

# *Schütziana*

The Gymnocalycium Online Journal

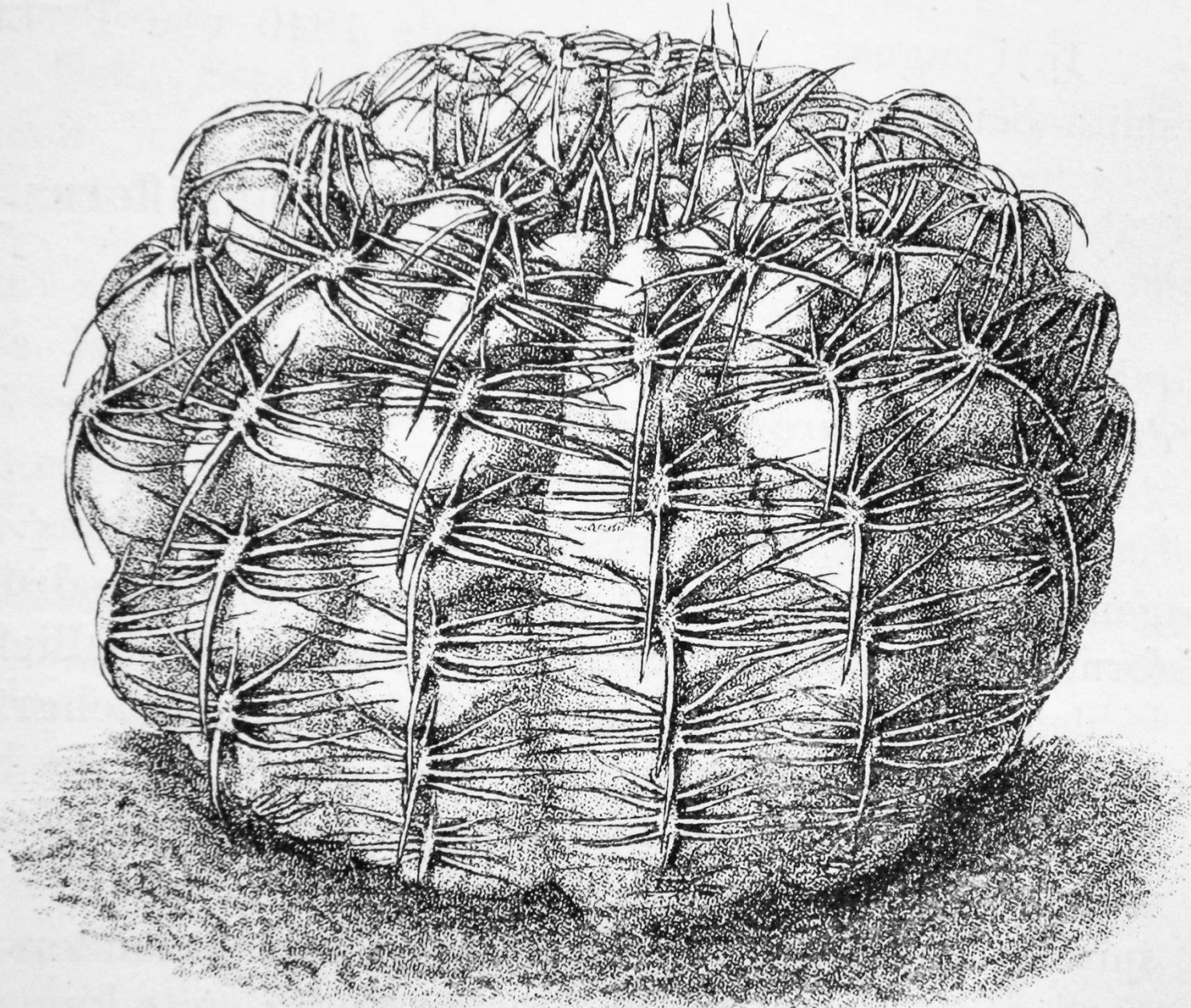


Fig. 70.

*Echinocactus hyptiacanthus* Lem.

Original von T. Gürke.

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## Editorial



### Dear *Gymnocalycium* enthusiast!

Times change! Computers permeate the different spheres of life more and more. Also for friends of cacti there are lots of home pages developed with love and a huge amount of information to discover. Even for our preferred genus '*Gymnocalycium*', it is the case.

Last year Massimo Meregalli had the idea to bring into being an Online *Gymnocalycium* Journal to exchange and discuss information on *Gymnocalycium* in real-time, with a low budget and without limitation on the number of pages and pictures.

It is planned to create 3-4 issues (perhaps more) per year, to publish it in pdf-format and to offer it to you as a free of charge journal. Furthermore, we will apply for an ISSN number, to make our work quotable. In addition, we have set up a forum to make discussion possible beyond the journal. You will find the link on our web pages.

Finally, we promise not to censor the content of your contributions.

We want to invite you to share with us your scientific and private researches and insights into the genus *Gymnocalycium*!

In the first issue of *Schütziana*, Massimo Meregalli deals with the problems around *Gymnocalycium hyptiacanthum* (Lemaire) Br. & R. Wolfgang Papsch will bring us closer to what we should understand as *Gymnocalycium papschii* H. Till – a species named for him. And I will introduce to you some natural localities of the three subspecies of *Gymnocalycium parvulum* (Spegazzini) Spegazzini.

## The *Gymnocalycium* of Uruguay.

### 1. *Gymnocalycium hyptiacanthum* (Lemaire) Britton & Rose: history of the name, historical interpretations, the neotype and nomenclatural considerations.

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**ABSTRACT.** The various interpretations that authors have had of *Echinocactus hyptiacanthus* Lemaire from its description to the present time are reported and discussed. The validity according to the international code of botanical nomenclature of the controversial neotype designated by Kiesling is analysed: it is explained why, strictly following the rules of nomenclature, the neotype designation cannot be rejected. The various populations referable to the nominal subspecies are illustrated.

In Uruguay I found my first Gymno, back in 1999, during a research expedition together with Roberto Kiesling and Omar Ferrari, and that Gymno was *Gymnocalycium hyptiacanthum*. Since that time I have travelled three more times to that country, finding a large number of populations. I will illustrate in a series of contributions the various forms of *Gymnocalycium* distributed in Uruguay and nearby regions of Brazil.

Before discussing the characters of the various populations, some notes on the nomenclature of *G. hyptiacanthum* will be given. I must here emphasize that, regardless of the feeling of collectors, the names of the Cactaceae are not different from the names of any other plant, and their use must follow the rules of the International Code of Botanical Nomenclature (McNeil & al., 2006).

Although the name *Echinocactus hyptiacanthus* was described in 1839 (Lemaire, 1839), the absence of any geographical indication, the incomplete description and the personal interpretation of subsequent authors who worked on the Cactaceae in the following years rendered its application far from consistent. This is quite often the case for many of the Cactaceae named in the first half of the 19<sup>th</sup> century, also because of the absence of precise geographical indication for most of the plants which were sent to Europe, the generally poor descriptions, the lack of type material, and the vague concepts of species at the time. The interpretation of most of the old names, often not typified, varied according to the authors; in many cases an initial mistake was propagated by subsequent authors. The necessity to fix the current usage of a name prompted some recent authors to typify some of these older names. One of these cases occurred for *Echinocactus hyptiacanthus*, which was typified by Kiesling (1999), with a neotype (mistakenly indicated as a lectotype) from the surroundings of

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Florida, in southern Uruguay. In doing this, Kiesling wanted to fix the usage of *G. hyptiacanthum*, at least in accordance with the majority of South American collectors and botanists – less so for those in Europe, as we'll see. This interpretation was soon questioned, and the name was rejected by Hunt & al. (2006), according to Art. 57.1 of the International Code of Botanical Nomenclature. This article says that “A name that has been widely and persistently used for a taxon, or taxa, not including its type is not to be used in a sense that conflicts with current usage”. Unfortunately, this article is quite vague – what does it mean “widely and persistently used”?? – and this renders its application somewhat confused. Anyway, first of all we need to ascertain what is the “current usage” of the name, to understand if it conflicts with the neotype designated by Kiesling. A short history of the application of the name is indispensable to clarify the problem. The name was proposed by Lemaire in 1839 for plants of unknown origin and without knowledge of flower and fruit (see a translation of the original description below).

Subsequent attributions of plants to this species were based on the personal interpretation of the original diagnosis according to the authors, and this caused an uncertain application of the name. Apart from simple citations in some lists or synonymic catalogues, we have the following taxonomic treatments of *E. hyptiacanthus*.

