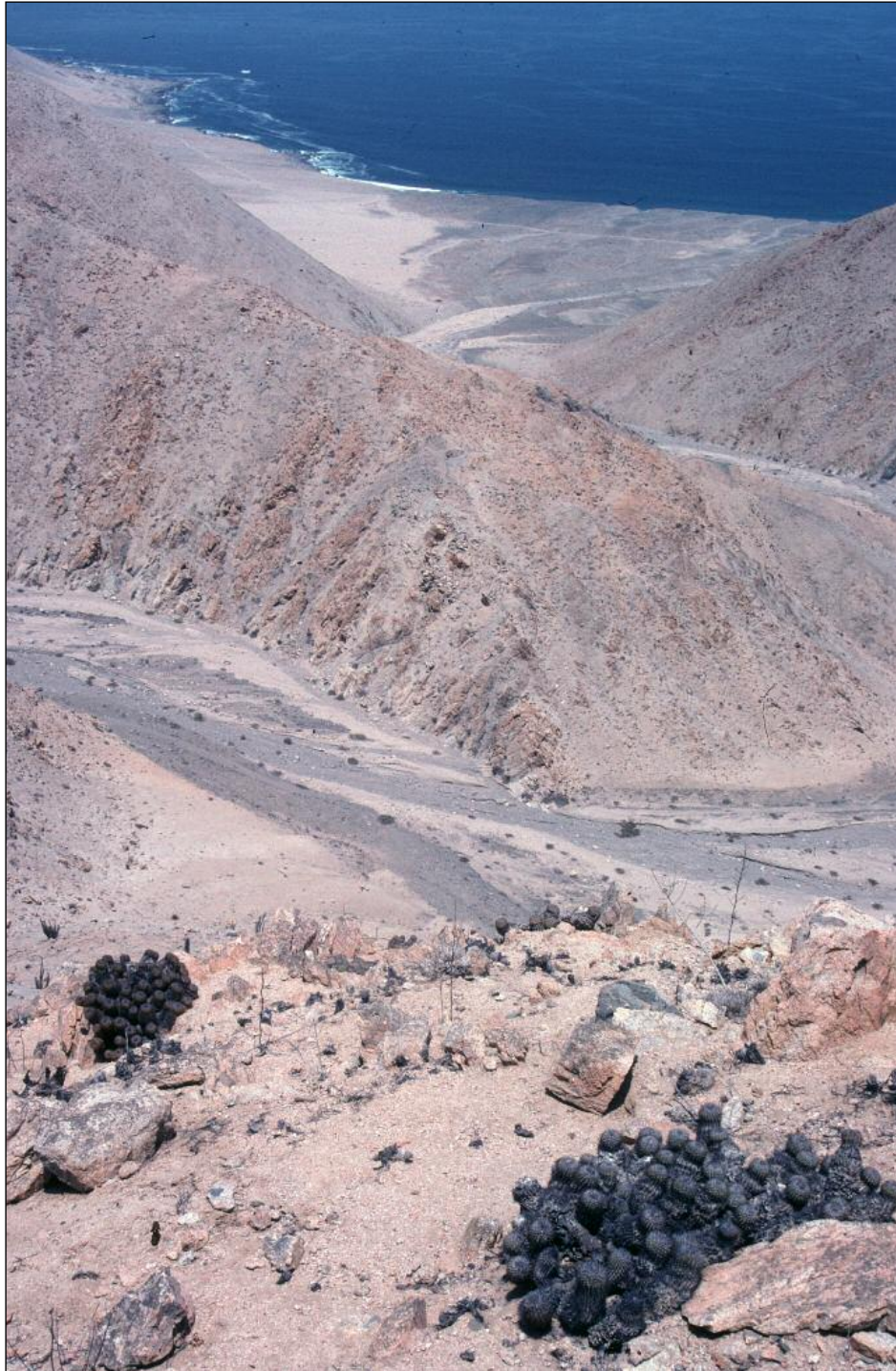


THE CHILEANS 2011

VOLUME 22 NUMBER 70



View from the north side of Quebrada Botija, Chile.
Copiapoa decorticans in the foreground.

Photo:- G. Charles



Copiapoa
ahremephiana
in
Quebrada
Botija

Copiapoa
decorticans
(= C.conglomerata?)
in
Quebrada
Botija

Photos: P. Hoxey



Copiapoa
atacamensis
in Quebrada
Botija

IMPRESSIONS OF THE COASTAL HILLS From R.Schultz.

During our travel of several days along the coast from as far north as El Cobre towards Paposo, we saw a considerable number of Eulychnias. At many places to the north of Rincon there were few plants visible near to the road, but with binoculars they could be commonly seen on the hills, mainly between 200 and 600m. At a few locations about 20km to the south of Blanco Encalada, they come right down to the coastal road and are mostly still alive. We found some Eulychnias at up to 1300m on the El Cobre road and also near to the summit of Mount Perales near Taltal, both places above the fog zone. The fog varied greatly from day to day. At night it descended lowest and on one night it was at sea level for a short time – but by daylight it had already lifted to 300m. We experienced the heaviest fog at El Cobre between 800-900m – visibility was only about 50m. Otherwise on the coast there were the usual overcast mornings.

The Botija valley is my favourite site in Chile. We spent two full days there. The Botija valley is easy to walk and the car can be driven up to the mouth of the canyon some one km. east of the coastal road. We walked for about 4 km. up the valley because we were too tired to hike into the hills to look for *Copiapoa variispinata*. We found a veritable botanical oasis there – we even saw some *Tillandsia geisseri* – most unexpected in these surroundings! And we did see *Neopterteria floccosa* there, mostly in the riverbed. In the upper Botija valley we found tens of thousands of *Copiapoa solaris*. The higher populations were up the slopes at possibly 1500m. – these we saw only with our binoculars. Near El Cobre the road to the Norma mine was visited. We found a plant of *Neopterteria* there. The *Copiapoa atacamensis* were healthy. We saw no guanaco tracks in the earth this far north – I seriously doubt if they could survive here. I did see one set of guanaco tracks in the Botija valley but this could have been during the rains of 1991 as I do not think that there could have been rains since then which were intense enough to obscure the guanaco trails.

.....from G.Charles

My first visit to the Botija Valley was on 31st January 1999 when the picture on the cover was taken. The road along the coast had a good quality graded surface and can be seen in the picture. The entrance to the Botija valley is quite difficult to see from the road because of rising ground in between but we knew where it was, so were travelling slowly. The first clues we saw were the mounds of what is now named as *Copiapoa ahremephiana* but, at the time, we only knew as RMF53. Roger Ferryman was with us and he remembered that the plants visible from the road were near the entrance to the valley. We found a track off the road leading inland and it took us through the population of *C. ahremephiana* so that we could park near to the entrance to the valley. We could go no further with the car because of a deep trench, presumably cut some time before by a torrent of water down the valley. You can perhaps make out the car as a speck on the picture.

As we usually did, Chris Pugh, Roger and I went in different directions. I elected to climb a ridge which lead to the top of the hill on the northern side of the valley. The route to the top was steep with loose rocks but not as steep as the faces of the ridge which would have been treacherous to attempt to climb. There was little vegetation, just a few leafless bushes and some Bromeliads, probably *Deuterocohnia*. I saw *Copiapoa atacamensis* on the way up together with *Copiapoa decorticans*, *Eulychnia taltalensis* and *Neopterteria floccosa*. On the flat top, (If you look on Google Earth near S24° 30.155' W70° 32.500' you can see where I was when I took the picture) at 450m, *Copiapoa decorticans* was present in large numbers as loose clumps up to 2m across but no young ones. The lower parts of the prostrate heads are just narrow sticks, the spines and skin having all fallen off, hence the name Nigel Taylor and I later gave it.

I understand that a road suitable for 4WD vehicles was made in the valley to reach some mine workings but rains in 2011 have now made it impassable.

.....from F.Vandenbroeck, *Succulenta* 65.2.1986

By comparison with the area to the north of the port of Antofagasta, to the south of it we enter an area where the growth of the cacti achieve really remarkable proportions, both in numbers and form. They are mainly *Eulychnia* and *Copiapoa* and to a lesser extent *Neochilenia*. Typically it is *Eulychnia* which dominate the high mist zone. An interesting species from the area immediately to the south of Antofagasta is *Copiapoa solaris*, a plant which in later age forms large round clumps. It was designated by Ritter as *Pilocopiapoa* because the ovary is hairy, which is an additional protection against drying out, in contrast to the other species of *Copiapoa*. The specific name *solaris* which Ritter gave to this plant surely refers to its sun-loving character. These plants grow near Blanco Encalada at sea level, in small groups where they look fresh and healthy. Further to the east, away from the coast and at a greater altitude, these plants are markedly larger though they clearly have to suffer from strong sunlight. In all groups it was the north-facing or sunny side which was most battered. At even higher altitude, most of these plants were always in impressive groups, but parched. It is clear that the most favourable habitat of *C. solaris* is fairly high, at about 700m altitude.

.....from P.Klaassen

On our way back from the very north of Chile in 2003 we made a stop at Quebrada Botija. At 104m altitude up the valley there were *Copiapoa ahremephiana*, *C. decorticans*, and *C. atacamensis* all growing together. The *C. decorticans* were in poor condition and no flowers or fruit were to be found. Walking up the valley to the "T" junction at 245m altitude there were *C. atacamensis* and *C. solaris* to be seen. The hillside in front of us had much darker soil than that found earlier, lower down the valley. These two taxa appear to occur on different soil, the *C. solaris* preferring the darker soil.

.....from J.Henshaw.

On our 2006 trip to Chile we travelled up into the northern part of the country and paid a visit to Botija, where we came across some *Copiapoa ahremephiana* growing on the beach. They had bodies up to the size of an apple – some 4 inches in diameter – with a chalky-grey or black epidermis and orange-yellow spines and up

to 20-21 ribs. They formed cushions of closely packed bodies, which were filled with wind-blown sand. The larger cushions became almost hemispherical, each head facing outwards at the surface of the clump, so that the heads next to the ground faced almost sideways.

Going inland from there, up a canyon leading into the coastal hills, there were *C.decorticans*, with green bodies and yellow spines, the individual heads growing up to 5 or 6 inches in diameter and up to about two feet in height. Each individual head was usually standing upright, slightly apart from one another and often with dead or dying stems in the centre of the clump. They were growing in company with *C.atacamensis* which were also columnar but with a narrower body and slab-sided ribs. Young plants of *C.atacamensis* had a glossy blue-grey body but on older plants the body was more chalky-grey.

About half a mile further inland and further up the canyon, there were still *C.atacamensis* to be seen, but now growing in company with *C.solaris*, which formed clusters of upright heads up to one metre across, so they were certainly the largest clusters among the four species of *Copiapoa* that we saw at this location. At lower elevations, there were also some blue-bodied *Cereus* which we took to be *Cereus aethiops*. We also saw plants of *Neochilenia floccosa* growing here and there on our ascent of the canyon, always growing in the rocks of the canyon walls. The juvenile *N.floccosa* were very woolly plants which became spiny when older.
.....from F.Larsen.

We visited this area of northern Chile in 2003 and 2006 – there had been unexpected rainfalls in the mountains in the Spring of 2003. About 100km to the south of Antofagasta there is the Quebrada Botija, a very deserted place where a few fishermen are living in primitive huts at the edge of the ocean. We had quite a long walk in front of us so we set off at dawn, concentrating on getting to the top and then looking at the plants on the way down. At the top we found *Copiapoa solaris* and *C.atacamensis*, large clusters with green bodies whilst the *C.atacamensis* have a waxy white look. On the descent we see *C.decorticans* on the steep mountain walls and then in the sand at the bottom of the quebrada there are little clusters of *C.ahremephiana*.
.....from P.Hoxey

To the north of Paposo the coast is fairly dry and going from there in the direction of Antofagasta, it gradually becomes drier, even more so at El Cobre, where we saw *Eulychnia* and *Trichocereus* on the hillsides, but many of them dead. Near El Cobre we also came across some plants of *Tephrocactus berterii*, as well as some *Neoporteria echinus* – which were growing about half way down the valley. The first *Copiapoa* that we came across here was *C. solaris* at 1050m, with more to be seen about half way down the valley. Here they were growing in company with *C.atacamensis*, and even an occasional *C.solaris*, at 120m altitude. We also saw *Copiapoa tenuissima* here, at its type location. Travelling south, we stopped at Punta Tragagente where *Eulychnia*, *T.berterii*, and *Neoporteria floccosa* grew, we again came across *C.atacamensis* and *C.solaris* at about 400m altitude. We then made a stop at Quebrada Botija, where we came across all four species of *Copiapoa* – *ahremephiana*, *atacamensis*, *decorticans*, and *solaris*, all growing between about 110-650m altitude, as well as more *N.floccosa* and *T.berterii*.

We then went a short way further to the south to the Quebrada Izcuna, to walk up the valley. Despite being a fairly short drive from Botija, there was quite a different selection of cacti growing at Izcuna. Here we found *C.atacamensis* growing in company with *Neoporteria paucicostata*, over an altitude range of about 410 to 970m. We also saw some *C.solaris* and *C.varispinata* growing in company at 410m altitude.
.....from C.Sherrah

We came across *Copiapoa ahremephiana* and *C. decorticans* growing on the floor of the Botija valley. In addition, *C.tenuissima* also grows from the alluvial fans at low altitude up to high altitudes on the southern ridge.
.....from Englera 16.

FR 538 *Neochilenia glaucescens* Herbarium specimen collected at El Cobre 1956.

FR 539 & FR 540 *Copiapoa tenuissima*. Herbarium specimen from El Cobre.

.....from F.Ritter, Kakeen in *Südamerika* Vol.3.

Neochilenia glaucescens (Fully detailed description given). Where I found this plant near El Cobre, the very numerous specimens for at least one km inland from the coast were all dead in consequence of the long years of drought. Then at first higher up in the hills to where the mist reached, there were still living examples.
.....from K.Schreier & P.Weisser, Kuas 1975.

On June 9th 1973 we set off from Antofagasta to look for the habitat of *Copiapoa solaris*, to whose discovery we are indebted to Lembcke. At that time the route down the valley to Blanco Encalada was dangerous. From about 2000m down to 200m all went fairly well. We were in the best of spirits. Everywhere along the road lay deep green copper ore. Down from about 800m altitude there grew *C.solaris*, with a body of a grey-white colour and not heavily spined. Close to this *Copiapoa* we found a *Neoporteria* with coal black spines, very probably *N.echinus*, in greater numbers. At about 200m the road had been swept away by water so we could not reach the coast. Disappointed, we began our return journey. In this unspeakable solitude we were consoled by the song of a little bird. Then the attempt to reach the sea by El Cobre failed already at 600m., as rock falls and mud washes blocked the route. We saw numerous, but larger, clumps of *C.solaris* in this valley. A few splendid *Eulychnias* grew in a bank of mist and there in the rocks was a very small, evidently rare, globular cactus. Buining believed it was the then extremely rare *Neochilenia glaucescens*. I question this idea since it is a dwarf *Copiapoa*.
.....from H.Middleditch.

This dwarf *Copiapoa* was perhaps *Copiapoa tenuissima*?

.....from N.Rebmann.

Ascending the track from the beach at El Cobre into the highlands, we came across *C.atacamensis* up to about 600m altitude, then *C.solaris* from 600m to 1000m - but many of them apparently almost dead. On our

visit here in 2001 we found *C.tenuissima* growing between 650m and 700m in reasonable condition but when we returned in 2008 they looked as though they were probably dead. Blanco Encalada is now a very dry locality and I have only seen *C.solaris* there, but in very poor condition.

.....from P.Hoxey.

I have driven from El Cobre up into the hills and I was fortunate in being able to find some *Copiapoa tenuissima*. They were indeed fairly small plants, the smallest being about 15mm across, larger ones up to about 5cm across, of a very dark body colour. The surroundings were indeed extremely arid and these plants grew close to the ground, usually in the vicinity of rocks.

..... from E.&N.Sarnes, K.u.a.s. 12.62.2011.

We had our first acquaintance with *Copiapoa tenuissima* about thirty years ago in the De Herdt nursery. This plant attracted us from the start and so found its way into our cactus collection. The yellow flower colour stood in a particularly fine contrast to the darker body colour. Naturally it stimulated us to go and see it in its habitat in Chile. The discoverer, F.Ritter, had from the start classified this as an endangered species. He referred to the body of the plants falling victim to the appetite of the guanacos. From the Schultz *Copiapoa* book we knew the finding place "above El Cobre". There, on an earlier field trip, we had seen dead groups of *Copiapoa solaris*. This time we approached El Cobre from the south, by the coast road. We reached the mine before noon and followed the road to Antofagasta, in order to search for our small "friend" in the hilltops. This area is reached night and morning by the coastal mists which advance up to a height of 800 – 1000m and generally makes plant growth possible.

The first hills afforded us no success as we only found dead *Eulychnias*. Then we started our second climb and quickly found a specimen of *C.atacamensis*. A few minutes later, right on the summit, we found tiny plants which were hardly visible between large stones. After careful consideration we were sure that we had finally found our sought-after *Copiapoa tenuissima*. We could scarcely believe that these dwarfs were the same as our plants at home in the greenhouse. But if one took into consideration under what life threatening conditions plants survived in the Atacama desert, the drastic differences were understandable.

.....from H.Middleditch.

The coastal strip of northern Chile between Paposo and Antofagasta, and in particular the section between Botija and El Cobre, has attracted the attention of an appreciable number of cactus enthusiasts at various times. Over the years this has yielded comments and observations on the various species of *Copiapoa* which are to be found there.

In Chileans No.48 there is the account by Philippi of the trek which he undertook in 1853-54, using a mule train to go north from Paposo to El Cobre, from where he then continued further north by sea. As outlined in Chileans No.47, the descriptions of the cacti that he found in the course of that journey appeared in the 1860 *Flora Atacamensis*. These included *Echinocactus conglomeratus* and an *Echinocactus* sp., both regarded as *Copiapoa* at a much later date. In Chileans No. 17, there is reproduced the article by Lembcke transferring the *E.conglomeratus* to *Copiapoa*. Lembcke also mentioned that he could not reach El Cobre on his 1958-59 trip to this area, as the road down to the coast at Caleta Cobre was blocked by landslides, but that he was able to do so during his 1965 visit to the same area..

In Chileans No.16 there was reproduced a 1986 article from Dodonaeus on the motor cycle trek made by K Knize, south from Antofagasta through the desert, as far as the turn off which went down to the coast at El Cobre. It was here that he came across *Copiapoa solaris* which is commonly accepted to grow closest to the desert zone. He also found another *Copiapoa* which he describes as *C.marginata*, which would nowadays be regarded as *C.atacamensis*, as outlined in Chileans No.48. This species has been found to occur at places to the south of El Cobre at an altitude about half way down the coastal mountains to the Pacific shore, so that Knize evidently did find the road going down to the coast at Caleta Cobre. This FR 541 *C.solaris* was described as a spec. nov. by Ritter in his 1980 *Kakteen in Südamerika*, which was reproduced in Chileans No.17. In Englera 16 this *C.solaris* is also recorded as being found by Ritter near El Cobre in 1956 and also subsequently near Blanco Encalada, some 20km to the south of El Cobre.