Förster (1845) indicated that the species came to cultivation in 1840, but since Lemaire's description was published in 1839 he could not have referred to the original collection. His description is even more general than Lemaire's. The flower colour was indicated as white by Labouret (1853), but his description of the plant was not fully corresponding with Lemaire's, and, moreover, his French translation of the original Latin was wrong, particularly in the point where he indicated the colour of the spines as "tout dorés à la base et pourpres à la pointe" (all gold-yellow at the base and purple at the apex), whereas in the original description the spines are described as yellow with base and point red (*aculei ... in plantam incurvati, aurei, ad basim et ad apicem atro-purpurei* – spines ... curved against the body, golden yellow, at base and at apex dark purple). Labouret also wrote "Lemaire a décrit la même plante..." (Lemaire described the same plant...), but it is difficult to know whether with these words Labouret meant that he was talking about the very same individual or if he used - as seems more likely - the term "plant" for species. Labouret associated *E. hyptiacanthus* with *E. multiflorus*, but the two taxa, according to the protologues, are surely distinct: Labouret's interpretation of the name was thus probably incorrect. His mistake and the confusion between *multiflorus* and *hyptiacanthus* continued to reappear for at least half of a century. The next appearance of *E. hyptiacanthus* is in Rümpler (1886), who described the flower as being large and white-yellowish. Again, no indication of origin was given. Weber (1896) for the first time reported Uruguay as a hypothetical country of origin, with a question mark, and indicated the flower as white. Schumann (1903) indicated the flower as white-yellowish and said that the seeds were sent from

Uruguay by Tweedie in 1840. This information may apply to the plants already cited by Förster (1845), but again it cannot correspond to the original plant described by Lemaire in 1839. It seems also doubtful that the seeds sent by Tweedie were collected in Uruguay, since he is known for his work in Buenos Aires and Brazil (Charles, personal communication). However, this is the first documented application of the name to Uruguayan plants. Schumann included an illustration by T. Gürke, which is probably the first illustration of a plant under this name (Fig. 1). It may belong to *G. schroederianum*, a species indeed living also in Uruguay and formally described only after many years. This drawing scarcely matches the original description but it can help in identifying what was grown as *E. hyptiacanthus* at the end of the 19<sup>th</sup> century.

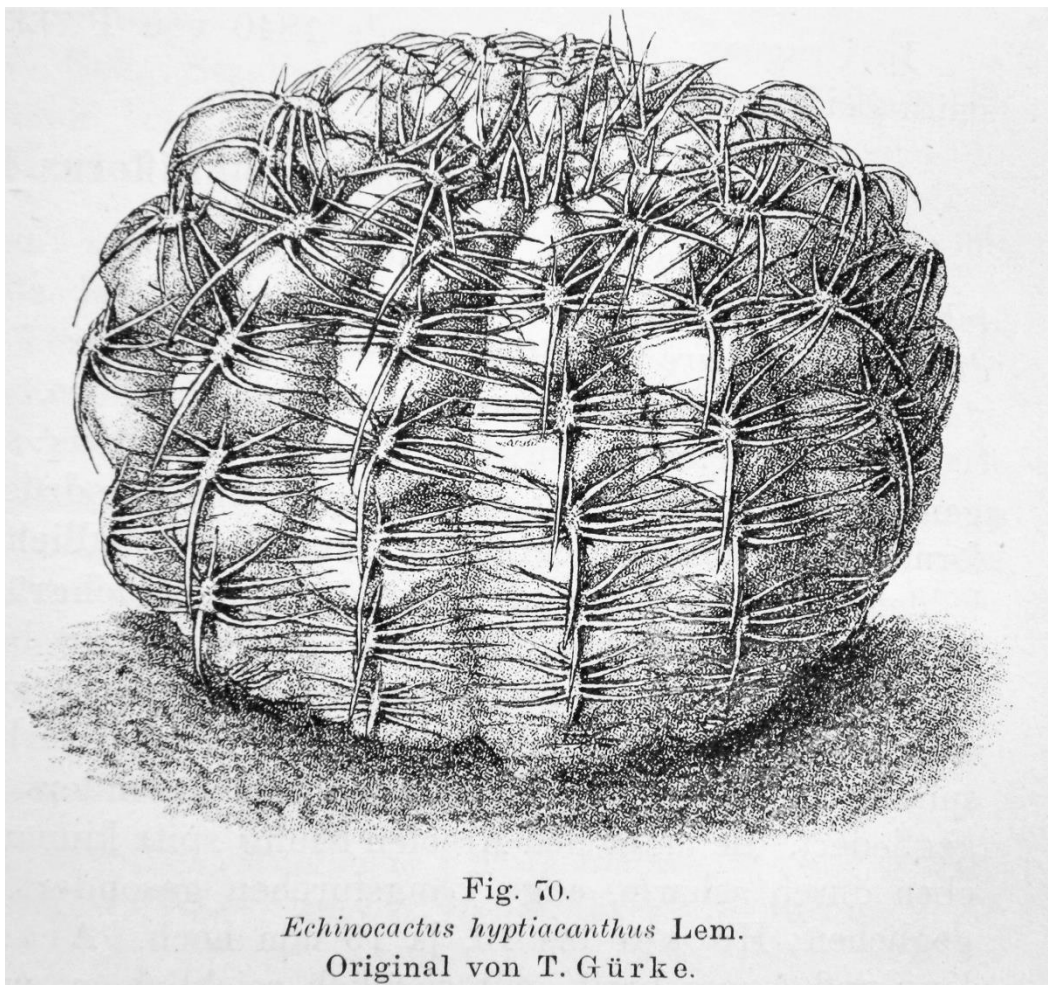


Fig. 1: *Echinocactus hyptiacanthus* Lemaire, the illustration in Schumann (1903).

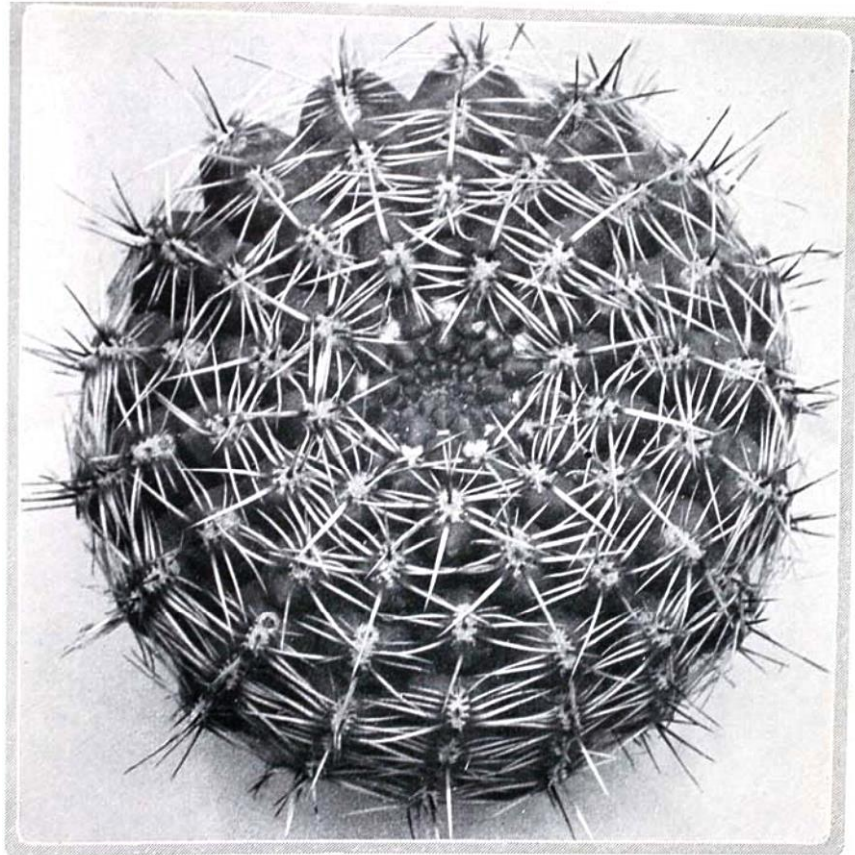
Arechavaleta (1905) named two new species from central Uruguay; he briefly reproduced one of the previous descriptions of *E. hyptiacanthus* but did not specify any Uruguayan locality for it. Schelle (1907) copied again the previous descriptions and reported the flower to be white-yellowish. A nice colour illustration was published by the Deutsche Kakteen-Gesellschaft in *Blühende Kakteen* (1914: tab. 164). This illustration depicts a plant surely different from that illustrated by Gürke; it is not easy

to identify it, but it may be referable to a form of *G. reductum* from the province of Buenos Aires (Fig. 2).



Fig. 2: *Echinocactus hyptiacanthus*, the illustration in Deutsche Kakteen-Gesellschaft (1914).