Then also in his 1980 book, Ritter described his FR 1447 *Copiapoa variispinata*, which was reproduced in Chileans No.53. In Englera 16 the collection date was given as 1968. The Type location was near the Izcuna, valley, some 15km to the south of Botija – map also in Chileans No.53. This Ritter description of *C.variispinata* included a commentary to the effect that it gave him the impression of encompassing a very wide range of variation, which he illustrates by two pictures, one of each variety, in cultivation. There is indeed a considerable difference between these two plants, so much so that they could almost be regarded as two different species.. One plant has about 21-23 ribs and fine short spines, whilst the other has about 16 ribs and much longer and more robust spines. This may suggest that the Ritter name of *variispinata* does indeed encompass two separate species. In the Charles' 2004 BCSJ article on the *Copiapoa* from Botija, there is a picture taken in the Izcuna valley – the type location for *variispinata* - by M.Machado, with about 11 ribs in camera view, so suggesting a total of about 22 ribs. This seems to be comparable in overall appearance with the Ritter Abb.981 picture. Might the Abb.982 possibly be a *Neoporteria* – a variety of *taltalensis*, perhaps?

.....from P.Hoxey.

I have seen plants like Abb.981 at the base of the hills near the Izcuna valley and at a higher altitude in that valley, plants like Ritter's Abb.982. Perhaps these two forms are one and the same species of *Copiapoa*. *Neochilenia floccose* does grow in the Izcuna valley, but it is quite different from Abb.982.

.....from N.Rebmann.

In Quebrada Izcuna I have seen *Copiapoa variispinata* with both long and short spines. – short spines at the mouth of the quebrada and long spines on the slopes inside the quebrada. The Ritter Abb.982 is *variispinata*, it is certainly not *Neochilenia floccose*, but I have seen *Neochilenia echinus* in Qu. Izcuna.

.....from H.Middleditch

The picture of *C.variispinata* on page 58 of the Schultz 2006 Copiapoa book captures two plants, each composed of small clumps of heads, growing barely half apace apart, one with long prominent spines like Ritter's Abb. 982, the other with mostly short and finer spines – this plant having a passing resemblance to the RMF 53 which might explain why this Ritter name was attached for several years to what was subsequently described as *C.ahremephiana*.

.....from F.Vandenbroeck.

When travelling north along the coast road from Botija, we stopped a few kms to the south of Blanco Encalada, close to the ocean. It was in 1995 that we came across *C.ahremephiana* here, with individual heads no more than 5-6 cms across forming an almost hemispherical clump, and then again on a later trip when we saw them in flower.

.....from H.Middleditch

A trip to Chile was made by R.Ferryman in 1982., an account of which appeared in Chileans No.42 and this included a trip from Antofagasta south through the desert to the turn-off to El Cobre. Taking that road to the coast, *C.solaris* was first found, high in the hills. At this time, there was no coast road from north or south to El Cobre and so the party had to return inland to the desert road to go on to Blanco Encalada. Descending towards the coast there, *C.solaris* was again seen and this account was illustrated by a photograph of *C.solaris* and *C.atacamensis* growing barely a pace apart. Then following the coast road further to the south, another species of Copiapoa was recorded from near the coast and some way inland, as RMF 53 but without a name.. This Copiapoa to be found next to the coast at Botija and Blanco Encalada was subsequently referred to by several writers by the Ritter name of *variispinata*. In Chileans No.53, R.Ferryman observes that the description of *C.variispinata* provided by Ritter “certainly does not fit the plant of RMF53 which I found near the coast at Botija”. In Chileans No.61 it is observed by B,Burke that where the coast road crossed the river-cut trench at the outlet from the Botija valley, “they walked towards the valley entrance and found plants of RMF53, adding that “ I feel that RMF 53 has nothing to do with Ritter's *variispinata* and certainly nothing to do with the two pictures of that species provided by Ritter”. This RMF53 was first described as Copiapoa *ahremephiana* in 2002.

The Schultz & Kapitany 1996 Copiapoa book provides an excellent selection of habitat photographs of Copiapoa and also demonstrates by a diagram the distribution of the four species of Copiapoa to be seen in the Botija valley. This places *variispinata* – now *ahremephiana* – nearest to the coast, then *C.atacamensis* at the next higher altitude, then an overlap with the then un-named sp.Botija – which was also illustrated in the Charles' 1998 Copiapoa book – and finally, at the highest altitude in the valley, the *C.solaris*. In 2002 the sp. Botija was described with the name *C.decorticans*. These numerous illustrations, together with the relevant descriptions, enable a comparison to be made not only between the outward appearance of these four species, but also between such details as rib count. Of the two overlapping species. *C.atacamensis* has an appearance comparable to *C.marginata* with a silver grey body, and 12-16 flat sided and slightly tuberculate ribs with areoles often very close together on each rib. The picture of *C.”sp. Botija”* on page 139, appears to display about 18-22 ribs, whilst *C.solaris* has 9-12 ribs which are much sharper than on *C.atacamensis* but with areoles not so closely spaced - 9-12 ribs according to the Ritter description. The rib count on the *C.ahremephiana* was described as 15-18 in the Charles' Botija article.

.....from R.Ferryman

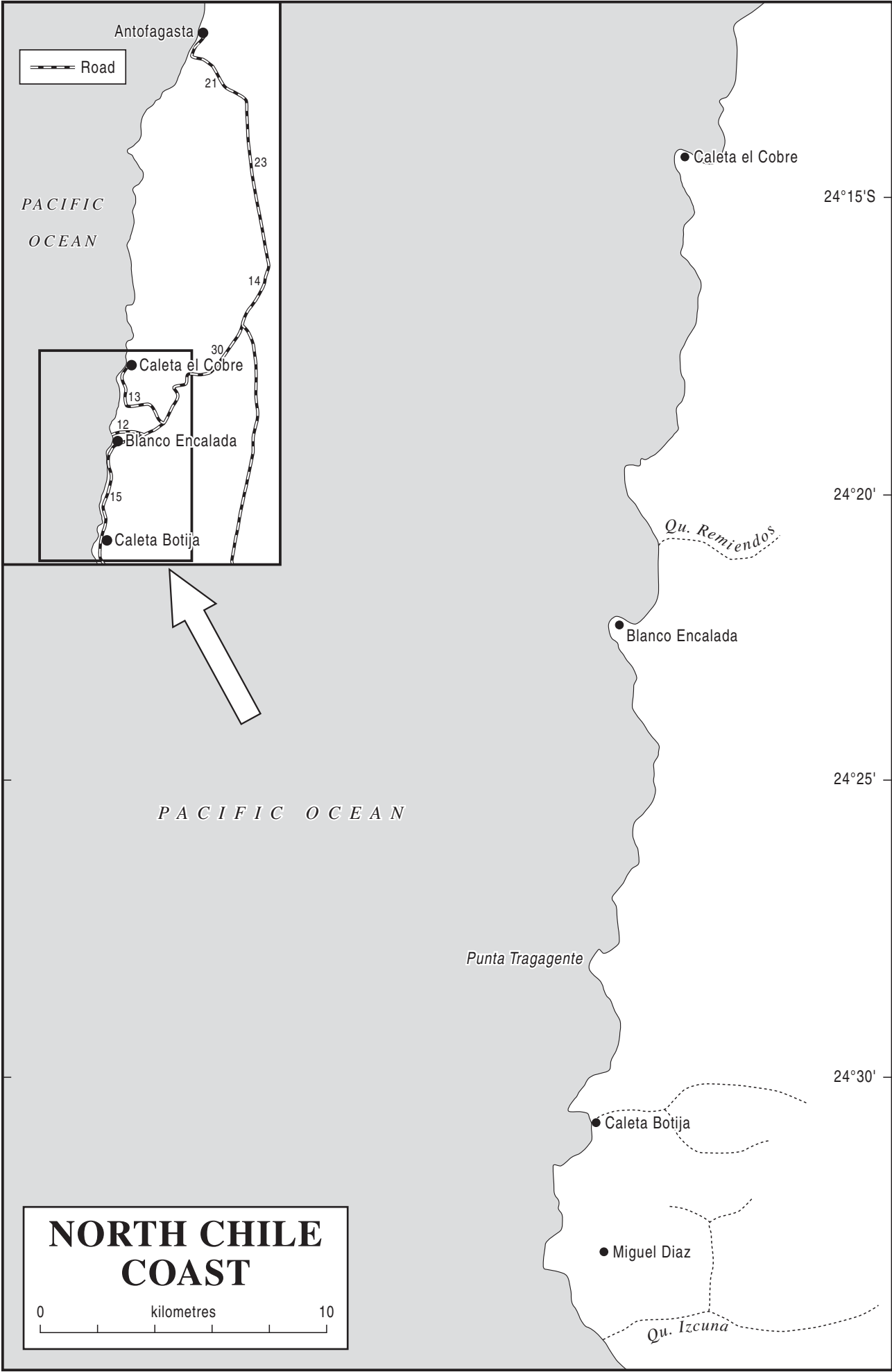
My own notes made from plants of RMF 53 *C.ahremephiana* seen in habitat would suggest a rib count of 14-16.

.....from H.Middleditch

However, there are illustrations which suggest a different rib count for RMF53 *C.ahremephiana*. In the Charles 1998 Copiapoa book there is an illustration (Fig.7) which is titled Copiapoa RMF53 in cultivation, which would appear to display about 20-22 ribs. Also the habitat pictures of this species in the 2006 Schulz Copiapoa book appear to display up to about 22 ribs.

In the Cactus World 2.2011 there is an article by H.Walter on *C.conglomerata* which includes an extract from the 1860 account by Philippi of his trip to this part of Chile. This extract commences with Philippi's own words “At 2.30 we left Miguel Diaz and reached Botija at a distance of 2.5 leagues”. This is followed in brackets with the words (1 league = 6-7km and about one hour's ride on paths) which might suggest that Philippi's mule train would proceed at a rate of about 6-7km per hour. This rate would appear to be confirmed by H. Walter quoting Philippi as “somewhat to the north of Botija, after an hour's ride - about 6-7km”. The Philippi extract then continues “At 6.00 we left the coastal path and reached Chagura de Jote at about half an hour from the sea”. From the 2.30 start and an arrival at 6.30 where they pitched camp at Chagura de Jote, this 4 hour trek at 6 to 7 km an hour would suggest that they travelled a total of some 25km from Miguel Diaz. Allowing for such as bends in the path, from the accompanying map it seems that they may have reached about 24° 24'S latitude. Looking at my own copy of the Philippi 1860 “Reise durch die wueste Atacama”, it is rather puzzling to be unable to find - on page 33 - these details quoted by H.Walter.

The Philippi extract is followed by a comment from H.Walter that “this shows that [the Philippi] *E.conglomerata* occurred at Chagura de Jote just 6-km to the north of Botija [although it is] reported more frequently further north [to the] south of Blanco Encalada at 24° 24'S”. This observation is hardly correct since the location quoted by Philippi in his 1860 description of *E.conglomerata* reads “inter loca Chagura de Jote c.24° 24'S m et El Cobre” i.e. at the quoted latitude at their camping site at some 20 km to the north of Botija. It may be advisable to bear in mind that the altitude quoted by Philippi for their camping site was at 400m. If this altitude is compared with the Schultz and Kapitany diagram of altitude distribution for the four species of Copiapoa to be found in these coastal hillsides, then at 400m this is at 100m above the altitude at which the



coastal *C. ahremephiana* (RMF53) is to be found and in the zone where *C. decorticans* occurs. Since Philippi in *Florula Atacamensis* 1860 quotes his *E. conglomeratus* from “rupibus litoralibus” which would be the coastal rocks, it would hardly be on the inland declivity included in the Schultz & Kapitany diagram.

However, there is yet a further possibility for establishing the location of the *E. conglomeratus*, as if the Philippi mule train proceeded at about 7km per hour, when they left the coast to reach Chagura de Jote, it would be the traditional route used then (and later) to travel from Taltal via Paposo to Antofagasta.

.....from Copiapo, Schultz & Kapitany 1966

At the Remiendios valley, the old road to El Cobre skirted inland to avoid the steep coastal cliffs and now a new road runs along the immediate coast from Blanco Encalada to El Cobre.

.....from F.Vandenbroeck.

From my visit to this part of the coast in 1983 I can remember a road leading from Blanco Encalada inland towards the Pan-American highway and Antofagasta. This road leads through a rather narrow valley. Here we found *Neochilenia paucicostata* v. *echinus* and *Copiapo atacamensis*. Another road leads from Blanco Encalada close to the ocean, towards the old copper mine of El Cobre. The coastal strip beside the steep high mountains is very narrow here and offers fantastic scenery. This road was in bad condition. Just before arriving at the ruins of the copper mine we saw specimens of *C. solaris* – groups of smaller freshly green plants with a shiny yellow spination. From the copper mine on the coast there was a very poor road going south-eastward inland to where it joins the forementioned road from Blanco Encalada. Along this road, somewhat above the fog belt, I found large numbers of *C. solaris* – greyish green plants about half of them which were starving or dead due to the excessive drought. The *C. atacamensis* seemed better adapted to the harsh conditions. It is a deserted world of solitude.

.....from H.Middleditch

Looking at my maps of this part of the coast of Chile, there are more than one which marks no coastal route between Blanco Encalada and El Cobre, just a route turning to head roughly north-west from a point only a few kms to the north of Blanco Encalada, then turning north when it had presumably reached the desert side of the coastal range of mountains, towards Antofagasta. This would appear to be the “old” road to which Schultz & Kapitany refer. It seems to be most probable that this “old road” was in existence at the time when Philippi was travelling up this part of the coast, in which case his party would pitch camp at about 24°19’S, and not at 24°24’S as Philippi quotes. Quite apart from no GPS being available when Philippi made this trek, of the scores of maps which I possess of countries and provinces in South America, most of them place latitude lines in rather different geographical positions as between one map and another. With this in mind, it would appear to be necessary to disregard the latitude quoted by Philippi in 1860 for his *E. conglomeratus*, and rely on the account of his 1860 trek to decide where this Type was found -apparently north west of the Remiendios valley.

Initially, I found the observation from J.Henshaw (above) about seeing *C. decorticans* in habitat with green bodies as decidedly surprising. Looking at the A5 size picture on p.139 of the Schultz & Kapitany 1996 *Copiapo* book of *C. decorticans*, the bodies of that plant appear to be a dirty brown colour. However, in comparison, the habitat pictures of this species in the 2006 Schultz *Copiapo* book on pages 31, but more clearly on page 30, are almost certainly greenish coloured bodies. The pictures of this species in cultivation in the 2006 book do display greenish coloured bodies.

.....from C.Sherrah.

As far as I know, *Copiapo decorticans* and *ahremephiana* are only to be found in the Botija valley, on the floor of the valley. The body of *decorticans* is green, as I saw in 2001, but as they age the stems turn woody and lose their green colour. Also with the difference in the coastal climate from year to year, in a dry year the plants become dessicated and the body is hidden by brown spines. From my diary I noted that these plants were in a poor condition in 2007 and less so in 2009 when they were stressed.

.....from P.Hoxey

The bodies of *C. ahremephiana* in Quebrada Botija have a grey-white coating, rather like *C. cinerea*. The *C. decorticans* which I have seen there quite definitely have green bodies.

.....from R.Ferryman

The *ahremephiana* /RMF53 which I have seen in Quebrada Botija most certainly have chalky grey bodies.

.....from R.Schulz. *Copiapo*, 2006

Copiapo ahremephiana (the *C. variispinata* of *Copiapo* 1996) has the white waxy epidermis similar to *C. atacamensis*.

.....from Maechler & Walter, K.u.a.S.56 (4) 2005.

The body of *Copiapo decorticans* is not frost-covered.

.....from H.Middleditch.

The appearance of the *Copiapo atacamensis* and *C. solaris* would appear to set them apart from the other *Copiapo* to be found in this part of Chile. It would appear from the various observations above that both *C. ahremephiana* and *C. decorticans* may display a rib count of up to about 22, but at the same time the habitat observations would attribute a grey, blue-grey, or chalky grey body to the *ahremephiana* and a green body to the *C. decorticans*. Since Philippi described his conglomerate as having a green body – “viridis” - it would appear that it would be what has comparatively recently been called *decorticans*. Hence, it is possible that *Copiapo decorticans* is a synonym of *Echinocactus conglomeratus* Philippi 1860 (non *C. ahremephiana*), named *Copiapo conglomerata* by Lembecke.

....from F.Larsen.

Copiapo grow in the northern part of Chile along the coastline next to the Atacama desert. These plants



The Remiendos Valley - about half way between the coast and desert

Photo: F. Vandenbroeck



Copiapoa solaris in Quebrada Izcuna

Photo: P.Hoxey

have managed to survive in a special ecological niche where the climate has become increasingly more and more dry. Today we only find remains of these Copiapoas close to the Pacific coast where there is still some humidity in the regular fog but very seldom a drop of rain. The soil can get humid or even wet on the surface from a heavy fog.

.....from F.Vandenbroeck, *Succulenta* 65 (2) 1986.

It has for some time been accepted that the already decidedly desert character of the northern Atacama area is gradually becoming more extreme. Because of the steadily increasing dryness of the climate in these areas and the consequent even less prevalence of mist, the plants may find themselves in a zone where little moisture penetrates. This would explain the damaging and extensive drying-out of plants. It is no imagination that, if the present climate evolution continues, various plant species in this area will find their very existence threatened. The currently present species will, in the opinion of some researchers, be nothing more than relics of an earlier time of much richer variation.

.....from R.Schulz, *Copiapoa* 1996.

It appears that these northernmost Copiapoas are under severe environmental stress from centuries of long term drying of the climate and their current populations are relics of a once larger distribution.

.....from H.Middleditch.

Few cactophiles who have visited this coast appear to have taken the old road going north-east from just north of Blanco Encalada, seemingly ascending the Remiendios valley. It would naturally be interesting to know if there were any *C.conglomeratus* still to be seen at about 400m altitude along that route. However, in view of the comments about steadily increasing aridity of this northern coastal area, it is quite possible that there are no remaining specimens to be found there. It would indeed be of interest if any cactophile on a field trip to this area was prepared to take this old road and stop at about 400m altitude for a dedicated walk-round the hillsides to try and find any remnants of *Copiapoa conglomerata* at the Philippi type location. However, it would not really be too surprising if the drying-out over the past one hundred and fifty years had left no trace of these plants.

.....from A.W.Craig, *Chileans* No.53

It was in October 1994 that I made my first visit to Chile and a further trip was made in 1995 when we went as far north as Blanco Encalada and El Cobre. From Paposo we followed the coastline. In the vicinity of Blanco Encalada we took the road going inland which passes through the coastal mountains, coming out on what was virtually level terrain, to the spot where the roads from Blanco Encalada and El Cobre come together.

.....from H.Middleditch

Evidently the "old road" was open for traffic in 1995.

.....from R.Schultz.

On my first visit to this area I missed seeing any signs of the "old road" that heads inland a few kms to the north of Blanco Encalada. But during 1996 I did spot a few remains of this road, but it appears to have been washed out a few years before. After the heavy 1997 rains just about all of the lower part was washed away, as it was built in the stream itself, so it did not take much to ruin it. I was shown the upper part in 2001 – it was still just drivable for about 4km below the junction with the road to El Cobre, where it is too high for cacti. But lower down we found *solaris* and then *atacamensis*, both healthier than along the El Cobre road. We did not find any of the *C.aff.paposoensis* that I am familiar with from the higher elevations at Botija, as I think Ritter mentioned this species going inland from Blanco Encalada.

.....from F.Ritter, *Kakteen in Südamerika*.

FR 1148 *Copiapoa paposoensis*. (Full description given). Type locality about 20km north of Paposo, from about 1100m altitude where the fog belt is only weak. The *C.paposoensis* begins here with its juicy, green, and hardy stems and goes up to 1300m where no fog occurs and the desert begins. Further to the north near Blanco Encalada, the hardy *C.solaris* and the even harder *C.paposoensis* occur beyond the fog belt where the weather is sunny for most of the time and where there is great aridity. The FR 1148 found by me in 1956.

.....from H.Middleditch

Might this suggest that Ritter had either walked or driven up the "old road" in 1956? But no indication of a possible *C. decorticans* at about 400m altitude. In the continually increasing aridity in this area, would any *C. "decorticans"* still exist after the lapse of some hundred and sixty years since Philippi found his *conglomerata* here? The position of the "old road" leading inland from just north of Blanco Encalada may be seen on the inset to the accompanying North Chile map – this latter being provided to make it easier for any reader who wishes to do so, to use Philippi's mule train speed and time travelled to plot where he would probably be when he stopped at Chagura de Jote.

.....from R.A.Philippi, *Journey to the Atacama Desert*. 1853-1854.

At 2.30 p.m. we left Agua Miguel Diaz. The vegetation decreased markedly on from here. In the valley of Botija lived the uncle of our guide and muleteer with his wife and children. He was engaged in collecting the water which occurred here and in taking it down to the beach for transport by boat twice a week to El Cobre for the mules used to bring the ore down there. Beyond the odd *Echinocactus* there was not a trace of vegetation in this desolate grit and rubble. At 6.00 p.m. we left the coast, going uphill to look for a campsite for the night. We passed a valley that had sheer sides, in which grew a few columnar cacti. The wood of the cactus was our firewood. Water was completely absent. The place is called Chagura de Jote, lying at 400m above sea level and half an hour from the sea. The following day we set off at daybreak and after some 3 and a half hours' sharp riding we caught sight of the tip heap of a copper mine. We rounded a small foothill and came to a little bay – and finally the establishment of El Cobre.

.....from H.Middleditch.

To the north of Botija, the only route going up from the coast to the desert is along the Remiendos valley in which Chagura de Jote lay, where Philippi probably found his *Copiapoa conglomerata* with a green body and about twenty ribs – perhaps today's *Copiapoa decorticans*. This would be about half way up the Remiendos valley. I have in my possession a copy of a map which purports to show the route taken by Philippi during his visit to Atacama, but the route is shown going inland from Botija, then across the desert to the main range of the Andes. This does not seem to fit with only "leaving the coast at 6.00p.m." and certainly would not take the party to El Cobre.

.....from Royal Botanic Gardens, Kew.

The map which you sent to us is a reprint of that which appears in Philippi's original "Reiche durch die Wüste Atacama" which we have in our library.

.....from H.Middleditch

As this was the very first occasion when Philippi visited this newly-acquired piece of Chilean territory, is it possible that his plot of his route may not be correct?

Any queries, observations, comments, or ideas from readers regarding the nature or location of Philippi's find would be welcome, such as any observation of a valley leading inland from the coast anywhere between Botija and Blanco Encalada, seen in the course of a field trip to that area. Also the meaning of 'Chagura de Jote', which could possibly be in the local indian dialect.

PARODIA IN BRAZIL? By F.Ritter Kakteen in Südamerika.

At the beginning of the sixties I struggled with the idea of writing a monograph of the genus *Parodia* with colour pictures of flowering specimens of all known species. At that time there was also the species *P.gummifera* published, from north-east Brazil, which could not be omitted, although I was very doubtful whether this species really was a *Parodia*. There were none existing in cultivation at that time and the quoted habitat location, which was stated to be Penha de Franca in Minas Gerais, had not been searched again. I undertook a trip there in 1964, by bus and on foot. I did find them and saw immediately that they were a new and different genus in front of me, which I called by the name *Gummocactus* in my notes.

Because I could not come to Brazil with my wagon, I was extremely limited in my habitat travels there, since in this scantily inhabited area there were bus routes in the more extensive flat lands between the high mountains. I would willingly have searched other tempting mountain districts in other areas, but as I lacked my own vehicle for the distances involved, it would have cost me day long marches and in that event great difficulty in finding overnight accommodation in this rain-rich area. Later, Horst, in his own wagon, sought out the adjoining area and found more species of the same new genus which created a sensation in the cactus world.

.....from R.Mottram

Parodia gummifera was first described in 1949 in Vol.IX of the Archives of the Jardim Botânico of Rio de Janeiro, by Backeberg & Voll, where it is noted that this plant was found by Dr.Mello-Barreto in 1938 in the Serra Ambrosia in the State of Minas Gerais. This article was accompanied by a photograph of one of these plants in cultivation.

.....from J.C.Hughes

The Serra Ambrosia lies near Penha de Franca, which is within the area where we now recognise that *Uebelmannia gummifera* is to be found.

UEBELMANNIA. By A. Wroblewski Translated from Swiat Kaktusow 1967 by K.Prugar

Indefatigable South American collectors of cacti find new varieties every year, but seldom has a new discovery made such a sensation as that of *Uebelmannia* in 1966. These plants were found in Brazil and sent to Europe by the collector working for the well-known importer of cacti, W.Uebelmann from Switzerland. The proposed provisional name is *Uebelmannia*, not after the collector but after the person who organised the expedition,

The news of this new discovery went quickly round the world and all well-known magazines printed the news with extensive comments and photographs. These are some of the quotations "This plant is one of the biggest surprises of the last few years" (*Kakteen und andere Sukkulente* November 1966) - "It is not an exaggeration to say that this discovery is a sensation the plant is really beautiful" (*N.C.S.S. Jnl*, September 1967).

During my visit to Switzerland in the Spring of this year I was fortunate enough to see in Wohlen (near Zurich) the Uebelmann collection and to view the new discoveries. I want to share with the readers of "Swat Kaktusy" my impressions and my knowledge of *Uebelmannia*. The South American collector found less than only a hundred specimens of this plant. All of them grew in one small group at the height of between 1000 to 1500m. above sea level. All the plants were dug out and sent to Europe, so at that time Uebelmann was the only person in the world who had this type of plant.

At the beginning of this year, the collector was fortunate enough to find another group of *Uebelmannia*, but Uebelmann asked only for part of those, and the rest were left in their habitat. When I was with Uebelmann, he received that second batch and I took a photograph of him with the opened box of new plants.

Uebelmannia is quite a big plant. The largest plants I have seen are about 15cm in diameter. Young plants are spherical, the old ones are slightly elongated, rather cylindrical in appearance. The plants that I saw have 10 sharp ribs. It seems that the number of ribs increases with the age of the plant. I noticed that on some of these cacti there were new ribs forming at the top of the plant. The skin of the new growth is purplish brown. After some time the skin gets white speckles like an *Astrophytum*. On the sharp edges of the ribs, greyish areoles form one continuous line. The spines growing upward from the areoles are about 10mm long and make a kind of dense comb along the rib. New spines are black, older ones are grey-black.

We will have to wait to see the flowers before we can classify this plant. It looks a bit like an older specimen of *Astrophytum* and it also reminds me of old plants of *Copiapoa* covered with a greyish-white patina. But *Copiapoa* grow in a restricted area in the north of Chile, more than 1000km away.

All point to the fact that *Uebelmannia* is a new plant. It is obvious that Uebelmann wants to pollinate the flowers to obtain fruits and to make the botanical description of this new plant, by himself. Because of that, he does not part with any specimens. He told me that he declined huge sums of money offered to him for the new plant. Nevertheless, he donated a few specimens to Botanic Gardens. I saw *Uebelmannia* in the Zurich city collection and in the collection of Prof. Rauh at Heidelberg. Uebelmann likes the new plant so much that he suggests for it the name: *Uebelmannia magnifica*. I learnt that recently two new varieties of *Uebelmannia* have been found, which are not named yet.

.....from G.O.K Newsletter November 1980

(Report of slide talk given by I.Markus to local branch)

Travelling north from Belo Horizonte towards Diamantina, near Serra, about 40km before Diamantina, there grew some *Pilosocereus werdermannianus*, as well as *P.meninensis* with blue fruits. Before Patos is the habitat location of *U.pseudopectinifera*, close by Bromeliads, Orchids, Tillandsias, and Hechtias. Among the *Uebelmannia* we found some extremely large plants up to 50cm tall and 20cm in diameter. After a short stay in Diamantina, we went out again into the mountains and there *Discocactus placentiformis* was to be found. In the vicinity were more *Pilosocereus meninensis* which were in flower.

.....from A.Hofacker

I do not know of any Serra or Patos on the approach to Diamantina. But perhaps it may have been Serro and Datas, which are both villages which are on a typical route going from Belo Horizonte to Diamantina.

.....from J.C.Hughes

It was in January of 2002 that I was lucky enough to be able to go to Diamantina, in Brazil, which is an ideal starting point for exploring the *Uebelmannia* habitats. Visits to three habitat locations were made using the services of Eco Tours, which operates at weekends, who have a jeep which is ideal for such trips, especially for travelling along dirt roads. January is the summer in the southern hemisphere but over much of Brazil it is also the season of the rains, so my observations may be different to those who travelled in other seasons.

To get to the first site that we visited from Diamantina, we crossed the Rio Jequitinhonha and then turned off along a track, stopping near a bridge crossing a small stream, which had very probably been visited earlier by M.Machado. The vegetation near to the stream was quite sparse, probably as it was growing in almost pure sand. Above this there were dark red rocks where some detritus seemed to have been deposited in the cracks and hollows, in which the cacti and various other plants had taken root. To either side of this rocky patch, the vegetation gave the impression of being like a jungle. I would think that this rocky clearing would be almost the size of a football pitch.

This gently sloping rocky area was partly shaded towards the summit by dwarf shrubs. Over this rocky area there were *Uebelmannia* to be seen, which grew mainly in the collected debris wedged in between the rocks. Looking at my photographs which were taken at this spot, I would be inclined to say that the tallest *Uebelmannia* that I saw there may have been about 50cm in height. It was very scarred and appeared to have been burnt at the base by some fire that had swept through here. These may have been *U.pectinifera* v. *multicostata*. There were also a few *Cipocereus* growing here, most of them with pale blue fruit.

There had been heavy rain overnight. One had to be very wary, when walking over the rock, of the darker patches which appeared to be some type of lichen which was particularly slippery when wet. The whole impression of this habitat in that season was of a stony outcrop in the jungle. Apparently at one time the *Uebelmannias* had also grown in the sand near the stream, but I expect that those would have been more easily collected out. The altitude there was about 600m.

We then turned back across the Rio Jequitinhonha and took another turning up a dirt road, which followed the river for some way, veering off through a small hamlet before we pulled up on the roadside verge. Here we would again be about 35km to the east of Diamantina. We approached the second site along a winding path which criss-crossed a small stream. At this site, the underlying ground near the stream was sandy and I noticed a lot of quartz spoil here, which may have been indicative of some mining operation. The slope consisted of a red-black rock similar in appearance to that at our first stop, although it carried much more detritus here and the rocks were generally more open. The tops of the hill were spectacularly jagged, almost as if of limestone, but the main surface of the hill slope was shiny and slippery. We really searched in only parts of two slopes of the hill here so there may have been further plants on the remaining slopes.

There was perhaps less vegetation here than on the rocky area at our first stop, but the vegetation at the sides of this patch was more scrub-like than jungle-like. There were large patches of *Vellozia* growing in the accumulated debris, some of which was at the base of the loose boulders on the hillside. There were more *U.pectinifera* to be seen here than at our first stop, the tallest that I saw - judged from one of my photographs - being about 40cm tall, growing on a ridge above a stream that ran down the hillside. Again there were *Cipocereus* to be seen in fruit, one plant also having a single spent flower. Also to be seen there were



A habitat of *Uebelmannia gummifera* near to Itamarandiba. The plants grow in white quartz sand in a forest of *Vellozia*

Photo: G. Charles



A habitat of *Uebelmannia pectinifera* near to Diamantina. This locality has been heavily collected and few plants remain. You can see a single plant bottom right. Photo: G. Charles

Pilosocereus aureisetus, some with fruit.

We found a further distinct population of *Uebelmannia*, this time *U. flavispina*, out to the west of Diamantina, at about 1200m altitude. Here they were growing on a much more gently sloping rocky terrace which lay a short walk away from the road. This was in the midst of an area covered with low growing grass that was about a foot high. It did not appear to be used for grazing and was certainly not in use as farmland. It was difficult to estimate the extent of this site as being gently sloping and surrounded by apparently similar grass vegetation there were few useful marker points to judge distance, but my best estimate would be that this site may have been about the size of a football pitch. At this same time of year there was much more verdant grass to be seen further to the south in Minas Gerais. Perhaps the sandy nature of the subsoil at this site and lower rainfall may account for the difference.

This rocky terrace had patches of accumulated detritus as well as shallow indentations in the rock which acted as pools, in which the previous night's rain still lay. There were some patches of shrubby vegetation on parts of this rock terrace. Looking at the photographs which I took there, I would think that the *Uebelmannia* did not exceed 30cm in height. There were also a few *Pilosocereus aureisetus* in fruit here.

Well beyond the stone terrace and close to a rocky cliff (or localised ridge) we found some *Discocactus placentiformis* growing on a flat patch of what appeared to be almost pure sand, together with sparse clumps of the low growing grass. The bare sand was readily visible between the clumps of grass and between the grass and the cacti. The *Discocactus* were up to about 18cm across and most of them had cephalia. The flowers would come out at night, but I could see no floral remains. It is quite possible that more of these *Discocacti* may have been growing in the surrounding grassy area.

.....from A.Hofacker

We have made several visits to that part of Brazil where *Uebelmannia* are to be found, and we have come across these plants at about thirty different places. At some of these locations there are only a few plants to be seen on a small area, but at other places the *Uebelmannias* extend over quite a large area of ground, with thousands of plants. Most of the places where we found these plants are close to a road and surrounded by tall and fairly dense vegetation through which it would be difficult to walk. So there could be a great many more places where *Uebelmannias* do grow, in between those places where they have been seen. Between Diamantina and Sitio, for example, there is a large area of Minas Gerais which is completely lacking in roads and so it is quite inaccessible. Consequently it is my belief that *Uebelmannias* are far more widespread within their overall distribution area than we know today.

The main hazard to the continued existence of these plants is not from collectors, but from fires which sweep over their growing places fairly often in the dry season of the year.

The main area of distribution of *Uebelmannia* is around Diamantina, from Mendanha in the east, to Conselheiro Mata in the west, and southwest to Datas where the *Uebelmannia* of the *pectinifera* group are to be found. The highest of these plants that I have seen were about 70cm tall, but there is a legendary picture of *Uebelmannia pectinifera* in the company of Leopold Horst, at a place near Mendanha where the *Uebelmannias* are more than one metre tall. They grow in the region around Mendanha and Inhai (east of Diamantina) where their habitat lies at about 700-900m altitude. Those *Uebelmannias* that grow around and to the west of Diamantina are at habitats lying at about 1200-1400m altitude and these plants are not as tall as those around Mendanha. It is my view that this can be accounted for by the UV light, as there would be more UV light at the higher altitude, where all the other vegetation is lower growing and more open than at lower altitudes. The *Uebelmannias* at these higher altitudes become flatter and less tall than those at lower altitudes.

At higher altitudes the vegetation is Cerrado, the same as at lower altitudes, but at the higher altitude there are mostly low growing to only modestly high shrubs, bushes, and trees, with open rocky places and often huge areas of open grassland, especially to the west of Diamantina. At higher altitudes the *Uebelmannia* grow mostly not in the open places but more under, or close to, shrubs. They can even be found in the dense forest areas, but in either circumstance it is perhaps the reason why they are not easy to find - and also they usually grow in smaller groups with not many plants, not over a large area.

The Type location for *U. horrida* is about 50km (as the crow flies) to the NW of Diamantina, at Engenheiro Dolabela. But we also found this same sort much further to the north, to the south of Bocauiva, not too far away from the little village of Sitio. Funnily enough, close by there grows a short spined form of *U. multicostata* which is also known under the number HU 1400.

The other group of *Uebelmannia* (*meninensis*, *buiningii*, and *gummifera*) is to be found to the NE of Diamantina, near the villages of Pedra Menina and Penha de Franca.

On every one of our visits to this part of the province of Minas Gerais I have always seen *Uebelmannia* in flower, but on each occasion we have been there in August to September time. So I cannot make any factual observations about the duration of their flowering period in habitat. But sometimes we also found seed pods which would have needed a further 3 to 5 months before they were ripe. This would suggest that their flowering season is longer than just a few weeks. In cultivation we know that, most of the time, there are flowers on *Uebelmannia* twice a year. And also the *U. gummifera*, *meninensis*, and *buiningii* flower about a month earlier than those of the *pectinifera* group.

.....from G.Charles.

My visits to Minas Gerais have been made in winter - in June or July as it is far too hot to travel there in summer. At a number of places near Diamantina we were able to find plants of *U. pectinifera*. There were a few flowers to be seen as well as occasional fruits, which might suggest that it flowers in late autumn - not in the hot, dry summer, even though it can get quite cold in the winter at this altitude of about 1000m. Both *U. gummifera* and the similar *U. meninensis* were seen in flower in June and ripe fruits were also found on both.

In cultivation I can only grow *U. gummifera* and *U. buiningii* successfully on grafts and they are kept dry over winter, but watered in summer, which is when they flower. My *U. pectinifera* are not grafted and they are given occasional careful watering in winter when they are kept at 15°C and they flower sporadically in winter. The easiest to flower is the golden-spined form known as *U. flavispina*. None of my plants have set fruit in culture since I assume they are self sterile and I have never had the chance to cross-pollinate individuals.

.....from R.Gillmann

My *Uebelmannia* are grown in a closed-off warmer part of the greenhouse, which is kept at 60°F, along with my *Discocactus* and *Buiningia*. In the winter, from October to March, I give them the occasional dribble of water, provided the weather is not very dull, cold, and damp. They are not given any water for the rest of the year. I have grown *Uebelmannia* from seed and I do have several very young plants that are only one or two years old that are grafted but the others are on their own roots. My *U. crebispina* is 6 inches tall by 4 inches in diameter and it has flowered for the last three years, but hardly grown in that time. The *U. pectinifera* is 4 inches tall and 2 inches in diameter, whilst *U. pseudopectinifera* is 3 inches tall and 2 inches in diameter, both having flowered for the first time last year. The flowers appear in the winter, during the watering period, and are a greenish yellow in colour. No fruit appears to be formed, but I have found a few - very few - loose seeds in the crown of one plant, late in summer.