Britton & Rose (1922) combined the species into *Gymnocalycium* and, in a very concise description, returned to indicating a white flower; Uruguay was always cited as the country of origin. In this period a larger number of specimens were exported from South America to Europe, and these included plants from Uruguay, particularly from its southern part, near to Montevideo. Kupper (1929) depicted a relatively strongly spined plant, described with a white flower, and its distribution was given as Uruguay (Fig. 3). However, this plant looks more similar to forms of *G. reductum* than to plants from Uruguay.



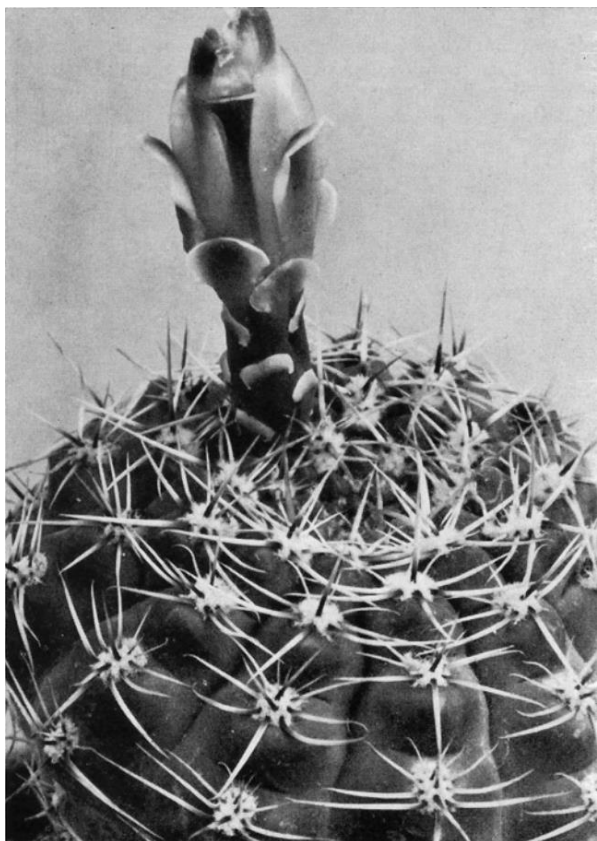
*Gymnocalycium hyptiacanthum*

Fig. 3: *Gymnocalycium hyptiacanthum*, the illustration in Kupper (1929).

Berger's (1929) treatment was analogous. The Uruguayan collector Müller-Melchers (1947) generically discussed the Uruguayan cactus, referring to "... verschiedene *Gymnocalycium*-Arten, die, nahe bei *hyptiacanthum*, *Leeanum* oder *Guerkeanum* stehend, vermutlich Standortsformen ... hell zitronengelben Blüten ..." (... different species of *Gymnocalycium* that are related to *hyptiacanthum*, *leeanum* or *guerkeanum*, perhaps local forms ... with light lemon yellow flowers ...). This sentence indicates that by the middle of the 20<sup>th</sup> century the Uruguayan collectors started attributing the name *hyptiacanthum* to (documented) Uruguayan plants, whereas in Europe the name kept on having a confused attribution, being always associated with undocumented plants – probably in part also to horticultural selections. Krainz (1956) indicated the inner segments of the perianth as being white or white-yellowish and suggested that the species was distributed in Argentina. The author added photos of two plants, which are different from each other; one of the photo is said to refer to a plant grown for 40 years in the Zürich Sukkulente Sammlung (Figs 4–5). The one in Fig. 4 is very similar to that illustrated by Kupper.

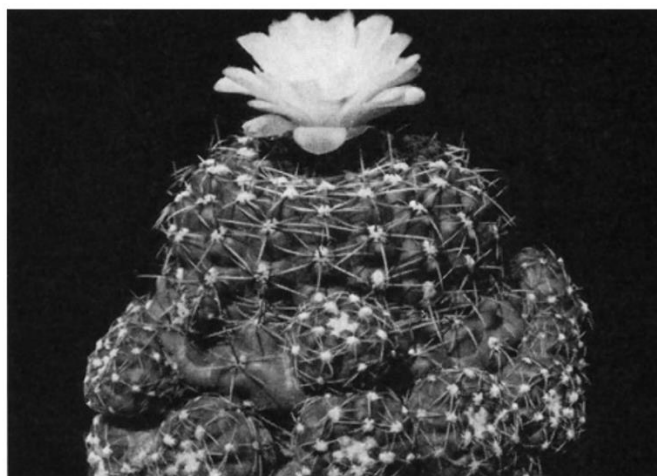
Backeberg (1959) returned to referring the name to Uruguayan plants, and associated the species with *G. leeanum* (sensu Britton & Rose, 1922) and *G. netrelianum*; the flowers were said to be whitish to white yellowish.





**Gymnocalycium hyptiacanthum** (Lemaire) Britton et Rose

gr. *hyptiacanthum* = krallenstachelig

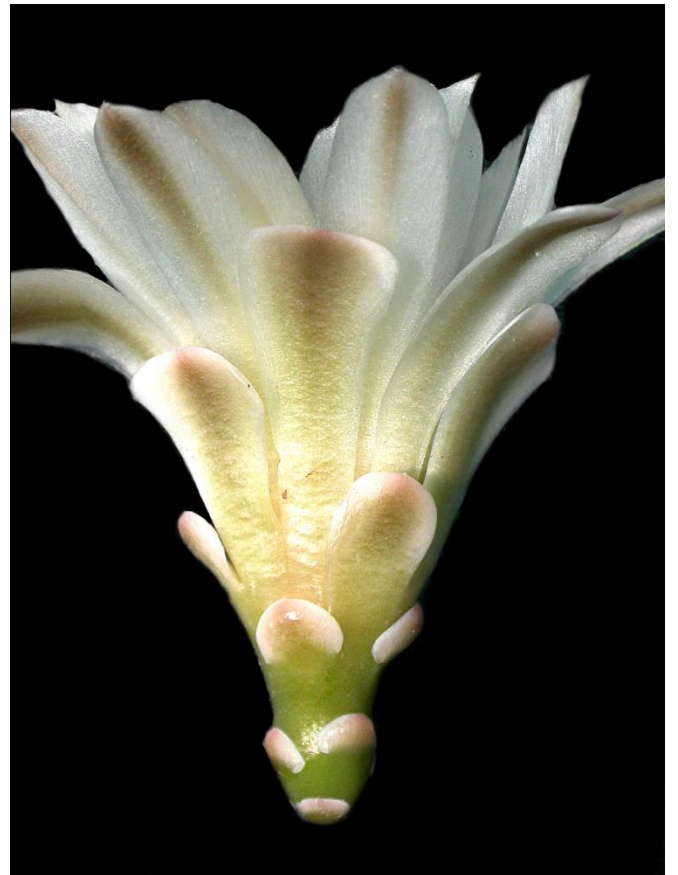
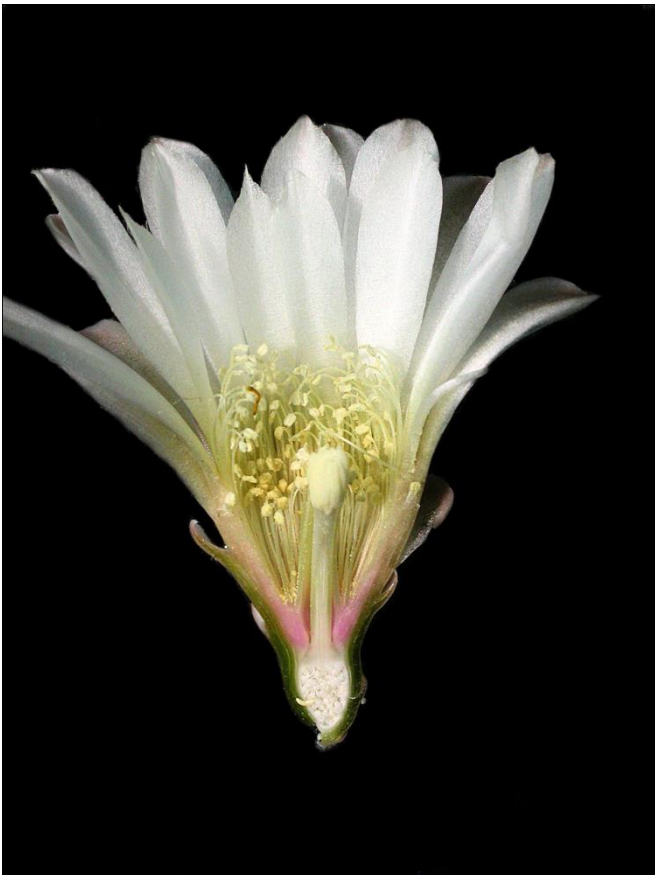


Figs 4–5: *Gymnocalycium hyptiacanthum*, the illustrations in Krainz (1956).