.....from K.Doble

From my first sowing of *Uebelmannia* seed in 2002, I now have six *U. pectinifera* which are almost globular and 4cm. in diameter, and one HU 642 *U. flavispina* which has grown to 24 cm. tall but only 3 cm. thick, which looks very peculiar. From my 2005 sowing of ex-Kohres seed, I have plants of HU106, HU 108, and HU 406 *pectinifera v. flavispina*. From Mesa Garden seed of MG 1302 sown at the same time, I also have *U. buiningii*, but these are very variable, some now looking more like *pectinifera* than *buiningii*. In addition, I have a *U. pseudopectinifera* "ammatrophus" which is globular, about 3 cm in diameter with 14 ribs, as well as an *U. pseudopectinifera*, now about 5cm. in diameter which had 14 ribs when I purchased it but now it has a further 14 ribs.

The compost which I use to grow these plants is totally inorganic. The ingredients are decomposed granite, crushed river gravel, and pumice. Both the river gravel and the decomposed granite is sifted to below 5mm in size. The pumice is about 4 to 7mm in size, of a flattened egg shape. The mixture consists of 2 parts of granite to one part each of the pumice and the gravel. For seeds and seedlings this mixture is sifted down to 2.5mm in size.

Seed is sown in September or October when the daytime temperature in this part of Australia ranges from the middle twenties to thirty degrees Celsius, with night time temperatures usually not below 11 degrees Celsius. The pots with the seed are then put into a shallow plastic box with a transparent lid, and watered at ten day intervals with Furoloxy, as well as with occasional low-nitrogen liquid fertiliser. Once any pots show germinated seed they are put on the bench. If there is any sign of moss, a 25% solution of vinegar in water is used to kill it off and this may have to be repeated periodically

.....from A.Hofacker

I grow all my *Uebelmannias* in a heated greenhouse which is specifically for my cacti from north-east Brazil. The *Uebelmannia* of the *pectinifera* group will tolerate a winter temperature of 10°C, possibly surviving even at 5°C, but it is better not to keep them in temperatures lower than 10°C. Plants of the *gummifera* group need higher temperatures in winter, possibly the best temperature for them is 15°C. I do have many *Uebelmannias* of flowering size, which are watered all year round, but only given a few dribbles of water during the winter months. They do flower regularly in the period from December to February, but I never get fruit to set even when I pollinate them. I suspect that this may be due to the lack of good sunshine during the winter so that the pollen does not function as it would do in summer. Even using pollen off *Piereskia* flowers to try and stimulate action from the *Uebelmannia* pollen is not successful.

.....from J.Arnold

A section of my greenhouse is heated to 50°F in winter for cold sensitive plants like my *Uebelmannia* which seem to be better able to resist less warm conditions than *Discocactus*. Unfortunately it is not in the sunniest position. The *Uebelmannia* - even those which are grafted, are not given any water during the winter months, from about mid-October to mid-March. It is in March, shortly after starting watering, that flower buds start to appear on my *U. pectinifera* which will then put out a few flowers, followed by a gap of 2 or 3 weeks, when another few flowers will appear, and so on for a period of months until just past the end of September, when the plants are no longer being watered.

.....from R.Zahra

Our climate conditions here in Malta are so different from those in the UK that we keep our plants in a greenhouse with all other cacti and with no special conditions for such as Brazilian cacti. Our greenhouse is not heated at all, even in the winter. Even in the winter we shade our greenhouse because of the intensity of the sun and the number of sunny days that we have. I always keep one small window open because if I do not, the temperature in the greenhouse will remain too high at night and that would stop certain cacti from flowering later on. As I do not keep any records, I am unable to tell you what the temperature is in the greenhouse in winter. But I can tell you that in winter I work in my greenhouse in my shirt sleeves even though I need to put a jacket on when I am going out.

We normally graft our *Uebelmannias* because our local compost is very alkaline and our other choice is a peat and sand mixture. If we graft our Brazilian cacti we can grow them using our local compost, which is less expensive and lasts longer. Seedlings of *Uebelmannia* are first grafted on to the growing tips of *Hylocereus undatus* and then when they are two years old they are regrafted on to *Trichocereus terscheckii*. My experience is that they start to flower when they are about four years old. Our Brazilian cacti have a habit of flowering in

winter which is when our plants are kept bone dry - my *Pierrebraunia bahiensis* and *Micranthocereus polyanthus* both had flowers in January. Both of them were cross-pollinated by hand and both of them set fruit.

I am growing all species of *Uebelmannia* except *U.pectinifera* v. *horrida*. The species that flower are *U.curvispina*, *U.brevispina*, *U.multicostata*, *U.buiningii* and *U.meninensis*, but there have never been any flowers on *U.gummifera*. My *Uebelmannias* are kept dry between November and March, but the buds on some of those plants appear in December or January, even before I start to water them. And not only flowers can appear before I start watering but fruit can also even be set. The flowers of *U.pectinifera* are much smaller than those of other species of *Uebelmannia* - they can be compared with those of *Melocactus* in size and shape. The flowers of *U.buiningii* and *U.meninensis* are much bigger and open wide.

To obtain seeds, flowers on one plant are cross pollinated with those on another plant of the same species. A brush is not used, but some anthers are removed with a pair of tweezers and these anthers are then put on to the stigma of the flowers of the second plant. My local friends produce lots of seed on their *Uebelmannia* which they then sell to seed distributors in several countries. We all use the same method of pollination because by doing so we will be 99% sure that no foreign pollen is carried from the flower on one plant to another.

.....from A.Johnston

I am growing about twenty *Uebelmannias* of adult sizes, as well as quite a number of younger seedlings. These plants all grow in my usual compost of 3 parts of John Innes No.2 with one part of quarter inch size grit - nothing special. They are all solitary, they all grow well, and many of them flower. They are kept in a separate compartment in the greenhouse, where they grow with *Discocactus* and Brazilian cereoids. This section is heated to 58°F during the winter by means of a soil warming cable. When I first acquired a few *Uebelmannia*, I grafted one or two on to *Trichocereus* stocks, in case I lost any on their own roots, but I now find that they do grow quite well without grafting them. Some years ago I came across an idea that it improved plant growth to use a well diluted phosphoric acid for watering cacti. But I stopped using it after trying it for a year or two as it seemed to make no difference to the rate of growth or flowering of my *Uebelmannias*.

One of the first *Uebelmannias* that I acquired was an *U.pectinifera*, which is on its own roots and is now over 8" tall and 5" wide and, like another plant of this species which is not quite as large, it has a body of dark purple colour. But another *U.pectinifera*, also on its own roots, of over 6" high and 3" wide, has a body of a distinctly green colour. These plants have about 15 ribs, whereas by comparison an *U.flavispina* that is nearly 10" tall by 4" diameter has about 36 ribs. Together with *U.crevispina* and *U.multicostata*, these plants would appear to form a group, whilst *gummifera*, *meninensis* and *buiningii* form a second group.

Initially, flowers on my *Uebelmannia* were few and far between, but now most of the mature plants will flower each year. The flowers on *U.flavispina* have a citrus-like fragrance when they open which is evident when entering the greenhouse. But none of the flowers on any other of my species of *Uebelmannia* seem to have any scent at all. My plants are kept dry over winter and any buds will usually appear after I start watering, which will be about March. But my *U.flavispina* flowers on and off several times a year, usually with two or three weeks between one flowering and another, even in November or in February, so that it can be carrying flowers and fruit at the same time. By comparison, most of my adult plants only produce flowers once in each year.

Flowers are not all the same size and shape on all species. One of my *U.pectinifera* has spines that are longer than those on my other plants of this species, so that the flowers are not able to open their petals fully due to the surrounding spines and are only quarter of an inch across. On my other *U.pectinifera*, with shorter spines, the flowers do open wide. But there have never been any flowers on my *U.meninensis*, *gummifera*, or *buiningii*.

When there are one or two plants of the same species out in flower at the same time, I cross pollinate them with a small brush and this often results in fruit being set. But when my *U.crevispina* was out in flower there was no other plant of this sort in flower to cross pollinate it with, so I merely tried using the brush to pollinate itself and it did set fruit. And some of the seed did germinate. On another occasion, with just one single plant in flower, with only one flower, it did set fruit itself.

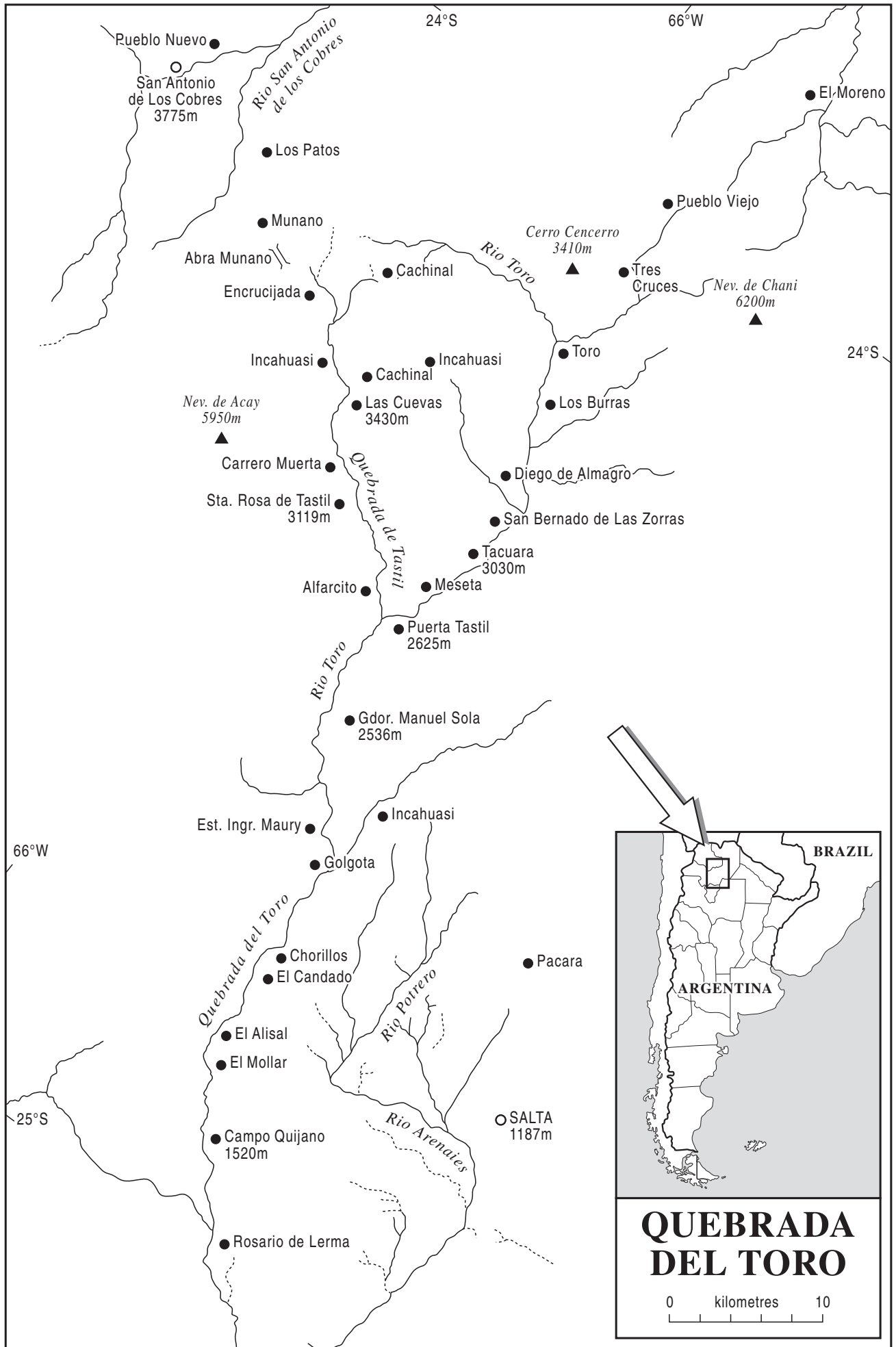
The fruit which sets on my *U.pectinifera* is red in colour, but they are not all of exactly the same size, being about one inch tall and half that in thickness. On *U.flavispina* the fruit are about the same height but rather slimmer. In one of these fruit there were as many as 44 seeds and germination was also quite good.

FINDING PYRRHOCACTUS UMADEAVE. From R.M.Ferryman

Travelling up the Quebrada del Toro towards Puerta Tastil, in north-west Argentina, the *Trichocereus* were very dominant giving a real cactus scene to the landscape. Then *Pyrrhocactus umadeave* appeared, at first modest in size but later on I was to discover many locations for this superb plant, including establishing itself - along with the *Gymnocalyciums* and the *Trichocereus* - on the soft, sandy river bed areas. The river itself was now less than one metre wide and running quite close to the westward slopes.

The best stands of cactus stretched back into the mountain and amongst the *Trichocereus atacamensis*, in a light clayish soil with a good deal of rocks strewn around, could be found *Pyrrhocactus umadeave*, *Parodia stuemeri*, *Gymnocalycium spegazzinii*, *Lobivia haematantha*, and two or three *Opuntia* forms. With the exception of the *Lobivia*, all the species were found in flower and the *Pyrrhocactus* were exhibiting rings of newly formed fruit.

Making our way still further to the north, we visited Puerta Tastil - the basin spreads to its widest at this point where the road turns off towards Pueblo Viejo. Most of the above mentioned cacti are happy on the flat ground here, except for the *Parodia nivosa* which can only be found on the rocks on the vertical cliffs.



Continuing towards Santa Rosa de Tastil, the valley became much narrower and the road now ran at the base of vertical cliffs, on which we again found *Parodia nivos*a. The pure white spines seen on these plants lower down the Quebrada were now mixed with dark brown forms. Yet everything else about these plants - including size - remained the same, but no flowers or fruit. On the flat ground, or where the incline was less severe, *Pyrrhocactus* were to be found along with *Tephrocactus* species which were very similar in form and habit to those that I had seen on the Chilean side of the border.

Continuing from Santa Rosa de Tastil, towards San Antonio de los Cobres, the pass became narrow and steep. Soon the previously familiar sight of *Trichocereus* stretching into the distant mountains makes way for precipitous cliffs and tortuous bends. Ascending these cliffs brings one almost immediately into contact with *Parodia nivos*a whilst *Pyrrhocactus umadeave* and *Trichocereus* inhabit relatively small flat and gently sloping areas.

As the afternoon drew on, the temperature dropped sharply and we pitched our tent in the small hamlet of El Huaco. Next morning we continued our journey, observing *Pyrrhocactus* and *Trichocereus* en route. Shortly before Las Cuevas, the road enters upon a plateau – on one side a highland plateau complete with grazing Alpaca. Flat and stretching into the distance it appeared to be very moist in places. On the other side, where the gentle slope took immediate effect, the area was covered with marvellous *Pyrrhocactus umadeave*. Again, all sizes were to be found, in flower and with newly formed fruit. Here we were at 3400m but these plants were in exactly the same stage as those we had seen at 2200m.

Continuing up the incline, we came across large plants of *Lobivia chrysantha*, flat to the ground and bearing short flower buds. Into the rocky outcrops we also found *Parodia* – *P. faustiana* according to the books but I can only see a higher form of *Parodia nivos*a, although here no white spined plants were to be found. Again, they were in fruit.

Continuing further north, the road ran along a fairly steepish hillside, from where I went down to a small ravine with a modest shallow stream, about one metre wide. On the rocky cliffs alongside the road I wandered in search of *Rebutia einsteinii*. *Tephrocactus* were to be found, which were again very similar to those growing across the border in Chile. Also amongst the rocks were beautiful specimens of *Soehrensia bruchii* with its yellow or reddish spination.

On another occasion we took the route from Purmamarca, in the Quebrada Humahuaca, which goes westwards towards San Antonio de los Cobres, passing the southern edge of the Salinas Grandes on the way. Turning off to take the side road to El Moreno, at 3880m altitude, and not far from El Moreno, we found *Pyrrhocactus umadeave* growing on flat, barren sandy plains with only the association of *Tephrocactus*. Further along the valley and into the hills, only *Echinopsis* and *Trichocereus* were to be seen, but no *Pyrrhocactus*,

The populations of *Pyrrhocactus* in this area are under intense pressure because of local collecting, where the plants are used to adorn locally made pottery. Numerous examples were to be seen for sale in the markets of Tilcara, Purmamarca, and Humahuaca during my visit there in 2001. Confirmation of the continued collecting activity was obtained when I approached local people on a later visit to this area.

The populations of *P. umadeave* beyond Santa Rosa de Tastil are also vulnerable due to the collection of the fine quartz sand in which they grow. Two known locations in this area have been wiped out during the past four years, as I have seen for myself, and similar areas look threatened as the collection of quartz sand continues.

These *Pyrrhocactus* plants are extremely impressive and it enwraps its body with curved straw coloured spines. All populations display consistency of all detail, differing only in the strength and numbers of the spination. They may grow to a size of up to 30cm across – and flowering is usually to be seen on plants of 8cm across, or larger. The flowers are a short funnel form and yellow to white in colour. The fruit and seed appears to be unique among the Argentinian *Pyrrhocactus*. The fruit is an elongated fleshy berry, hollow, with basal dehiscence. Rodents were seen collecting fresh fruit and eating the fruit and seed, but there was little evidence of any birds. The fruit often remains on these *Pyrrhocactus* for many months when it compresses into a hard, dry, globular shape. The outer wall is then quite brittle.

...from A. Delladdio.

During our visit to Argentina, we started our day's journey from San Antonio de Los Cobres in order to drive down the Quebrada de Tastil, finding ourselves surrounded by clouds for quite some distance, before, over, and after, the Abra Munano. Our first stop was at about 7km before reaching Las Cuevas, where the road was running down a valley between stony slopes which were covered with rocks and stones, up to the size of huge boulders. We stopped just to take some pictures of the *Trichocereus pasacana* emerging from the mist. But on walking up the slope – keeping the road in view in order to avoid losing our sense of direction in the mist – we found some *Lobivias*, *Tephrocactus*, a *Platyopuntia* and also some *Pyrrhocactus umadeave*. There were flowers on the *Platyopuntia*, but none on the *Tephrocactus*, the *Pyrrhocactus*, or the *Lobivia*. There were also quite a number of low growing bushes here, mostly up to about knee high, perhaps occasionally waist high as a maximum. Visibility was so poor that we did not see a population of *Pyrrhocactus umadeave* on the opposite side of the road – until we were on our way back.

At about 2 km to the south of Las Cuevas, we stopped again, where the clouds were still hanging round the mountain tops, but visibility was much better. Here, the road was running next to a stony slope which in places was covered with flat stones of various sizes. Again, there were quite a number of low growing bushes here, as well as more *Pyrrhocactus umadeave*.

At about 3 km before we reached Santa Rosa de Tastil, there was some gently sloping ground which ran for almost a km from the west side of the road to the mountain slopes behind, where we caught sight of some



Quebrada
del Toro

North of
Santa Rosa de Tastil

**Pyrrhocactus
umadeave**

Photos: R.Ferryman



Photo: A. Delladdio



Photo: C. Sherrah

Pyrrhocactus umadeave

Quebrada del Toro, near Las Cuevas

more *Pyrrhocactus umadeave*. The ground here was definitely not sandy, but it was made up of gravel of 1 to 5mm in size mixed with soil – it would do nicely as a potting compost. The bushes here were widely scattered, most of them lacking any signs of life. The ground was very dry here, whereas at our other stopping places it was very wet, and we did find several dead cacti. The large *Pyrrhocactus* plants were sometimes less than a metre apart, more often 2 to 3 metres apart, with smaller plants in between.

Several of these large plants carried a complete ring of fruits and we found one plant (which we photographed) with almost two complete rings of fruit, which was rather exceptional. One of these large plants was 30cm in diameter and almost 40cm tall, which curiously enough had no fruits at all, but showed fruit scars as if the fruit had been removed. We also found one plant which had been toppled over and it had been eaten at the base, but we did not see any Guanaco in the Quebrada.

We continued to travel down the Quebrada del Toro, stopping near Alfarcito where we found some *Lobivia chrysantha* with flower colours ranging from yellow to orange, and one with red flowers. They were growing in company with *Gymnocalycium spegazzinii* – which were in bud – and *Parodia stuemeri*. We continued down the Quebrada as far as the river crossing, but as we did not have a 4WD vehicle we did not feel inclined to venture the crossing, but turned round to set off back to San Antonio de Los Cobres. On the way back we stopped at about 1.5km beyond Las Cuevas, where on a hill we found some *P.umadeave*, some *Soehrensia bruchii*, many *Gymnocalycium* in bud, but the most remarkable feature was the many hundreds and hundreds of *Lobivia chrysantha*, all in flower, with colours ranging from yellow to orange.

Quite close to where we had stopped that morning on our way down the Quebrada, about 7km past Las Cuevas, the road was taking us through a wide, flat valley bottom, which stretched for a km or more down the Quebrada. Here the soil looked almost clayish and it was mixed with pebbles and stones of various sizes. Dwarf bushes were very sparse here, but there were many large clumps of *Platyopuntia* and *Tephrocactus*, as well as many smaller clumps. Here again there were large plants of *P.umadeave*, mainly growing 2 or 3 metres apart, but many of those that we could see were much more widely spaced apart.

We did get the impression that the *P.umadeave* probably grew in many places in the Quebrada del Toro, except on the cultivated land – of which there was quite a lot.

.....from J.Henshaw,

It was late in the afternoon as we were driving up the Quebrada del Toro, when the warmth of the day was cooling off a little. Near Chorillos we found clumps of *Cleistocactus hyalacanthus* which were up to about two and a half feet high, growing in company with low shrubs and grasses. This location seemed to be damper than at any of our other stops further up the valley. About 10km further on we stopped and found some *Parodia stuemeri* in bud, growing among rocks in partial shade. Then further on, seeing some cacti growing on some extensive gently sloping ground running down from the road, we decided to stop and walk a short distance towards the river. We had already passed some *Trichocereus terscheckii*, but here they were replaced by *T. pasacana*, some growing only a few paces apart, others a good stone's throw apart, mostly solitary columns up to approaching two metres in height, but also one or two taller ones that were branching from part way up the stem. We also found a few small *Lobivia chrysantha* with globular bodies and a glaucous grey epidermis, as well as *Gymnocalycium spegazzinii*, both growing mainly in the open. It was lower down the slope that we came across two plants of *Pyrrhocactus umadeave*, partly embedded in a shrub.

It was only about three kms further on, a short way into the Quebrada de Tastil, that we stopped and walked up a steep slope which, possibly as a result, seemed to have less non-succulent vegetation. There were some well-scattered dwarf bushes, a little over a foot high, and very little other vegetation. The ground was what I would call a clayish type of soil with gravel and small stones. There were some well scattered dwarf bushes, a little over a foot high, together with very little other lower growing vegetation. There was a shallow arroyo, or rain water run-off, coming roughly down the middle of this slope, which was little more than a meter deep and perhaps 3 or 4 meters wide. It contained a discontinuous line of bushes and similar arroyos with their lines of bushes could be seen coming down the slopes of the hills in the background, that appeared to be several stone's throw apart. We were not able to walk over to look at them in the time that we had available. There were tall *T.pasacana* growing here and we also saw several plants of *Pyrrhocactus umadeave*, some of them quite large plants, up to as high as 18 inches tall and 9 to 10 inches in diameter, mostly growing several metres from each other. There was little or no sign of any plants below about 4 inches in diameter, so we did not see any really young plants of this *Pyrrhocactus*. None of them were in flower but the larger plants were in fruit.

We were at quite a high altitude here and after driving further up the Quebrada we started to feel the effects of altitude sickness. After arriving at Las Nubes we really did feel that we were up in the clouds.

.....from E.Vatter, *Kakteenkunde* 1.1940

For a long time I had intended to visit the cactus regions of N.W. Argentina and I finally began the journey in 1938. It was evening when I reached Salta. Next day I caught the first bus from Salta to Campo Quijano where I found somewhere to stay. The clouds pile up against the 3,000 -5,000m mountains and heavy rainfall is the consequence. But the mountains on the opposite side were almost bare, apart from grass, with no sign of cacti. But in the crevasses of the rocky walls I found some *Rebutia* with their roots deeply anchored in the damp soil deep in the crevasses. Between Alisal and Chorillos I found the silvery-white columns of *Cleistocactus strausii* which were carrying masses of red fruits, growing on the rock walls. In the crevasses in the rock and in hollows I found the white spined *Parodia sanguiflora*, the odd plant in flower, as well as a heavily spined *Rebutia*. It needs a keen eye to spot these plants. Mostly you find only small ones as they are constantly being eaten by goats. High up in this area the *Trichocereus* occurred for the first time, as the *Cleistocactus* petered out.

Not far from Chorillos, *Parodia stuemeri* grew in masses on the mountain sides, plants of up to 20cm in

diameter, many in full bloom. That afternoon I got to Golgota, where a native family put me up for a few days. Next morning I set off to climb round the rock faces. On the scree slopes, almost hidden under the rubble, I found *Gymnocalycium spegazzinii*. Its grey-green colour camouflages it so well that I had difficulty in finding odd examples. Here, too, were massive columns of *Trichocereus pasacana*, growing up to 5-6m high with a diameter of 50-60cm. This plant is everything to the local people. Everything is made from pasacana wood – windows and doors, floors and ceilings, tables and chairs. The bits that are left are used for firewood. Even the fruits are eaten.

Next day the mules took us quickly up to the ridge at 3 - 4,000m, where, apart from the pasacanas, we found a few *G.spegazzinii* but soon we found a *Lobivia* group, with small, grey-brown heads, almost completely hidden under lichen and scree. They were scarcely showing in the scree because they were so well camouflaged amongst the surrounding soil and stones. Their fine, close-lying recurved spines, mostly comb-like in their arrangement, range from ruby red in new growth to almost black.

Near to the border of Salta and Los Andes provinces the *Trichocereus pasacana* had disappeared. In its place were spherical plants. At San Antonio de los Cobres I found some of these plants, 20-30cm diameter, with a heavy yellowish-white to brownish-red spination, individual spines being long and flexible. The red flowers emerged from areoles near the crown. They are said to be *Soehrensia bruchii*.

.....from F.Vandenbroeck.

On most of the lower slopes of the eastern Andes in the provinces of Salta, Jujuy, and Tucuman, a forest can be seen where a dense blanket of clouds hangs clings to the mountains. But taking roads along valleys entering these ranges, once the clouds are left behind you come into dry sunny regions where the rainfall is scarce. Entering the Quebrada del Toro we met with this same phenomenon, the clouded zone here of course being mostly visible in spring and summer. Getting out of the lush clouded plains we were heading towards speckled blue skies leaving a whole white blanket of clouds behind us. There was a wooded zone, but not very impressive. I think that human activity has destroyed a lot in this valley - the railway, for example. From Las Cuevas down to past Puerta Tastil I found *Pyrrhocactus umadeave* at various places., but they had neither fruit nor flowers. They grow at fairly high altitudes – from 2500m upwards in open, barren surroundings, in company with *Trichocereus pasacana*, *Parodia stuemeri*, *Gymnocalycium spegazzinii*, *Tephrocactus pentlandii* and *Platyopuntia sulphurea*.

.....from M.Lowry.

From what I have observed it appears that *Trichocereus terscheckii* grows at lower altitudes in the warmer, wetter eastern valleys of the Andes, sometimes even amongst trees and scrub, whilst *T.pasacana* seems to prefer the stony bajadas at higher altitude. In the middle section of the Quebrada del Toro, between Chorillos and Puerta Tastil, they came close to each other.

.....from F.Kasinger.

We travelled along the Quebrada del Toro and over the pass to San Antonio de Los Cobres during the month of March. On our way we saw large numbers of *Parodia stuemeri* but very few *P. nivosa*. Near Las Cuevas we found *P.faustiana* which was at a location new to me. These *Parodia* were not in flower – it may be December when they flower. Between Las Cuevas and Abra Munano (the pass) we saw an extensive population of *Pyrrhocactus umadeave*, none of them in flower, some of them bearing fruit. At this location, there were plants up to 25cm in height and 15–20 cm in diameter. Between the Abra Munano and San Antonio de los Cobres there was another population of *P.umadeave* and here we found even taller plants – up to 40cm high. We had the impression that *P.umadeave* would be about 10cm high before it would set fruit. I have sowed some of the seed that I was able to collect and there was germination, but the seedlings only lasted about two weeks and then died off.

.....from R.Ferryman

In cultivation, this *P.umadeave* is an extremely slow growing plant and it is very difficult to keep in cultivation. I must have sown about 10,000 seeds of this species over the past ten or fifteen years, but I have only been able to raise 5 or 6 plants for my collection.

....from V.A.Fric, Kakteenjäger Seed list (n.d. – 1932?)

Friesia umadeave - germinates only under specific conditions and very erratically.

.....from H.Middleditch.

This is the only entry in this extensive seed list which is accompanied by this comment. It is also referred to in the article on *Pyrrhocactus* in *Chileans* No.51. Does the seed of *Pyrrhocactus umadeave* still pose a problem with germination in cultivation?

NOT GROWING PYRRHOCACTUS - FROM SEED? From R.Moreton.

Compared with a great many other cacti, raising *Pyrrhocactus* from seed, and growing them on, does pose a problem. I have probably grown most species of *Pyrrhocactus* from seed, which gave no particular problem with germination. They grow on fairly well, if but slowly, but they do have a nasty habit of just dying off for no apparent reason.

One of the easiest to grow from seed is *P.andreaeanus* which will then also flower well, as will *P.vertongenii* and *P.villicumensis*. But I have never tried growing these last two on their own roots, only as grafts. But *P.umadeave* is virtually ungrowable on its own roots. Even if you can get the seed to germinate (1% is good), the only way to grow them is on a graft. Even then they are difficult. The biggest one that I ever grew reached about 10cm across before expiring.

For many years I have used a coir-based compost, which is composed firstly of one coir block, which

when soaked as instructed makes one bucketful. To this is added a second bucketful made up of four parts of grit, four parts of coarse sand, and two parts of perlite. The great thing about coir composts for seed sowing is that they never suffer from algal growth. I have recently tried just a couple of trays of 2" pots using a peat based compost, but it went green in no time. Now I have gone over to John Innes based mixes, which I feel are better for slow growing plants. I also find that when using a coir base for long term potting, it seems to decompose and leave a pot of sand.

After sowing the seeds, they are watered in with tap water - our water here is about pH 9.0, presumably being that figure on account of the additives in the supply. The trays of seed are covered with a piece of plastic sheet and stood on a soil warming cable, which has a thermostat set at 70°F, placed in an enclosure which is equipped with three fluorescent tubes which are on for 18 hours each day.

.....from J.Henshaw

Despite collecting seed of *Pyrrhocactus umadeave* in the course of our field trip to Argentina, I have yet to get any to germinate, but it appears that I am not the only one with that problem

.....from J.Karweck

I sowed about 30 seeds of *P.umadeave* in February of 2010 but not a single one of them have germinated.

.....from D.W.Whiteley

Sowing seed of *Pyrrhocactus* has usually resulted in some germination, but even some of the very young seedlings have expired before pricking out. It is after potting up that more losses occur and none of my seedling plants survived very long. I have tried *P.umadeave* from seed several times but have never had any germination.

.....from A. de Barmon.

After germination, *Pyrrhocactus* seedlings seem to be quite sensitive to fungus and when a first seedling damps off the rest are likely to follow. Fast drying mineral soil seems to be the best way to avoid such losses. I always sterilise the soil before sowing. During the first two months I water all the seedlings with distilled water, this being the most effective way that I have found to prevent the formation of algae.

The only species of *Pyrrhocactus* that I would regard as challenging to germinate is *P.umadeave*. Last year I had some pots of seed of this species which had failed to germinate so I tried leaving them out of doors during the winter before giving them the usual seed raising process, but that did not prove successful at all in getting any germination.

.....from R.Gillmann

The Argentinian *Pyrrhocactus* are wonderful plants but I have tried growing them from seed with no germination success at all. And I have never seen any offered for sale, so I suppose that no one else has had any luck with them, either

.....from C.Holland

I actually recorded the germination results of the *Pyrrhocactus* seed which I obtained from Steve Brack, as follows: *bulbocalyx* 10%, *megliolii* 45%, *strausianus* 18%, *umadeave* 2% and *marayesensis* 28%.

.....from R.Edginton

We do have one or two Argentinian *Pyrrhocactus* that I grew from seed. They germinated at the rate of about five out of ten seeds. But most did not survive beyond two or three years. I do have a seedling *P.bulbocalyx*, which is struggling, that I am growing in ceramic granules - at least it has not dried up yet.

.....from J.Lambert

It is quite definite that the Argentinian *Pyrrhocacti* are difficult to keep in cultivation. Some of them will survive for a couple of years, even flower, but then - without any apparent reason - they inevitably waste away and finally perish. Others do remain alive longer, but then they hardly ever flower.

.....from K.Doble.

My own *Pyrrhocactus* are grown very slowly. The oldest *Pyrrhocactus* that I have were sown in 2001 and they are only one inch high. The soil that I use is composed of 50% decomposed granite, 25% crushed river gravel, and 25% pumice (which I get from New Zealand). I use no organic matter in the mix. I use the same mix for seed sowing but sieved much finer. For about five months of the year I do not water these plants at all but in the growing season I water at most twice a week. With each watering I use a low nitrogen liquid fertiliser.

.....from J.Karweck

At the end of 2008 I sowed a selection of *Pyrrhocactus* seed using a 6cm square pot for each species. My compost was an all mineral mixture which I put together myself from fairly sterile ingredients, consisting of sand, perlite, bims, and lava, with some sphagnum moss in the bottom of each pot. The pots were then stood in shallow water on a tray and put into the propagator. The propagator has bottom heat, set to a minimum temperature of 10°C, and top lighting which is on during the day.

Once the seed had germinated, each pot was enclosed in a plastic bag and placed on a warm windowsill in the house. In Spring they went back into the greenhouse and each pot, still in its bag, was hung high under the roof. As they were getting too hot and dry there, I moved them to underneath the bench, but most of the seedlings expired. This year I will use a commercial compost which has some organic compounds, together with some sand, perlite, and lava, as well as using only boiled water. The germinated seedlings will then be kept in the greenhouse but out of direct sunlight. The pots will be taken out of their plastic bags in Spring and given regular waterings.

.....from P.Crewe

In July 2007 I sowed some *Pyrrhocactus* FK 583 *strausianus*, putting them on a windowsill without any artificial heat or light. There are currently 18 strong seedlings. This seed was originally obtained - not by me -

from SuccSeed in the autumn of 2006 and I only acquired it later, so it was probably at least a year old when I sowed it. So viability for that species at least does not drop off sharply in a short time.

In 2007 I built myself a propagator which consists of nothing more than a long, shallow box to take two 5 ft long fluorescent tubes of 58W each. It was made out of the sort of hardwood that has a glossy melamine-like surface on one side - facing inwards. It is only ten inches wide and seven inches deep, so that it can be accommodated in the house. The fluorescent tubes are on for about 16 - 18 hours of the day and keep the temperature inside the propagator at about the mid twenties degrees centigrade, maybe lower on very cold nights as the room is unheated.

I grow all my plants and seeds in a soil and peat-free compost. So far I have not even found a soil-based compost that is peat free, so I use a peat-free J.Arthur Bowers New Horizon compost which seems to be a composted plant material, perhaps like that made from hedge cuttings and garden waste that Council recycling schemes collect. It does need blending with other things and for seed sowing I use a mix of equal parts of this compost, of vermiculite, and of cat litter, this last being Tesco's premium lightweight cat litter (now rebranded as Low Dust Lightweight) which is a bit like a fine grade of Seramis. Before use, I microwave the mix until it is steaming.

This compost is put into two inch square pots and then wetted with tap water, which is quite soft here. The seed is sown on to the top of the compost and then the pots are put into the propagator and covered with a sheet of plastic film which is sold as acetate for use on an overhead projector and weighed down with one penny coins to give a good seal to covering the pots. The fluorescent tubes are about two inches above this sheeting. Within a couple of months some seedlings begin to lift up the acetate sheet which I remove at that stage. Seedlings are transferred to the greenhouse in early summer (for a January sowing) with just slight shading for a week or so.

The germinated *Pyrrhocactus* seedlings grown in this way have progressed steadily. I am reluctant to transplant any of them, as I have heard that young *Pyrrhocactus* plants do not like being transplanted. So I may leave them in their pots for another year, even if that means they become squashed. The FK 583 *P.straussianus* which were sown in July 2007 germinated very well - some eighteen seedlings. So I did transplant some of them which now have more space and probably more water, so they continued to grow well, much better than the others left behind, cramped in their two inch square pots. The TK 209 *P.villicumensis* seed ex BCSS, sown in January 2009, produced 13 seedlings which occupied the whole of the pot, rather squashed together, all of which have survived. I hope to transplant these next Spring as they have stopped growing due to lack of space.

Among the 2007 sowings were *Pyrrhocactus villicumensis vertongenii* VS 2. from seed from SuccSeed, but there is now only one of the twenty five germinated seedlings left, owing to the disastrous effect of using Armillatox to try and counteract some mould growth. I have switched to using Chinosol for sowings 2008 onwards. Of the 2007 sowings, there was no germination of the VS 99 *P.umadeave*, also from SuccSeed. My January 2009 sowings included *P.umadeave* MPL 61, and MPL 91, also from SuccSeed. To my surprise both of these started to germinate about two weeks after they were sown and I now have 4 of the MPL 61 and 7 of the MPL 91 seedlings. I have discovered that M. Mieczkowsky - MPL - travelled to Argentina in 2005 when the seed was most likely collected. There was one germination in 2009 from the BCSS JB 64 seed of *P.umadeave*, but I have since killed it off!