The plant illustrated here (Fig. 6) matches very well with the pictures published by Kupper and Krainz. It comes from a vegetative propagation of an old plant, grown in Strigl's collection, without any precise habitat documentation. It does not correspond to any presently known population; its flower is rather small, with short pericarpel, the colour of the perianth segments is very pale yellow and the throat has a very slightly pinkish flush (Figs 7–8). The relatively strong spines may recall plants from the southern part of the province of Buenos Aires, presently identified as *G. reductum* ssp. *schatzlianum*, and the same may be suggested by the slightly pinkish colour of the flower throat. However, the *Gymnocalycium* populations of the province of Buenos Aires are sufficiently well known and no plant referable to this form has been observed recently. As previously said, undocumented material may belong to horticultural hybrids, selected forms, or even to natural populations not anymore found or now extinct in habitat. Some Uruguayan plants from the area around Punta Ballena may have a central spine and look relatively similar, although the spines are never so strong and the flower is smaller and more distinctly yellow, without any trace of pink in the throat. Unfortunately, no seed was ever obtained from this plant.



Fig. 6: *Gymnocalycium hyptiacanthum* sensu Kupper. Plant obtained from a vegetative propagation of an old undocumented plant presently grown in coll. Strigl.



Figs 7–8. Flower section of the plant reproduced in Fig. 6.

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First-hand information from Uruguay from Hugo Schlosser (Schlosser & Schütz, 1982), based on the study of several different populations, confirmed the application of the name by the South American collectors and botanists; moreover, for the first time they suggested a precise geographical distribution, identifying with this name all the plants from the southern part of the country; the authors also discussed the notable intra- and interpopulation variability.

Since most of the Uruguayan plants grown in Europe in the last decades of the 20<sup>th</sup> century were received from Schlosser, the name *hyptiakanthum* started to be more consistently applied to the plants found in southern Uruguay.

In 1999, to help stability of the nomenclature according to the general interpretation, at least in South America, Kiesling designated a neotype for *G. hyptiakanthum* using a plant belonging to a peculiar population, characterized by spines distinctly reddish at the base, found on the Cerro Pelado, a small hill about 30 meters high at the southern edge of the town of Florida, in southern Uruguay.

Papsch (2001), mistakenly considering Kiesling's designation of the neotype as invalid, suggested that *E. hyptiakanthus* was referable to the species later described as *G. schroederianum* Osten. He then deposited a new neotype and proposed the synonymy *G. hyptiakanthum* = *G. schroederianum*. This designation of the neotype, based on a wrong interpretation of Kiesling's previous designation, cannot be validated. The last interpretation of the name was suggested by Till & Amerhauser (2010). The authors rejected Kiesling's designation (without mentioning which article of the code they were invoking) and again considered *G. hyptiakanthum* to be referable to the species that we now know as *G. schroederianum*.

Although the history of the application of the name reveals that quite a lot of confusion occurred after its description, it cannot be denied that: 1) at least from the beginning of the 20<sup>th</sup> century, most of the citations referred to Uruguay as the country of origin; and 2) starting from the middle of the 20<sup>th</sup> century, all the documented plants found in southern Uruguay were named *G. hyptiakanthum*. Thus, the *current* application of the epithet cannot be questioned. It is true that *hyptiakanthum* was not always applied in Kiesling's sense, at least in Europe, and that some of the authors referred it to plants from the province of Buenos Aires, but this alternative use was surely not "wide and persistent" as required by the code. Therefore, art. 57.1 cannot be elicited to reject Kiesling's neotype.

There is another article of the Code which rules the application of a neotype, Art. 9.17, that allows the exclusion of a neotype if it conflicts with some elements of the original description. It says "*The author who first designates a lectotype or a neotype must be followed, but that choice is superseded if (a) the holotype or, in the case of a neotype, any of the original material is rediscovered; the choice may also be superseded if one can show that (b) it is in serious conflict with the protologue and another element is available that is not in conflict with the protologue*". The option (b) rules cases such as that

of *G. hyptiacanthum*, since no original material (herbarium specimens nor illustrations) exists. The protologue must be carefully read and compared with the plants from the Cerro Pelado. It says (English translation from Charles (2009):

Diagnosis: Body slightly elongated, crown sunken, rich green, 11 tubercled ribs; ribs straight, tubercles six sided; areoles oval; spines seven, short, slender, rigid, clearly curved towards the body, brownish-yellow to yellow, four laterals in two rows.

Tubercles arranged in 11 rows, 6-sided at the base, 8–10 mm wide, separated by short shallow cross-cuts; these separated by long curved downwards running furrows, giving the effect of a green line, flattening towards the base, areoles elliptical, covered with short hair, not very woolly, white, persistent, later becoming grey; carrying 6–7 spines, the top 1-2 erect, hardly bristle-like, 2–4 mm long, 2 pairs radiating each side, the lower pair a little stronger, 6-8 mm long, the one pointing straight down being the longest, 8-10mm long, all thin, very rigid, curved towards the body, brownish-yellow, deep purple at the base and tips.

Clearly a distinct species related to *Ech. gibbosus*, yet totally different. The described plants were 2.5" (63.5 mm) high, 2" (51 mm) broad, all mature plants.

Habitat, flowers and fruit, unknown.



Fig. 9: *G. hyptiacanthum* MM 154, from the neotype locality: Cerro Pelado, south of Florida. Body

Here the description of a plant from the neotype locality.

DESCRIPTION OF *Gymnocalycium hyptiacanthum* (based on plants MM-154, Figs 9–16):

**Body** globose, up to 8 cm wide and 5 cm high, moderately branching from a short shoot starting from the basal areoles; epidermis green to dark green, dull or moderately glossy

**Roots** two or three thickened branches which divide into several small roots

**Ribs** numerous, usually 9 to 15, weakly convex, about 15 mm wide at base and 5 mm high, straight

**Tubercles** broad, obtuse, slightly hexaedric, scarcely prominent below the areoles

**Longitudinal clefts** narrow and shallow, sinuate

**Transversal clefts** deep and narrow, continuous on the whole width of the rib

**Areoles** elliptical, 6 x 2 mm, with dense yellowish hair

**Radial spines** usually 9–11, basal third red, upper part yellowish to greyish, top of the spine sometimes slightly reddish; all spines slightly curved to slightly twisted, up to 20 mm long, appressed against the body, flexible and scarcely or not sharp