.....from H.Middleditch

Is there the possibility that there may be an advantage in sowing some seed when it is a year or more old? Such as the example of the MPL *P.umadeave*?

.....from G.Charles

Pyrrhocactus grow well for a while and then a perfectly healthy plant decides not to grow.

.....from R.M.Ferryman

Pyrrhocactus do have a reputation for being difficult to grow. I have been told that even if they germinate readily, they are difficult to keep going. Fortunately I have been quite successful in growing them to a reasonable size, - *P.straussianus*, *andreaeanus*, *megliolii*, *villicumensis* and *bulbocalyx* all grown from seed are well represented in my greenhouse. But *P.umadeave* can be very difficult indeed. Winter (or Ritter) once quoted germination below 2%, so it all seems to be consistent.

Interestingly, however, I have found quite a lot of young seedlings in the wild, but one must take into account the vast amount of seed that the mature plants produce in order to reflect on how successful germination may be in nature. Even then, I think that I have seen more young plants of *P.umadeave* in Argentina than of any other of the species.

In my experience the seed growing compost is not important. I tend to use equal parts of peat and loam with three parts of grit. Seed is watered in with rain water only. The seed is germinated under lights on a twelve hour on, twelve off, system. Following germination the seedlings go into the other light box, which stands on the germination box, with lights on for 14 hours per day. There is no additional heat as sufficient is generated by the lights. I use four lights of 40W each, 1.8m long, a mix of tubes, white-cool-white-cool. The seed is never covered or enclosed with polythene or anything else. Air is allowed to enter naturally at the ends of this box.

Most successful has been to grow the seedlings under lights for a full season i.e twelve months, followed by a short rest, with no water. Potting on is done when the seedlings are large enough to handle, in autumn/winter when they are naturally resting. For this potting on into individual pots I use a loam plus grit compost without peat. After germination the seedlings need to be exposed to good air circulation and they are only pricked out when large enough to handle - I wait until autumn/winter when they are resting. *Pyrrhocactus* resent root disturbance so I replot only when essential and try to retain as much of the root system as possible.

.....(later)

Fresh seed of *P. umadeave* which I collected in the Quebrada el Toro, did not germinate too well with me, even when I used different methods of cultivation. Some of the seed which was collected fresh in habitat in 2006 was sown in the UK in the early spring of 2007, with moderate success. More of this 2006 collected seed was brought out here to South Africa in 2008 and sown in August (Spring here) and the remainder in 2009 and 2010, both with good success. At present I have 40 to 50 seedlings here, all around 2 inches in diameter.

The seed that I grew here in South Africa had to follow what was locally available and also the local climate, so it was very different to the UK. Locally available compost is recycled waste complete with large chunks of tree roots and branches. It was first sifted and then vermiculite was added as no perlite is available out here, the compost being two parts of recycled compost to three parts of vermiculite. At the time of sowing, the outside temperatures would range from minus 2°C to plus 22°C, night to day. No heat was applied either to the seed or to the greenhouse. Tap water was used with some acid added to keep the pH to around 6. Seed was sown in pots and covered with white plastic sheet (bin liners). Emerging seedlings were covered with quartz but no special treatment was applied. Due to the heat one has to keep a careful eye on watering as the small pots can dry out quite quickly.

I believe that the key to germination is the high daytime temperature, some 30°C by day followed by cooler nights at 6 to 12°C, recorded in a small plastic greenhouse here. Day length may also have some impact here as it is a constant 12 hours of daylight. Sowing later in the summer, one has to be careful on account of the daytime temperature which can exceed 45°C in the greenhouse for most of the day.

In habitat, *Pyrrhocactus umadeave* rarely gets very hot for long periods by day whilst afternoon temperatures drop dramatically as the wind gets up. I am certain that germination of seed from all high altitude plants responds to cool night temperature.

.....from J.Karweck

I already keep my propagator in my cool greenhouse and let the temperature drop to about 15°C during the nights in the propagator. I am sure that imitating the habitat conditions with a wide range of temperature variation between day and night is beneficial. If my *P. umadeave* still does not want to germinate for me this year (2011) I might try to take it out of the propagator at nights so that it experiences the 6 to 8°C in the greenhouse at night.

.....from R.Zahra

In the course of sowing seed for many years, which produced about 300 different species of cacti for my collection, I found that the optimum time for sowing was during the last two weeks in April and the first two weeks in May. I use a plastic pot that has been washed with soap and water and dried, which is then filled with a compost made of peat and sand, but as I purchase this compost ready mixed I do not know the proportions. To obtain an even surface, the compost is pressed down a little. Then the seeds are sown on the surface and then pressed down into the surface of the compost. They are not covered, because cactus seeds need light to germinate properly. After that, the compost is watered from below – so as not to disturb the surface of the compost. A fungicide is added to that water and it is important that it is of a type without copper in it, because copper inhibits germination. When, by osmosis, the water has come up to the surface of the compost, the pot is enclosed in a transparent plastic bag, which is then sealed. The bags are then simply placed into the greenhouse - I do not use any extra heating for them – here in Malta the daytime temperature will be about 20°C or a little more and probably no more than about 5°C less at night time. Quite soon, drops of water will appear on the inside of the plastic bags - water which will have evaporated from the pot. The seedlings are in a very humid environment but there is very little free water in the bags. Germination will start within a few days and can continue for up to 4 weeks or more. These bags are left sealed until September, when the seedlings will get their first watering since they were sown. Some fertiliser is added to this water.

It was in March of 2007 when I had a visit from R.Ferryman who kindly presented me with some seed of *Pyrrhocactus umadeave* which he had collected in habitat. This was sown shortly afterwards, using my usual compost of peat and sand. However, I had already found out that *P. umadeave* seed would not germinate unless it was watered in after sowing with some gibberelic acid added to the water. I dissolve a few grains of the acid in a little water and with the aid of a pipette I start dropping drops of the acid solution on to the surface where the seeds are – it is the seeds that have to be wetted with this acid solution. This procedure has resulted in germination rates of 70% of the seeds of *P. umadeave* that were sown.

.....from J.Arnold

I have had problems not so much with germination of *Pyrrhocactus* seed but with them burning as bigger plants. They seem to be very sensitive to high and even moderate temperatures. Some show the scars of several such events! So now I try to be more careful and put some shading up early in April - the worst month for these plants getting damaged! Some of them are now of flowering size, producing flowers in shades of yellow and orange.

.....from J.Karweck

I have noticed that Argentinian *Pyrrhocactus* seem to be very susceptible to burning at the apex. This happened to one of my older plants and to all three seedlings (5 years old) of *P. sanjuanense* which I have. They were placed in a very sunny and windy spot in the greenhouse near the open door where they received a few drops of rain occasionally. The burning happened shortly after having been given a few drops of water with fertiliser, but I do not know if this was only by coincidence.

GYMNOCALYCIUM OBDUCTUM By J.Piltz from Succulenta 1970.

On the search for the occurrence and the distribution area of *Gymnocalycium ragonessii* (Cast.) on the west side of the Salinas Grandes in 1978, we discovered in the border area between the provinces of Cordoba and Catamarca a population of small cacti belonging to the genus *Gymnocalycium*. Our first impression was that we were concerned with a new variation of *G. ragonessii*. The new sort grew in a comparable plant biotype as the foregoing species, on the margin of the huge salt lake in the transition area from the halophytic vegetation zone to the dry woodland of the Chaco. The Chaco vegetation stretches from Paraguay over the Argentine provinces of Chaco and Santiago del Estero as far as to the north of province Cordoba. However, the Chaco dry woodland here is much more open than in the proper Chaco Central and Chaco Austral, although this has not been brought about by human influence.

Gymnocalycium obductum does not grow like *G. ragonessii* in a semi-firm mixture of sand and clay in the shade of bushes. The body is almost entirely hidden in the ground whereby the flat crown is barely visible; we know this form of growth with many *Gymnocalycium* from the series *Quehliana*, observed round the Salinas Grandes. Even after twelve years of cultivation, the collected plants have retained the same flat growth, the overground part being barely 2 cm high. In the meantime the numerous seedlings exhibit on the one hand a striking homogeneity and on the other hand - even for this group which are known as slow growers - an extremely slow growth. They flower, however, already at a body size of between one and two cm in diameter, really a demonstration of a perfect adaptation to the extreme circumstances at their natural habitat.

With the closer study of the plant body, flowers, and fruit, the initial supposition of a close relationship with the *G. ragonessii* growing in the immediate vicinity could not be confirmed. As small seedlings they already exhibited quite distinct differences on account of the number and form of the ribs. In *G. obductum* the areoles are always sunken, while the areoles lying exactly on the ribs in *G. ragonessii* is a significant characteristic.

Somewhat confusing were the statements in the reference literature concerning the flower size for *G. ragonessii* (Cast. 1949). The author described a flower of 3.5 to 4 cm, a length which also fits the flower of *G. obductum*. The flower portrayed alongside the text has a slim flower tube, which is typical for *G. ragonessii*; presumably Cardenas had described the flower off a still young plant. I have made the very same observation myself; young plants have significantly shorter flowers than the fully grown specimens. The plants of *G. ragonessii* P.18 collected by us near Totoralejas in 1976 have flowers with a length of 4-6 cm, which agree with the dimensions given in the subsequent, complementary description made by Frank in 1974. Very obvious differences are also displayed between the fruit of both sorts. The slender, spool shaped fruit of *G. ragonessii* differs markedly from the small, globular to oval fruit of *G. obductum*. This fruit shape suggests a relationship with the further south c.f. westerly growing *G. quehlianum* and *G. stellatum*, from which this new species distinguishes itself clearly however in the flower

The material examined comprised P.13 Serra Tulumba, P.18 Salinas Grandes, P.117 Cruz del Eje, P.122 Recreo, P.160 South of Cruz del Eje, P.206 west of Salinas Grandes, P.402 San Martin; all populations from the *G. stellatum*, lying to the SE, N, and W of the Salinas Grandes.

[Detailed description follows] At the habitat location, other cacti were found - *Gymnocalycium schickendantzii* (*G. michoga*), *Stetsonia coryne*, *Cleistocactus baumannii*, *Echinopsis leucantha*, and an *Opuntia* sp.

.....from B. & K. Schweitzer, *Gymnos* 11(22)1994.

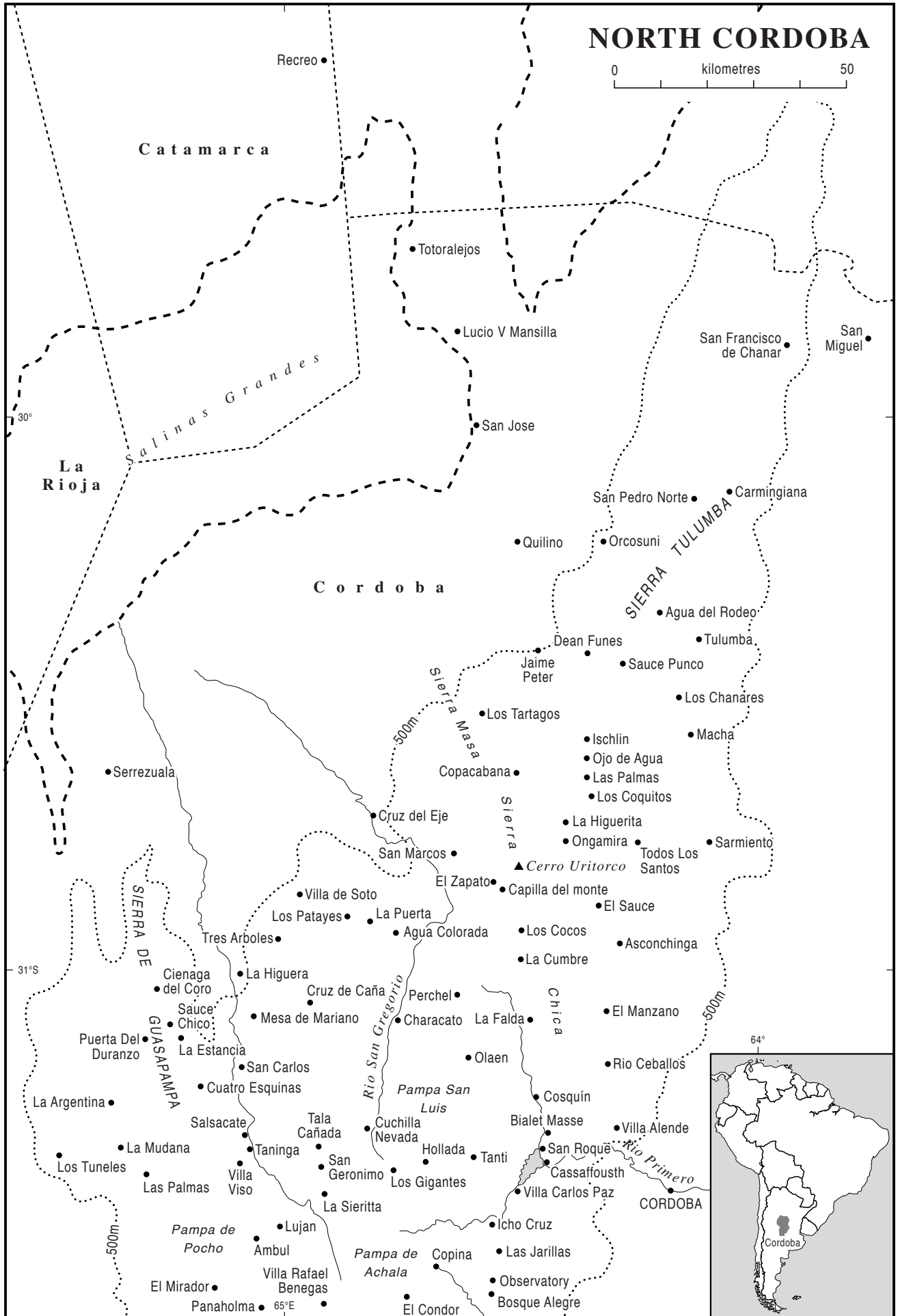
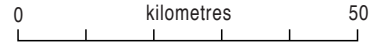
In the course of the first day of our 1993 trip to Argentina, we limited our search to the northern part of province Cordoba. Here, in the transition zone from the dry Chaco forest to the salt pan of the Salinas Grandes, we searched in the open bushland in order to find the species of *G. ragonessii* and *G. obductum* described from there. The ground there consisted of a firm mixture of sand and clay which is often covered with a layer of moss or lichen. In the intermediate parts between pale sun and shade, a search for a small, round *Gymnocalycium* is very difficult. Catching our attention here there were meter high plants of *Stetsonia coryne*, as well as *Echinopsis leucantha*, *Opuntia quimilo*, and also *Gymnocalycium schickendantzii* with a very dark epidermis.

In the direction of the original discovery place for *Gymnocalycium obductum*, we discovered somewhat further to the south, a further population of this species, but which differed considerably from the first description in regard to their size, so that an amplification appears to be necessary. From the plants discovered there, *G. obductum* no longer belongs to the dwarf forms.

In the indicated area we succeeded in finding almost everywhere very fine specimens of *G. schickendantzii* with an almost black epidermis. Also with the help of a local resident, whom we questioned about small cactus plants, we searched no further. Then, as we were photographing a fine example of *G. schickendantzii* near to a cushion of moss. We discovered a round, flat depression which was almost full of sand and leaf debris. This was the crown area of the *Gymnocalycium* species that we were searching for, certainly of appreciably greater diameter than stated by Piltz. The specimen we found there possessed a diameter of up to 14cm and displayed a distinctly larger size and a longer spination. This plant would also suggest a greater size of the flowers and fruit, as was then subsequently discovered.

On a later trip, travelling in company with H. Amerhauser and H. Till, we again found *G. obductum* near El Salvador (STO 474), in province Catamarca, on the edge of the Salinas Grandes where it was growing in fine sandy ground, hidden under bushes. It was really *G. ragonessii* that we were searching for there but we were not able to find it.

NORTH CORDOBA



.....from H.Middleditch.

This location STO 474 is on the Catamarca province side of the Salinas Grandes may possibly be at the original Piltz finding place for this species. The location in Cordoba, to the south of the original Piltz discovery could possibly be BKS 93/10 from Lucio V. Mansilla.

.....from F.Strigl.

Coming from Catamarca province, heading for Dean Funes, we were only a few kms off the crossing of the very north end of Salinas Grandes when we stopped at STO 474 and came across not only *G.obductum*, but also *G.gronesii*.

.....from L.Bercht.

It was at a sandy spot a couple of kms to the east of Villa de Soto where I found my LB 1046 *G.obductum*. These plants were brownish with a darker base and had between three and five spines per areole. They were growing in an open sandy area with no stones at the surface in company with grasses and low growing bushes. There were also *Cleistocactus* to be seen there but no *Stetsonia*.

.....from H.Middleditch.

In the Austrian *Gymnocalycium* Journal 9(1)1996, the *G.obductum* was published as *G.stellatum* v.*obductum*, by H. & W.Till, where various other species names, including *G.quehlianum*, were also reduced to varieties of *G.stellatum*. How does *G.obductum* compare with *G.stellatum* and *G.quehlianum*?

.....from T.Kuhlhanek.

I have come across *G.obductum* both near Cruz del Eje and by the Rio Quilpo, where it was to be found in open sandy areas beneath Chaco bushes. These plants have two thirds of their body underground. This name was placed as a variety under *G.stellatum*, but *G.stellatum* has more prominent ribs and grows on rocky ground. There are other varieties of *G. stellatum*, such as *G.zantnerianum*, which includes populations from Quilino, which have been recorded as *obductum*. There does not seem to be a great deal of difference between *G.zantnerianum* and *G.obductum*. I think that *G.obductum* is more flat and grows in sand, whilst *G.zantnerianum* has more ribs and with more prominent tubercles, also it grows in more rocky areas. Those plants which grow in sand have about two thirds of the body below ground. The picture on page 221 of the Charles' *Gymnocalycium* book, from Quilino, is *zantnerianum*.

.....from P.Crewe.

There is also a record of *G.obductum* CH 1376 – J Chvastek – at 459m at Quilino.

.....from H.Middleditch

And are the surroundings of Quilino flat sandy ground? In the pictures in the Charles' book from Quilino it appears to be somewhat different.

.....from M.Kurka.

I saw *G.obductum* in February of 2007 on a hill overlooking Villa Quilino. These *Gymnocalycium*s were mostly out of reach of the cattle, at the base of small acacias, or protected by rocks. Some were on open terrain, but undamaged plants were rare there. Because of the nature of the terrain, the plants were not subterranean, but were on the rocky surface. To me, they are ecotypes of *G.stellatum* as the size of the plants responds to the conditions where they grow. Because it usually grows in rocky places, you can see apparently old plants which may be as tiny as 3-4 cm across growing on solid rock with a tiny layer of sand and debris and only 30cm away a more exuberant example of 10cm or more in diameter which benefits from more soil and debris in a crevice in the rock. The plants that I saw near Quilino were brown and relatively small, less than 10cm in diameter. But the habitat was not only rather rocky but heavily overgrazed as well so it is possible that the larger plants had been eaten by the livestock.

Very similar plants of *G.stellatum* were seen were seen in the Sierra Condores, on the opposite side of the Sierras de Cordoba to Quilino. These two areas have in common that they are the first chain of hills above a hot and flat area and they experience really hot temperatures.

...from L.Bercht

There are indeed some hilly areas near Quilino, certainly not of any great altitude and from what I have seen, without steep slopes, having a sandy surface with small stones where *Gymnocalycium stellatum* v.*zantnerianum* and *G.obductum* can be found growing in open areas. The picture on P.221 of the Charles' *Gymnocalycium* book illustrates that very well. There were no *Stetsonia* to be seen in the same vicinity as these *Gymnocalycium*. For separating v.*zantnerianum* from *G.stellatum* I follow Till & Till in their 1996 *Gymnocalycium* article.

.....from H. & W.Till, *Gymnocalycium* 9(1)1996

The variety *zantnerianum* was indeed validly published. The Schick 731 must be regarded as the Type for *zantnerianum* but it has not been possible to determine its habitat location. A specimen of HT 88 117/1720 from Dean Funes at 850m altitude, has been deposited in the Vienna herbarium as Epitype. This variety, found in the area around Dean Funes, occurs over an extensive habitat area, at ca. 200-380m altitude, which one can describe as thickly colonised. The ground is pretty sandy, partly intermixed with shingle and often with large, dispersed flat blocks of stone on the surface. In the shelter of such blocks of stone, but also in rock crevices where sufficient humus has collected, there grow numerous plants. In most populations the majority of the flowering size plants have a diameter of 30 to 40mm. On later field trips, in other populations, in other populations, there were found essentially larger of up to about 60mm across, which were however mostly in small numbers. The plants in the area of Dean Funes are flat globular with a slightly sunken, usually spineless, crown. The body colour is grey green, ribs about 10-15, straight, divided into small rounded to oval tubercles with a small chin. Spines whitish to yellowish, brown to nearly black at the base, only occasionally are plants to be found with dark brown to black spines. Flower 5-6cm long, in various shades of white.

These *zantnerianum* differ from *stellatum* by a generally smaller body size, darker body colour, mostly

Gymnocalycium
quehlianum
'zantnerianum'

South of Quilino
at 440m



East of Quilino.

Gently sloping land
damaged by grazing

Gymnocalycium
quehlianum
'zantnerianum'

South of Quilino.
Flat land at 440m



Photos: G. Charles



| | | | |
|-----------------|--------------|------------|---------------|
| LB1137 | STO99 | P121 | |
| 4" pot | 3.5" pot | 2.75" pot | |
| G. zantnerianum | G quehlianum | G.obductum | Photo: P.Moor |

more sturdy and sharper ribs that are closer together
from G.Charles.

I would regard the Trichosemineae Gymnos that I saw near Quilino as G.quehlianum, but they could equally be regarded as G.zantnerianum, which are much broader and can reach up to about 12cm across, whereas the G.quehlianum are usually up to 5 or 6cm across. Note that the Austrian Gymnocalycium group use the name G. stellatum for what I call G. quehlianum.

....from D.Metzing,

Around Quilino there grows Gymnocalycium quehlianum (Trichosemineum), G.robustum (Gymnocalycium), and G. prochazkianum (Scabrosemineum) which may appear to be quite similar to one another if you see only plants in their habitat.

....from P.Moor.

In 2003 I sowed some Gymnocalycium seed - they were all raised in the same compost, in the same manner, and potted up the same year into the same compost, watered equally and as often, and kept in the same greenhouse conditions. I now have a plant of P121 G.obductum which is 50mm across the body, one of STO 99 G.stellatum (quehlianum) which is 70mm wide, and a G.zantnerianum which is 80mm wide. (see illustration above)

....from H.Middleditch.

Which fits the comment from G.Charles on body size of G.zantnerianum, but not that of H.&W.Till. It is also a little confusing to read in the Till & Till Gymnocalycium article that the extensive habitat area lies at 200-380m altitude but the Epitype is from 850m altitude. In the top right hand of the fig.499 in the Charles' Gymnocalycium book there is a plant which appears to have about twenty ribs, whereas all the descriptions to which I have been able to refer appear to attribute up to about 15 ribs to stellatum, quehlianum, obductum and zantnerianum.

....from G.J.Swales.

But I would have thought that Gymnocalycium would tend to display an increase in rib count with increase in age and plant size, like most other cacti.

....from J.Arnold.

It is my impression that Gymnocalycium do not seem to display an increase in rib count with increase in age and plant size. I have had a look at the Gymnocalycium in my own collection and I do not find any which have produced a new rib between base and growing point.

....from H.Middleditch.

Amongst my own Gymnocalycium there will be about half a dozen that are in pots of five inches across or over, but I see only one extra rib between base and crown on a G. monvillei and on a G.valnicekianum.

....from G.J.Swales

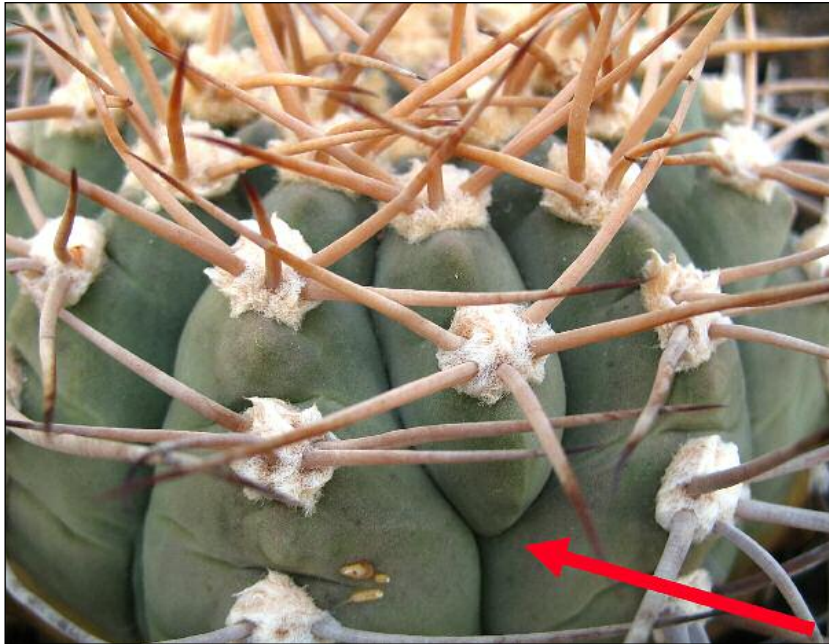
There is a picture on page 173 in the Austrian Gymnocalycium Journal 9(1)1996 of a G.obductum which clearly displays two additional ribs appearing at about the shoulder of the body.

....from H.Middleditch.

The plant in this picture has flowers which appear to be wide open. Taking the flower diameter of 3.3cm from the accompanying text, the plant body appears to be about 8cm across, which would not appear to be a very old plant.

....from U.Eggli.

Looking at the plants of stellatum, quehlianum, and zantnerianum in our Zurich City Cactus collection, we found that 11-14 ribs are commonly encountered. Only G.quehlianum P13b and G.quehlianum Supthut 86144 had 16 ribs, but no plants with more than 16 ribs.



Gymnocalycium
bayrianum CB13a

Gymnocalycium
paraguayense U35



Gymnocalycium
valnicekianum

Extra ribs on
Gymnocalycium

Photos: D. Metzger

.....from D.Metzing.

There will be some plants of these *Gymnocalycium* which will produce more ribs as they grow older, and others which do not. In the description of these plants there is often a range of rib count quoted, such as “8 to 15”, which indicates that the species concerned may display either a constant rib count within that range, or the rib count will increase as the plant gets older. This does not mean that all plants of any one species will follow just one of these two alternatives. In one population of one species of *Gymnocalycium* there may be plants which all fit into the described rib count range, and others which do not. So it is not unexpected to see the *Gymnocalycium* with the high rib count in Fig.499 of the Charles’ *Gymnocalycium* book, when many other illustrations display only plants which fit into the described rib count range.

.....from H.Middleditch

In the article on the *G.stellatum* group in “*Gymnocalycium*” 12(3)1999, most illustrations appear to show this species with up to about 16 ribs, which seems to be in accordance with the comments from D.Metzing.

.....from M.Kurka

In the more populated areas of Cordoba with abundant grass where cattle are farmed, the pastures are cleared of spiny bushes by fire. This procedure seems to be repeated maybe every decade or two and includes burning in two subsequent years. The first year the bushes (mostly acacias) are alive and when only the grass fires it is usually not strong enough to burn the moist bushwood. But it is strong enough to kill many of the branches of every bush. The second year, the branches killed by fire the previous year are dry and burn easily when the grass is set afire again. This time the wood fire is much hotter and stronger and wipes out the bushes almost completely. When the grass burns, most of the cacti survive, but the wood fire is usually fatal for the cacti. So for me it is no wonder that I did not find any really mature plants like that in Fig 499 in the Charles’ *Gymnocalycium* book. However there does appear to be an increase in rib count with age which is visible on the plants in Figs. 497 and 498. The plant in Fig. 497 added a rib at the half past seven position while the plant in Fig.498 added a rib more recently in the half past six position. I think this process may be rather slow and such large plants are only likely to be encountered in secluded areas. I think that G.Charles was really lucky to find an undisturbed population.

.....from H.Middleditch.

The new ribs on the Figs. 497 and 498 had escaped my attention – they are not exactly very obvious. Enquiries to date have not brought to light any *G.stellatum* or *quehlianum* in cultivation which do display any additional ribs above the base.

.....from J.Arnold.

I am under the impression that plants of *Gymnocalycium* do not often produce new ribs as they increase in age and size, but I would accept that the plants in Figs. 497 and 498 in the Charles’ *Gymnocalycium* book certainly do. Also on Fig.491, a reproduction of that which accompanied the article by Quehl in the 1900 *Monatsschrift für Kakteenkunde*, a new rib starting about half way up the plant may be seen facing the camera.

.....from P.Grewe

There is also a record of *G.obductum* at MT 7-214 from Los Argarobus, near Orcosuni.

.....from M.Tvrđik

Orcosuni stands in a level plain from which emerge some small hillocks, of up to about 20 or 30m in height. They are mostly covered in tall bushes up to about 5m high. Here and there on these hillocks are areas where the bedrock appears on the surface and it is precisely at these spots where MT 7-214 *G.obductum* grows, along with *G.bicolor*. These *G.obductum* prefer a modest amount of shade, but they can withstand full sun. They grow in a mixture of sand and gravel, and in company with moss if there is ample moisture. I have never seen *G.obductum* in the flat ground around Orcosuni.

.....from R.Edginton

Our plants of *G.obductum*, which are now five or six years old, are still of a small size, as our plants are grown hard and probably not watered as often as they might like. Their bodies are almost subterranean with much of it well down in the compost and only the top above soil level. I would regard *G.quehlianum* as a quite distinct species – a plant which I had for over thirty years developed into a large clump in a ten inch pan. Sadly it succumbed to the harsh winter but I managed to save an offset which has rooted in Seramis. My *G.quehlianum* have larger heads than *G.obductum* and a more fibrous root, also less body beneath the soil level.

.....from H.Middleditch

What is to be made of the name *pseudoragonesii*? Could this actually be a *G.obductum*? We are told by J.Piltz that *G.obductum* and *G.ragonesii* grow in fairly close proximity to one another. Could the original plants or seeds have been collected in habitat without the collector being aware that he was involved with two sorts of plants?

.....from J.Piltz

Plants were collected in this location by Fehser of which specimens reached Czechoslovakia, which probably included specimens of both *G.ragonesii* and *G.obductum*. When these plants flowered, some of them had the shorter form of flowers and these were named in Czechoslovakia as *Gymnocalycium pseudoragonesii*, although the name was never validly published. Before I published the description of *G.obductum*, I received a plant of *G.pseudoragonesii* from Brno Botanic Garden and this did indeed prove to be *G.obductum*

.....from G.R.Allcock

I can recollect having a flower on what I would have regarded as a young plant of *G.ragonesii*, the flower being only 3cm tall. Despite its very diminutive stature, the flower was extremely slender and every bit a picture of what I expected for a flower on this plant, except for its size. Also I do have a plant of

G.pseudoragonessii which does not have a long slender flower, more of the short and broad form of flower that I would associate with other species of *Gymnocalycium*.

.....from H.& W.Till, *Gymnocalycium* 9(1)1996

The mostly small, disk-like flat plants of *G.obductum* can reach a diameter of 12 cm in old age. The 13-15 flat, only slightly raised ribs are straight, the areoles slightly sunken and carry mostly 5 bristle-like 2-6 mm long spines. At their habitat location these spines are usually grey, in cultivation white to pale grey with a darker base. The flowers from near the crown are of differing lengths. They were measured at from 30 to 50 mm in length, by 35-40 mm in diameter. They are similar to *G.stellatum*, in the fruit and seed also, and could be regarded as a miniature form of that species.

The name *obductum* (concealed, enwrapped) is very appropriate for this form, since the plants are usually sunken well down into the sandy ground and are found only with difficulty. Through field work by the Austrian *Gymnocalycium* group we now know that the Salinas Grandes is their northern boundary. Their distribution extends to the south more or less as far as Cruz del Eje.

.....from H.Middleditch

The original description by J.Piltz gave a body size of 5.5 cm width and 6 cm height, together with a flower size of 37 mm long. The respective sizes quoted by Till are not just slightly larger, but quite considerably larger.

.....from J.Piltz

The plants described and illustrated as *G.obductum* in the Austrian *Gymnocalycium* publication are not what I would regard as falling within the compass of the name *obductum*.

.....from H.Middleditch.

In the Austrian *Gymnocalycium* Journal 9(1)1996, in the article by H.&W.Till on *G.stellatum* there is an illustration on p.169 of a *G.zantnerianum* taken near Carminiaga. Together with Orcosuni, and Sierra Condores, these places lie outside the area of distribution for *G.stellatum* (*G.quehlianum*) as shown on the map on p.220 of the Charles' *Gymnocalycium* book.

WE FIND ECHINOPSIS HYSTRICHOIDES From M.Lowry

We came across *Echinopsis obrepanda* at a number of different locations during the course of our visits to Bolivia, which were undertaken between mid-December and mid-January. Very few of these plants were to be seen in flower on those occasions and I can only recollect one specific location where we saw *E.obrepanda* in flower - and that was only two plants, both with a pink flower, to the north of Charcas in the Inca Huasi basin, not far from Culpina.

Individual plants here grew up to about baseball size, all those we saw being solitary. They grew on sloping ground in company with various herbs and bunches of grass, with very little in the way of shrubs, and no real bushes, so there was no difficulty in finding these plants. Fortunately I do have an *Echinopsis obrepanda* PM 182 grown from seed which was collected from habitat, near Inca Huasi, by K.Preston-Mafham, which flowers pink, so the *E.obrepanda* in the Inca Huasi basin may be the pink-flowering version.

Originally we regarded *Echinopsis obrepanda* as being distributed over quite an extensive area of Bolivia and at the time of our visit there were recorded almost a score of locations as habitats for *E.obrepanda*. These included a number of places, mostly on the margins of the supposed distribution area, where white, pink, or purple-flowering *Echinopsis* had been recorded earlier under other names. However, cultivation of plants of certain of these names, and careful comparisons between their features and those of *E.obrepanda*, now suggests that a number of these *Echinopsis* names from the margins of the *E.obrepanda* distribution area, may need to be accepted. One such is *Echinopsis roseolilacina* Card., which is very probably the same as *E.boyuibensis* Ritt. Other forms which grow to the south of Tarija may also be distinct.

.....from H.Middleditch

Other than a couple of lines noting its existence, Ritter does not devote any specific attention to *Echinopsis obrepanda* in his book, although it does merit an occasional passing reference in his pages which deal with the *Echinopsis* that he found in Bolivia. Under the heading of *Echinopsis calliantholilacina* Card., which has purple flowers, Ritter describes this species as "widely distributed from Dept. Tarija in the south to Cochabamba in the north in mountainous situations, whereas the related - and more abundant - white flowering *E.obrepanda* prefers less mountainous parts of the same area". This statement makes it quite clear that Ritter regarded *E.obrepanda* as having only white flowers.

In view of the report from K.Preston-Mafham who came across hundreds of *Echinopsis obrepanda* in flower near Cuchu Punata (between Cochabamba and Torata), with mostly pink or magenta coloured flowers, it is difficult to accept Ritter's suggestion of only white flowers for *Echinopsis obrepanda* and purple flowers for *E.calliantholilacina*, within a similar area of distribution.

Indeed, one is obliged to wonder if Ritter erected his *Echinopsis hystrichoides* with a purple flower solely in order to distinguish it from what he took to be *Echinopsis obrepanda* with a white flower.

In Englera 6, *Echinopsis hystrichoides* FR 806 is recorded from La Cueva, not far from Culpina, and from Culpina.

.....from M.Lowry

Fortunately we did come across *Echinopsis hystrichoides*, with just a single wilting purple flower to be seen, after crossing the ridge between Culpina and the La Cueva basins, right at the top of a small rise, just before the descent into La Cueva itself. This was very open, exposed ground with only low growing vegetation, with no shrubs above ankle height, due to heavy grazing by sheep and goats, since at this spot we

were only one km from La Cueva.

It was on our later visit to this same area that we parked our vehicle in La Cueva and walked eastwards out of the village, down the river, for less than one km. It was here that we found *Echinopsis kermesina* growing in a far less exposed situation, within a fairly sheltered valley, with far more shrubs, grasses, and herbs compared with the exposed site not 2 km away on the other side of La Cueva where we had found *E.hystrichoides*. It had been an El Nino year which had resulted in the rains in this part of Bolivia being delayed by six to eight weeks, so there was not much greenery to be seen in this valley. The *Echinopsis kermesina* were growing on a rocky knoll above the river, but we did not see any of them in flower.

These *Echinopsis kermesina* had a globular body with vertical, fairly blunt ribs which were formed into a series of humps by undulations along the crown. However, there was no real cross-groove between adjacent humps on the same rib, just a shallow depression which went down nowhere near to the base of the rib. The areoles were situated more or less on the crown of each hump. The areoles were not far apart from each other, were fairly woolly, and carried a number of shortish spines, so that the overall effect was rather to obscure sight of the body. In general appearance, they were very similar to some *Echinopsis mamillosa* which we had seen near Abra Condor (east of Tarija) which flowered very close to the centre of the crown. So close, in fact, that it was very difficult indeed to count the areoles between the flower and the growing point.

In contrast, the *Echinopsis hystrichoides* which we had seen on the western side of La Cueva were a very different looking plant. Here, the ribs were slightly offset from the vertical and much more tuberculate, with the areoles more at the upper end of each tubercle, close to the cross-furrow between adjacent tubercles, and certainly not on the outer crown of a hump. The areoles were further apart, they had less wool and fewer spines - although the spines were longer - so that by comparison with the *Echinopsis kermesina*, these *E.hystrichoides* were a much greener looking plant with the spination not obscuring sight of the body. The picture of *E.hystrichoides* in Ritter's book is of very poor quality, possibly because it is a black-and-white version of an original colour picture. But at least it does show that the flower arises at a point near the shoulder of the plant, well away from the growing point. Consequently *Echinopsis hystrichoides* cannot be associated with *Echinopsis mamillosa*, although it might possibly be associated with *E.obrepanda*.