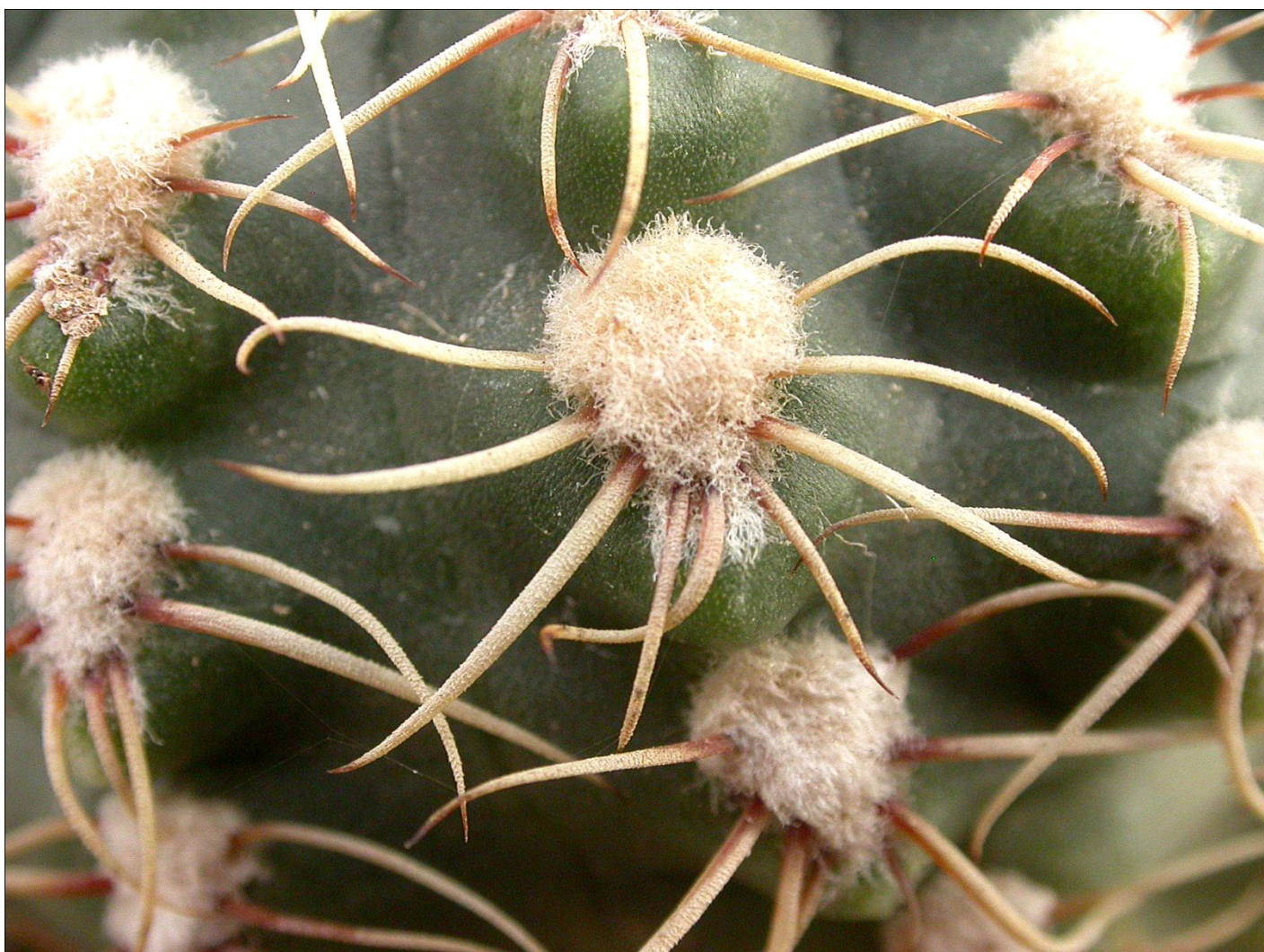


Fig. 10: *G. hyptiacanthum*, MM 154. Areole.

**Central spines** generally absent, seldom 1, short, scarcely stiff

**Flower** unisexual or bisexual, about 40 mm long and wide, shortly funnelform, pericarpel short, less than 10 mm long, slightly longer than wide, glossy green, with semicircular, acutely pointed scales, yellow laterally and green-brownish at middle; ovary broad, as long as wide, white; outer segments of the perianth elliptical, regularly tapering at apex, about 15 x 4 mm, dark green with a brownish fade towards apex on their outer side, light yellow in the inner side; inner segments light yellow, narrower, acutely pointed at apex, about 30 mm long; nectar chamber yellow, filaments yellow, inserted in a few rows; female flowers with style large, yellow-greenish in basal half and yellow at the top, as high as the highest anthers, stigma light yellow, with 5-6 lobes; stamens with light yellow filament, anthers yellow, lower ones close to base of stigma, others regularly inserted in the receptacle; female flowers with sterile anthers, male flowers with regularly developed female structures, although the stigma is usually small, scarcely developed.



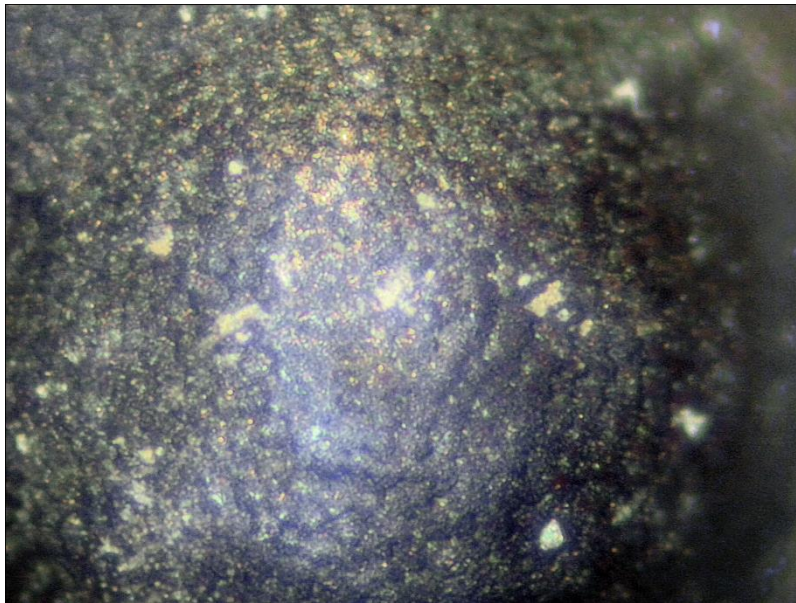
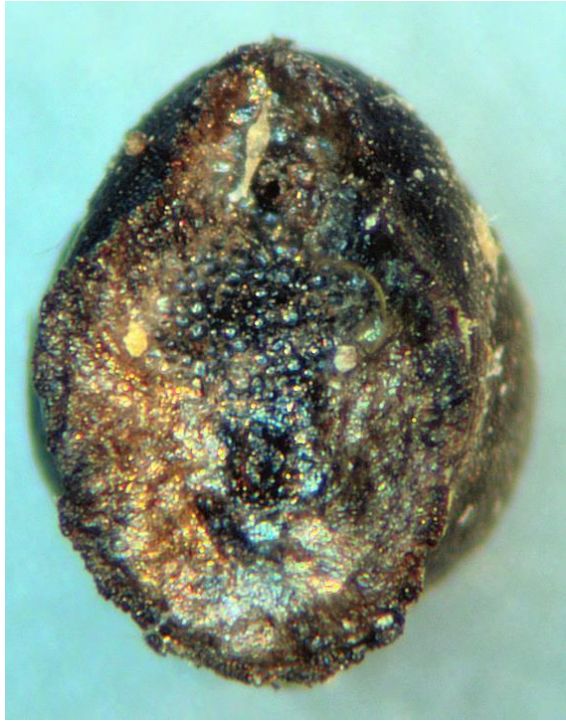
Figs 11–12: *G. hyptiacanthum* MM 154. Flowering plant.



Fig. 13: *G. hyptiacanthum* MM 154. Flower section.

**Fruit** globose, up to 15 x 15 mm, dark green, splitting vertically, drying at ripening, with whitish pulp.

**Seed** almost symmetric, broadly oval, about 1.5 mm long, black, matt, periphery slightly keeled, border of testa curved, very slightly angular at middle, expanded around hilum, cells gradually smaller near hilum, on centre of testa cells polygonal, low, scarcely distinct, slightly longer than wide, anticlinal cell-boundaries very narrowly channelled, straight, interstices undifferentiated, periclinal walls flat, microrelief densely striate; HMR large, basal, shallowly impressed, very broadly ovate, moderately constricted at micropyle, margins of testa scarcely folded downwards, strophiole pad very shallow, usually limited to the border.



Figs. 14–16: *G. hyptiacanthum* seed of MM 154. Bar: 1 mm

According to art. 9.17, the neotype designation can be superseded **only** if it is in **serious** conflict with the protologue **and** it can be replaced with another element (in this case, another specimen, of course belonging to a different species) "not in conflict" with the protologue. It is virtually impossible to apply this article to reject Kiesling's neotype. The fact is that the description is vague enough to be applied to a large number of cacti, and this renders very complex the comparisons of the traits of the neotype. The shape of the tubercles indicated in the protologue suggests it belongs to the genus *Gymnocalycium*, but very little else can be said. The shape of the body, number of ribs, their morphology and the form of the tubercles are consistent with the neotype. There are small differences in the spines, in the neotype in fact the spines are 7-9 instead of 6-7, the two upper are



not erect, as in the description, and the lower one, downwards directed, is not the longest. However, as in the description, they are greyish with red base, the apex is also slightly red and the lower laterals are stronger. So, there are no characters which can be used to define that the neotype is in **serious** conflict with the protologue. It was suggested that the cluster of spines as described by Lemaire in the protologue recalls that of *G. schroederianum*, but this seems to be a really weak evidence. The minor differences in the spine cluster clearly cannot be considered as such, they are part of the natural variation of a species. As said, Schlosser & Schütz (1982) also demonstrated a conspicuous variation in some populations, and I could observe the same situation in many habitats, particularly in the southern part of Uruguay, where plants clearly belonging to the same species as the neotype indeed have spines more corresponding to the description. So, it will not be supported here that the original plants described by Lemaire (1839) were really found in Florida, but that the variation observed among the various populations from southern Uruguay accounts for the slight differences between the neotype and the characters described in the protologue in the sense of the requirements of the code of nomenclature. For the same reason, it is a nonsense to try to find any other species which can be referred more properly to the protologue of *Echinocactus hyptiacanthus*. Moreover, the application of the epithet to *G. schroederianum* would conflict with art. 57.1, since never before 2001 was *hyptiacanthum* applied to that species. Even though it is impossible to state without any doubt that the plants seen by Lemaire surely belonged to *G. hyptiacanthum* in the sense of the neotype, Kiesling's act was justified as an attempt to fix the current usage of the name (at least for a part of the specimens identified as such in literature and collections). The neotype cannot be rejected according to the code of nomenclature, since neither art. 9.17, nor art. 57.1 can be applied, and the last article also prevents the epithet being applied to *G. schroederianum*. In a recent informal meeting among *Gymnocalycium* collectors and students (Niftrik Gymno-day, September 2010) it was suggested to submit a proposal to the Commission for Botanical Nomenclature in order to reject Kiesling's designation and apply the name *G. hyptiacanthum* to the species today known as *G. schroederianum*. In consideration of the previous remarks, and bearing in mind the relatively widespread application of *G. hyptiacanthum* to plants of Uruguay, the use of *G. hyptiacanthum* in Kiesling's sense in the most recent check-list of the genus (Charles, 2009) and finally also considering that referring the epithet to *G. schroederianum* would go against the principle of stability, I do not think that such a proposal should be submitted.

VARIATION. All the specimens from the hill south of Florida are extremely similar. Some of the apparently male flowers are indeed hermaphroditic, and are self-fertile, although self pollination does not always result in the ripening of the fruit; when this occurs the fruit is smaller and has only a few seeds, which however are regularly fertile.

CONSERVATION. This neotype population is critically endangered, due to its extremely small size, consisting of only a few tens of individuals, the very small range, and to invasive alien plants covering most of the soil and threatening the survival of the plants. Searches in the surrounding hills, in apparently favourable habitats, did not result in finding other populations, but obviously the presence of other colonies at other not yet examined sites cannot be excluded.

OTHER POPULATIONS. As said, no other populations were found in the surroundings of Florida. The closest one morphologically, known for a long time as *Gymnocalycium* sp. WD-1, was found by the Uruguayan collector Williams Duarte on the Cerro Campana, a hill north of Rosario. Here the plants grow in a gravel soil and are often nearly completely covered and hidden by grass. They are very similar to those from Florida, and, similarly, some of them are self-fertile. The main difference is the more distinctly red base of the spines; the remaining traits are not significantly distinct (Figs 17–22). Also, this population is very scarce in the number of plants, and is endangered by gravel extraction.





Figs. 17–22: *G. hyptiacanthum* WD-1. Habitat, plants in habitat, plants in cultivation: body and detail of the spine cluster.

Plants perfectly referable to the “WD-1” were distributed by Schlosser as Schl-136, from “Ruta 2, between Rosario and Cardona” (Schlosser, field number list, undated), thus in the same region of the Cerro Campana. Williams Duarte (personal communication) said that on a nearby hill he discovered yet another population comparable with his WD-1.



Figs 23–24: *G. hyptiacanthum* Schl-136. Body and detail of the spine cluster.

Thus, it seems that the hills north of Rosario host several populations of *G. hyptiacanthum*, all of them probably rather difficult to find, isolated and consisting of few individuals.

To be continued.

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## Gymnocalycium papschii H. Till pro parte.

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**ABSTRACT.** Hans Till published in *GYMNOCALYCIUM* (2001) the first description of *Gymnocalycium papschii* H. Till. In his description he mixed characteristics of plants from San Javier (*G. papschii* WP 83/111) and Loma Bola (*G. spec.* HA 521). However, these two taxa can clearly be distinguished based on body, spines and flowers. Thus, it is necessary to label *G. papschii* H. Till pro parte.

In the third issue of *GYMNOCALYCIUM*, vol. 14 Hans Till described a new find from the Cerro Champaqui (Sierra de Comechingones, Prov. Córdoba) as *Gymnocalycium papschii* H. Till (Till 2001). The holotype is a plant from the first collection with the field number WP 89-83/111, deposited in CORD. In the protologue this plant is presented in fig. 8. Furthermore, an Isotype with the same field number was deposited in WU.

The new species was discovered on the west slopes of the Cerro Champaqui, above San Javier, in the surroundings of La Constancia at approximately 1200 m above sea level, in an open shrub area. The plants usually grow in the protection of bushes in fine-grained, sandy soil. During three visits to the habitat no further cacti could be found.

A lot of collectors have been irritated since the first publication, because two different plants are present in our collections under the name *G. papschii*.

The reason for this is that the author extended the distribution area in his remarks about the distribution and ecology of *G. papschii* to include Luyaba, Loma Bola and later on Cortaderas. Thus, he assigns also plants collected by Berger (Berger Be 517 Luyaba) and Amerhauser (HA 521 Loma Bola) to the newly described taxon. Additionally, he added a HT 2668 to his statements in the article. Since Hans Till never visited this location, HT 2668 must be a plant number in his collection which can be traced back to discoveries from Loma Bola by third parties. So, this number should be regarded as an accession number in the Till collection.

From Be 517 Luyaba no plant material was collected (Berger, personal information). The photo in the protologue documents this find but, due to lack of investigation material, these plants can't be evaluated further.

We have a different situation regarding plants with the field number HA 521 (identical with the field number STO 521). These plants are very common in collections. According to the captions in the first description, these plants were collected at Loma Bola.

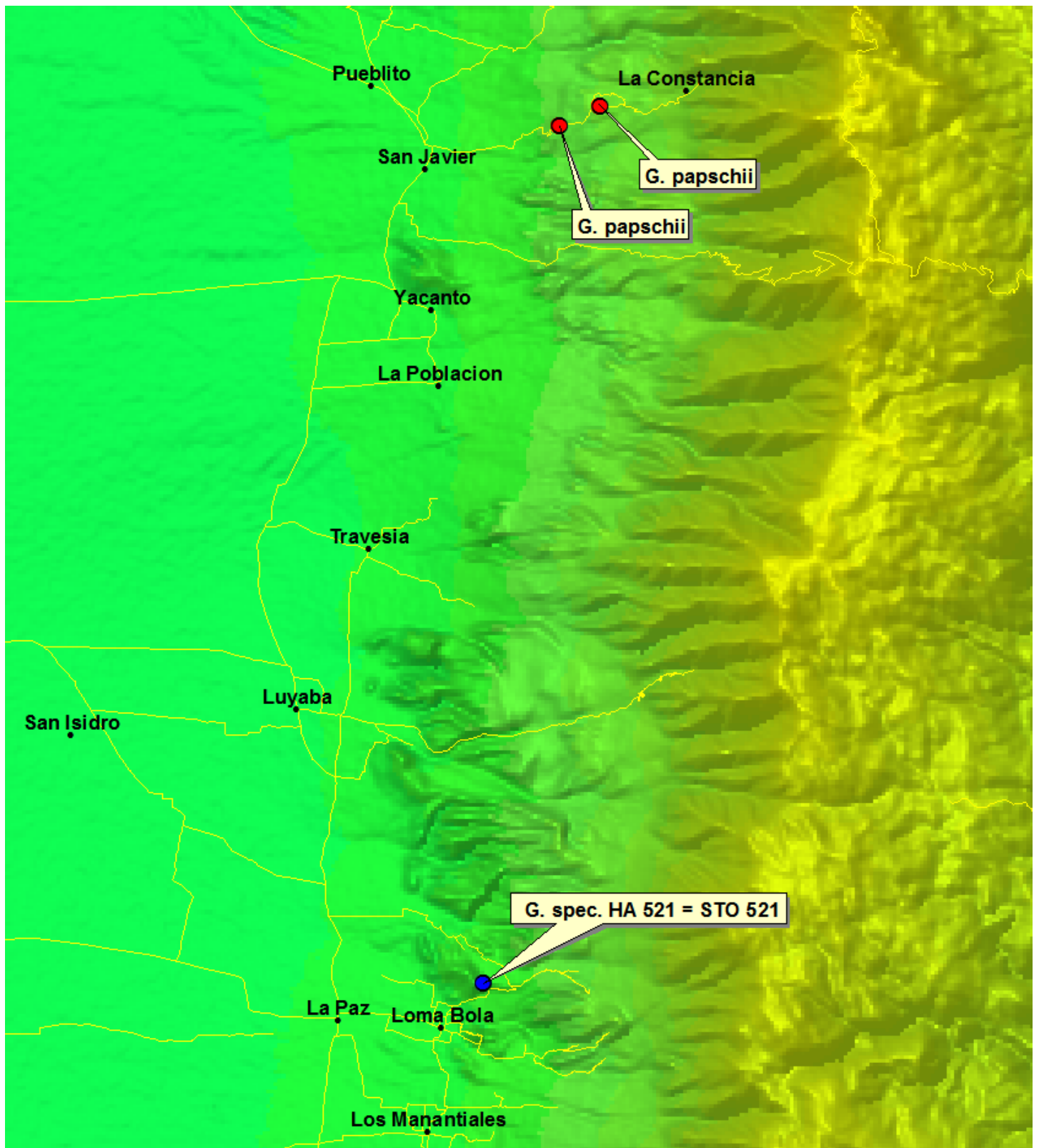


Fig.1: Map of distribution (map: Mario Wick)

Comparing the plants from WP 83/111 and HA 521 it becomes clearly visible that they differ remarkably in their characteristics from each other and that they don't belong to the same species. They represent two taxa which can be clearly separated. However, the author in the protologue of the first description mixed up the characteristics of both taxa and presented a photo of plants from Loma Bola as *G. papschii*. This led to the wrong impression we have of *G. papschii* today.