.....from R.Martin.

Travelling in company with B.Bates we were going along the road from Culpina to Inca Huasi. We stopped to look at some *Echinopsis hystrichoides*, where we saw both red and pink flowers. Then beyond Inca Huasi, on the road to Chunchillas, we came across more of these plants, some of which displayed pale pink or white flowers - but these flower colours were less common than the deeper shades such as red. A range of flower colours was found not just all in one population, but within a few metres of each other. The plants themselves were fairly abundant, one or two per square metre, sometimes in groups - but not offsetting. They were growing on a flat area next to the road; indeed, I do not really remember seeing any *Echinopsis* spp. growing on slopes.

.....from T.Marshall.

On our visit to Bolivia in 1996 we were able to travel into the Culpina basin on New Year's day - and then from Culpina, further on into the basin around Inca Huasi. There is a ridge of mountains separating these two basins, which is crossed by the road going from Culpina to Inca Huasi. We made a stop where this road reaches the top of the pass, at an altitude of 3016m. This pass was not a narrow defile between steep sides, but had only modest slopes rising at either side of the road. There were no *Oreocereus* or *Trichocereus* to be seen here, nor any very tall bushes, only a few scattered shrubs of barely waist height, together with other low-growing vegetation which did not cover the ground, but left bare rocks and gravel exposed.

At both sides of the road there were scattered plants of *Parodia subterranea* to be found, also of *Lobivia ferox* growing up to about 50cm tall, as well as *Lobivia haemantha*. There were also some *Echinopsis hystrichoides*, which were growing up to roughly 20cm tall, mostly solitary. Some were growing in clumps, but these may have consisted of several individual plants together, as we did not see any mature plants with smaller offsets. Some of these plants were in flower, all with pink flowers.

Further along the road, we passed through Inca Huasi and then some 2km to the north of that place we stopped close to a very steep slope at the side of the road. Here we did find more *Parodia subterranea*, as well as *Rebutia pygmaea*, but no *Lobivia*. The general nature of the vegetation was similar to that at the pass between Culpina and Inca Huasi, but possibly with rather more bare ground visible. But here we found two different *Echinopses*, both the *E.hystrichoides* which we had already seen on the pass, together with *E.obrepanda*. These plants were both generally similar in shape and size, but the *E.obrepanda* were more short-spined, and had a much darker epidermis colour.

Some 2km further on, we found more *E.obrepanda*, again growing in similar surroundings. Then a couple of km to the north of Chunchillo Alto, we found some more *E.obrepanda*, similar to those seen at the previous stopping points.

.....from F.Ritter, Kakteen in Südamerika

Echinopsis hystrichoides Body green, semi-globular or flatter, 12 - 18 cm broad ... ribs with acute hatchet shaped tubercles arched upwards between the cross-furrows, the tubercles 12-18mm high; the cross-furrows between tubercles are one half to three-quarters rib depth. Areoles markedly oblique, situated in the cross-furrows, often arising from the base of the cross-furrows, 8-18mm long, 4-6mm broad. flowers from well at the side. Petals - inner white, middle purplish, outer reddish brown. Type location Cueva, prov. Sud Cinti, at 3000m

.....from H.Middleditch

In this Ritter description the body features would certainly seem to fit with *E.obrepanda* and hardly be

applicable to *E.mamillosa*. In his *Lobivia* 1,2,3, under *Echinopsis obrepanda*, Rausch refers to "ribs mostly crooked, rarely straight continuous" together with a thumb-nail sketch which indicates that each tubercle is offset from the adjacent ones above and below, which would seem to be comparable with the rib form described by Ritter for *Echinopsis hystrichoides*. In his commentary on *Echinopsis mamillosa* in *Lobivia* 1,2,3, Rausch refers to the "straight upright ribs", which would seem to match the accepted rib form for *E.mamillosa*. Rausch also refers to the flowers on *Echinopsis mamillosa* appearing from areoles near to the crown.

Consequently Rausch appears to present us with a direct contradiction between the body habit and flower location described by Ritter for *E.hystrichoides* and that attributed to this name by Rausch. How can this come about? Especially since in his *Lobivia* 1,2,3, under *Echinopsis mamillosa*, Rausch also mentions the "pink flowered form of *E.mamillosa* found near Cueva, at 3000m, named by Ritter as *E.hystrichoides*".

.....from T.Marshall

We were also able to visit the La Cueva basin, where we made a short climb up to the top of a hill from which we had a good view over La Cueva. Here we found a few *E.mamillosa*, no larger than grapefruit size. It seems that Rausch mistook these *E.mamillosa* for Ritter's *E.hystrichoides* and in his *Lobivia* 1,2,3 refers to them as *E.mamillosa v.hystrichoides*. The picture of *E.hystrichoides* provided by Ritter in his *Kakteen in Südamerika* has the flower originating from well down the side of the body, whereas in *E.mamillosa* the flowers arise from the edge of the depression at the crown. In addition, *E.mamillosa* does not have obrepand ribs.

.....from H.Middleditch

Similarly, the sketch of *E.mamillosa* provided by Rausch (*Lobivia* 1,2,3 p.89.) also places the flower quite close to the growing point, whereas the sketch of *E.obrepanda* (*Ibid* p.49) would suggest a flower arising from the shoulder of the plant.

.....from M.Lowry

It seems to be quite probable that Rausch came across the *Echinopsis kermesina* that grows to the east of La Cueva and mistook it for Ritter's *E.hystrichoides*. Hence the apparent contradictions between the descriptions provided by the two authors. The adoption of the name *E.mamillosa v.hystrichoides* by Rausch, for this population of *E.kermesina* seen to the east of La Cueva, suggests that he found some of these plants with pink or purple flowers - although we did not see any flowers on this population of *E.kermesina*.

.....from T.Marshall.

Of all the *E.mamillosa* seen in habitat, only white flowers have been seen.

.....from H.Middleditch

Is it possible that Rausch became acquainted with this situation after the appearance of his *Lobivia* 1,2,3, which might explain why these *Echinopsis* do not appear in his *Lobivia* 85?

.....from M.Lowry

It was barely 2 km to the north of Inca Huasi that we came across another population of *Echinopsis*, growing on slightly sloping ground, of open aspect. Here we found plants of *E.mamillosa* and *E.obrepanda* which were growing intermingled with one another, scattered over the slope. In places, there was an *E.obrepanda* growing within a pace of an *E.mamillosa*. The *E.obrepanda* here were big plants, definitely flattened globular in shape, up to about dinner-plate in size. The tubercles on these *E.obrepanda* were even more in evidence than on the *E.hystrichoides* which we had seen near to La Cueva, but they had much shorter, stiffer, recurved spines. They were similar to my own plant of PM182 which was raised from seed collected in this same area. The WR 682 plants are probably from the same population.

.....from H.Middleditch

Ritter apparently regarded *Echinopsis obrepanda* as a white flowering plant. The name *hystrichoides* was apparently only established by Ritter to separate out the pink flowered forms of *obrepanda*, a situation evidently misunderstood by Rausch. But from the several observations of the range of flower colours seen on *E.obrepanda* in habitat, including white, pink, purple, and reddish, no such distinction appears to exist between *E.obrepanda* and *E.hystrichoides*. Consequently it becomes necessary to question the continued use of the name *hystrichoides*.

Enquiries to date have not found any *E.hystrichoides* of flowering size in cultivation. Advice from any reader who is aware of one would be welcome.

SELF POLLINATION IN REBUTIAS From M.O'Hara.

Rebutias have always been my favourites among the cacti. After having collected and studied many other genera over the years my main interest has once again come back to the *Rebutia*. Considering the complexity of this genus it is rather surprising that so very little has been written about this genus in more recent times, although it seems that many collections still boast a selection of *Rebutia*.

In comparison with many other genera, little work seems to have been done on *Rebutias* since the essays written by J.D.Donald in *Ashingtonia* and elsewhere in the 1970's. One of the perennial problems with *Rebutia* has been the shuffling of segregate genera - *Digitorebutia*, *Cylindrorebutia*, *Mediolobivia*, and so on. Much criticism was heaped upon Backeberg for his raising of the genus *Mediolobivia* although such criticism seldom appeared to be accompanied by logical argument to the contrary. In his *Lobivia* '85, Rausch has transferred the *Mediolobivia* group to *Lobivia* but regrettably without any detailed explanation - or even without explanation - for the basis of the decision. Only rarely does any explanation seem to appear for or against one or other form of classification of the groups within *Rebutia*. This led me to decide to take a more detailed look at these groups.

.....from H.Middleditch

The experiments undertaken by M.Z.O'Hara (Chileans No.65) would appear to cast some doubts upon the use of the self-fertile or self-sterile feature of the flowers for the purpose of classifying Rebutias into e.g. Aylostera, Mediobolivia, etc. Various other features have been suggested for this purpose, but are they really reliable indicators for classifying Rebutias into groups?

.....from G.Laub

The grouping of Rebutia into Aylostera, Digitorebutia, or Mediobolivia, and so on, poses considerable difficulties. Even J.Donald seemingly resigned from this task at the end of his Rebutia saga in Ashingtonia. We now know that there is a wide geographical distribution of most of the Rebutia groups in Bolivia and Argentina and frequently representatives of more than one group are to be found growing not far from each other. Or, more significantly, they also exist in close relationships to one another, so much so that it becomes almost impossible to state where one group ends and another begins. The more plants we obtain from collectors in the field, the more evident it becomes that there are transitions from any one of these groups, into another.

In the meantime, Hunt has included these plants under the family of Echinopsis, but it is very doubtful to me if this helps in any way to get a better understanding of all the plants which are given this umbrella name.

.....from H.Middleditch

The genus Aylostera was established by Spegazzini in 1923 in his "Breves Notas Cactológicas" in the Anals. de la Soc. Cient. Arg. Vol.XCVI, with the emphasis on the "narrow elongated tube solidly united with the style" which had been seen in his Echinopsis pseudominuscula described in 1905. No doubt Spegazzini was perfectly correct in noting in 1923 that this particular feature had not been seen on any other sort of Cactus, but as more material came to hand with the passing years, this particular feature was found to occur to a lesser extent in some Rebutia than in others.

.....from M.Winberg

It is indeed quite possible to assemble a fairly simple table of the characters which could separate Mediobolivia from Aylostera, for example. But it seems that there are some intermediate forms of Rebutia which make it difficult to allocate them into one or other of these two groups. Frankly it is not easy to see any clear dividing lines between Aylostera and Mediobolivia, or between Rebutia and Aylostera.

One observation I made recently is on the flower of Rebutia fabrisii. I have some original clones of MN 126 fabrisii, MN123 fabrisii v.aurieflorea, and the tiny MN 135 fabrisii v.nana - all being forms of the same species, in my opinion. These do not have a distinct Rebutia flower with the style standing free all the way down to the ovary, but seem to have a short length of adnate tube. The yellow flowering MN 123 seems to have a naked ovary, with no hairs or bristles, but the other forms from higher altitude all have bristles! The petal colour of fabrisii proper varies from purple through red to orange yellow.

The fruit of Aylostera could be anything from a tiny heliosa, supthutiana, or schatzliana fruit, to a rather large fiebrigii or spegazziniana fruit. It can have bristles or hair, or both. The Mediobolivia, such as pygmaea, steinmannii, atrovirens, or nigricans, mostly have larger fruits with hair and bristles. The seeds of this latter group are mostly larger, too. But I doubt if any clear lines can be drawn between these various groups of plants.

.....from H.Middleditch

Is it possible that the size of the fruit may not really be a feature of a specific plant but more an indication of the effectiveness of the pollination?

.....from R.Martin

As for differences between Aylostera and Mediobolivia, I find it hard to draw firm conclusions. Even Rausch changed his mind about some plants, and swapped them from one group to the other. I would not always agree with the tap-root distinction for Mediobolivia. Has the possibility been considered that some species may form a tap root when grown from seed, but not if they are grown from cuttings? Although Aylosteras do tend to have longer flower tubes, some can be relatively short, and I do not think that there is a magic gap between the lengths of the flower tube on Aylostera compared with Mediobolivia. On the whole, Aylosteras do have thinner, less fleshy flowers, which probably accounts for the observation that their flowers stay open for less time. Also they do have paler fruit.

.....from M.Winberg

On our visit to northern Argentina in 1990 we took the bus from Iturbe to Iruya, and back. On our return visit in 1993 we had decided to take a closer look at the first part of this road, so we set off from Iturbe on foot. It took us two hours to walk to Chaupi Rodeo. A few kilometres further on towards Abra Condor we stopped to look round and found some nice plants, which we subsequently identified as Rebutia pygmaea. Of these, the Rebutia pygmaea MN 225 were small plants, only 10 to 15mm broad. We were able to unearth one of these plants without damaging the root, which was about 10cm long and tapered gradually from the body thickness at the top to a mere thread right at the bottom. A few km beyond Chaupi Rodeo we found a spot close to a stream where we could camp for the night, at about 3550m altitude

.....from H.Middleditch

A slide of some seedlings of R.einsteini which came into my hands a number of years ago from P.Smart, also displays a rootstock whose upper portion is likewise the same thickness as the body. This rootstock had not been able to develop naturally to a good length, evidently due to the shallow depth of the container in which it had been grown.

.....from W.Phillips.

A year or two ago I grew some Pterocactus kuntzei from seed, sowing them in the usual sort of relatively

shallow pot. When it came to pot up the resultant seedlings, I found that they had attempted to grow a long rootstock which had curled round in the bottom of the pot. So last year I sowed some more of the same seed, but this time in a 6 inch deep pot, to allow the root to develop naturally.

.....from H.Middleditch

One of these seedlings was received less than one year after being sown - the stem was about 6mm thick and some 3 to 4 inches in length, the tapering root of over four inches in length had an upper half of just the same thickness as the body. If Rebutia seed was given a comparable depth of compost, what species would produce a similarly thickened rootstock? Not just the "Mediolobivia"?

There is a good photograph in Rausch Lobivia 85 of half a dozen Rebutia einsteinii, all seemingly with thickened rootstocks which appear to be branching. Perhaps this root branching feature is not peculiar to just the one population?

.....from C.Pugh

When we were near Purmamarca we came across a number of Rebutia which may have been R.einsteinii. We were able to unearth a plant of moderate size and found that it had two thickened tap roots. One of these did look a bit older whilst the other looked as if it was fairly new.

.....from H.Middleditch

Is the thickened rootstock really only to be found on certain species of Rebutia, or is it a fairly widespread feature?

MATERIAL AVAILABLE.

.....from W.Philipps

I have available two DVD's of the American Cactus Journal from its start to the 1980's. Also a selection of Cactus books - for a list write to 2 Goodshaw Close, Pleckgate, BB1 8PG. A stamped addressed envelope would be appreciated.

.....from H.Middleditch.

Books on South American Botany, Geography, Topography, and History. List available.

The Cactus Explorers Club

September 14th to 16th 2012 University of Leicester

A residential weekend for cactus enthusiasts who want something a bit more in-depth than the norm. Emphasis on unusual plants and places. About 20 talks including two speakers from overseas.

Full days of lectures covering cacti from North and South America. Plant and Book Sales. See <http://www.cactusexplorers.org.uk> for information about the meeting and our FREE downloadable PDF journal.

Previous attendees will receive an invitation in February. There may be a few available spaces.

graham.charles@btinternet.com

Graham Charles, Briars Bank, Fosters Bridge, Ketton, Stamford PE9 3BF

ACCOUNTS, Chileans Volume 21, Numbers 67 to 69

| | | | |
|-------------------------|-----------|---------------------------|-----------|
| Income | | Expenditure | |
| Balance brought forward | 5,068.39 | Printing | 848.61 |
| Subscriptions | 2,178.56 | Postage, Stationery, etc. | 1,915.81 |
| Back Numbers | 463.71 | Refunds | 22.00 |
| Other publications | 49.00 | Computer repairs | 264.00 |
| Sundry income | 44.03 | | ----- |
| | ----- | | £3,050.42 |
| | £7,803.69 | | |
| Less expenditure | £3,050.42 | | |
| | ----- | | |
| Balance carried forward | £4,753.27 | | |

CONTENTS No.70

| | | |
|---------------------------------------|--------------|----|
| Impressions of the coastal hills | R.Schultz | 3 |
| Parodia in Brazil? | F.Ritter | 11 |
| Uebelmannia | A.Wroblewski | 11 |
| Finding Pyrrhocactus umadeave | R.Ferryman | 16 |
| Not growing Pyrrhocactus - from seed? | R.Moreton | 22 |
| Gymnocalycium obductum | J.Piltz | 26 |
| We find Echinopsis hystrichoides | M.Lowry | 33 |
| Self pollination in Rebutias | M.Z.O'Hara | 35 |

Chileans Picture Library

| | |
|---------------|---|
| Cleistocactus | T.Lavender, Kalanchoe, Market Place, Tetney DN36 5NN |
| Copiapoa | P.Hoxey,34, Stonehill Rd., Graet Shelford, CB2 5LJ paul@hoxey.com |
| Echinopsis | R.Purslow, 75 Littleheath Rd., Selsdon CR22 7SJ |
| Frailea | R.Gillman, Oddyns Farm, High Cross Lane, Little Canfield CM6 1TF |
| Gymnocalycium | S.G.Slack, 50 Sunnyside, Edenthorpe DN3 2PH grahamandirene@slack2830.freeserve.co.uk |
| Lobivia | P.Crewe, 6 Douglas Rd., Hazel Grove, Stockport SK7 4JG |
| Matucana | J.Arnold, Suffolk House, 2 Oak Hill, Washingborough LN4 1BA |
| Melocactus | M.Madders, 1 Potheridge Gate, Merton, EX20 3DN |
| Notocactus | P.Moor, 60 Milton Hall Road, Gravesend DA12 1QW philipmoor@blueyonder.co.uk |
| Parodia | P.Down,24 Brackley way, Totton. SO40 3HN |
| Rebutia | I.Crook, Croshaw, 3. Clarendon Rd., Audenshaw M34 5QB. |
| Sulcorebutia | J.R.Kirtley, 11 Fire Station Houses, Alnwick NE66 2PB jimrkirtley@talktalk.net |
| Tephrocactus | R.K.Hughes, 16 Ashbourne Avenue, Bootle L30 3SF |
| Weingartia | A.Glen, 5 Hall Grove, Macclesfield SK10 2HQ aglen@tinyworld.co.uk |

For availability etc. of Library pictures on CD, see Chileans No.69

THE CHILEANS

| | |
|----------------|---|
| Hon. Organiser | H.Middleditch, 5 Lyons Avenue, Hetton-le-Hole DH5 OHS |
| Hon. Treasurer | R.L.Purves, 19 Brocks Drive, Guildford GU3 3ND |
| Hon. Secretary | P.C.Bint, 313 Manchester New Road, Alkington, M24 1NR |