Comparing the striking differences between the two taxa it becomes apparent that in particular the shape of the body differs. Whereas *G. papschii* (WP 83/111) grows with a flat-spherical body with up to 7 cm diameter and about 4 cm height, *G. spec.* (HA 521, Loma Bola) has a short-cylindrical body with increasing age, about 4-5 cm diameter and a height of 12 cm or more. *G. papschii* has 13 ribs at wider distance which clearly form 8:13 spirals. *G. spec.* HA 521 has up to 17 ribs on a body diameter which is far smaller. Therefore, the ribs stand very close.

Also very remarkable are the differences in the spines. *G. papschii* has 6-9 homogeneous radial spines of approximately 6 mm length, which are arranged in 2-3 pairs. Often there are two further lateral spines which point up. The upper third of the areole is without spines. Almost always a central spine, very similar to the radial spines, is present. All spines are of horn-colour with a distinctive red base. The surface of the body remains visible.

The spines of *G. spec.* HA 521 are densely interwoven. There are up to 12 radial spines of varying length (5 mm average). Although no central spine is present, the dense, fine spination makes a shaggy impression with its confused arrangement. The body is completely covered with spines.

*G. papschii* flowers in spring, together with *G. gaponii* Neuhuber. The range of flowering time starts at the end of March and stops in the middle of April and thus, it is still before *G. erinaceum* Lambert. *G. spec.* HA 521, however, is a typical summer flowering plant with a main blooming period from July to the beginning of August. The differences in the construction of the flower of the two taxa are also clearly visible: the flower of *G. papschii* is astonishingly similar to that of *G. gaponii*, those of *G. spec.* HA 521 shows similarity with that of *G. parvulum* (Spegazzini) Spegazzini.

SUMMARY: Hans Till mixed two different taxa in his first description of *G. papschii*. Because of the deposition of a plant from location WP 83/111 (Cerro Champaqui) as the type, the name *G. papschii* can only be applied to plants from San Javier and/or La Constancia. HA 521 = STO 521 is a different species and must be regarded separately from *G. papschii*. Thus, it is necessary to label *G. papschii* H. Till pro parte.

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Till, H., 2001. *Gymnocalycium papschii*, ein interessanter Neufund von Cerro Champaqui aus der Sierra de Comechingones. In: *Gymnocalycium* 14(3), 405-408



Fig. 1: *G. spec.* STO 521, body, all photos W. Papsch



Fig. 2: *G. spec.* STO 521, body



Fig. 3: *G. spec.* STO 521, body



Fig. 4: *G. spec.* STO 521, body





Fig. 5: *G. spec.* STO 521, body



Fig. 6: *G. spec.* STO 521, body



Fig. 7: *G. spec.* STO 521, body with flowers



Fig. 8: *G. spec.* STO 521, flower section



Fig. 9: *G. papschii* WP 83-111, body



Fig. 10: *G. papschii* WP 83-111, body



Fig. 11: *G. papschii* WP 83-111, body



Fig. 12: *G. papschii* WP 83-111, body



Fig. 13: *G. papschii* WP 83-111, body



Fig. 14: *G. papschii* WP 83-111, body with flower



Fig. 15: *G. papschii* WP 83-111, body with flower

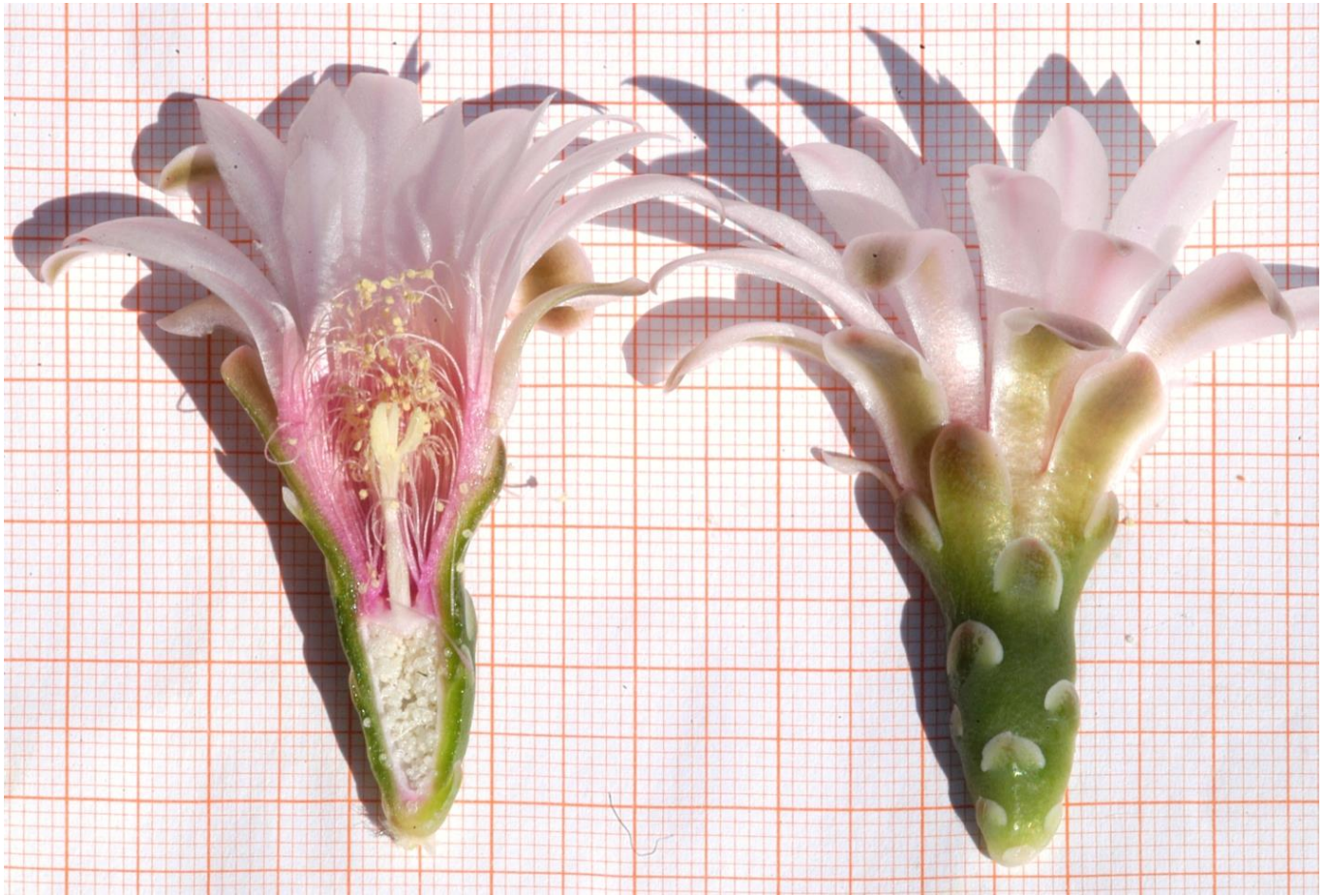


Fig. 16: *G. papschii* WP 83-111, flower section



Fig. 17: *G. papschii* WP 83-111, flower section

## Three subspecies of *Gymnocalycium parvulum* (Spegazzini) Spegazzini in nature.

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**ABSTRACT.** The author presents the three taxa *Gymnocalycium parvulum* ssp. *amoenum*, *Gymnocalycium parvulum* ssp. *agnesiae* and *Gymnocalycium parvulum* ssp. *huettneri* with pictures from nature.

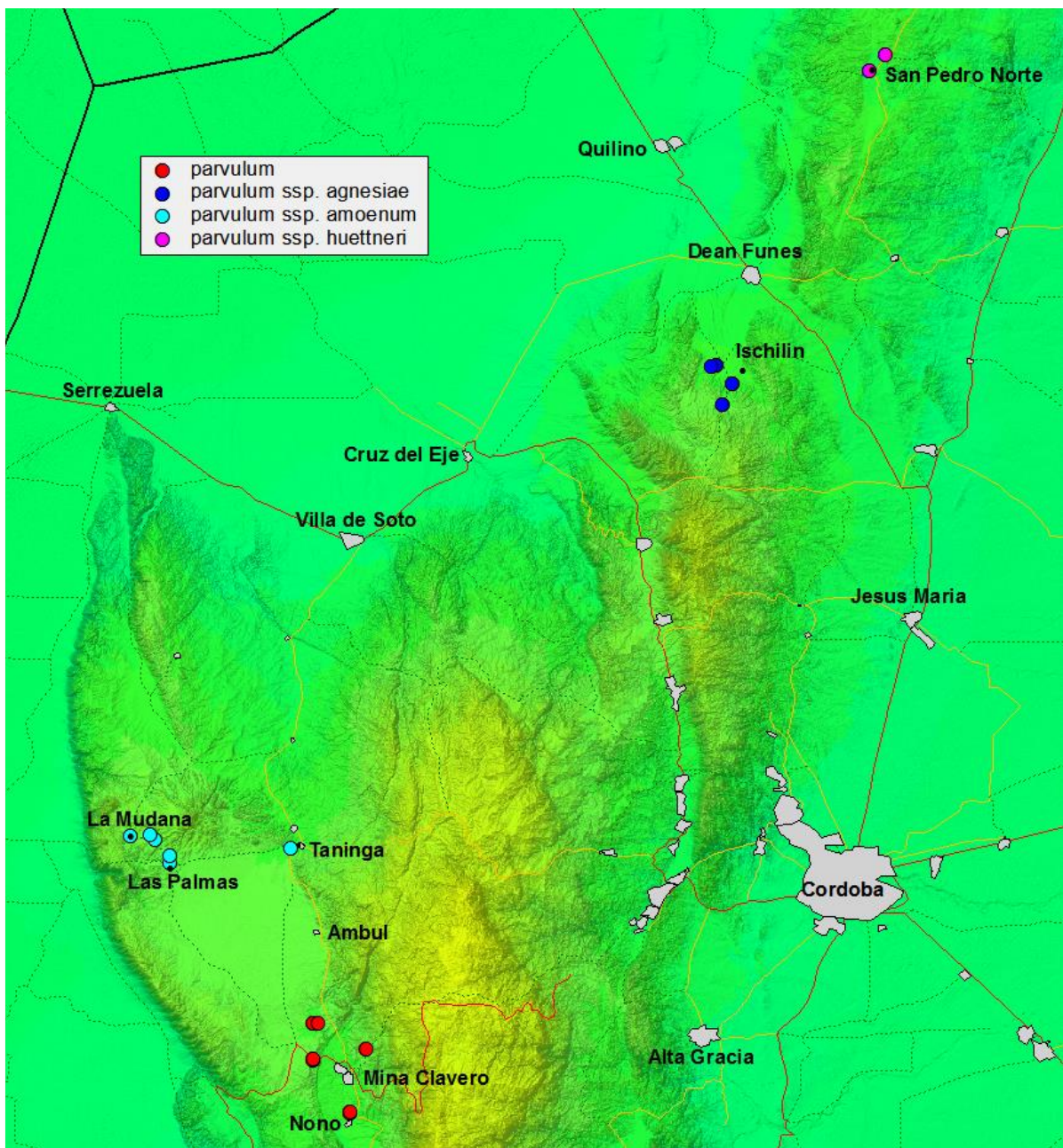


Fig. 1: Visited locations of *G. parvulum* aggregate (all figures: Mario Wick)

Not for everybody is it possible to visit *Gymnocalycium* in South America. In this and following articles I want to present interesting plants in their natural surroundings.

During our trip to Argentina in January 2010 (Volker Schädlich, Germany; Thomas Strub, Switzerland and me) we wanted to investigate some species of the subgenus *Gymnocalycium* (sensu Metzinger, *Ovatisemineum* sensu Schütz) from North Córdoba, Argentina. One special point was to visit the different populations of the three subspecies of *Gymnocalycium parvulum* (Spegazzini) Spegazzini comprising *G. parvulum* ssp. *agnesiae* F. Berger (Berger 2010), *G. parvulum* ssp. *amoenum* (H. Till) F. Berger (Berger 2008) and *G. parvulum* ssp. *huettneri* F. Berger (Berger 2008).

All populations of the *G. parvulum* aggregate, as far as we found it, are domiciled in province Córdoba at altitudes between 800-1200 m. To be complete let's start with a picture of the specie *G. parvulum* ssp. *parvulum*, which we found at different locations around Mina Clavero (Fig. 2).



Fig. 2: *G. parvulum* ssp. *parvulum* in early morning sun, 1.5 km north of Nono, prov. Córdoba

### ***Gymnocalycium parvulum* ssp. *amoenum* (H. Till) F. Berger**

Described as a variety of *G. parvulum* by Hans Till in 1994, Franz Berger changed the status of this taxon to subspecies (Berger, 2008). We found several location of *G. parvulum* ssp. *amoenum* between Las Palmas and La Mudana (Fig. 1). The soil is always rocky, filled up with weathered material and gravel. The plants are quite often numerous, except the population in the very north of



the distribution area at La Mudana. There, *ssp. amoenum* shares the habitat with *G. gaponii* Neuhuber and *G. horridispinum* Frank ex H. Till (Fig. 16-19). Whereas *G. horridispinum* prefers the clefts, *G. gaponii* and *G. parvulum ssp. amoenum* grow at La Mudana under bushes in the sediment of rocks. We found a lot of fruits, very often only one per head.



Fig. 3-4: *G. parvulum ssp. amoenum*, Las Palmas



Fig. 5-6: *G. parvulum ssp. amoenum*, Las Palmas



Fig. 7-8: *G. parvulum ssp. amoenum*, Las Palmas



Fig. 9-10: habitat, Las Palmas



Fig. 11: *Trichocereus candicans* accompanying *G. parvulum* ssp. *amoenum*, Las Palmas



Fig. 12: *G. parvulum* ssp. *amoenum*, 2 km north of Las Palmas



Fig. 13-14: *G. parvulum* ssp. *amoenum*, 2 km north of Las Palmas





Fig. 15: habitat, 2 km north of Las Palmas



Fig. 16: *G. parvulum ssp. amoenum* (right) and *G. gaponii* (left), La Mudana



Fig. 17-18: *G. gaponii* and *G. horridispinum* grow together with *G. parvulum ssp. amoenum*, La Mudana



Fig. 19: *G. horridispinum*, La Mudana



Fig. 20: habitat near La Mudana

### **Gymnocalycium parvulum ssp. huettneri F. Berger**

*G. parvulum ssp. huettneri* comes from the very north of the distribution area of *G. parvulum* – around San Pedro Norte. It grows on flat stony hills together with *G. valnicekianum* var. *bicolor* (Schütz) H. Till & Amerhauser, the almost ubiquitous *Notocactus submammulosus*, *Wigginsia* spec. and even a small *Frailea* spec. Like the other taxa of *G. parvulum*, *ssp. huettneri* has black seeds without a detaching cuticle. Here again, we found a lot of ripe fruits.



Fig. 21-22: *G. parvulum ssp. huettneri* with flower, 12 km west of San Pedro Norte



Fig. 23-24: *G. parvulum ssp. huettneri* with fruit, 12 km west of San Pedro Norte



Fig. 25-26: *G. parvulum ssp. huettneri*, 12 km west of San Pedro Norte



Fig. 27-28: habitat of *G. parvulum* ssp. *huettneri*, 12 km west of San Pedro Norte



Fig. 29-30: *G. parvulum* ssp. *huettneri*, 3 km north of San Pedro Norte



Fig. 31-32: *G. bicolor*, 3 km north of San Pedro Norte



Fig. 33: further accompanying cacti are *Notocactus submammulosus* and a *Wigginsia*



Fig. 34: habitat, 3 km north of San Pedro Norte

### ***Gymnocalycium parvulum* ssp. *agnesiae* F. Berger**

*Gymnocalycium parvulum* ssp. *agnesiae* F. Berger was described last (Berger 2010). Soil and habitat are similar to that at the locations of the first two subspecies. Here, the accompanying *Gymnocalycium* is *G. mostii* var. *bicolor* (Schütz) H. Till & Amerhauser. The plants are sometimes almost covered by *Selaginella*.



Fig. 35-36: *Gymnocalycium parvulum* ssp. *agnesiae*, 3 km north-east of Ischilin Viejo



Fig. 37-38: *G. parvulum* ssp. *agnesiae*, 3 km north-east of Ischilin Viejo



Fig. 39-40: *G. parvulum* ssp. *agnesiae*, 3 km north-east of Ischilin Viejo



Fig. 41: *G. mostii* fa. *genseri* n.n., same location



Fig. 42: habitat, 3 km north-east of Ischilin Viejo



Fig. 43-44: *G. parvulum ssp. agnesiae*, 4 km north-east of Ischilin Viejo



Fig. 45-46: *G. parvulum ssp. agnesiae*, 4 km north-east of Ischilin Viejo



Fig. 47-48: *G. mostii fa. genseri n.n.* occurs very frequently, 4 km north-east of Ischilin Viejo





Fig. 49-50: habitat, 4 km north-east of Ischilin Viejo

#### DISCUSSION:

Comparing the three subspecies with *G. parvulum* at home with cultivated plants, it seems that the subspecies are more closely related to each other than to *G. parvulum ssp. parvulum*. The seedlings are more similar and also the flowers of the subspecies as well. Bercht (2010) very recently discussed this problem in Succulenta.

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